UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/325,225	**08/21/2024 11:13:07 AM Z ET**	**RARETRG 12US**

Title of Invention

FIREARM TRIGGER MECHANISM

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	12038247
CONFIRMATION #	5749	FILED BY	Laura Koehler
PATENT CENTER #	66867283	FILING DATE	05/30/2023
CUSTOMER #	26875	FIRST NAMED INVENTOR	Mr. Brian A. Blakley
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Wayne Jacobs

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
RARETRG-12US_Letter Calling Attention to Error.pdf	2	Miscellaneous Incoming Letter	17 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
RARETRG-12US_Letter Calling Attention to Error.pdf	0C63972032EB64744AD4190EC062973C86BFE7BB06FC9623B3EA300E0285EA02FB756E8BCC94D5FAD50B2D9884C5ABE6F4E99F99573B9C8F4D2ED6D9EA599742

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Docket No.: RARETRG-12US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Letters Patent of:
Brian A. Blakley

Patent No.: 12,038,247

Issued: July 16, 2024

For: FIREARM TRIGGER MECHANISM

LETTER CALLING ATTENTION TO ERRORS IN PATENT

Mailstop Post Issue
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

It is respectfully requested that this letter calling attention to the following errors in this patent be made of record in the patent file:

Column 9, lines 17-19, should read: "… As the cam 72 pivots counter-clockwise, the cam lobe 78 may act upon the cam ….".

Since these errors are not believed to affect the true meaning or scope of the claim(s), a Certificate of Correction is not indicated; however, it is requested that this Letter Calling Attention to Errors in Patent be placed in the file wrapper of the above-identified Letters Patent in order to complete the record.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 23-3000, under Order No. RARETRG-12US from which the undersigned is authorized to draw.

Dated: August 21, 2024

Respectfully submitted,

Electronic signature: /Wayne L. Jacobs/
Wayne L. Jacobs
Registration No.: 35,553
WOOD HERRON & EVANS LLP
600 Vine Street, Suite 2800
Cincinnati, Ohio 45202-2409
(513) 241-2324
(513) 241-6234 (Fax)
Attorney for Applicant

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/325,225	05/30/2023	Brian A. Blakley	RARETRG 12US	5749

26875 7590 07/16/2024
WOOD, HERRON & EVANS, LLP
600 VINE STREET
SUITE 2800
CINCINNATI, OH 45202

EXAMINER
TILLMAN, JR, REGINALD S

ART UNIT	PAPER NUMBER
3641	

NOTIFICATION DATE	DELIVERY MODE
07/16/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptodock@whe-law.com

APPLICATION NO.	ISSUE DATE	PATENT NO.
18/325,225	16-Jul-2024	12038247

WOOD, HERRON & EVANS, LLP
600 VINE STREET
CINCINNATI, OH 45202

EGRANT NOTIFICATION

Your electronic patent grant (eGrant) is now available, which can be accessed via Patent Center at https://patentcenter.uspto.gov

The electronic patent grant is the official patent grant under 35 U.S.C. 153. For more information, please visit https://www.uspto.gov/electronicgrants

Atrius Ex. 1002--0006

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/325,225	07/16/2024	12038247	RARETRG 12US	5749

26875 7590 06/26/2024

WOOD, HERRON & EVANS, LLP
600 VINE STREET
SUITE 2800
CINCINNATI, OH 45202

ISSUE NOTIFICATION

The projected patent number and issue date are specified above. The patent will issue electronically. The electronically issued patent is the official patent grant pursuant to 35 U.S.C. § 153. The patent may be accessed on or after the issue date through Patent Center at https://patentcenter.uspto.gov/. The patent will be available in both the public and the private sides of Patent Center. Further assistance in electronically accessing the patent, or about Patent Center, is available by calling the Patent Electronic Business Center at 1-888-217-9197.

The USPTO is implementing electronic patent issuance with a transition period, during which period the USPTO will mail a ceremonial paper copy of the electronic patent grant to the correspondence address of record. Additional copies of the patent (i.e., certified and presentation copies) may be ordered for a fee from the USPTO's Certified Copy Center at https://certifiedcopycenter.uspto.gov/index.html. The Certified Copy Center may be reached at (800)972-6382.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Center (https://patentcenter.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

Atrius Ex. 1002--0007

INVENTOR(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional inventors):

Mr.Brian A. Blakley, Pinellas Park, FL;

APPLICANT(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional applicants):

ABC IP, LLC, Dover, DE;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/325,225	06/17/2024 10:28:09 AM Z ET	RARETRG 12US

Title of Invention

FIREARM TRIGGER MECHANISM

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5749	FILED BY	Jane Walker
PATENT CENTER #	65991819	AUTHORIZED BY	Glenn Bellamy
CUSTOMER #	26875	FILING DATE	05/30/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Mr. Brian A. Blakley

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 8789	E20246GA28556016	Jane Walker

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2501	UTILITY ISSUE FEE	480.00	1	480.00
			TOTAL AMOUNT:	$480.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage

submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/325,225	**06/17/2024 10:28:09 AM Z ET**	**RARETRG 12US**

Title of Invention

FIREARM TRIGGER MECHANISM

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5749	FILED BY	Jane Walker
PATENT CENTER #	65991819	FILING DATE	05/30/2023
CUSTOMER #	26875	FIRST NAMED INVENTOR	Mr. Brian A. Blakley
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Glenn Bellamy

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
RARETRG-12US Issue Fee Transmittal.pdf	1	Issue Fee Payment (PTO-85B)	239 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
RARETRG-12US Issue Fee Transmittal.pdf	3E3781E65F9CC7945C255FA83544293FAC06115DF2F84AF156B2E7C2979246D20AF0317AC3C0973A9F458DADE57C318AF089ABA09898692C265226C6DE34E6EE

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized

by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PART B–FEE(S) TRANSMITTAL

Complete and send this form, together with the applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

By fax, send to: (571) 273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

WOOD HERRON & EVANS LLP
600 Vine Street, Suite 2800
Cincinnati, Ohio 45202-2409

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

Glenn D. Bellamy	(Typed or printed name)
/Glenn D. Bellamy/	(Signature)
June 17, 2024	(Date)

APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
18/325,225	05/30/2023	Brian A. Blakley	RARETRG-12US	5749

TITLE OF INVENTION: FIREARM TRIGGER MECHANISM

APPLN: TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480.00			$480.00	08/22/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
R. S. Tillman	3641	042-069.010

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363)

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. Wood Herron & Evans LLP
2.
3.

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: ABC IP, LLC

(B) RESIDENCE: (CITY and STATE or COUNTRY): Dover, Delaware

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees Submitted: ☒ Issue Fee ☐ Publication Fee (if required)

4b. Method of Payment (*Please first reapply any previously paid fee shown above*):

☒ Electronic Payment via the USPTO patent electronic filing system ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 23-3000

5. Change of Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29. NOTE: Absent a valid Certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

☐ Applicant asserting small entity status. See 37 CFR 1.27. NOTE: If the application was previously under micro entity status, checking this box will be taken as a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status. NOTE: Checking this box will be taken as a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature: /Glenn D. Bellamy/ Date: June 17, 2024

Typed or printed name: Glenn D. Bellamy Registration No.: 32,887

Atrius Ex. 1002--0013

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/325,225	**05/23/2024 10:55:55 AM Z ET**	**RARETRG 12US**

Title of Invention

FIREARM TRIGGER MECHANISM

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5749	FILED BY	Jane Walker
PATENT CENTER #	65642791	FILING DATE	05/30/2023
CUSTOMER #	26875	FIRST NAMED INVENTOR	Mr. Brian A. Blakley
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Glenn Bellamy

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
RARETRG-12US Comments Reasons for Allowance 05-22-2024.pdf	2	Post Allowance Communication - Incoming	163 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
RARETRG-12US Comments Reasons for Allowance 05-22-2024.pdf	23934E210164511FCAFEEC818C2AC25CB7AD0B32003329EDD54FB99C64D4B16C419336016278A19C137D9ABE09A8ABA991C369CFC500A6D12ACDDC619A3AE87C

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Docket No.: RARETRG-12US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Brian A. Blakley

Application No.: 18/325,225 Confirmation No.: 5749

Filed: May 30, 2023 Art Unit: 3641

For: FIREARM TRIGGER MECHANISM Examiner: Reginald S. Tillman, Jr.

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

COMMENTS ON EXAMINER'S REASONS FOR ALLOWANCE

The Notice of Allowability mailed May 22, 2024, included the Examiner's Statement of Reasons for Allowance. The Applicant agrees that the claims are patentable. However, the Applicant takes no position regarding patentability other than positions taken during prosecution to secure allowance of the claims. Therefore, the Examiner's Reasons for Allowance should not be attributed to the Applicant as an indication of the basis for Applicant's belief that the claims are patentable. To the extent that the Statement summarizes or paraphrases the claims, the Applicant respectfully submits that the meaning and scope of the claims depend on the actual language of the claims. Furthermore, to the extent that the Statement refers to only selected portions of a claim, the Applicant points out that the claims may contain additional limitations other than the ones mentioned in the Statement, and that patentability is measured against a claim as a whole, not just selected limitations. Other limitations alone or in combination may provide distinguishing aspects over the prior art. To the extent that the Statement suggests that the mentioned limitations have any special prominence, the Applicant respectfully disagrees. Moreover, the dependent claims may include additional limitations that may also provide further reasons for patentability. Finally, the Applicant respectfully asserts that there may also be additional reasons for patentability of the claimed subject matter not explicitly stated in this record and

the Applicant does not waive its right to such arguments by not further addressing such reasons herein.

The Statement at pages 2-5 also makes several assertions regarding the scope and content of several of the cited references. By paying the issue fee, the Applicant makes no concessions or admissions regarding the scope and content of the items of record.

No disavowal of claim scope is made either by the above comments or by silence regarding any aspects of the Statement. *Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1347 (Fed. Cir, 2005).

Applicant submits that no fee is due with this Response. However, if any fee is due, please charge our Deposit Account No. 23-3000, under Order No. RARETRG-12US, from which the undersigned is authorized to draw.

Dated: May 23, 2024

Respectfully submitted,

Electronic signature: /Glenn D. Bellamy/
Glenn D. Bellamy
Registration No.: 32887
WOOD HERRON & EVANS LLP
600 Vine Street, Suite 2800
Cincinnati, Ohio 45202-2409
(513) 241-2324
(513) 241-6234 (Fax)
Attorney for Applicant

Atrius Ex. 1002--0017

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

26875 7590 05/22/2024
WOOD, HERRON & EVANS, LLP
600 VINE STREET
SUITE 2800
CINCINNATI, OH 45202

EXAMINER	
TILLMAN, JR, REGINALD S	
ART UNIT	PAPER NUMBER
3641	

DATE MAILED: 05/22/2024

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/325,225	05/30/2023	Brian A. Blakley	RARETRG 12US	5749

TITLE OF INVENTION: FIREARM TRIGGER MECHANISM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0.00	$0.00	$480	08/22/2024

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

Atrius Ex. 1002--0018

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26875 7590 05/22/2024
WOOD, HERRON & EVANS, LLP
600 VINE STREET
SUITE 2800
CINCINNATI, OH 45202

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/325,225	05/30/2023	Brian A. Blakley	RARETRG 12US	5749

TITLE OF INVENTION: FIREARM TRIGGER MECHANISM

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0.00	$0.00	$480	08/22/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
TILLMAN, JR, REGINALD S	3641	042-069010

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via the USPTO patent electronic filing system ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

❑ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

❑ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

Atrius Ex. 1002--0019

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/325,225	05/30/2023	Brian A. Blakley	RARETRG 12US	5749

26875 7590 05/22/2024

WOOD, HERRON & EVANS, LLP
600 VINE STREET
SUITE 2800
CINCINNATI, OH 45202

EXAMINER	
TILLMAN, JR, REGINALD S	
ART UNIT	PAPER NUMBER
3641	

DATE MAILED: 05/22/2024

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Atrius Ex. 1002--0020

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/ owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013).
https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to:

1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
2) a federal, state, local, or international agency, in response to its request;
3) a contractor of the USPTO having need for the information in order to perform a contract;
4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));
9) the Office of Personnel Management (OPM) for personnel research purposes; and
10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Notice of Allowability	Application No. 18/325,225	Applicant(s) Blakley, Brian A.	
	Examiner REGINALD S TILLMAN, JR	Art Unit 3641	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to Application Filing of 5-30-23.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-23 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 8-31-23.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/REGINALD S TILLMAN, JR/
Primary Examiner, Art Unit 3641

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Allowable Subject Matter

2. The following is an examiner's statement of reasons for allowance:

In regards to independent claims 1, 4, 9, 14, and 20, the closest prior art is to Blakley (US 7,398,723), provided by applicant. Blakley (Fig 1) discloses a firearm trigger mechanism comprising: a hammer (56) having a sear catch (52) and a hook (54) for engaging a disconnector and adapted to be mounted in a fire control mechanism pocket of a receiver to pivot on a transverse hammer pivot axis between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of a bolt carrier, a trigger member (Fig 1) having a sear (34) and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions, wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member, a disconnector (44) having a hook for engaging said hammer and adapted to be mounted in the fire control mechanism pocket to pivot on said transverse trigger member pivot axis, a cam (66) having a cam lobe (71) and adapted to be mounted in the fire control mechanism pocket to pivot on a

transverse cam pivot axis, said cam being pivotable between a first position at which said cam lobe does not force said trigger member towards said set position and a second position at which said cam lobe does force said trigger member towards said set position.

Blakley does not show, however, a safety selector adapted to be mounted in the fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions, whereupon in said standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member towards said set position but prior to reaching said set position said disconnector hook catches said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to pivot to said first position, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire the firearm, and whereupon in said forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member to said set position, said safety selector preventing said disconnector hook from catching

said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to pivot to said first position, at which time the user can pull said trigger member to fire the firearm without manually releasing said trigger member; and there is no teaching in the prior art that would have motivated one of ordinary skill in the art to modify Blakley in such a manner.

In regards to independent claim 15, the closest prior art is to Blakley (US 7,398,723), provided by applicant. Blakley discloses a firearm trigger mechanism comprising :a hammer having a sear catch and a hook for engaging a disconnector and adapted to be mounted in a fire control mechanism pocket of a receiver to pivot on a transverse hammer pivot axis between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of a bolt carrier, a trigger member having a sear and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions, wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member, said disconnector having a hook for engaging said hammer and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse disconnector pivot axis, and a cam having a cam lobe and adapted to be movably mounted in the fire control mechanism pocket, said cam being movable between a first position and a

second position, in said second position said cam lobe forces said trigger member towards said set position.

Blakley does not show, however, a trigger mechanism whereupon in a standard semi-automatic mode, said cam is in said first position, rearward movement of the bolt carrier causes rearward pivoting of said hammer such that said disconnector hook catches said hammer hook, and thereafter the bolt carrier moves forward into battery, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire the firearm, and whereupon in a forced reset semi-automatic mode, said cam is in said second position, rearward movement of the bolt carrier causes rearward pivoting of said hammer such that said disconnector hook is prevented from catching said hammer hook, and thereafter the bolt carrier moves forward into battery, at which time the user can pull said trigger member to fire the firearm; and there is no teaching in the prior art that would have motivated one of ordinary skill in the art to modify Blakley in such a manner.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to REGINALD S TILLMAN, JR whose telephone number is (571)270-7010. The examiner can normally be reached M-F 830-530.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Troy Chambers can be reached on 571-272-6874. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/REGINALD S TILLMAN, JR/
Primary Examiner, Art Unit 3641

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/325,225	Blakley, Brian A.
	Examiner	**Art Unit**
	REGINALD S TILLMAN, JR	3641

CPC						
Symbol					**Type**	**Version**
F41A	/	19	/	45	F	2013-01-01
F41A	/	17	/	46	I	2013-01-01
F41A	/	19	/	10	I	2013-01-01
F41A	/	19	/	16	I	2013-01-01
F41A	/	19	/	15	A	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	23	
/REGINALD S TILLMAN, JR/ Primary Examiner, Art Unit 3641	11 May 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	15	7

U.S. Patent and Trademark Office

Part of Paper No.: 20240511

Atrius Ex. 1002--0029

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/325,225	Blakley, Brian A.
	Examiner	**Art Unit**
	REGINALD S TILLMAN, JR	3641

INTERNATIONAL CLASSIFICATION				
CLAIMED				
F41A19/45	/	19	/	45
F41A17/46	/	17	/	46
F41A19/10	/	19	/	10
F41A19/16	/	19	/	16
F41A19/15	/	19	/	15

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	23	
/REGINALD S TILLMAN, JR/ Primary Examiner, Art Unit 3641	11 May 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	15	7

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/325,225	Blakley, Brian A.
	Examiner	**Art Unit**
	REGINALD S TILLMAN, JR	3641

☑ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	23	
/REGINALD S TILLMAN, JR/ Primary Examiner, Art Unit 3641	11 May 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	15	7

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/325,225	Blakley, Brian A.
	Examiner	Art Unit
	REGINALD S TILLMAN, JR	3641

CPC - Searched*		
Symbol	Date	Examiner
F41A19/10; F41A19/45; F41A19/15; F41A17/46	05/11/2024	RST

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
42	69.01; 69.03	05/11/2024	RST

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Applicant; Assignee; Inventor; IDS; Internet	05/11/2024	RST

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	see attached	05/11/2024	RST

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	1	18/325225.app.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/09 11:39 AM
L2	140	("10002500"|"10006734"|"10030924"|"10077960"|"10107580"|"10254067"|"10267584"|"10330413"|"10488136"|"10502511"|"10514223"|"10584932"|"11287205"|"11293715"|"11346627"|"11724003"|"20060048426"|"20060101695"|"20070051236"|"20070199435"|"20090151213"|"20090188145"|"20110209607"|"20130118343"|"20140311004"|"20160010933"|"20160102933"|"20160161202"|"20170176124"|"20170219307"|"20170276447"|"20170284761"|"20170299309"|"20170328663"|"20180066911"|"20180087860"|"20180112944"|"20180195823"|"20180202740"|"20180231342"|"20210222974"|"2765562"|"3045555"|"3292492"|"3301133"|"3670442"|"4023465"|"4057003"|"4151670"|"4276808"|"4433610"|"4463654"|"4516466"|"4580484"|"4656993"|"4658702"|"4693170"|"4697495"|"4787288"|"4937964"|"5149898"|"5183959"|"5223649"|"5339721"|"5517897"|"5614691"|"5623114"|"5682699"|"5701698"|"5704153"|"5760328"|"5770814"|"6101918"|"6360467"|"6601331"|"6718680"|"6722072"|"6851346"|"6889459"|"6976416"|"7051638"|"7162824"|"7213359"|"7293385"|"7337	(US-PGPUB; USPAT)	ADJ	ON	ON	2024/05/10 10:40 AM

		574"|"7347021"|"73987 23"|"7421937"|"763495 9"|"7661220"|"7806039" |"8037805"|"8112928"|" 8127658"|"8156854"|"8 443537"|"8464454"|"84 90309"|"8667881"|"869 5477"|"8720096"|"8820 211"|"8893607"|"89252 34"|"8985006"|"901618 7"|"9021732"|"9021733" |"9052150"|"9121661"|" 9146066"|"9146067"|"9 182189"|"9228786"|"93 10150"|"9347726"|"944 8023"|"9476660"|"9513 076"|"9568264"|"96182 88"|"9618289"|"962523 1"|"9631886"|"9651329" |"9658007"|"9683800"|" 9733031"|"9759504"|"9 777980"|"9810493"|"98 10496"|"9816772"|"982 9263"|"9835398"|"9863 730"|"9869522"|"98744 17"|"9927197"|"993922 1").PN.					
L3	7	(abc ip).aanm,as.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 01:54 PM
L4	688	blakley.in.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 01:55 PM
L5	2	4 AND f41a$.cpc.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 01:55 PM
L6	2139	f41a19/10.cpc.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 01:55 PM
L7	491	f41a19/45.cpc.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO);	ADJ	ON	ON	2024/05/11 03:00 PM

			FPRS; EPO; JPO)				
L8	411	7 NOT 6	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 03:00 PM
L9	809	f41a19/15.cpc.	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 03:13 PM
L10	538	9 NOT (7 OR 6)	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 03:13 PM
L11	1826	f41a17/46.cpc.	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 03:23 PM
L12	1459	11 NOT (9 OR 7 OR 6)	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 03:23 PM
L13	1179	42/69.01.ccls.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 03:48 PM
L14	788	13 NOT (11 OR 9 OR 7 OR 6)	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 03:48 PM
L15	146	("2765562" | "3045555" | "3292492" | "3301133" | "3670442" | "4023465" | "4057003" | "4151670" | "4276808" | "4433610" | "4463654" | "4516466" | "4580484" | "4656993" | "4658702" | "4693170" | "4697495" | "4787288" | "4937964" | "5149898" | "5183959" | "5223649" | "5339721" | "5517897"	(US-PGPUB; USPAT; USOCR)	ADJ	ON	ON	2024/05/11 04:29 PM

		| "5614691" | "5623114" | "5682699" | "5701698" | "5704153" | "5760328" | "5770814" | "6101918" | "6360467" | "6601331" | "6718680" | "6722072" | "6851346" | "6889459" | "6976416" | "7051638" | "7162824" | "7213359" | "7293385" | "7337574" | "7347021" | "7398723" | "7421937" | "7634959" | "7661220" | "7806039" | "8037805" | "8112928" | "8127658" | "8156854" | "8443537" | "8464454" | "8490309" | "8667881" | "8695477" | "8720096" | "8820211" | "8893607" | "8925234" | "8985006" | "9016187" | "9021732" | "9021733" | "9052150" | "9121661" | "9146066" | "9146067" | "9182189" | "9228786" | "9310150" | "9347726" | "9448023" | "9476660" | "9513076" | "9568264" | "9618288" | "9618289" | "9625231" | "9631886" | "9651329" | "9658007" | "9683800" | "9733031" | "9759504" | "9777980" | "9810493" | "9810496" | "9816772" | "9829263" | "9835398" | "9863730" | "9869522" | "9874417" | "9927197" | "9939221" | "10002500" | "10006734" | "10030924" | "10077960" | "10107580" | "10254067" | "10267584" | "10330413" | "10488136" | "10502511" | "10514223" | "10584932" | "10816297" | "11287205" | "11293715" | "11346627" | "20060048426" | "20060101695" | "20070051236" | "20070199435" |				

		"20090151213" | "20090188145" | "20110209607" | "20130118343" | "20140311004" | "20160010933" | "20160102933" | "20160161202" | "20170176124" | "20170219307" | "20170276447" | "20170284761" | "20170299309" | "20170328663" | "20180066911" | "20180087860" | "20180112944" | "20180195823" | "20180202740" | "20180231342" | "20200191513" | "20210222974" | "20220364812").pn. OR ("11724003").urpn. AND (PGPB | USPT | USOC).dbnm.					
L16	32	("5704153" | "6101918" | "6722072" | "7162824" | "7213359" | "7293385" | "7398723" | "8127658" | "8820211" | "9021732" | "9513076" | "9568264" | "9816772" | "9939221" | "20070199435" | "20160010933" | "20160102933" | "20170219307" | "20180066911" | "20180087860").pn. OR ("10514223").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	ADJ	ON	ON	2024/05/11 04:31 PM
L17	28	("6101918" | "6722072" | "7162824" | "7213359" | "7293385" | "7398723" | "8127658" | "8820211" | "9021732" | "9146067" | "9568264" | "9816772" | "9939221" | "10006734" | "10254067" | "10267584" | "10488136" | "10502511" | "10514223" | "10584932" | "11002500" |	(US-PGPUB; USPAT; USOCR)	ADJ	ON	ON	2024/05/11 04:32 PM

		"11287205" | "11293715" | "20160102933" | "20180066911" | "20210022974").pn. OR ("11346627").urpn. AND (PGPB | USPT | USOC).dbnm.					
L18	38	("4004496" | "5501134" | "5680724" | "5881485" | "6131324" | "6615527" | "7331136" | "7398723" | "7421937" | "7600338" | "7854084" | "8047119" | "8069602" | "8074393" | "8667881" | "20030126781" | "20030136041" | "20060086031" | "20070051236" | "20090183414" | "20090188145" | "20100281739" | "20110099871" | "20110167697" | "20110185615" | "20120180356").pn. OR ("9146067").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	ADJ	ON	ON	2024/05/11 04:33 PM
L19	32	("2009/0188145").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	ADJ	ON	ON	2024/05/11 04:36 PM
L20	59	("000H107" | "4433610" | "4658702" | "5623114").pn. OR ("5881485").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	ADJ	ON	ON	2024/05/11 04:38 PM
L21	51	("4023465" | "4057003" | "4463654" | "4580484" | "4697495" | "4787288" | "5614691" | "6101918").pn. OR ("7398723").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	ADJ	ON	ON	2024/05/11 04:43 PM
L22	32	("5704153" | "6101918" | "6722072" | "7162824" | "7213359" | "7293385" | "7398723" | "8127658" | "8820211" | "9021732" | "9513076" | "9568264" | "9816772" | "9939221" | "20070199435" | "20160010933" |	(US-PGPUB; USPAT; USOCR)	ADJ	ON	ON	2024/05/11 05:08 PM

		"20160102933" | "20170219307" | "20180066911" | "20180087860").pn. OR ("10514223").urpn. AND (PGPB | USPT | USOC).dbnm.					
L23	28	("6101918" | "6722072" | "7162824" | "7213359" | "7293385" | "7398723" | "8127658" | "8820211" | "9021732" | "9146067" | "9568264" | "9816772" | "9939221" | "10006734" | "10254067" | "10267584" | "10488136" | "10502511" | "10514223" | "10584932" | "11002500" | "11287205" | "11293715" | "20160102933" | "20180066911" | "20210022974").pn. OR ("11346627").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	ADJ	ON	ON	2024/05/11 05:13 PM
L24	225	("0804986" | "0980980" | "1202707" | "1227439" | "1357949" | "1363262" | "1402459" | "1413409" | "1431059" | "1476657" | "1500580" | "1588887" | "1771311" | "1907164" | "1946388" | "2088268" | "2096028" | "2147208" | "2217848" | "2287066" | "2345031" | "2361985" | "2365306" | "2365392" | "2376466" | "2391756" | "2429204" | "2462119" | "2482880" | "2488233" | "2495460" | "2503116" | "2510685" | "2589274" | "2712192" | "2756640" | "2910332" | "2918848" | "2981154" | "3043198" | "3090148" | "3090149" | "3198076" | "3226869" | "3236155" | "3283435" | "3290815" | "3300889" | "3318192" | "3330183" | "3333510" | "3345771" | "3346982" | "3366011"	(US-PGPUB; USPAT; USOCR)	ADJ	ON	ON	2024/05/11 05:14 PM

		| "3381405" | "3429223" | "3440751" | "3604142" | "3641691" | "3672089" | "3688641" | "3795173" | "3969983" | "3977114" | "3990348" | "4020740" | "4057003" | "4127954" | "4142314" | "4150819" | "4279091" | "4388773" | "4416186" | "4428137" | "4440062" | "4446645" | "4448109" | "4505182" | "4524672" | "4589218" | "4765224" | "4769938" | "4833970" | "4910904" | "4986018" | "5155284" | "5168648" | "5267406" | "5343649" | "5448940" | "5495687" | "5561933" | "5617664" | "5634288" | "5726377" | "5827992" | "5900577" | "5909002" | "5920028" | "6340161" | "6484430" | "6606812" | "6609319" | "6722255" | "6829974" | "6848351" | "6898888" | "6931978" | "7117626" | "7275472" | "7293385" | "7464496" | "7627974" | "7793453" | "7823314" | "7827722" | "7832326" | "7886470" | "7938055" | "8028611" | "8061071" | "8087194" | "8141285" | "8205373" | "8210089" | "8261653" | "8297175" | "8316756" | "8365454" | "8561337" | "8887426" | "9097478" | "9217615" | "20030154640" | "20030188567" | "20040128898" | "20050260545" | "20050262752" | "20070051236" | "20070199435" | "20080092733" | "20080134557" | "20080168695" | "20090031607" | "20090071053" | "20090151213" | "20100095833" | "20100126053" | "20100163250" | "20100269389" | "20100300278" |				

		"20110005384" | "20110173857" | "20120131831" | "20120137869" | "20120152105" | "20130111794" | "20130111796" | "20130139424" | "20140075798" | "20150059221" | "20150253094").pn. OR ("10488136").urpn. AND (PGPB | USPT | USOC).dbnm.					
L25	48	89/146.ccls.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 05:17 PM
L26	330	89/148.ccls.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 05:18 PM
L27	286	26 NOT (13 OR 11 OR 9 OR 7 OR 6)	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 05:19 PM
L28	408	42/69.03.ccls.	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 05:48 PM
L29	272	28 NOT (26 OR 13 OR 11 OR 9 OR 7 OR 6)	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	ADJ	ON	ON	2024/05/11 05:48 PM
L30	61	("5074190" | "6131324" | "6772548" | "6966138" | "20090188145" | "20110167697").pn. OR ("8667881").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	ADJ	ON	ON	2024/05/11 05:58 PM
L31	4	"6,101,918".pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP,	ADJ	ON	ON	2024/05/11 06:07 PM

			KR, OA, RU, SU, WO); FPRS; EPO; JPO)				

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	1	(trigger mechanism AND disconnector AND cam AND safety selector).clm.	(US-PGPUB; USPAT)	ADJ	ON	ON	2024/05/11 06:13 PM

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7398723		2008-07-15	Blakley, Brian A.	
	2	9568264		2017-02-14	Graves, Thomas Allen	
	3	9816772		2017-11-14	Graves, Thomas Allen	
	4	9939221		2018-04-10	Graves, Thomas Allen	
	5	10514223		2019-12-24	Rounds, Jeffrey Cooper	
	6	11346627		2022-05-31	DeMonico, Lawrence	
	7	11724003		2023-08-15	Strbac, Mladen Thomas	
	8	2765562		1956-10-09	ROPER et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325223
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	9	3045555		1962-07-24	STONER EUGENE M	
	10	3292492		1966-12-20	STURTEVANT FOSTER E	
	11	3301133		1967-01-31	STURTEVANT FOSTER E	
	12	3670442		1972-06-20	Kennedy et al.	
	13	4023465		1977-05-17	Inskip, Thomas C.	
	14	4151670		1979-05-01	Rath, Hans M.	
	15	4057003		1977-11-08	Atchisson, Maxwell G.	
	16	4276808		1981-07-07	York, Norman N.	
	17	4433610		1984-02-28	Tatro, Henry J.	
	18	4463654		1984-08-07	Barnes et al.	
	19	4516466		1985-05-14	Jennie, Fred	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	20	4580484		1986-04-08	Moore, Wildey J.	
	21	4656993		1987-04-14	Yuzawa et al.	
	22	4658702		1987-04-21	Tatro, Henry J.	
	23	4693170		1987-09-15	Atchisson, Maxwell G.	
	24	4697495		1987-10-06	Beretta, Pier G.	
	25	4787288		1988-11-29	Miller, Clifford E.	
	26	4937964		1990-07-03	Crandall, David L.	
	27	5149898		1992-09-22	Chesnut et al.	
	28	5183959		1993-02-02	McCoan et al.	
	29	5223649		1993-06-29	Claridge, Joseph M.	
	30	5339721		1994-08-23	Beretta, Pier G.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	31	5517897		1996-05-21	Perrine, Walter E.	
	32	5614691		1997-03-25	Taylor, James M.	
	33	5623114		1997-04-22	Soper, Terry A.	
	34	5682699		1997-11-04	Gentry, Roger	
	35	5701698		1997-12-30	Wesp et al.	
	36	5704153		1998-01-06	Kaminski et al.	
	37	5760328		1998-06-02	Robbins, Laurance E.	
	38	5770814		1998-06-23	Ealovega, George D.	
	39	6101918		2000-08-15	Akins, William	
	40	6360467		2002-03-26	Knight, William A.	
	41	6601331		2003-08-05	Salvitti, Alfred W.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	42	6718680		2004-04-13	Roca et al.	
	43	6722072	B1	2004-04-20	McCormick, Michael L.	
	44	6851346		2005-02-08	Herring, Geoffrey A.	
	45	6889459		2005-05-10	Salvitti, Alfred W.	
	46	6976416		2005-12-20	Ealovega, George D.	
	47	7051638		2006-05-30	Thomele, Adrian	
	48	7162824	B1	2007-01-16	McCormick, Michael L.	
	49	7213359		2007-05-08	Beretta, Ugo Gussalli	
	50	7293385	B2	2007-11-13	McCormick, Michael L.	
	51	7337574		2008-03-04	Crandall et al.	
	52	7347021		2008-03-25	Jones, C. Barry	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	53	7421937		2008-09-09	Gangl, John	
	54	7634959		2009-12-22	Frickey, Steven J.	
	55	7661220		2010-02-16	Crandall et al.	
	56	7806039		2010-10-05	Gomez, Jesus S	
	57	8037805		2011-10-18	Neroni, Randy A.	
	58	8112928		2012-02-14	Keough, Ronald William	
	59	8156854		2012-04-17	Brown, Michael J.	
	60	8127658		2012-03-06	Cottle, Jeremiah	
	61	8443537		2013-05-21	Curry, Brett	
	62	8464454		2013-06-18	Martin et al.	
	63	8490309		2013-07-23	Zukowski, Gary	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	64	8667881		2014-03-11	Hawbaker, Peter Jonathan	
	65	8695477		2014-04-15	Esch, Brian	
	66	8720096		2014-05-13	Siddle, Kevin	
	67	8820211		2014-09-02	Hawbaker, Peter Jonathan	
	68	8893607		2014-11-25	Audibert et al.	
	69	8925234		2015-01-06	Barrett, Christopher Gene	
	70	8985006		2015-03-24	Christensen et al.	
	71	9016187		2015-04-28	Findlay, David S.	
	72	9021732		2015-05-05	Johnson, Julian Eric	
	73	9021733		2015-05-05	DiChario, Anthony	
	74	9052150		2015-06-09	Talasco, Eric	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	75	9121661		2015-09-01	Calvete, Angel	
	76	9146066		2015-09-29	Cason, Russell	
	77	9146067	B2	2015-09-29	Stakes, Michael A.	
	78	9182189		2015-11-10	Seigler, Stanley Hahn	
	79	9228786		2016-01-05	Sullivan et al.	
	80	9310150		2016-04-12	Geissele, William H.	
	81	9347726		2016-05-24	Thomas, Phillip Brady	
	82	9448023		2016-09-20	Sheets, Jr. et al.	
	83	9476660		2016-10-25	Potter et al.	
	84	9618288		2017-04-11	Wilson, John	
	85	9618289		2017-04-11	Geissele, William H.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	86	9625231		2017-04-18	Hass, David N.	
	87	9631886		2017-04-25	Findlay, David S.	
	88	9651329		2017-05-16	Hittmann, Karl	
	89	9513076		2016-12-06	Kolev et al.	
	90	9658007		2017-05-23	Withey, Michael	
	91	9683800		2017-06-20	Sewell, Jr. et al.	
	92	9733031		2017-08-15	Sylvester et al.	
	93	9759504		2017-09-12	Geissele, William H.	
	94	9777980		2017-10-03	Heizer, Charles K.	
	95	9810493		2017-11-07	Fluhr et al.	
	96	9810496		2017-11-07	Kolev et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	97	9829263		2017-11-28	Bonner, James Dillon	
	98	9835398		2017-12-05	Biegel, Jack Richard	
	99	9863730		2018-01-09	Elftmann, Arthur J.	
	100	9869522		2018-01-16	Larson, Jr. et al.	
	101	9874417		2018-01-23	Zajk et al.	
	102	9927197		2018-03-27	Geissele, William H.	
	103	10002500	B2	2018-06-19	Hall et al.	
	104	10006734	B1	2018-06-26	Findlay, David S.	
	105	10030924	B1	2018-07-24	Smith, Clinton Lee	
	106	10077960	B2	2018-09-18	Geissele, William H.	
	107	10107580	B2	2018-10-23	Fellows et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325228
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	108	10254067		2019-04-09	Foster, David	
	109	10267584	B2	2019-04-23	Kasanjian-King, Zackary	
	110	10330413	B2	2019-06-25	Williams et al.	
	111	10488136	B2	2019-11-26	Sullivan et al.	
	112	10502511		2019-12-10	Graves, Thomas Allen	
	113	10584932	B2	2020-03-10	Foster, David	
	114	11287205	B2	2022-03-29	Biegel, Jack Richard	
	115	11293715		2022-04-05	Newsome et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20060048426	A1	2006-03-09	Crandall, David L.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	2	20060101695	A1	2006-05-18	Longueira, Dino C.	
	3	20070051236	A1	2007-03-08	Groves et al.	
	4	20070199435	A1	2007-08-30	Hochstrate et al.	
	5	20090151213	A1	2009-06-18	Bell, Timothy L.	
	6	20090188145	A1	2009-07-30	Fluhr et al.	
	7	20110209607	A1	2011-09-01	St. George, Charles	
	8	20130118343	A1	2013-05-16	Hirt, Robert	
	9	20140311004	A1	2014-10-23	Barrett, Ronnie	
	10	20160010933	A1	2016-01-14	Bonner	
	11	20160102933	A1	2016-04-14	Graves	
	12	20160161202	A1	2016-06-09	LARUE, MARK C.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	13	20170176124	A1	2017-06-22	Wilson, John	
	14	20170219307	A1	2017-08-03	Foster, David	
	15	20170276447	A1	2017-09-28	Foster, David	
	16	20170284761	A1	2017-10-05	Lewis et al.	
	17	20170299309	A1	2017-10-19	Fellows et al.	
	18	20170328663	A1	2017-11-16	Fellows et al.	
	19	20180066911	A1	2018-03-08	Graves	
	20	20180087860	A1	2018-03-29	Sullivan et al.	
	21	20180112944	A1	2018-04-26	Underwood et al.	
	22	20180195823	A1	2018-07-12	Schafer et al.	
	23	20180202740	A1	2018-07-19	Elftmann, Jr., Arthur J.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

	24	20180231342	A1	2018-08-16	Martinez, Michael	
	25	20210222974	A1	2021-07-22	Graves, Thomas Allen	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	4008351	DE	A1	1991-09-19	Fritz, Bernhard		
	2	1678458	EP	B1	2012-02-08	Ra Brands, L.l.c		
	3	2950033	EP	B1	2016-11-23	Merkel Jagd Und Sportwaffen GmbH		
	4	409847	TW	U	2000-10-21	205th Factory, Combined Service Forces		X
	5	2016/028337	WO	A1	2016-02-25	Tubb, George		☐
	6	2018/058174	WO	A1	2018-04-05	Oceania Prec Pty Limited		☐
	7	582963	DE	C	1933-08-26	Firma, Franz Stock		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

~~ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /R.S.T/~~

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Statutory Invention Registration No. H107, Inventor: Bauer, Published Aug. 5, 1986 (8 pages)	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/REGINALD S TILLMAN, JR/	Date Considered	05/10/2024

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Wayne L. Jacobs/	Date (YYYY-MM-DD)	2023-08-31
Name/Print	Wayne L. Jacobs	Registration Number	35,553

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Bibliographic Data

Application No: 18/325,225

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /REGINALD S TILLMAN, JR/ (Examiner's Signature) ____ (Initials)

Title: FIREARM TRIGGER MECHANISM

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
05/30/2023	042	3641	RARETRG 12US
RULE			

APPLICANTS

ABC IP, LLC, Dover, DE, UNITED STATES

INVENTORS

Mr. Brian A. Blakley, Pinellas Park, FL, UNITED STATES

CONTINUING DATA

This application has PRO of 63374941 09/08/2022

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

07/03/2023

** SMALL ENTITY **

STATE OR COUNTRY

UNITED STATES

ADDRESS

WOOD, HERRON & EVANS, LLP
600 VINE STREET
SUITE 2800
CINCINNATI, OH 45202
UNITED STATES

FILING FEE RECEIVED

$856

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/325,225	**04/04/2024 01:11:06 PM Z ET**	**RARETRG 12US**

Title of Invention

FIREARM TRIGGER MECHANISM

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5749	FILED BY	Laura Koehler
PATENT CENTER #	64965389	FILING DATE	05/30/2023
CUSTOMER #	26875	FIRST NAMED INVENTOR	Mr. Brian A. Blakley
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Wayne Jacobs

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
RARETRG-12US_PrelAmend.pdf	15	Preliminary Amendment	50 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
RARETRG-12US_PrelAmend.pdf	FD170F3CB81B0EBAA466AC2541DA6221204A92139BDA93DB C3CA72DB776B4CA11DBB9CFE30930193AD3DDD7239691626 DAEFE81CCCE9F1265A20F579409666DF

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized

by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/325,225	04/04/2024 01:11:06 PM Z ET	RARETRG 12US

Title of Invention

FIREARM TRIGGER MECHANISM

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5749	FILED BY	Laura Koehler
PATENT CENTER #	64965389	AUTHORIZED BY	Wayne Jacobs
CUSTOMER #	26875	FILING DATE	05/30/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Mr. Brian A. Blakley

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 2217	E202444D12177469	Laura Koehler

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
233000	37 CFR 1.16 (National application filing, search, and examination fees); 37 CFR 1.17 (Patent application and reexamination processing fees); 37 CFR 1.19 (Document supply fees); 37 CFR 1.20 (Post Issuance fees); 37 CFR 1.21 (Miscellaneous fees and charges)

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2202	EACH CLAIM IN EXCESS OF 20	40.00	3	120.00
2201	EACH INDEPENDENT CLAIM IN EXCESS OF THREE	192.00	2	384.00
			TOTAL AMOUNT:	$504.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as

described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Docket No.: RARETRG-12US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Brian A. Blakley

Application No.: 18/325,225 Confirmation No.: 5749

Filed: May 30, 2023 Art Unit: N/A

For: FIREARM TRIGGER MECHANISM Examiner: Not Yet Assigned

PRELIMINARY AMENDMENT UNDER 37 C.F.R. § 1.115

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

INTRODUCTORY COMMENTS

Prior to examination on the merits, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 15 of this paper.

AMENDMENTS TO THE CLAIMS

1. (Original) A firearm trigger mechanism comprising:

a hammer having a sear catch and a hook for engaging a disconnector and adapted to be mounted in a fire control mechanism pocket of a receiver to pivot on a transverse hammer pivot axis between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of a bolt carrier,

a trigger member having a sear and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions,

wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member,

a disconnector having a hook for engaging said hammer and adapted to be mounted in the fire control mechanism pocket to pivot on said transverse trigger member pivot axis,

a cam having a cam lobe and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse cam pivot axis, said cam being pivotable between a first position at which said cam lobe does not force said trigger member towards said set position and a second position at which said cam lobe does force said trigger member towards said set position, and

a safety selector adapted to be mounted in the fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions,

whereupon in said standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member towards said set

Atrius Ex. 1002--0066

position but prior to reaching said set position said disconnector hook catches said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to pivot to said first position, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire the firearm, and

whereupon in said forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member to said set position, said safety selector preventing said disconnector hook from catching said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to pivot to said first position, at which time the user can pull said trigger member to fire the firearm without manually releasing said trigger member.

2. (Original) The trigger mechanism of claim 1, wherein said safety selector has a protuberance thereon which, when said safety selector is in said forced reset semi-automatic position, contacts said disconnector preventing said disconnector hook from catching said hammer hook.

3. (Original) The trigger mechanism of claim 1 further including a spring which biases said trigger member towards said set position.

Atrius Ex. 1002--0067

4. (Original) A firearm trigger mechanism comprising:

a housing adapted to be installed in a fire control mechanism pocket of a receiver and having a first pair of transversely aligned openings for receiving a hammer pin, a second pair of transversely aligned openings for receiving a trigger pin, and a third pair of transversely aligned openings for receiving a cam pin,

a hammer having a sear catch and a hook for engaging a disconnector and mounted in said housing to pivot on said hammer pin between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of a bolt carrier,

a trigger member having a sear and mounted in said housing to pivot on said trigger member pin between set and released positions,

wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member,

a disconnector having a hook for engaging said hammer and mounted in said housing to pivot on said trigger member pin,

a cam having a cam lobe and mounted in said housing to pivot on said cam pin, said cam being pivotable between a first position at which said cam lobe does not force said trigger member towards said set position and a second position at which said cam lobe does force said trigger member towards said set position, and

a safety selector adapted to be mounted in the fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions,

Atrius Ex. 1002--0068

whereupon in said standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member towards said set position but prior to reaching said set position said disconnector hook catches said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to pivot to said first position, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire the firearm, and

whereupon in said forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member to said set position, said safety selector preventing said disconnector hook from catching said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to pivot to said first position, at which time the user can pull said trigger member to fire the firearm without manually releasing said trigger member.

5. (Original) The trigger mechanism of claim 4, wherein said safety selector has a protuberance thereon which, when said safety selector is in said forced reset semi-automatic position, contacts said disconnector preventing said disconnector hook from catching said hammer hook.

Atrius Ex. 1002--0069

6. (Original) The trigger mechanism of claim 4, wherein said first and second pairs of transversely aligned openings in said housing are adapted to be aligned with first and second pairs of transversely aligned assembly pin openings in the fire control mechanism pocket.

7. (Original) The trigger mechanism of claim 4 further including a spring which biases said trigger member towards said set position.

8. (Original) The trigger mechanism of claim 7 wherein said spring is a torsion spring.

9. (Original) A firearm comprising:

a receiver having a fire control mechanism pocket therein,

a reciprocating bolt carrier,

a hammer having a sear catch and a hook for engaging a disconnector and mounted in said fire control mechanism pocket to pivot on a transverse hammer pivot axis between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of said bolt carrier,

a trigger member having a sear and mounted in said fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions,

wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member,

Atrius Ex. 1002--0070

a disconnector having a hook for engaging said hammer and mounted in said fire control mechanism pocket to pivot on said transverse trigger member pivot axis,

a cam having a cam lobe and mounted in said fire control mechanism pocket to pivot on a transverse cam pivot axis, said cam being pivotable between a first position at which said cam lobe does not force said trigger member towards said set position and a second position at which said cam lobe does force said trigger member towards said set position, and

a safety selector mounted in said fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions,

whereupon in said standard semi-automatic position, rearward movement of said bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member towards said set position but prior to reaching said set position said disconnector hook catches said hammer hook, and thereafter forward movement of said bolt carrier causes said cam to pivot to said first position, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire said firearm, and

whereupon in said forced reset semi-automatic position, rearward movement of said bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member to said set position, said safety selector preventing said disconnector hook from catching said hammer hook, and thereafter forward movement of said bolt carrier causes said cam to pivot to said first position, at

which time the user can pull said trigger member to fire said firearm without manually releasing said trigger member.

10. (Original) The firearm of claim 9 further comprising:

a housing having a first pair of transversely aligned openings with a hammer pin therethrough and a second pair of transversely aligned openings with a trigger member pin therethrough,

said hammer mounted on said hammer pin, said trigger member and disconnector mounted on said trigger member pin.

11. (Original) The firearm of claim 10 further comprising:

said receiver having a first pair of transversely aligned assembly pin openings and a second pair of transversely aligned assembly pin openings,

said housing first pair of openings coaxial with said receiver first pair of openings and said housing second pair of openings coaxial with said receiver second pair of openings,

a first assembly pin passing through said receiver first pair of openings and through said housing first pair of openings, and

a second assembly pin passing through said receiver second pair of openings and through said housing second pair of openings.

12. (Original) The firearm of claim 10 further comprising a spring which biases said trigger member towards said set position.

Atrius Ex. 1002--0072

13. (Original) The firearm of claim 12 wherein said spring is a torsion spring.

14. (Original) A firearm trigger mechanism comprising:

a hammer having a sear catch and a hook for engaging a disconnector and adapted to be mounted in a fire control mechanism pocket of a receiver to pivot on a transverse hammer pivot axis between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of a bolt carrier,

a trigger member having a sear and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions,

wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member,

a disconnector having a hook for engaging said hammer and adapted to be mounted in the fire control mechanism pocket to pivot on said transverse trigger member pivot axis,

a cam having a cam lobe and adapted to be movably mounted in the fire control mechanism pocket, said cam being movable between a first position at which said cam lobe does not force said trigger member towards said set position and a second position at which said cam lobe does force said trigger member towards said set position, and

a safety selector adapted to be mounted in the fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions,

whereupon in said standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and movement of said cam from said first position to said second position such that said cam lobe forces said trigger member towards said set position but prior to reaching said set position said disconnector hook catches said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to move to said first position, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire the firearm, and

whereupon in said forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and movement of said cam from said first position to said second position such that said cam lobe forces said trigger member to said set position, said safety selector preventing said disconnector hook from catching said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to move to said first position, at which time the user can pull said trigger member to fire the firearm without manually releasing said trigger member.

15. (New) A firearm trigger mechanism comprising:

a hammer having a sear catch and a hook for engaging a disconnector and adapted to be mounted in a fire control mechanism pocket of a receiver to pivot on a transverse hammer pivot axis between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of a bolt carrier,

Atrius Ex. 1002--0074

a trigger member having a sear and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions,

wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member,

said disconnector having a hook for engaging said hammer and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse disconnector pivot axis, and

a cam having a cam lobe and adapted to be movably mounted in the fire control mechanism pocket, said cam being movable between a first position and a second position, in said second position said cam lobe forces said trigger member towards said set position,

whereupon in a standard semi-automatic mode, said cam is in said first position, rearward movement of the bolt carrier causes rearward pivoting of said hammer such that said disconnector hook catches said hammer hook, and thereafter the bolt carrier moves forward into battery, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire the firearm, and

whereupon in a forced reset semi-automatic mode, said cam is in said second position, rearward movement of the bolt carrier causes rearward pivoting of said hammer such that said disconnector hook is prevented from catching said hammer hook, and thereafter the bolt carrier moves forward into battery, at which time the user can pull said trigger member to fire the firearm.

Atrius Ex. 1002--0075

16. (New) The trigger mechanism of claim 15, further comprising:

a housing having a first pair of transversely aligned openings with a hammer pin therethrough and a second pair of transversely aligned openings with a trigger member pin therethrough,

said hammer mounted on said hammer pin, said trigger member and disconnector mounted on said trigger member pin.

17. (New) The trigger mechanism of claim 15, further comprising a spring which biases said trigger member towards said set position.

18. (New) The trigger mechanism of claim 17, wherein said spring is a torsion spring.

19. (New) The trigger mechanism of claim 15, wherein the trigger member pivot axis and disconnector pivot axis are coaxial.

20. (New) A firearm trigger mechanism comprising:

a hammer having a sear catch and a hook for engaging a disconnector and adapted to be mounted in a fire control mechanism pocket of a receiver to pivot on a transverse hammer pivot axis between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of a bolt carrier,

a trigger member having a sear and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions,

Atrius Ex. 1002--0076

wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member,

a disconnector having a hook for engaging said hammer and adapted to be mounted in the fire control mechanism pocket to pivot on said transverse disconnector pivot axis,

a cam having a cam lobe and adapted to be movably mounted in the fire control mechanism pocket, said cam being movable between a first position at which said cam lobe does not force said trigger member into said set position and a second position at which said cam lobe does force said trigger member into said set position, and

a safety selector adapted to be movably mounted in the fire control mechanism pocket to move between safe, standard semi-automatic, and forced reset semi-automatic positions,

whereupon in said standard semi-automatic position, said cam is in said first position, rearward movement of the bolt carrier causes rearward pivoting of said hammer such that said disconnector hook catches said hammer hook, and thereafter the bolt carrier moves forward into battery, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire the firearm, and

whereupon in said forced reset semi-automatic position, said cam is in said second position, rearward movement of the bolt carrier causes rearward pivoting of said hammer such that said disconnector hook is prevented from catching said hammer hook, and thereafter the bolt carrier moves forward into battery, at which time the user can pull said trigger member to fire the firearm.

Atrius Ex. 1002--0077

21. (New) The trigger mechanism of claim 20, wherein said cam is not a part of said safety selector.

22. (New) The trigger mechanism of claim 20, wherein said safety selector moves between safe, standard semi-automatic, and forced reset semi-automatic positions by rotation.

23. (New) The trigger mechanism of claim 20, wherein the trigger member pivot axis and disconnector pivot axis are coaxial.

Atrius Ex. 1002--0078

REMARKS

By this Preliminary Amendment, new claims 15-23 have been added.

Early and favorable treatment of the application is respectfully requested.

Applicant submits that the only fee due with this Response is an extra claims fee, which fee is being paid by credit card concurrently with the filing hereof. However, if any other fee is due, please charge our Deposit Account No. 23-3000, under Order No. RARETRG-12US, from which the undersigned is authorized to draw.

Dated: April 4, 2024

Respectfully submitted,

Electronic signature: /Wayne L. Jacobs/
Wayne L. Jacobs
Registration No.: 35,553
WOOD HERRON & EVANS LLP
600 Vine Street, Suite 2800
Cincinnati, Ohio 45202-2409
(513) 241-2324
(513) 241-6234 (Fax)
Attorney for Applicant

Atrius Ex. 1002--0079

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 18/325,225	Filing Date 05/30/2023	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $ 192 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	04/04/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 23	Minus	** 20	= 3		x $40 =	120
	Independent (37 CFR 1.16(h))	* 6	Minus	*** 4	= 2		x $ 192 =	384
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	504

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $ 0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $ 0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/BRENDA L TURNER/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/325,225	05/30/2023	Brian A. Blakley	RARETRG 12US

CONFIRMATION NO. 5749

26875
WOOD, HERRON & EVANS, LLP
600 VINE STREET
SUITE 2800
CINCINNATI, OH 45202

PUBLICATION NOTICE

OC000000069683835

Date Mailed: 03/14/2024

Title:FIREARM TRIGGER MECHANISM

Publication No.US-2024-0085136-A1
Publication Date:03/14/2024

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently https://portal.uspto.gov/pair/PublicPair. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Atrius Ex. 1002--0081

PTO/SB/08a (01-22)
Approved for use through 05/31/2024. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7398723		2008-07-15	Blakley, Brian A.	
	2	9568264		2017-02-14	Graves, Thomas Allen	
	3	9816772		2017-11-14	Graves, Thomas Allen	
	4	9939221		2018-04-10	Graves, Thomas Allen	
	5	10514223		2019-12-24	Rounds, Jeffrey Cooper	
	6	11346627		2022-05-31	DeMonico, Lawrence	
	7	11724003		2023-08-15	Strbac, Mladen Thomas	
	8	2765562		1956-10-09	ROPER et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	9	3045555		1962-07-24	STONER EUGENE M	
	10	3292492		1966-12-20	STURTEVANT FOSTER E	
	11	3301133		1967-01-31	STURTEVANT FOSTER E	
	12	3670442		1972-06-20	Kennedy et al.	
	13	4023465		1977-05-17	Inskip, Thomas C.	
	14	4151670		1979-05-01	Rath, Hans M.	
	15	4057003		1977-11-08	Atchisson, Maxwell G.	
	16	4276808		1981-07-07	York, Norman N.	
	17	4433610		1984-02-28	Tatro, Henry J.	
	18	4463654		1984-08-07	Barnes et al.	
	19	4516466		1985-05-14	Jennie, Fred	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	20	4580484		1986-04-08	Moore, Wildey J.	
	21	4656993		1987-04-14	Yuzawa et al.	
	22	4658702		1987-04-21	Tatro, Henry J.	
	23	4693170		1987-09-15	Atchisson, Maxwell G.	
	24	4697495		1987-10-06	Beretta, Pier G.	
	25	4787288		1988-11-29	Miller, Clifford E.	
	26	4937964		1990-07-03	Crandall, David L.	
	27	5149898		1992-09-22	Chesnut et al.	
	28	5183959		1993-02-02	McCoan et al.	
	29	5223649		1993-06-29	Claridge, Joseph M.	
	30	5339721		1994-08-23	Beretta, Pier G.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	31	5517897		1996-05-21	Perrine, Walter E.	
	32	5614691		1997-03-25	Taylor, James M.	
	33	5623114		1997-04-22	Soper, Terry A.	
	34	5682699		1997-11-04	Gentry, Roger	
	35	5701698		1997-12-30	Wesp et al.	
	36	5704153		1998-01-06	Kaminski et al.	
	37	5760328		1998-06-02	Robbins, Laurance E.	
	38	5770814		1998-06-23	Ealovega, George D.	
	39	6101918		2000-08-15	Akins, William	
	40	6360467		2002-03-26	Knight, William A.	
	41	6601331		2003-08-05	Salvitti, Alfred W.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	42	6718680		2004-04-13	Roca et al.	
	43	6722072	B1	2004-04-20	McCormick, Michael L.	
	44	6851346		2005-02-08	Herring, Geoffrey A.	
	45	6889459		2005-05-10	Salvitti, Alfred W.	
	46	6976416		2005-12-20	Ealovega, George D.	
	47	7051638		2006-05-30	Thomele, Adrian	
	48	7162824	B1	2007-01-16	McCormick, Michael L.	
	49	7213359		2007-05-08	Beretta, Ugo Gussalli	
	50	7293385	B2	2007-11-13	McCormick, Michael L.	
	51	7337574		2008-03-04	Crandall et al.	
	52	7347021		2008-03-25	Jones, C. Barry	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	53	7421937		2008-09-09	Gangl, John	
	54	7634959		2009-12-22	Frickey, Steven J.	
	55	7661220		2010-02-16	Crandall et al.	
	56	7806039		2010-10-05	Gomez, Jesus S	
	57	8037805		2011-10-18	Neroni, Randy A.	
	58	8112928		2012-02-14	Keough, Ronald William	
	59	8156854		2012-04-17	Brown, Michael J.	
	60	8127658		2012-03-06	Cottle, Jeremiah	
	61	8443537		2013-05-21	Curry, Brett	
	62	8464454		2013-06-18	Martin et al.	
	63	8490309		2013-07-23	Zukowski, Gary	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	64	8667881		2014-03-11	Hawbaker, Peter Jonathan	
	65	8695477		2014-04-15	Esch, Brian	
	66	8720096		2014-05-13	Siddle, Kevin	
	67	8820211		2014-09-02	Hawbaker, Peter Jonathan	
	68	8893607		2014-11-25	Audibert et al.	
	69	8925234		2015-01-06	Barrett, Christopher Gene	
	70	8985006		2015-03-24	Christensen et al.	
	71	9016187		2015-04-28	Findlay, David S.	
	72	9021732		2015-05-05	Johnson, Julian Eric	
	73	9021733		2015-05-05	DiChario, Anthony	
	74	9052150		2015-06-09	Talasco, Eric	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	75	9121661		2015-09-01	Calvete, Angel	
	76	9146066		2015-09-29	Cason, Russell	
	77	9146067	B2	2015-09-29	Stakes, Michael A.	
	78	9182189		2015-11-10	Seigler, Stanley Hahn	
	79	9228786		2016-01-05	Sullivan et al.	
	80	9310150		2016-04-12	Geissele, William H.	
	81	9347726		2016-05-24	Thomas, Phillip Brady	
	82	9448023		2016-09-20	Sheets, Jr. et al.	
	83	9476660		2016-10-25	Potter et al.	
	84	9618288		2017-04-11	Wilson, John	
	85	9618289		2017-04-11	Geissele, William H.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	86	9625231		2017-04-18	Hass, David N.	
	87	9631886		2017-04-25	Findlay, David S.	
	88	9651329		2017-05-16	Hittmann, Karl	
	89	9513076		2016-12-06	Kolev et al.	
	90	9658007		2017-05-23	Withey, Michael	
	91	9683800		2017-06-20	Sewell, Jr. et al.	
	92	9733031		2017-08-15	Sylvester et al.	
	93	9759504		2017-09-12	Geissele, William H.	
	94	9777980		2017-10-03	Heizer, Charles K.	
	95	9810493		2017-11-07	Fluhr et al.	
	96	9810496		2017-11-07	Kolev et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	97	9829263		2017-11-28	Bonner, James Dillon	
	98	9835398		2017-12-05	Biegel, Jack Richard	
	99	9863730		2018-01-09	Elftmann, Arthur J.	
	100	9869522		2018-01-16	Larson, Jr. et al.	
	101	9874417		2018-01-23	Zajk et al.	
	102	9927197		2018-03-27	Geissele, William H.	
	103	10002500	B2	2018-06-19	Hall et al.	
	104	10006734	B1	2018-06-26	Findlay, David S.	
	105	10030924	B1	2018-07-24	Smith, Clinton Lee	
	106	10077960	B2	2018-09-18	Geissele, William H.	
	107	10107580	B2	2018-10-23	Fellows et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	108	10254067		2019-04-09	Foster, David	
	109	10267584	B2	2019-04-23	Kasanjian-King, Zackary	
	110	10330413	B2	2019-06-25	Williams et al.	
	111	10488136	B2	2019-11-26	Sullivan et al.	
	112	10502511		2019-12-10	Graves, Thomas Allen	
	113	10584932	B2	2020-03-10	Foster, David	
	114	11287205	B2	2022-03-29	Biegel, Jack Richard	
	115	11293715		2022-04-05	Newsome et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20060048426	A1	2006-03-09	Crandall, David L.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	2	20060101695	A1	2006-05-18	Longueira, Dino C.	
	3	20070051236	A1	2007-03-08	Groves et al.	
	4	20070199435	A1	2007-08-30	Hochstrate et al.	
	5	20090151213	A1	2009-06-18	Bell, Timothy L.	
	6	20090188145	A1	2009-07-30	Fluhr et al.	
	7	20110209607	A1	2011-09-01	St. George, Charles	
	8	20130118343	A1	2013-05-16	Hirt, Robert	
	9	20140311004	A1	2014-10-23	Barrett, Ronnie	
	10	20160010933	A1	2016-01-14	Bonner	
	11	20160102933	A1	2016-04-14	Graves	
	12	20160161202	A1	2016-06-09	LARUE, MARK C.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	13	20170176124	A1	2017-06-22	Wilson, John	
	14	20170219307	A1	2017-08-03	Foster, David	
	15	20170276447	A1	2017-09-28	Foster, David	
	16	20170284761	A1	2017-10-05	Lewis et al.	
	17	20170299309	A1	2017-10-19	Fellows et al.	
	18	20170328663	A1	2017-11-16	Fellows et al.	
	19	20180066911	A1	2018-03-08	Graves	
	20	20180087860	A1	2018-03-29	Sullivan et al.	
	21	20180112944	A1	2018-04-26	Underwood et al.	
	22	20180195823	A1	2018-07-12	Schafer et al.	
	23	20180202740	A1	2018-07-19	Elftmann, Jr., Arthur J.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

	24	20180231342	A1	2018-08-16	Martinez, Michael	
	25	20210222974	A1	2021-07-22	Graves, Thomas Allen	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	4008351	DE	A1	1991-09-19	Fritz, Bernhard		
	2	1678458	EP	B1	2012-02-08	Ra Brands, L.l.c		
	3	2950033	EP	B1	2016-11-23	Merkel Jagd Und Sportwaffen GmbH		
	4	409847	TW	U	2000-10-21	205th Factory, Combined Service Forces		X
	5	2016/028337	WO	A1	2016-02-25	Tubb, George		☐
	6	2018/058174	WO	A1	2018-04-05	Oceania Prec Pty Limited		☐
	7	582963	DE	C	1933-08-26	Firma, Franz Stock		☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18325225
	Filing Date	2023-05-30
	First Named Inventor	Brian A. Blakley
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	RARETRG 12US

NON-PATENT LITERATURE DOCUMENTS			Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Statutory Invention Registration No. H107, Inventor: Bauer, Published Aug. 5, 1986 (8 pages)	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	18325225
Filing Date	2023-05-30
First Named Inventor	Brian A. Blakley
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Wayne L. Jacobs/	Date (YYYY-MM-DD)	2023-08-31
Name/Print	Wayne L. Jacobs	Registration Number	35,553

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	48520393
Application Number:	18325225
International Application Number:	
Confirmation Number:	5749
Title of Invention:	FIREARM TRIGGER MECHANISM
First Named Inventor/Applicant Name:	Brian A. Blakley
Customer Number:	26875
Filer:	Wayne L. Jacobs/Laura Koehler
Filer Authorized By:	Wayne L. Jacobs
Attorney Docket Number:	RARETRG 12US
Receipt Date:	31-AUG-2023
Filing Date:	30-MAY-2023
Time Stamp:	13:29:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	RARETRG_14US_-_DE4008351A1.pdf	337458 3c1ac72b8682d68c77f513a1d86184695cf4048a	no	11

Warnings:

Atrius Ex. 1002--0099

Information:					
2	Foreign Reference	RARETRG_14US_-_EP1678458B1.pdf	212504 371faf951ef4a571bf55da2ab191cfe136fe4cf9	no	9
Warnings:					
Information:					
3	Foreign Reference	RARETRG_14US_-_EP2950033B1.pdf	570352 014883b129656af4afbd9cdce062805ae596c7b6	no	19
Warnings:					
Information:					
4	Foreign Reference	TW409847.PDF	884876 2965a95d8cf7ad46010a98b8ade4b067c56e52e0	no	34
Warnings:					
Information:					
5	Foreign Reference	RARETRG_14US_-_WO2016028337A1.pdf	1926887 612db5fb0ee57549a232f67b4f75887571f39839	no	49
Warnings:					
Information:					
6	Foreign Reference	RARETRG_14US_-_WO2018058174A1.pdf	965575 96361bd93da24aa18325a7946b59ac882659969d	no	26
Warnings:					
Information:					
7	Foreign Reference	RARETRG_14US_-_DE582963C.pdf	586967 2a1b780c888f8154c5e23d3716a31da8e0902b8a	no	11
Warnings:					
Information:					
8	Non Patent Literature	H107.PDF	1236529 795244d6dcd41b5f22b10b356b592cc1c06a50c8	no	8
Warnings:					
Information:					

9	Information Disclosure Statement (IDS) Form (SB08)	_IDS1.pdf	1267836 c848bcf35b875310787d673f911e3b135304c978	no	17

Warnings:	
Information:	
Total Files Size (in bytes):	7988984

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Espacenet

Bibliographic data: DE4008351 (A1) — 1991-09-19

Safety device for gun firing mechanism - has additional tooth to hold firing hammer in safe position

Inventor(s): FRITZ BERNHARD [DE] ± (FRITZ, BERNHARD, 7165 FICHTENBERG, DE)

Applicant(s): FRITZ BERNHARD [DE] ± (FRITZ, BERNHARD, 7165 FICHTENBERG, DE)

Classification: **- international:** ***F41A17/74;*** (IPC1-7): F41A17/00
- cooperative: **F41A17/74 (EP)**

Application number: DE19904008351 19900315

Priority number (s): DE19904008351 19900315

Abstract of DE4008351 (A1)

A gun with a projecting firing hammer (4) is provided with a safety device to prevent accidental firing of the weapon by inadvertent actuation of the firing hammer (4) without operating the trigger (3). The firing hammer (1) pivots about the axis (6) and is driven against the firing pin (4) by a spring (FI) as soon as the lever (2) is rotated by the action of the trigger (3) so that the tip of the lever (2) is swung clear of the ratchet tooth (1b). The safety device consists of an additional tooth (5) which is pivoted to the firing hammer and holds the firing hammer in its extreme retracted position if it has accidentally been pulled back to this extreme position. USE - Safety device for guns.

(19) BUNDESREPUBLIK DEUTSCHLAND

DEUTSCHES PATENTAMT

(12) **Offenlegungsschrift**

(10) **DE 40 08 351 A 1**

(51) Int. Cl.[5]: **F 41 A 17/00**

(21) Aktenzeichen: P 40 08 351.9
(22) Anmeldetag: 15. 3. 90
(43) Offenlegungstag: 19. 9. 91

DE 40 08 351 A 1

(71) Anmelder:
Fritz, Bernhard, 7165 Fichtenberg, DE

(72) Erfinder:
gleich Anmelder

(54) Sicherheitsentspannvorrichtung für Waffen mit außenliegendem Hahn

DE 40 08 351 A 1

Beschreibung

Stand der Technik

Die Erfindung geht aus von Waffen aller Art, die mit einem außenliegenden Hahn versehen sind, bei welchen z. B. durch Zurückziehen des Hahnes, durch Abkippen des Laufes, durch Zurückgleiten des Verschlusses oder durch Betätigen des Abzuges, der Hahn gespannt wird.

Geladene Waffen, bei denen der Hahn sich in gespanntem Zustand befindet, müssen als extrem gefährlich betrachtet werden, zumal nur noch der Abzug betätigt werden muß, um den Hahn aus seiner Rast gleiten zu lassen, der dann von der Schlagfeder getrieben durch Nachvorneschlagen auf den Schlagbolzen trifft und diesen in das Zündhütchen der Patrone treibt, wodurch der Schuß ausgelöst wird.

Durch Stoß oder Fall, also durch Erschütterung, kann ebenso aber unbeabsichtigt, der Hahn aus seiner Rast gleiten und einen Schuß auslösen.

Waffen mit gespanntem Hahn werden in der Regel so entspannt, daß der Hahn mit dem Daumen der Bedienungshand weiter nach hinten gezogen, also noch mehr gespannt wird, wodurch die Rast des Hahnes nicht mehr an der Abzugsstange anliegt und diese durch Betätigen, also Zurückziehen des Abzuges mit dem Zeigefinger ebenfalls der Bedienungshand nach unten bewegt und ihrerseits aus der Rast des Hahnes gehoben wird. Der Daumen, der den Hahn hält, läßt diesen jetzt langsam nach vorne bis zu einem Totpunkt gleiten und zieht ihn wieder zurück, bis der Hahn in seiner "Ruhestellung", der sogenannten Ruhe- oder Sicherheitsrast einrastet.

Bei manchen Konstruktionen wird der Hahn durch eine Feder selbstätig in diese Position bewegt. In dieser Sicherheitsrast eingerastet ist der Hahn weitgehend dagegen gesichert, durch ungewollte mechanische Einwirkung unbeabsichtigt, z. B. durch Umfallen der Waffe, z. B. durch deren Eigengewicht auf den Schlagbolzen oder das Zündhütchen getrieben zu werden und einen unbeabsichtigten Schuß auszulösen.

Sehr wichtig ist natürlich, daß zuerst der Hahn und erst dann der Abzug gezogen wird, da sich sonst ungewollt ein Schuß lösen kann.

Um Waffen mit außenliegenden Hähnen zu sichern, geht man allgemein davon aus, die Waffen wie o. a. manuell zu entspannen. In der Tat sind natürlich ungespannte Waffen mit entsprechender Positionierung des Hahnes als sehr sicher anzusehen. Die Manipulation des Entspannens birgt jedoch sehr offensichtlich und aus der Praxis wohlbekannt, die Gefahr in sich, daß der unter starkem Federdruck stehende Hahn, z. B. bei Kälte, oder wenn die Waffe ölig ist, dem Daumen entgleitet, federgetrieben nach vorne schlägt und einen unbeabsichtigten Schuß auslöst.

Verhängnisvoll wirkt sich beim Entspannen der bekannte Bedienungsfehler aus, daß zuerst der Abzug gezogen wird, der Hahn kann dann nicht mehr vom Daumen festgehalten werden, da er durch die Schlagfeder getrieben, bereits den unbeabsichtigen Schuß ausgelöst hat.

Vorteile der Erfindung

Die Erfindung geht davon aus, daß Waffen mit außenliegenden Hähnen in entspanntem Zustand als sehr sicher anzusehen sind, beim Entspannen das Ziehen und damit Ausheben der Abzugsstange aus der Hahnrast als

Hauptgefahren- und mögliche Fehler- und Unfallquelle anzusehen ist, da dann der Hahn nur manuell gehalten, wohl aber auch von der Schlagfeder bewegt werden kann. Die Erfindung verhindert ungewollte, unkontrollierte und ungesteuerte Bewegungen von Abzug und Hahn dadurch, daß durch Zurückziehen des Hahnes über ein Steuerteil die Abzugsstange zwangsgesteuert die Hahnraste freigibt, kontrolliert und nur solange, bis der Hahn, ob manuell gehalten oder nicht, die Position in der er von der Abzugsstange gespannt gehalten werden kann, überwunden hat, um dann in die Sicherheits- oder Ruherast einzutreten. Bei Schlössern, die nach dem Konstruktionsprinzip von Holland & Holland gearbeitet sind, wird der nach vorne gleitende Hahn dann von der sogenannten Sicherheitsfangstange gefangen und gehalten.

Der große Vorteil der Erfindung besteht also darin, daß es zum Entspannen des Hahnes nicht mehr nötig ist, den Abzug zu betätigen und der Hahn dadurch nicht mehr von der Abzugsstange soweit freigegeben wird, daß beim Entspannvorgang ungewollt die Sicherheits-, Ruherast oder die Fangstange übersprungen werden kann, wodurch der unbeabsichtigte Schuß ausgelöst würde. Durch die mechanische Zwangssteuerung kann der Weg der Abzugsstange exakt abgestimmt werden und zwar so, daß der Hahn beim Entspannen nicht mehr über Ruhe- oder Sicherheitsrast gleiten kann, selbst dann nicht, wenn der Hahn dem Daumen entgleitet und durch die Schlagfeder nach vorne geschleudert wird. Die Abzugsstange rastet immer zuverlässig in einer der o. a. Rasten ein und verhindert ein Aufschlagen des Hahnes auf dem Schlagbolzen.

Zeichnungen

Die Zeichnungen **Fig.** 1, 2 und 3 geben erklärende Übersicht über eine mögliche Hahn-Schloß-Ausführung, die als Stand der Technik anzusehen ist. Die Zeichnungen **Fig.** 4, 5 und 6 zeigen die Erfindung bezogen auf die Hahn-Schloß-Ausführung wie in 1, 2 und 3 dargestellt.

Fig. 1 Hahnschloß im ausgelösten Zustand, der Hahn schlägt auf den Schlagbolzen.

Fig. 2 Hahnschloß im Ruhezustand, die Abzugsstange befindet sich in der Sicherheitsraste.

Fig. 3 Hahnschloß in gespanntem Zustand, die Abzugsstange befindet sich in der Spannraste.

Fig. 4 Hahnschloß mit Steuerteil, gespannt, die Abzugsstange befindet sich in der Spannraste.

Fig. 5 Hahnschloß mit Steuerteil im überzogenen Zustand.

Fig. 6 Hahnschloß mit Steuerteil beim Entspannvorgang.

Beschreibung des Ausführungsbeispiels

Der in der Zeichnung mit **1** bezeichnete Hahn hat, getrieben durch die Schlagfeder **F1**, das Bestreben, sich um seine Achse **6** zu drehen, um auf den Schlagbolzen **4** aufzuschlagen. **Fig.** 1 zeigt das Ausführungsbeispiel im Moment, in dem der Hahn **1** auf den Schlagbolzen **4** aufschlägt und somit den Schuß auslöst.

Die in der Zeichnung mit **2** bezeichnete Abzugsstange hat die Aufgabe den Hahn **1** in seiner Ruheraste, in seiner Spannraste festzuhalten, oder ihn, betätigt durch den Abzug **3**, freizugeben. Die Abzugsstange **2** wird durch die Feder **F2** gegen den Hahn **1** gedrückt.

Der in der Zeichnung mit 3 bezeichnete Abzug hat die

Atrius Ex. 1002--0104

Aufgabe die Abzugsstange **2** anzuheben, damit der Hahn **1** sich um seine Achse **6** drehen kann.

Fig. 1 zeigt das Hahnschloß im Zustand während der Schußauslösung. Durch den Abzug **3** wurde die Abzugsstange **2** aus der Spannrast **1a** gehoben, wodurch der Hahn **1**, getrieben durch die Feder **F1** sich um seine Achse **6** drehen konnte, um auf den Schlagbolzen **4** aufzuschlagen.

Fig. 2 zeigt das Hahnschloß im Ruhezustand. Die Abzugsstange **2** rastete, gedrückt von der Feder **F2**, in die Ruheraste des Hahnes **1** ein.

Fig. 3 zeigt das Hahnschloß im gespannten Zustand. Die Abzugsstange **2** rastete, gedrückt von der Feder **F2**, in der Spannraste **1a** des Hahnes **1** ein und hält diesen in seiner Position. Durch betätigen des Abzuges **3** kann dadurch der Schuß ausgelöst werden, daß die Abzugsstange **2** aus der Spannraste **1a** gehoben wird, wodurch der Hahn **1**, getrieben durch die Feder **F1**, auf den Schlagbolzen **4** schlagen kann.

Fig. 4 zeigt das Hahnschloß im gespannten Zustand wie **Fig.** 3, jedoch mit dem Steuerteil **5**.

Fig. 5 zeigt das Hahnschloß in überzogenem Zustand. Manuell wurde der Hahn **1** soweit gespannt, daß das bewegliche Steuerteil **5** zwischen Spannraste **1a** und Abzugsstange **2** gleiten konnte, wodurch das Steuerteil **5** verhindert, daß beim Nachvornegleiten des Hahnes **1**, die Abzugsstange **2** in die Spannraste **1a** eingreift. Der Hahn kann also soweit nach vorne gleiten, bis die Abzugsstange **2** in die Sicherheitsraste **1b** eintritt und dadurch den Weg des Hahnes **1** vor dem Aufschlagen auf den Schlagbolzen **4** begrenzt. Das Steuerteil **5** verhindert, wenn der Hahn **1** weit genug nach hinten gezogen wird, das Eingreifen der Abzugsstange **2** in die Spannraste **1a**, ohne daß der Abzug **3** gezogen werden muß. Es verhindert nicht das Einrasten der Abzugsstange **2** in der Sicherheitsraste **1b** beim Nachvornegleiten des Hahnes **1**. Es ist zu erkennen, daß der Abzug **3** nicht an der Abzugsstange **2** anliegt, diese also nicht durch den Abzug **3** betätigt wird.

Fig. 6 zeigt das Hahnschloß mit nach vorne gleitendem Hahn **1** in dem Moment, indem das Steuerteil **5** verhindert, daß die Abzugsstange **2** in die Spannraste **1a** eingreifen und dadurch den Weg des Hahnes **1** der von der Feder **F1** bewegt wird, blockieren kann. Die Abzugsstange **2** wird ohne Zutun des Abzugs **3** daran gehindert, in die Spannraste **1a** einzugreifen.

Patentanspruch

Sicherheitsspannvorrichtung für Waffen mit außenliegendem Hahn, diese können sein Kipplauf-, Repetier-, Bolck-, oder Automatische Waffen, Pistolen oder Revolver, **dadurch gekenzeichnet,** daß der gespannte, also in der Spannraste sich befindende Hahn durch weiteres Zurückziehen entriegelt wird und nach vorne in die Sicherheits- oder Ruherast gleiten kann, ohne daß der Abzug der Waffe betätigt werden muß, selbst wenn der Hahn der bedienenden Hand entgleitet. Bei Waffen mit Schlössern nach Konstruktion "HOLLAND & HOLLAND" kann der Hahn von der Sicherheitsfangstange gehalten werden.

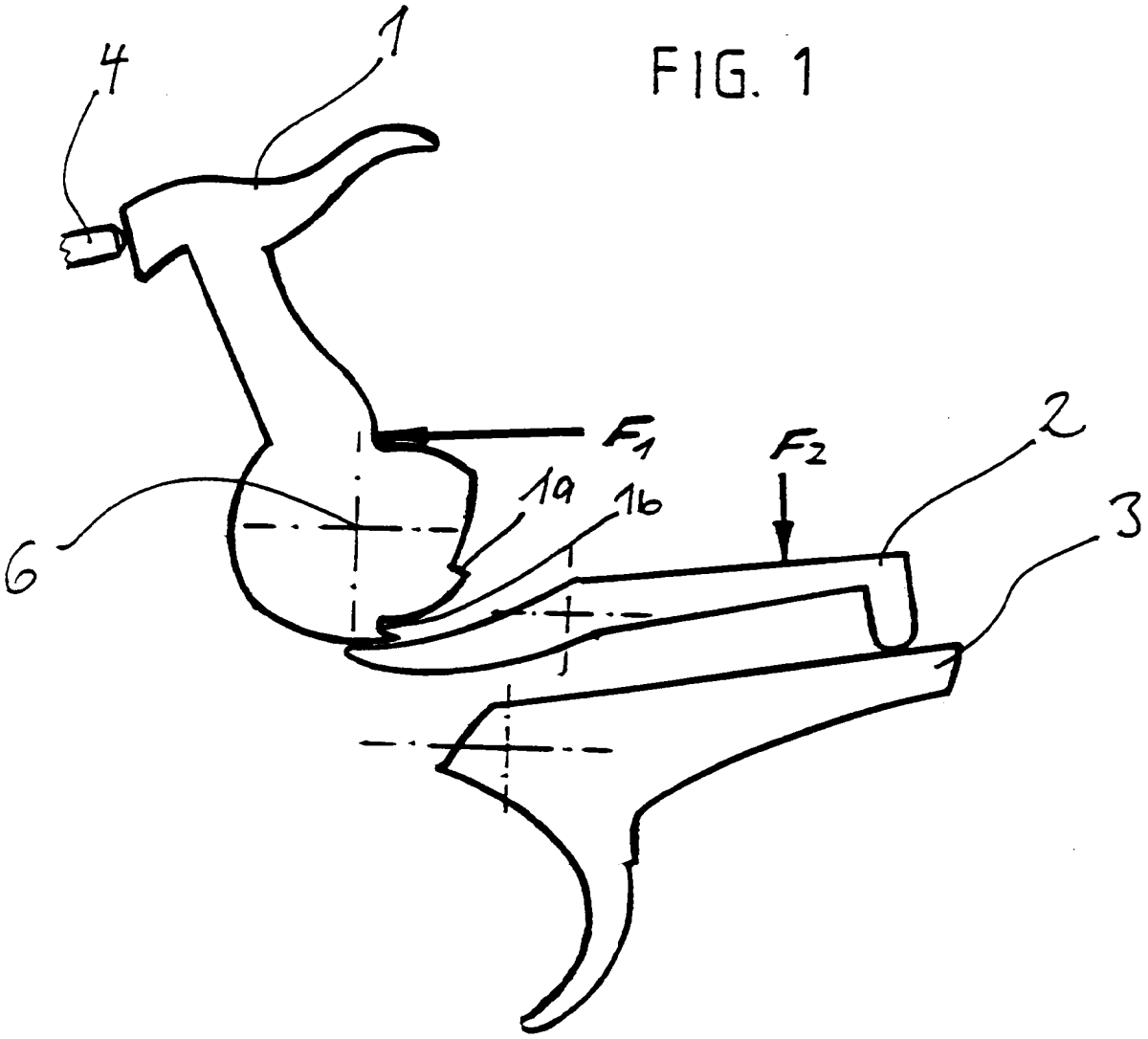
Hierzu 6 Seite(n) Zeichnungen

Atrius Ex. 1002--0105

— Leerseite —

Nummer: DE 40 08 351 A1
Int. Cl.[5]: F 41 A 17/00
Offenlegungstag: 19. September 1991

FIG. 1



Atrius Ex. 1002--0107

Nummer: DE 40 08 351 A1
Int. Cl.[5]: F 41 A 17/00
Offenlegungstag: 19. September 1991

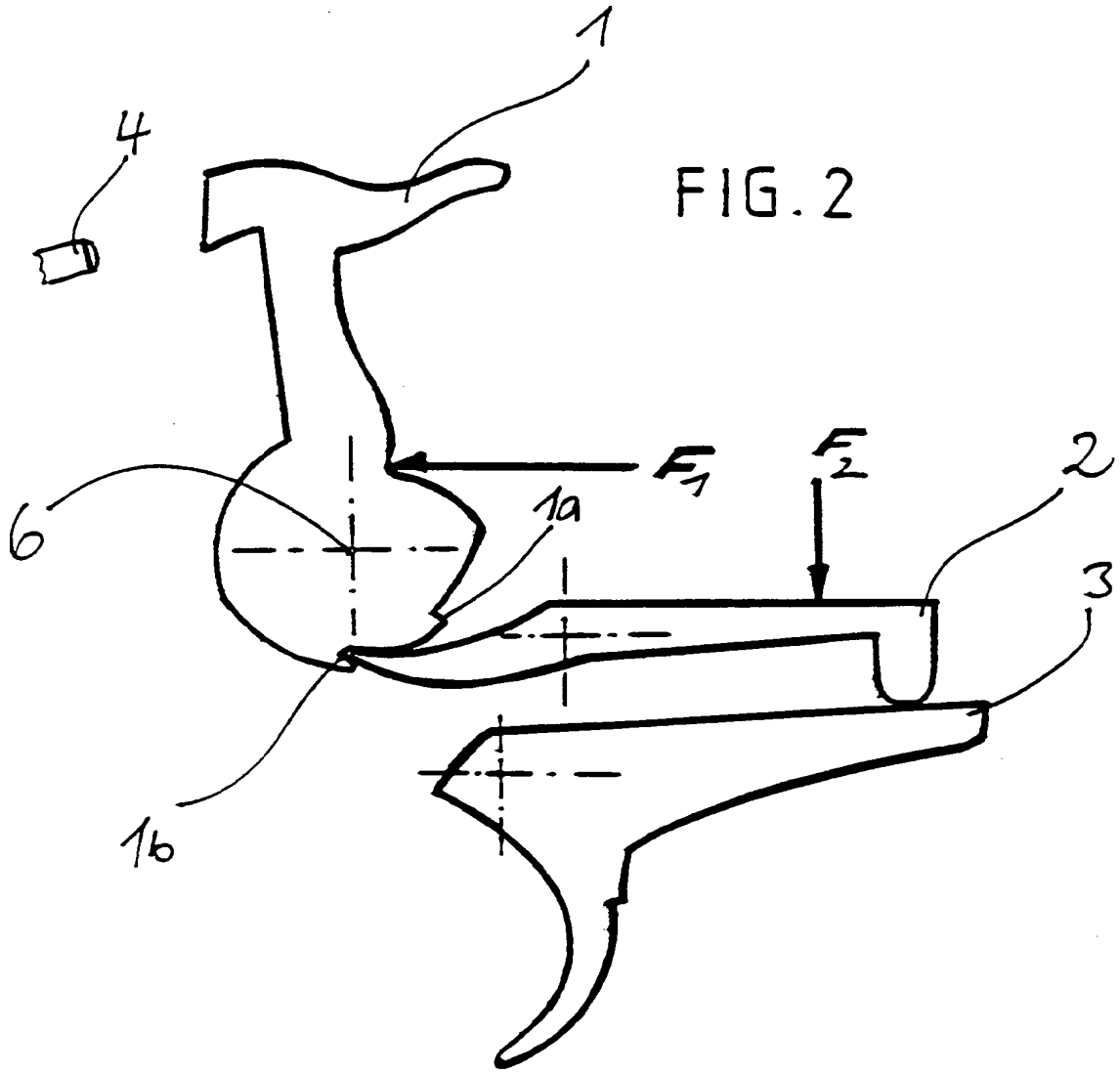


FIG. 2

Atrius Ex. 1002--0108

Nummer: DE 40 08 351 A1
Int. Cl.[5]: F 41 A 17/00
Offenlegungstag: 19. September 1991

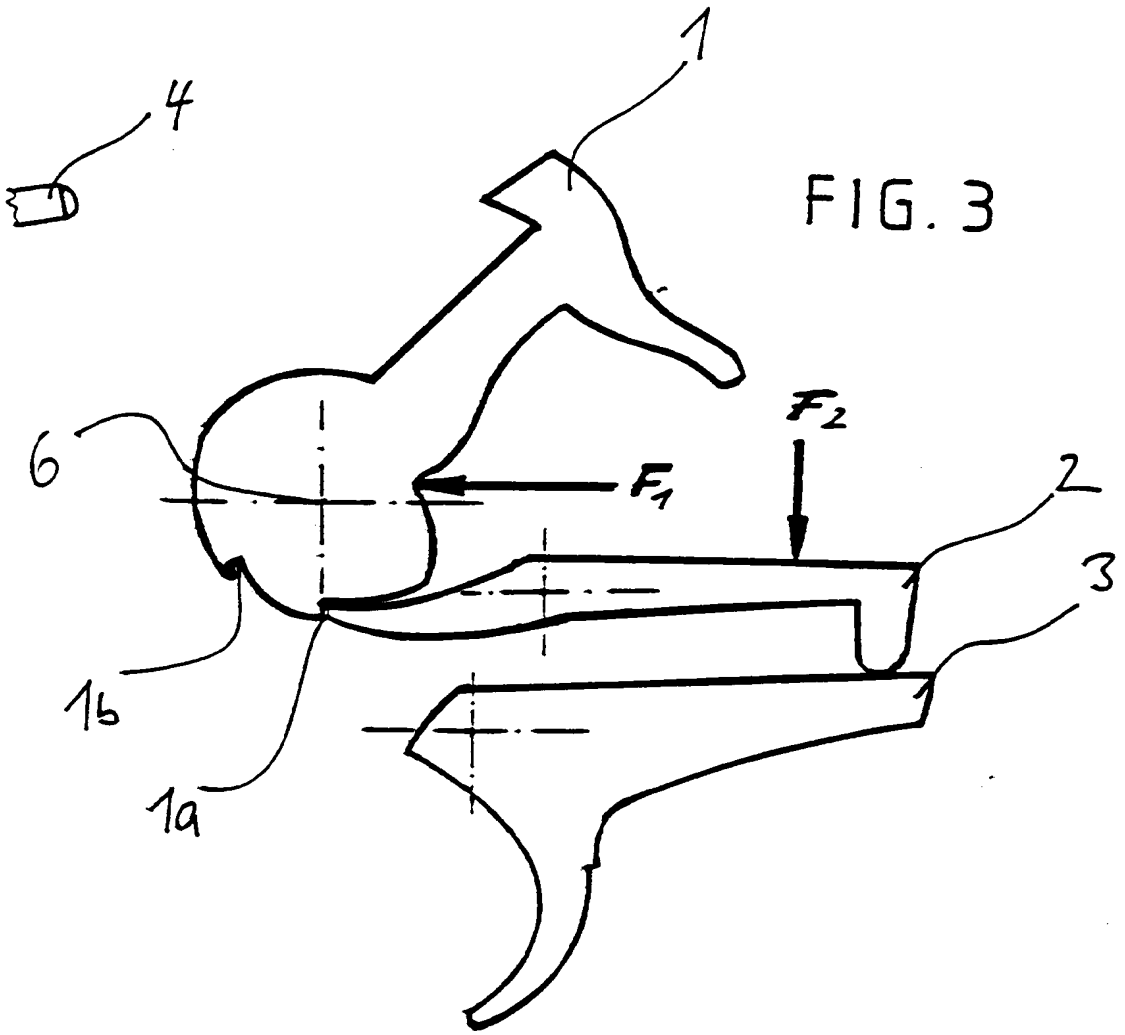


FIG. 3

Atrius Ex. 1002--0109

Nummer: DE 40 08 351 A1
Int. Cl.[5]: F 41 A 17/00
Offenlegungstag: 19. September 1991

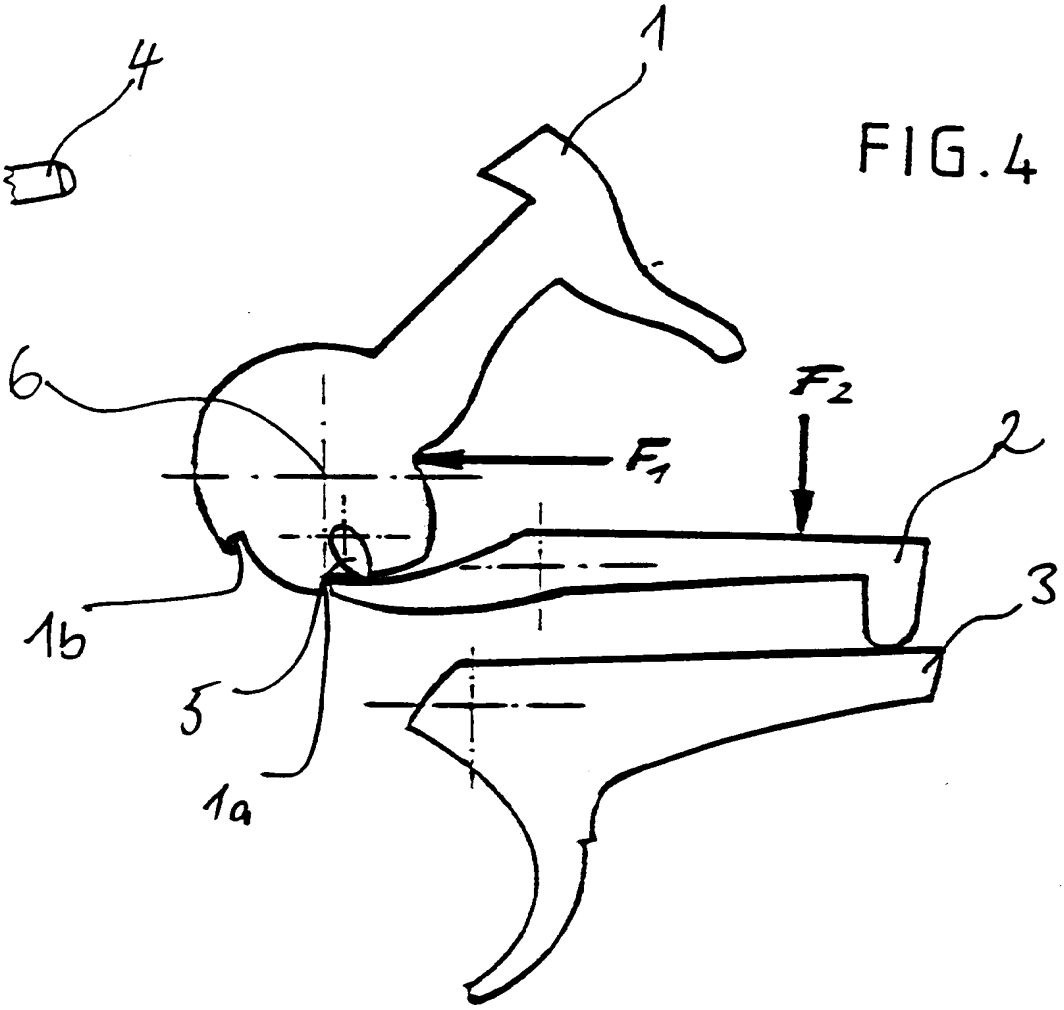
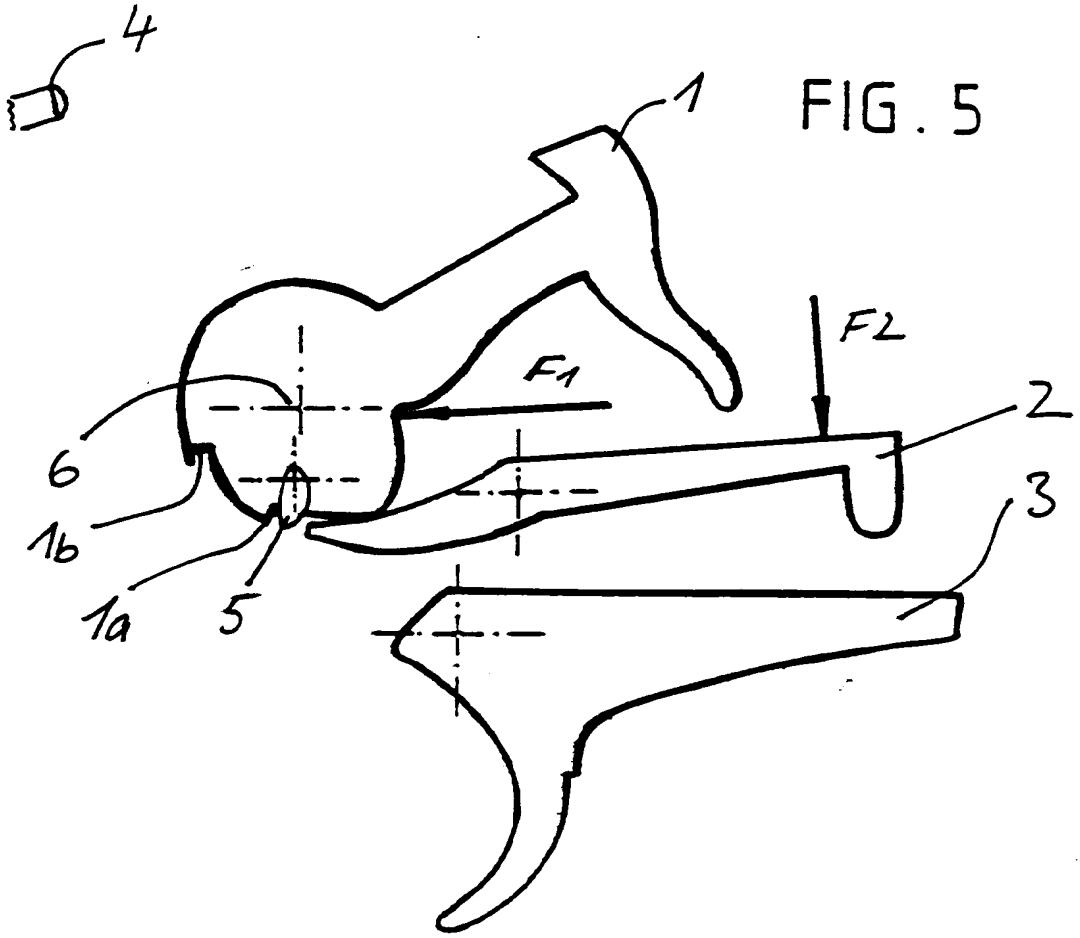


FIG. 4

Atrius Ex. 1002--0110

Nummer: DE 40 08 351 A1
Int. Cl.[5]: F 41 A 17/00
Offenlegungstag: 19. September 1991

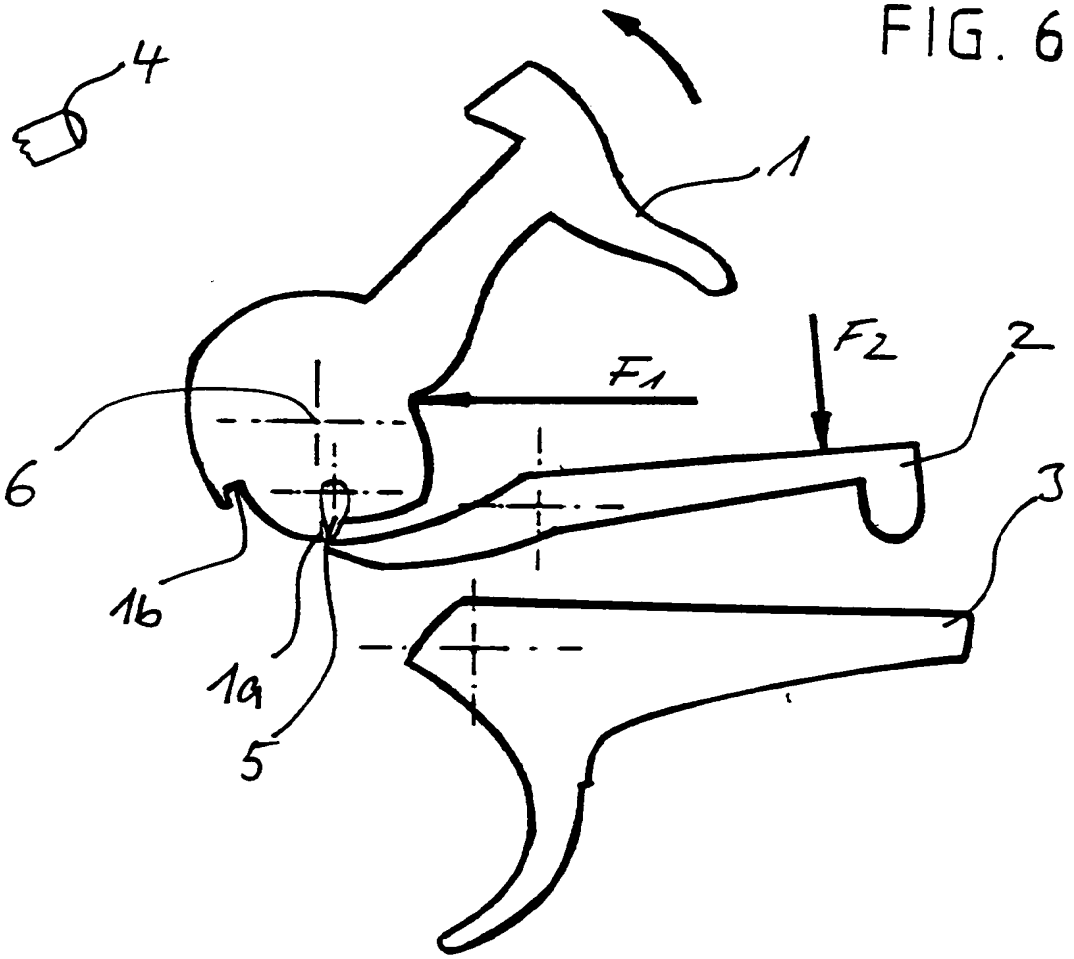
FIG. 5



Atrius Ex. 1002--0111

Nummer: DE 40 08 351 A1
Int. Cl.[5]: F 41 A 17/00
Offenlegungstag: 19. September 1991

FIG. 6



Atrius Ex. 1002--0112

Espacenet

Bibliographic data: EP1678458 (A1) — 2006-07-12

ROLLER SEAR/HAMMER INTERFACE FOR FIREARMS

Inventor(s): KEENEY MICHAEL D [US] ± (KEENEY, MICHAEL, D)

Applicant(s): RA BRANDS LLC [US] ± (RA BRANDS, L.L.C)

Classification: **- international:** ***F41A19/12; F41A19/44;*** (IPC1-7): F41A19/44
- cooperative: **F41A19/12 (EP); F41A19/44 (EP)**

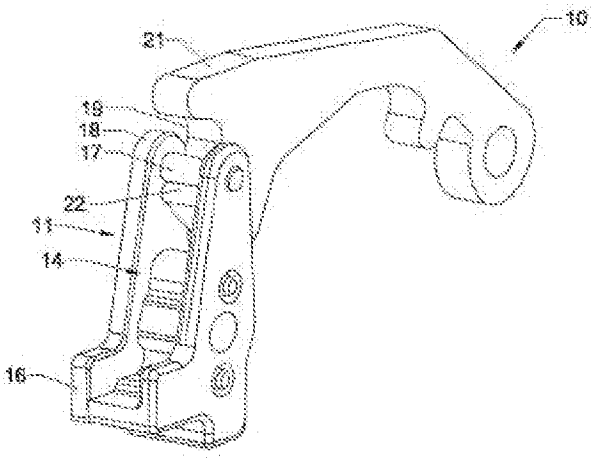
Application number: EP20040796919 20041029 Global Dossier

Priority number (s): US20030516443P 20031031 ; US20040973679 20041026 ; WO2004US37987 20041029

Also published as: EP1678458 (B1) AT545000 (T) AU2004286353 (A1) AU2004286353 (B2) BRPI0415909 (A) more

Abstract not available for EP1678458 (A1)
Abstract of corresponding document: WO2005043068 (A1)

A roller sear/hammer interface for a firearm. The sear (11) has a roller (17) rotatably mounted between two side plates (16) forming a portion of the sear body (14). As the trigger (13) is moved, a linkage (12) connecting the trigger (13) and sear (11) causes the sear (11) to pivot rearward such that the roller (17) engages a notched surface (22) formed in the hammer (21). This rolling action releases the hammer (21) to strike a firing pin (24) to fire a round of ammunition. When the trigger (13) is released, the sear roller (17) rolls downward into an engaged and locked position within the notch (22) formed in the hammer (21).



(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 678 458 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
08.02.2012 Bulletin 2012/06

(21) Application number: **04796919.1**

(22) Date of filing: **29.10.2004**

(51) Int Cl.:
F41A 19/44 *(2006.01)*

(86) International application number:
PCT/US2004/037987

(87) International publication number:
WO 2005/043068 (12.05.2005 Gazette 2005/19)

(54) **ROLLER SEAR/HAMMER INTERFACE FOR FIREARMS**

KOPPLUNG ZWISCHEN SCHLAGHAMMER UND ABZUGSHEBEL MITTELS EINES ROLLERS

INTERFACE A ROULEAU ENTRE GACHETTE ET CHIEN POUR ARMES A FEU

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR

(30) Priority: **31.10.2003 US 516443 P**
26.10.2004 US 973679

(43) Date of publication of application:
12.07.2006 Bulletin 2006/28

(73) Proprietor: **RA BRANDS, L.L.C.**
Madison, NC 27025-0700 (US)

(72) Inventor: **KEENEY, Michael, D.**
Rineyville, KY 40162 (US)

(74) Representative: **Hofstetter, Alfons J.**
Hofstetter, Schurack & Skora
Balanstrasse 57
81541 München (DE)

(56) References cited:
BE-A- 524 187
DE-A1- 4 125 148
US-A- 2 189 202
US-A- 4 908 970

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 678 458 B1

Description

Field of the Invention

[0001] The present invention generally relates to hammer driven firearm trigger assemblies, and in particular to a hammer/sear interface for hammer driven firearm trigger assemblies as described in the preamble of claim 1. Such a trigger assembly is disclosed in DE 41 25 148 A1.

Background of the Invention

[0002] In hammer driven firearm trigger assemblies or fire control systems, such as for handguns, shotguns and various other types of long guns including lever action and semiautomatic rifles, the hammer of the firearm generally is held in a cocked position by a mechanical interface with a sear. The sear is connected either directly or through mechanical linkages to the trigger of the firearm. When the trigger is squeezed or moved rearward to fire a round of ammunition, the sear generally is moved out of locking engagement with the hammer so as to release the hammer. The hammer then is pivoted into contact with a firing pin of the firearm by a hammer spring. The engagement of the firing pin by the hammer causes the firing pin to strike a round of ammunition in the chamber of the firearm to initiate the firing of a round of ammunition.

[0003] Fig. 1 generally illustrates a conventional hammer sear interface in which the sear 2 includes a notched, hooked portion 6 that engages a corresponding notch or hook 8 formed in the rear hammer 4. Due to the sliding nature of this mechanical interface, the sear 2 and hammer 4 generally must be precisely machined so as to provide and ensure smooth and even surfaces on both the hammer and sear, so as to provide a smooth and crisp trigger feel during shooting to avoid catching or hesitation during firing, which can lead to misfires and affect the aim of the shooter. In addition, it is also important for hammer/sear interfaces that upon a partial trigger pull, i.e., where the sear 2 is partially rotated but does not release the hammer 4, the two components must be returned to full engagement upon release of the trigger to prevent inadvertent discharge of the firearm. The criticality of the components returning to full engagement upon release of the trigger thus further requires that the geometry and surface finishes of the hammer 4 and sear 2 be carefully and precisely machined and finished, such that the hammer and sear will regain full engagement in such a situation in which the trigger is released after a partial trigger pull without firing. Such precise and careful machining of these components, however, generally is more expensive and requires significant quality control and review to ensure that such parts are precisely machined to within specific, narrow ranges of tolerances necessary to provide a smooth interface and function.

[0004] Accordingly, it can be seen that a need exists for a new hammer/sear interface for hammer driven firearm trigger assemblies that addresses the foregoing and other related and unrelated problems in the art.

Summary of the Invention

[0005] The present invention is directed to a roller sear/hammer interface for a firearm. In an exemplary embodiment, the sear has a roller rotatably mounted between two side plates forming a portion of the sear body. As the trigger is moved, a linkage connecting the trigger and sear causes the sear to pivot rearward such that the roller rolls along a notched surface formed in the hammer. This rolling action releases the hammer to strike a firing pin to fire a round of ammunition. Following the firing of the round of ammunition, the hammer is returned to the fully cocked position, after which the sear roller rolls downward into an engaged and locked position within the notch formed in the hammer.

[0006] In one aspect of the invention, a sear-hammer interface is provided for a firearm trigger assembly. The sear-hammer interface includes a hammer having a roller receiving notch formed along a rear surface; and a sear connected to the trigger assembly so as to pivot rearward in response to movement of a trigger. The sear has a roller mounted between a pair of opposed side plates. The roller rolls along an engaging surface of the notch formed in the hammer when the trigger is moved to release the hammer.

Brief Description of the Drawings

[0007] The invention is better understood by reading the following detailed description of the invention in conjunction with the accompanying drawings.

[0008] Fig. 1 is a side elevation view of a conventional hammer/sear interface.

[0009] Fig. 2 is a perspective illustration of the roller sear/hammer interface of the present invention.

[0010] Fig. 3 is a side elevation view of the roller sear/hammer interface of the present invention with portions broken away for clarity.

[0011] Fig. 4 is a schematic illustration of a hammer driven fire control or trigger assembly utilizing the roller sear/hammer interface of the present invention.

[0012] Fig. 5 is a side elevation view illustrating an example of the fire control trigger assembly utilizing the roller sear/hammer interface of the present invention mounted in a firearm.

Description of the Invention

[0013] The following description of the invention is provided as an enabling teaching of the invention in its best, currently known embodiment Those skilled in the relevant art will recognize that many changes can be made to the embodiments described, while still obtaining the beneficial results of the present invention. It will also be apparent that some of the desired benefits of the present

Atrius Ex. 1002--0115

invention can be obtained by selecting some of the features of the present invention without utilizing other features. Accordingly, those who work in the art will recognize that many modifications and adaptations to the present invention are possible and may even be desirable in certain circumstances and are a part of the present invention. Thus, the following description is provided as illustrative of the principles of the present invention and not in limitation thereof, since the scope of the present invention is defined by the claims.

[0014] The present invention generally is directed to an improved hammer/sear interface 10 (Figs. 2 and 3) for hammer driven trigger assemblies or fire control systems T (Figs. 4 and 5) of firearms F (Fig. 5) such as various types of long guns, including shotguns and rifles, handguns, and other types of firearms utilizing hammer driven trigger assemblies or fire control systems for firing rounds of ammunition therefrom. The present invention is further directed to providing a smoother and crisper trigger feel during operation of the hammer driven trigger assembly without requiring extensive surface finishing and precision milling or forming operations of the sear and hammer and the interface therebetween as is typically required with conventional hammer/sear interfaces for conventional hammer driven firearm trigger assemblies or fire control systems.

[0015] As generally illustrated in Figs. 2 - 5, the improved hammer/sear interface 10 of the present invention generally includes a sear 11 connected via a mechanical linkage 12 (Figs. 4 and 5) to a trigger 13 of a firearm trigger assembly or fire control. As shown in Fig. 2, the roller sear 11 of the present invention generally includes a body portion 14, having a pair of opposed side plates 16, each typically formed from a metal such as steel or other durable, high strength materials and attached together via fasteners such as rivets, bolts or other similar fastening mechanisms. Alternatively, the body 14 can be stamped, milled, metal injection molded, or otherwise formed as a single, unitary piece or component. A roller or linear bearing 17 is rotatably mounted between the side plates at the upper ends 18 thereof so as to rotate upon movement of the sear 11 in response to movement of the trigger 13 of the firearm as indicated in Figs. 4 and 5. As further shown in Figs. 2 and 3, the roller or linear bearing 17 engages and rests in a notch 19 formed in a rear portion of a hammer 21 so as to engage and lock the hammer 21 in a cocked or ready position.

[0016] As indicated in Figs. 4 and 5, as the trigger 13 is moved or pulled rearward, it will cause the linkage 12 between the trigger and the sear 11 to be moved forwardly, in turn causing the sear 11 of the present invention to be pivoted rearwardly. As the sear pivots rearward, the roller or linear bearing 17 will roll along the angled rearward surface 22 of the notch 19 formed in the hammer 21 so as to release the hammer from engagement by the sear. As the hammer is released, it will be urged forwardly by a hammer spring (not shown) and will strike the rearward end 23 of the firing pin 24 of the firearm, causing the firing pin to be moved forwardly and strike the primer of a round of ammunition (not shown) loaded within the chamber of the firearm to fire the round. Thereafter, as the hammer is moved back to its cocked, ready to fire position, upon release of the trigger, the roller 17 of the sear 11 again will be engaged by and roll downwardly into a fully engaged and locked position within the notch 19 of the hammer 21.

[0017] Accordingly, the roller sear/hammer interface of the present invention enables/allows greater tolerances in the machining of the hammer and sear, and the surface finishes thereof, than generally are required to form conventional sear and hammer components for a hammer driven trigger assembly or fire control system for firearms. The roller action of the present invention further generally will ensure a smooth rolling engagement as opposed to the fictional sliding engagement of conventional hammer/sear interfaces. Further, if the sear is subjected to a partial trigger pull and release, the roller design of the present invention also generally will regain its engaged and locked position with the hammer with less hesitancy, due to the reduced frictional aspects of the roller sear/hammer interface of the present invention.

Claims

1. A sear-hammer interface for a firearm trigger assembly comprising:

   a sear (11) having a roller (17) mounted thereon;
   a hammer (21) having a roller receiving notch (19) for engaging the roller (17) formed in a rear portion of the hammer (21), the notch (19) having an angled rearward surface (22);

   characterized in that
   the roller (17) is mounted between a pair of opposed side plates (16); and
   the sear (11) is connected to the trigger assembly by a mechanical linkage (12) wherein an upper sear part carrying the roller (17) pivots rearward towards the trigger (13) in response to a rearward movement of the trigger (13), and wherein the engaging surface (22) of the notch (19) formed in the hammer (21) is constructed to roll the roller (17) along its surface when the trigger (13) is moved to release the hammer (21).

2. The sear-hammer interface of claim 1 wherein the roller (17) is mounted between the side plates (16) at an upper end (18) of each plate (16).

3. The sear-hammer interface of claim 1 wherein the roller (17) rolls along the surface (22) of the notch (19) in an opposite direction into an engaged and locked position within the notch (19) of the hammer (21) when the trigger (13) is released.

Atrius Ex. 1002--0116

4. The sear-hammer interface of claim 1 wherein the roller (17) rolls along the surface (22) of the notch (19) in an opposite direction along the notch (19) of the hammer (21) to return to an engaged and locked position when the trigger (13) is released before the sear (11) releases the hammer (21) during a partial trigger pull.

Patentansprüche

1. Abzugsstück-Hammer-Kopplung für eine Schusswaffenabzugsanordnung mit:

   einem Abzugsstück (11) mit einer daran montierten Rolle (17);
   einem Hammer (21) mit einer Rollenaufnahmekerbe (19) zum Eingriff mit der Rolle (17), die in einem hinteren Abschnitt des Hammers (21) ausgebildet ist, wobei die Kerbe (19) eine abgewinkelte hintere Oberfläche (22) aufweist;
   dadurch gekennzeichnet, dass
   die Rolle (17) zwischen einem Paar von entgegengesetzten Seitenplatten (16) montiert ist; und
   das Abzugsstück (11) mit der Abzugsanordnung durch eine mechanische Verbindung (12) verbunden ist, wobei ein oberer Abzugsstückteil, der die Rolle (17) trägt, in Reaktion auf eine Rückwärtsbewegung des Abzugs (13) in Richtung des Abzugs (13) nach hinten schwenkt und wobei die Eingriffsoberfläche (22) der Kerbe (19), die im Hammer (21) ausgebildet ist, konstruiert ist, um die Rolle (17) entlang ihrer Oberfläche zu rollen, wenn der Abzug (13) zum Lösen des Hammers (21) bewegt wird.

2. Abzugsstück-Hammer-Kopplung nach Anspruch 1, wobei die Rolle (17) zwischen den Seitenplatten (16) an einem oberen Ende (18) jeder Platte (16) montiert ist.

3. Abzugsstück-Hammer-Kopplung nach Anspruch 1, wobei die Rolle (17) entlang der Oberfläche (22) der Kerbe (19) in einer entgegengesetzten Richtung in eine eingerückte und verriegelte Position innerhalb der Kerbe (19) des Hammers (21) rollt, wenn der Abzug (13) losgelassen wird.

4. Abzugsstück-Hammer-Kopplung nach Anspruch 1, wobei die Rolle (17) entlang der Oberfläche (22) der Kerbe (19) in einer entgegengesetzten Richtung entlang der Kerbe (19) des Hammers (21) rollt, um in eine eingerückte und verriegelte Position zurückzukehren, wenn während eines teilweisen Abdrückens des Abzugs der Abzug (13) losgelassen wird, bevor das Abzugsstück (11) den Hammer (21) löst.

Revendications

1. Interface gâchette - chien pour un ensemble formant détente d'arme à feu, comprenant :

   une gâchette (11), ayant un rouleau (17) qui y est monté ;
   un chien (21), ayant une encoche (19) de réception de rouleau, pour mettre en prise le rouleau (17), formé dans une partie arrière du chien (21), l'encoche (19) ayant une surface arrière angulaire (22) ;
   caractérisée en ce que
   le rouleau (17) est monté entre une paire de plaques latérales opposées (16) et
   la gâchette (11) est reliée à l'ensemble formant détente par une jonction mécanique (12), dans laquelle une partie supérieure de la gâchette, qui porte le rouleau (17), pivote vers l'arrière, vers la détente (13), en réponse à un mouvement vers l'arrière de la détente (13) et dans laquelle la surface (22) de mise en prise de l'encoche (19), formée dans le chien (21), est fabriquée pour faire rouler le rouleau (17) le long de sa surface, lorsque la détente (13) est déplacée pour relâcher le chien (21).

2. Interface gâchette - chien selon la revendication 1, dans laquelle le rouleau (17) est monté entre les plaques latérales (16), sur une extrémité supérieure (18) de chaque plaque (16).

3. Interface gâchette - chien selon la revendication 1, dans laquelle le rouleau (17) roule le long de la surface (22) de l'encoche (19), dans une direction opposée, dans une position mise en prise et verrouillée, dans l'encoche (19) du chien (21), lorsque la détente (13) est relâchée.

4. Interface gâchette - chien selon la revendication 1, dans laquelle le rouleau (17) roule le long de la surface (22) de l'encoche (19), dans une direction opposée, le long de l'encoche (19) du chien (21), pour revenir à une positon mise en prise et verrouillée, lorsque la détente (13) est relâchée, avant que la gâchette (11) ne relâche le chien (21), durant une traction partielle, exercée sur la détente.

Atrius Ex. 1002--0117

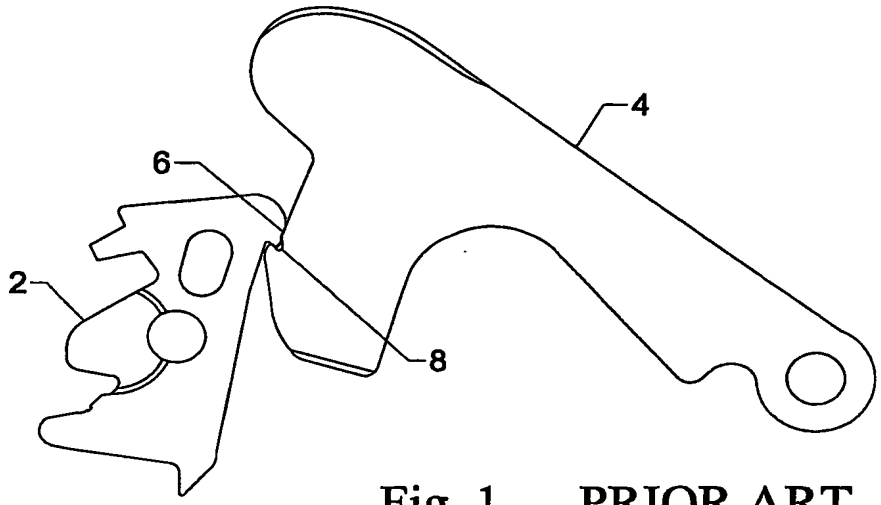


Fig. 1 PRIOR ART

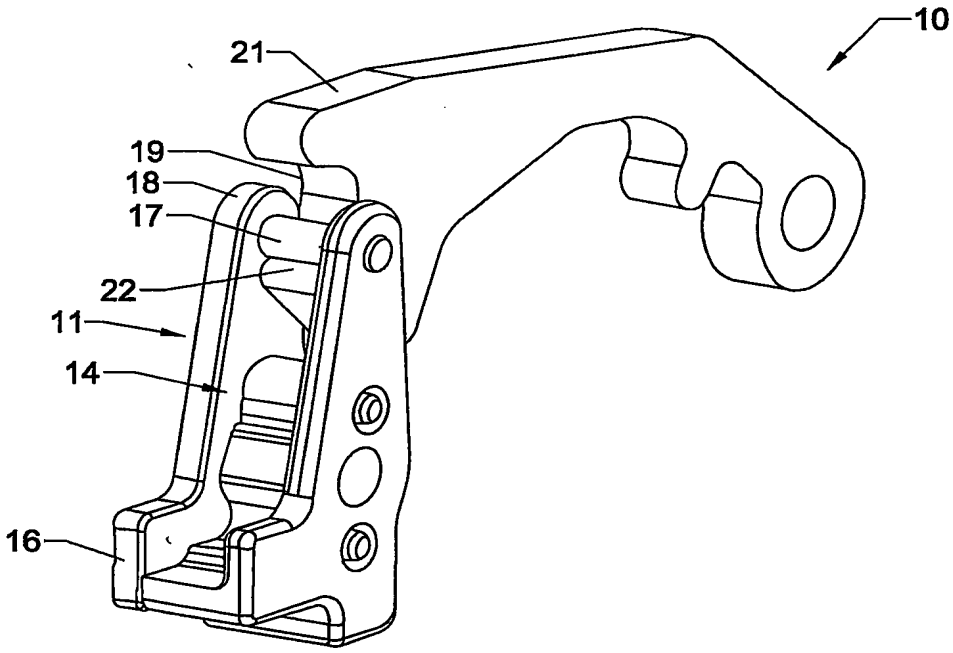


Fig. 2

Atrius Ex. 1002--0118

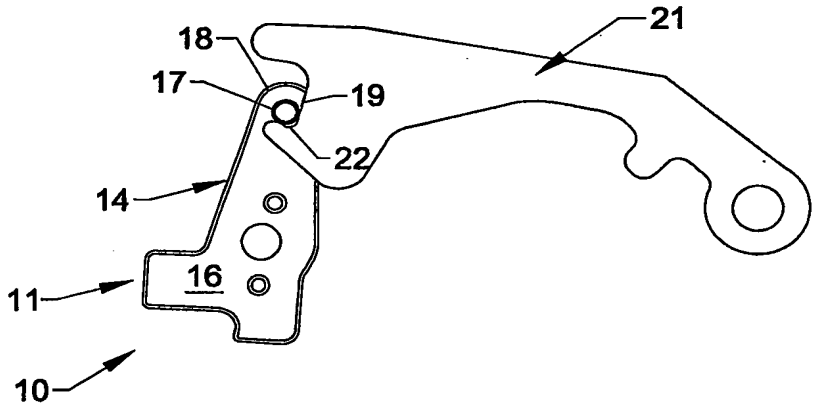


Fig. 3

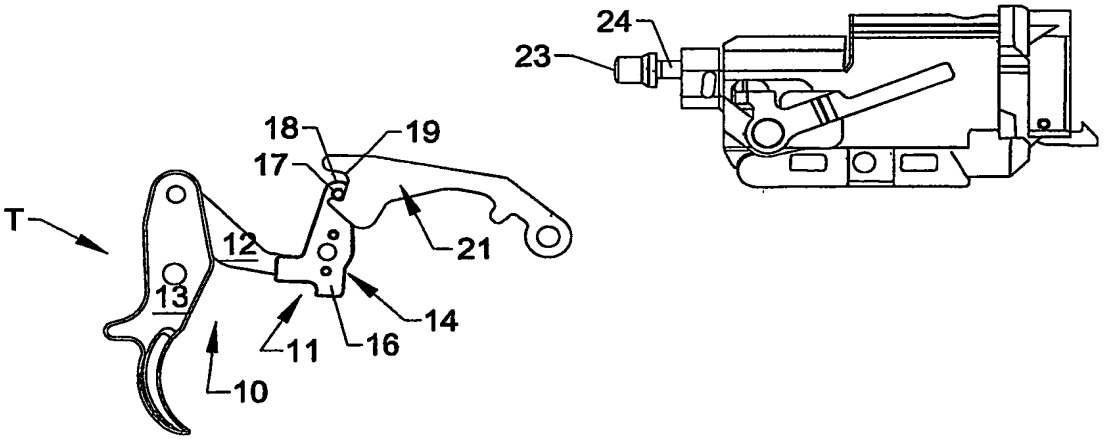


Fig. 4

Atrius Ex. 1002--0119

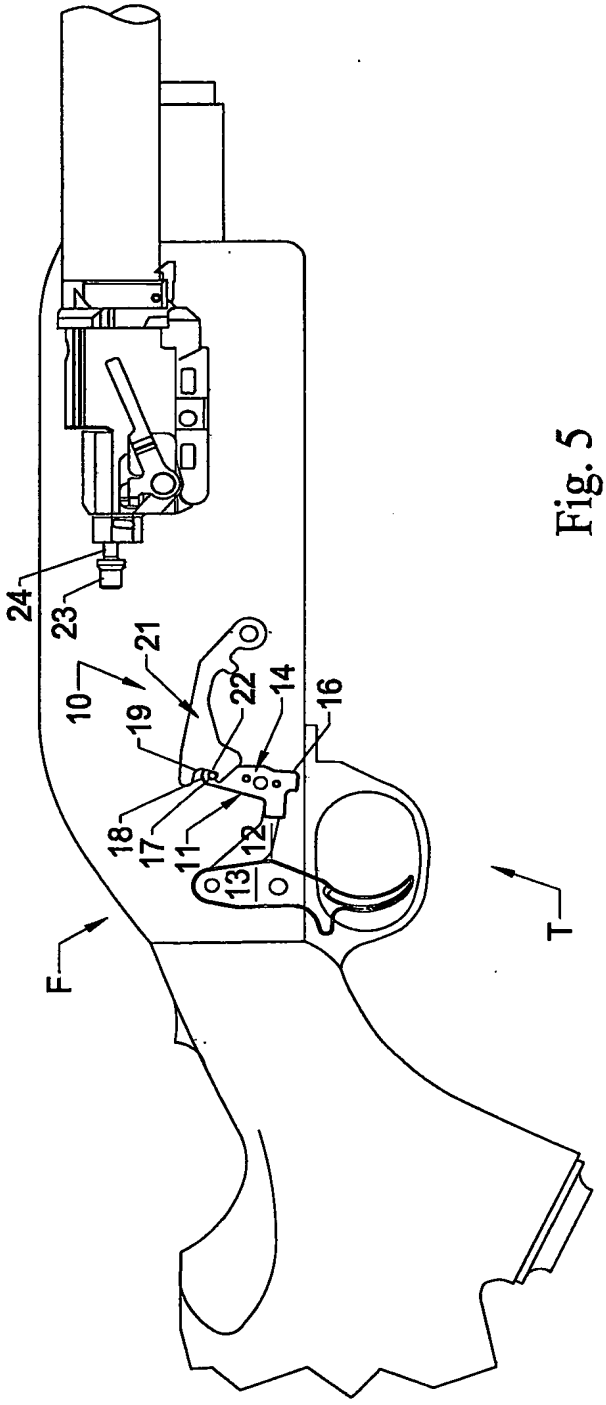


Fig. 5

Atrius Ex. 1002--0120

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- DE 4125148 A1 **[0001]**

Atrius Ex. 1002--0121

Espacenet

Bibliographic data: EP2950033 (A1) — 2015-12-02

HANDGUN AND TRIGGER LOCK FOR SAME

Inventor(s): OSTANIN ALEXANDER [DE]; SAUER OLAF [DE]; MORGENROTH LUTZ [DE] ± (OSTANIN, ALEXANDER, ; SAUER, OLAF, ; MORGENROTH, LUTZ)

Applicant(s): MERKEL JAGD UND SPORTWAFFEN GMBH [DE] ± (MERKEL JAGD- UND SPORTWAFFEN GMBH)

Classification: **- international:** ***F41A17/46***
- cooperative: **F41A17/46 (EP)**

Application number: EP20150169105 20150526 Global Dossier

Priority number (s): DE201410107620 20140530

Also published as: EP2950033 (B1) DE102014107620 (B3) ES2616560 (T3) PL2950033 (T3) PT2950033 (T)

Abstract of EP2950033 (A1)

Abzugsvorrichtung (01) einer Handfeuerwaffe mit einer Sicherungswelle (04), die eine Steuerkurve (05) trägt und von einer Sicherheitsstellung in eine Abschussstellung verdrehbar ist. Die Sicherungswelle (04) blockiert in ihrer Sicherheitsstellung in einem gespannten Zustand der Handfeuerwaffe einen Abzugshebel (13). Die Abzugssicherung (01) unfasst ein federkraftbelastetes Abstandshalteelement (02), welches im gespannten Zustand der Handfeuerwaffe zwischen dem Abzugshebel (13) und der in ihrer Sicherheitsstellung befindlichen Sicherungswelle (04) angeordnet ist. Die Steuerkurve (05) ist durch eine zumindest abschnittsweise spiralartig ausgebildete Ausnehmung (11) gebildet, welche in der Abschussstellung der Sicherungswelle (04) im gespannten Zustand der Handfeuerwaffe dem Abstandshalteelement (02) zugewandt ist, sodass das Abstandshalteelement (02) nur einen ersten Teil eines Abstands zwischen der Sicherungswelle (04) und dem Abzugshebel (13) ausgleicht und ein Abzugsabstand verbleibt. Das Abstandshalteelement (02) ist im entspannten Zustand der Handfeuerwaffe durch einen Wechsel der Sicherungswelle (04) in deren Sicherungsposition durch die Ausnehmung (11) axial in einen Sperrbereich verdrängt, wobei im gespannten Zustand eine Bewegung des Abstandshalteelementes (02) aus dem Sperrbereich in Richtung der Federkraft freigegeben ist.

Atrius Ex. 1002--0122

Patent Translate
Powered by EPO and Google

Notice

This translation is machine-generated. It cannot be guaranteed that it is intelligible, accurate, complete, reliable or fit for specific purposes. Critical decisions, such as commercially relevant or financial decisions, should not be based on machine-translation output.

ABSTRACT EP2950033A1

[0001]

Trigger device (01) of a handgun with a safety shaft (04), which carries a control cam (05) and can be rotated from a safety position into a firing position. In its safety position, the safety shaft (04) blocks a trigger (13) when the handgun is cocked. The trigger safety device (01) includes a spring-loaded spacer element (02) which, when the handgun is cocked, is arranged between the trigger lever (13) and the safety shaft (04), which is in its safety position. The control cam (05) is formed by a recess (11) that is designed in a spiral fashion, at least in sections, which faces the spacer element (02) when the safety shaft (04) is in the firing position when the handgun is cocked, so that the spacer element (02) only has a first part a distance between the safety shaft (04) and the trigger (13) and a trigger distance remains.

When the handgun is in the uncocked state, the spacer element (02) is displaced axially into a blocking area by changing the safety shaft (04) to its safety position through the recess (11), with the spacer element (02) moving out of the blocking area in the direction in the cocked state the spring force is released.

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 950 033 B1

(12) **EUROPÄISCHE PATENTSCHRIFT**

(45) Veröffentlichungstag und Bekanntmachung des Hinweises auf die Patenterteilung:
23.11.2016 Patentblatt 2016/47

(51) Int Cl.:
F41A 17/46 *(2006.01)*

(21) Anmeldenummer: **15169105.2**

(22) Anmeldetag: **26.05.2015**

(54) **HANDFEUERWAFFE UND ABZUGSSICHERUNG HIERFÜR**

HANDGUN AND TRIGGER LOCK FOR SAME

ARME DE POING ET BLOCAGE DE DETENTE ASSOCIE

(84) Benannte Vertragsstaaten:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priorität: **30.05.2014 DE 102014107620**

(43) Veröffentlichungstag der Anmeldung:
02.12.2015 Patentblatt 2015/49

(73) Patentinhaber: **Merkel Jagd- und Sportwaffen GmbH**
98527 Suhl (DE)

(72) Erfinder:
- **Ostanin, Alexander**
  98527 Suhl (DE)
- **Sauer, Olaf**
  78727 Oberndorf (DE)
- **Morgenroth, Lutz**
  98673 Merbelsrod (DE)

(74) Vertreter: **Engel, Christoph Klaus**
Engel Patentanwaltskanzlei
Marktplatz 6
98527 Suhl/Thüringen (DE)

(56) Entgegenhaltungen:
DE-B3-102007 004 588
DE-U1-202011 004 556
US-A- 3 258 871
US-B1- 6 880 281

Anmerkung: Innerhalb von neun Monaten nach Bekanntmachung des Hinweises auf die Erteilung des europäischen Patents im Europäischen Patentblatt kann jedermann nach Maßgabe der Ausführungsordnung beim Europäischen Patentamt gegen dieses Patent Einspruch einlegen. Der Einspruch gilt erst als eingelegt, wenn die Einspruchsgebühr entrichtet worden ist. (Art. 99(1) Europäisches Patentübereinkommen).

EP 2 950 033 B1

Beschreibung

[0001] Die vorliegende Erfindung betrifft eine Abzugssicherung für eine Handfeuerwaffe, insbesondere für eine halbautomatische Langwaffe. Im Weiteren betrifft die Erfindung eine Handfeuerwaffe mit der erfindungsgemäßen Abzugsvorrichtung.

[0002] Aus dem Stand der Technik ist es bekannt, Schusswaffen, insbesondere Langwaffen, durch eine mechanische Sicherung vor ungewolltem Betätigen eines Abzugs und Abfeuern der Schusswaffe zu schützen. Neben Handhabungsfehlern können auch Stürze der Schusswaffen oder mechanische Mängel an der Waffe zu einem ungewollten Auslösen eines Schusses führen. Neben der Abzugssicherung wird alternativ eine Stangensicherung, eine Schlaghebel- bzw. Schlagbolzensicherung oder eine Kombinationen aus diesen Grundvarianten eingesetzt. Allen Sicherungen liegt zu Grunde, dass spezielle mechanische Komponenten in einer Sicherheitsstellung arretiert werden und/oder den direkten Kontakt zu benachbarten mechanischen Komponenten oder einer Baugruppe verhindern. Eine Abzugssicherung blockiert in der Sicherheitsstellung über eine Mechanik den Abzug der Schusswaffe. Dabei verhindert sie bei der gespannten Schusswaffe eine Energieübertragung von einer Abzugsbaugruppe über eine Schlaghebelbaugruppe zu einem einen Schuss auslösenden Schlagstück oder einem Schlagbolzen. Die Energie wird in einem gespannten Zustand der Schusswaffe durch ein Vorspannen von technischen Federn, wie beispielsweise einer Abzugsfeder und einer Schlagfeder, bereitgestellt. Die Abzugssicherung besteht beispielsweise aus einer Sicherungswelle, die eine Steuerkurve trägt und über einen Betätigungshebel in zwei Stellungen verdrehbar ist. Dabei behindert die Sicherungswelle eine Schwenkbewegung eines Abzugshebels am Abzug in der Sicherheitsstellung. Die Abzugssicherung ist zumeist so konzipiert, dass die Schusswaffe in dem gespannten Zustand, also bei gespannter Schlaghebelfeder und gespannter Abzugsfeder, ge- bzw. entsichert werden kann. Nach Abschlag der Waffe verändert der Abzugshebel seine Position und greift mit einem seiner Enden in der Weise in die Steuerkurve ein, dass eine Rückbewegung der Sicherungswelle in die Sicherheitsstellung nicht mehr möglich ist. Somit besteht ein erhöhtes Risiko für Mensch und Umgebung, beispielsweise durch fehlgezündete, in der Schusswaffe verbleibende Munition. Es ist von Interesse, zum Beispiel im militärischen oder weidmännischem Einsatz, eine Waffensicherung bereitzustellen, die auch in einer entspannten Waffenstellung in die Sicherheitsstellung bewegt werden kann, um die Schusswaffe anschließend gefahrlos spannen zu können.

[0003] Die DE 20 2007 004 747 U1 zeigt eine Sicherheitsvorrichtung einer Schusswaffe mit mindestens einem Schlaghebel und einer Schlagfeder, welche als Schlaghebelsicherung ausgebildet ist. Eine Zündvorrichtung ist zwischen einer Sicherungsstellung und einer Feuerstellung hin und her verschiebbar. In der Sicherungsstellung ist die Zündvorrichtung von einem Zündstift soweit entfernt, dass kein mechanischer Zugriff möglich ist. Diese Sicherheitsvorrichtung soll eine kraftarme Bedienung bei gespannter und ungespannter Schlagfeder ermöglichen. Dabei kann eine Blockade der Mechanik oder ein Ausfall der Sicherungsvorrichtung dazu führen, dass die gesamte Schusswaffe unbrauchbar wird.

[0004] Aus der DE 20 2011 004 556 U1 ist eine Abzugseinrichtung für Schusswaffen mit einem Schlaghebel, einem Abzug und einem walzenförmigen Sicherungselement einer Abzugssicherung bekannt. Das Sicherungselement ist drehbar gelagert und kann in zwei Stellungen verdreht werden. In Sicherheitsstellung blockiert die Abzugssicherung den Abzug und in einer Feuerstellung gibt sie den Abzug frei. Ein drehbar gelagerter Abzugsstollen ist zwischen Abzug und Schlaghebel angeordnet und wird durch eine Abzugsfeder in Richtung Schlaghebel energetisch beaufschlagt. Die spezielle Formgebung des Abzugsstollens und dessen Anordnung in der Abzugseinrichtung erlauben auch bei abgeschlagener Waffe, das Sicherungselement in Sicherheitsstellung zu bewegen. Nachteilig ist jedoch eine aufwändige Montage zusätzlicher Einzelteile an der Abzugseinrichtung, die zudem zu einem erhöhten Ausfallrisiko führen. Ein Ausfall des Abzugsstollens kann sogar zur Unbrauchbarkeit der Schusswaffe führen.

[0005] Die DE 10 2007 004 588 B3 zeigt ein Steuerelement für einen um eine Schwenkachse beweglichen Schlaghebel einer Waffe, der in seiner Spannstellung über eine Rastfläche mit einer Gegenfläche eines Auslöseelements, beispielsweise einem Abzugsstollen am Abzugshebel, verrastbar ist. Am Schlaghebel ist ein Steuerkurvenabschnitt vorgesehen, der in einer von der Spannstellung abweichenden Schwenkstellung des Schlaghebels an einer Steuerfläche des Auslöseelements angreift und dieses in einer entsicherten Stellung hält.

[0006] Aus der DE 10 2006 048 436 B4 ist eine Abzugseinrichtung für eine Feuerwaffe, insbesondere für ein Selbstlade-Militärgewehr bekannt, welche ein Abzugszüngel, ein mit dem Abzugszüngel verbundenes Abzugsstollenteil und mindestens eine auf das Abzugsstollenteil einwirkende Abzugsfeder umfasst. Bei dieser Abzugseinrichtung ist der Abzugszüngel vom Abzugsstollenteil gesondert zwischen zwei Anschlägen angeordnet, von denen der eine die Bewegung des Abzugszüngels relativ zum Abzugsstollenteil nach vorne, der andere nach hinten verhindert. Zwischen den beiden Anschlägen ist eine kurze Bewegung des Abzugszüngels relativ zum Abzugsstollenteil möglich.

[0007] Die DE 1 453 913 A zeigt einen Abzugsmechanismus für automatische und halbautomatische Feuerwaffen mit einem zwischen einer Spannfeder und Feuerstellungen angeordneten Hammer. Ein Abzug dient zum Steuern des Arbeitens des Hammers. Ein Feuerstoß-Steuermechanismus dient dazu, bei einer einzelnen Betätigung des Abzuges einen Feuerstoß mit einer

Atrius Ex. 1002--0126

vorbestimmten Anzahl von Schüssen abzufeuern. Der Feuerstoß-Steuermechanismus verbindet wahlweise den Abzug und den Hammer zwecks selbsttätigen Arbeitens des Hammers.

[0008] Aus dem Stand der Technik ist eine Vielzahl an Lösungen zur Sicherung einer Waffe bekannt. Verschiedene Sicherungsarten zeigen dabei unterschiedliche Lösungsansätze, die je nach Art der Schusswaffe bevorzugt eingesetzt werden. Dabei zeigen die Sicherungen einen erhöhten Montageaufwand durch zusätzliche mechanische Teile und ein erhöhtes Risiko für Defekte und Ausfälle. Übliche Abzugssicherungen mit drehbarem Sicherungselement zeigen den Nachteil, in entspanntem Zustand der Waffe nicht gesichert werden zu können und/oder bei Ausfall der Sicherung zur Unbrauchbarkeit der Waffe zu führen.

[0009] Die Aufgabe der vorliegenden Erfindung besteht ausgehend vom Stand der Technik darin, eine kostengünstige Abzugssicherung mit geringem Montageaufwand zur Verfügung zu stellen, die ein Sichern des Abzugs auch in entspanntem Zustand der Waffe gestattet und im Falle eines Defekts der Sicherung nicht zur Schussunfähigkeit der Waffe führt.

[0010] Die genannte Aufgabe, ausgehend von der DE 20 2011 004556U, durch eine Abzugssicherung gemäß dem beigefügten Anspruch 1 gelöst. Die Aufgabe wird weiterhin gelöst durch eine Handfeuerwaffe gemäß dem beigefügten nebengeordneten Anspruch 10.

[0011] Die Erfindung stellt eine Abzugssicherung für eine Handfeuerwaffe, insbesondere für eine halbautomatische Langwaffe, zur Verfügung. Die Abzugssicherung lässt sich sowohl in einer gespannten, als auch in einer ungespannten Waffenstellung von einer Abschussstellung in eine Sicherheitsstellung bewegen. Dabei ist die Abzugssicherung an einen um eine Abzugsachse schwenkbaren Abzugshebel anschlagbar, der hier bevorzugt als ein einziges Bauteil ausgebildet ist und aus dem Gebiet der Waffenkunde bekannte Teile, wie eine Abzugsstange, ein Abzugsblatt und ein Abzugszüngel vereint. Ein Abschnitt des Abzugshebels, welcher der Abzugsstange entspricht, ist in einer Längsrichtung der Schusswaffe ausgerichtet. Befindet sich die Schusswaffe in einer Gebrauchshaltung, ist bevorzugt ein mit der Abzugsstange verbundenes, halbmondförmiges Abzugszüngel in bekannter Weise unterhalb der Abzugstange angeordnet. Dabei ist das von der Abzugsstange beabstandete Ende des Abzugszüngels in eine Schussrichtung ausgerichtet. In einem gespannten Zustand der Handfeuerwaffe blockiert die Sicherungswelle in der Sicherheitsstellung den Abzugshebel, während sie in der Abschussstellung den Abzugshebel freigibt.

[0012] Neben bekannten Komponenten, wie einer Sicherungswelle, die eine Steuerkurve trägt, und einem Betätigungshebel zum Verdrehen der Sicherungswelle von der Sicherheitsstellung in die Abschussstellung und zurück weist die erfindungsgemäße Abzugssicherung mindestens ein zusätzliches federkraftbelastetes Abstandshalteelement auf. Dabei ist das Abstandshalteelement bevorzugt durch einen Schenkel einer Schenkelfeder gebildet, welche bevorzugt zwei der Schenkel besitzt. Das Abstandshalteelement liegt bevorzugt in Längsrichtung des Abzugshebels auf dem Abzugshebel auf. Dabei ist das Abstandshalteelement bzw. die Schenkelfeder in Richtung der Sicherungswelle bevorzugt von der Abzugsachse beabstandet gelagert. Entsprechend erstreckt sich das Abstandshalteelement bzw. die Schenkelfeder in Richtung Sicherungswelle und endet zwischen der Sicherungswelle und dem Abzugshebel oder hinter der Sicherungswelle. Während sich bei aus dem Stand der Technik bekannten Abzugssicherungen der Abzugshebel in gesicherter Waffenstellung in direktem Kontakt zur Sicherungswelle befindet, ist bei der erfindungsgemäßen Abzugssicherung das Abstandshalteelement als ein Verbindungselement zwischen der Sicherungswelle und dem Abzugshebel angeordnet. Der direkte Kontakt zwischen dem Abzugshebel und der in der Sicherheitsstellung befindlichen Sicherungswelle ist zumindest im gespannten Zustand der Handfeuerwaffe nicht möglich. Das Abstandshalteelement ist zumindest in die Richtung der Achse der Sicherungswelle bewegbar und kann mindestens zwei von Positionen der Sicherungswelle abhängige Stellungen einnehmen. Dabei befindet sich das Abstandshalteelement im gespannten Zustand der Handfeuerwaffe bevorzugt nicht im Eingriff der Steuerkurve der in der Abschussstellung befindlichen Sicherungswelle und die das Abstandshalteelement belastende Federkraft ist bevorzugt minimal.

[0013] Befindet sich die Handfeuerwaffe im gespannten Zustand und befindet sich die Sicherungswelle in ihrer Sicherheitsstellung, so ist das federkraftbelastete Abstandshalteelement zwischen dem Abzugshebel und der Sicherungswelle angeordnet, wodurch ein Schwenken des Abzugshebels zur Sicherungswelle blockiert ist. Das Abstandshalteelement gleicht einem Abstand zwischen der Sicherungswelle und dem Abzugshebel aus, wobei kein Abzugsabstand verbleibt.

[0014] Die Steuerkurve ist durch mindestens eine zumindest abschnittsweise spiralartig ausgebildete Ausnehmung in der Sicherungswelle gebildet. Zur Ausbildung der Spiralartigkeit besitzt die Ausnehmung zumindest eine in der Sicherungswelle verlaufende Seitenfläche, welche gegenüber der Achse der Sicherungswelle geneigt ist. Diese spiralartig ausgebildete Seitenfläche muss sich zumindest über einen Bruchteil einer Umdrehung um die Achse der Sicherungswelle erstrecken; bevorzugt mindestens eine achtel Umdrehung und bevorzugt weniger als eine viertel Umdrehung. Die Spiralform besitzt bevorzugt dieselbe Achse wie die Sicherungswelle. Dabei weist die Ausnehmung beispielsweise mindestens zwei Tiefen und beispielsweise zwei Breiten auf, wobei eine erste Breite in eine zweiten Breite und eine erste Tiefe in eine zweite Tiefe übergeht. Dabei entspricht die erste Tiefe einem kleineren und die zweite Tiefe einem größeren Wellendurchmesser der Sicherungswelle. Benachbart zu einem die Ausnehmung aufweisenden axialen Abschnitt der Sicherungswelle befin-

Atrius Ex. 1002--0127

det sich ein axialer Abschnitt der Sicherungswelle, der bevorzugt als eine Vollwelle ausgebildet ist. Durch die zumindest abschnittsweise spiralartig ausgebildete Ausnehmung sind Vollwellenabschnitte und Abschnitte der Ausnehmung abwechselnd auf der Sicherungswelle angeordnet. Mindestens einer der Vollwellenabschnitte ist an seinem Übergang zu der spiralartigen Ausnehmung bzw. zu dem spiralartig ausgebildeten Abschnitt der Ausnehmung bevorzugt so geformt, dass er beim Drehen der Sicherungswelle von der Abschussstellung in die Sicherheitsstellung bei entspannter Waffenstellung das Abstandshalteelement erfasst und axial verdrängt.

[0015] Befindet sich die Schusswaffe im gespannten Zustand und in ungesicherter Waffenstellung, so befindet sich die Sicherungswelle in der Abschussstellung, sodass die Ausnehmung dem Abstandshalteelement zugewandt ist. Dabei kann es sich um einen umfänglichen Abschnitt der Ausnehmung handeln, der nicht spiralartig ausgebildet ist. Bevorzugt ist im gespannten Zustand und in ungesicherter Waffenstellung ein Abschnitt der Ausnehmung dem Abstandshalteelement zugewandt, welcher einen kreissegmentförmigen Querschnitt besitzt. Befindet sich die Schusswaffe in Gebrauchshaltung, so befindet sich die Ausnehmung bevorzugt mit der ersten Tiefe und der ersten Breite oberhalb des Abstandshalteelements. Der Abzugshebel befindet sich in einer ersten Schwenkstellung. Dabei gleicht das Abstandshalteelement nur einen ersten Teil eines Abstandes zwischen der Sicherungswelle und dem Abzugshebel aus. Es verbleibt zumindest ein Abzugsabstand zwischen dem Abzugshebel und der Sicherungswelle, sodass der Abzugshebel schwenkbar ist, wodurch die Handfeuerwaffe schussfähig ist.

[0016] Befindet sich die Handfeuerwaffe in Gebrauchshaltung und in gespannter und gesicherter Waffenstellung, so ist die Sicherungswelle in der Sicherheitsstellung, nämlich in einer Drehstellung, in der sich bevorzugt einer der Vollwellenabschnitte oberhalb des Abstandshalteelements befindet. Der Abzugshebel befindet sich in der ersten Schwenkstellung. Der Abzugsabstand zwischen der Sicherungswelle und dem Abstandshalteelement ist in diesem Zustand nicht vorhanden. In dieser Stellung ist der Abzugshebel nicht schwenkbar und die Handfeuerwaffe gesichert.

[0017] Sobald ein Schuss mit der Handfeuerwaffe abgefeuert ist, befindet sie sich in entspannter und ungesicherter Waffenstellung. Der Abzugshebel befindet sich in einer zweiten Schwenkstellung, wobei der Abstand zwischen dem Abzugshebel und der Sicherungswelle gegenüber der ersten Schwenkstellung verkleinert ist. Die Sicherungswelle befindet sich noch in der Abschussstellung, nämlich in einer Drehstellung, in der sich die Ausnehmung bevorzugt mit der ersten Tiefe und der ersten Breite oberhalb des Abstandshalteelements befindet. Dabei gleicht das Abstandshalteelement nur einen Teil eines veränderten Abstands zwischen der Sicherungswelle und dem Abzugshebel aus. Es verbleibt zumindest der Abzugsabstand zwischen dem Abzugshebel und der Sicherungswelle, sodass der Abzugshebel weiterhin schwenkbar ist.

[0018] Durch einen Wechsel der Sicherungswelle von deren Abschussstellung in deren Sicherungsstellung wird im entspannten Zustand der Handfeuerwaffe durch die spiralartige Ausnehmung bzw. durch den spiralartig ausgebildeten umfänglichen Abschnitt der Ausnehmung das Abstandshalteelement axial bezogen auf die Sicherungswelle entgegen der Federkraft in einen axialen Sperrbereich verdrängt. In dem Sperrbereich gleicht das Abstandshalteelement einen veränderten Abstand zwischen dem Abzugshebel und der Sicherungswelle aus und es verbleibt kein Abzugsabstand, sodass ein Schwenken des Abzugshebels zur Sicherungswelle blockiert ist. Bei diesem Wechsel von der entspannten ungesicherten in die entspannte gesicherte Waffenstellung verbleibt der Abzugshebel in der zweiten Schwenkstellung ein. Dabei wird das Abstandshalteelement in der Ausnehmung bevorzugt von der ersten Breite und der ersten Tiefe in die zweite Breite mit der zweiten Tiefe geführt und verbleibt unter Federkraftbeaufschlagung in der Ausnehmung.

[0019] Im gespannten Zustand der Handfeuerwaffe ist eine Bewegung des Abstandshalteelementes gegenüber der in der Sicherungsstellung befindlichen Sicherungswelle aus dem Sperrbereich in Richtung der Federkraft freigegeben, sodass sich das Abstandshalteelement aus dem Sperrbereich zurückbewegt und ein Schwenken des Abzugshebels zu der in ihrer Sicherungsstellung befindlichen Sicherungswelle blockiert. Der Abzugshebel nimmt beim Überführen der Handfeuerwaffe von der entspannten gesicherten Waffenstellung in die gespannte gesicherte Waffenstellung wieder die erste Schwenkstellung ein. Der Abstand zwischen Sicherungswelle und Abzugshebel ist somit vergrößert. Das Abstandshalteelement nimmt daraufhin durch seine Federeigenschaften seine Grundstellung wieder ein, indem es beispielsweise aus der Ausnehmung mit der zweiten Breite herausgleitet und sich axial zurückbewegt. Die Federkraft bewirkt, dass das Abstandshalteelement die axiale Position im Sperrbereich, in die es zuvor verdrängt wurde, wieder verlässt. Im Ergebnis befindet es sich bevorzugt außerhalb der Ausnehmung zwischen dem Vollwellenabschnitt und dem Abzugshebel. Die Handfeuerwaffe ist gefahrlos in den gesicherten gespannten Zustand überführt.

[0020] Ein wesentlicher Vorteil der erfindungsgemäßen Abzugssicherung besteht darin, dass die Handfeuerwaffe auch in abgeschlagener Waffenstellung in einen Sicherungszustand gebracht werden kann. Dies erlaubt auch bei einem Zündversagen ein gefahrloses Sichern der Handfeuerwaffe. Vorteilhaft ist auch, dass die Handfeuerwaffe auch bei defekter Abzugssicherung schussfähig bleibt.

[0021] Das Abstandshalteelement dient zum Halten eines Abstandes und bildet daher einen Abstandshalter. Das Abstandshalteelement ist bevorzugt durch einen beweglichen Schenkel gebildet, wobei ein Querschnitt des

Atrius Ex. 1002--0128

Schenkels den zu haltenden Abstand bestimmt. Der Querschnitt des Schenkels ist bevorzugt kreisförmig, sodass der Durchmesser des Querschnittes dem zu haltenden Abstand gleicht. Das Abstandshalteelement ist bevorzugt schwenkbar, sodass die Bewegbarkeit durch eine Schwenkbarkeit gebildet ist. Das Abstandshalteelement ist bevorzugt um eine erste Achse und um eine zweite zur ersten Achse senkrechte Achse schwenkbar, wobei die erste Achse senkrecht zur Achse der Sicherheitswelle und senkrecht zur Erstreckungsrichtung des Abzugshebels angeordnet ist, während die zweite Achse parallel zur Achse der Sicherheitswelle angeordnet ist. Das federkraftbelastete Abstandshalteelement ist durch eine Federkraft belastet, welche bevorzugt nur das Schwenken um die erste Achse beaufschlagt.

[0022] Bevorzugt ist das Abstandshalteelement durch ein Federelement gebildet.

[0023] Bei bevorzugten Ausführungsformen der erfindungsgemäßen Abzugssicherung ist das Abstandshalteelement durch einen Schenkel einer Schenkelfeder gebildet. In einer bevorzugten Variante ist die Schenkelfeder U-förmig mit mindestens zwei Schenkeln ausgelegt. Die Schenkelfeder kann als ein handelsübliches Standardteil kostengünstig erworben werden. Hohe Herstellungskosten für spezielle Einzelteile sind zur erfindungsgemäßen Ausführung nicht notwendig. Dabei ist die Schenkelfeder leicht zu montieren und bei einem Bruch schnell und unkompliziert austauschbar.

[0024] Grundsätzlich kann das mindestens eine Abstandshalteelement Teil einer Feder sein oder durch eine zusätzliche Feder belastet sein.

[0025] Das Abstandshalteelement bzw. das Federelement ist vorzugsweise aus einem Federstahldraht, einem Edelstahldraht oder einem verzinktem Federstahldraht gefertigt. Federmaterialien dieser Art gehören zu den handelsüblichen Federmaterialien und können im Auswahlverfahren leicht berücksichtigt werden.

[0026] In einer weiteren vorteilhaften Ausführungsform sind die Sicherungswelle und das Abstandhalteelement, bezogen auf die Gebrauchshaltung der Waffe, oberhalb des Abzugshebels angeordnet. Dabei sind die Sicherungswelle und das Abstandshalteelement an dem, einem Schlaghebel gegenüberliegenden Ende des Abzugshebels angeordnet.

[0027] Das Abstandshalteelement bzw. die Abstandshalteelemente werden beim Wechsel der Sicherungswelle von deren Abschussstellung in deren Sicherungsstellung durch die spiralartig ausgebildete Ausnehmung bzw. durch den spiralartig ausgebildeten Abschnitt der Ausnehmung axial über einen Bereich des Abzugshebels verschoben, der bevorzugt eben ist, sodass ein gleicher Abstand zur Achse der Sicherungswelle gewährleistet ist. Allerdings kann bei alternativen bevorzugten Ausführungsformen dieser Bereich des Abzugshebels unterschiedliche Höhen aufweisen, insbesondere im Sperrbereich.

[0028] Vorteilhaft ist es, die Sicherungswelle rechtwinklig zur Längsrichtung des Abzugshebels anzuordnen. Die Sicherungswelle ist kürzer dimensionierbar und damit gewichtsärmer, und der Betätigungshebel ist nah an der Handfeuerwaffe platzierbar, was eine gute Handhabung der Handfeuerwaffe erlaubt, da keine Waffenteile von der Handfeuerwaffe abstehen.

[0029] Bei Ausführungsformen, bei welchen die Abstandshalteelemente durch die Schenkel einer U-förmigen Schenkelfeder gebildet sind, ist der Vollwellenabschnitt der Sicherungswelle durch die beiden axial benachbarte spiralartig ausgebildeten Ausnehmung bzw. durch die beiden spiralartig ausgebildeten Abschnitte der Ausnehmungen bevorzugt keilförmig ausgeführt. Durch diese Form wird ein sicheres Mitnehmen der beiden Schenkel bei der axialen Verdrängung der Abstandshalteelemente erreicht.

[0030] Besonders bevorzugt sind die Steuerkurve und das Abstandshalteelement jeweils paarig ausgebildet. In diesem Fall sind die beiden Abstandshalteelemente bevorzugt durch die beiden Schenkel einer U-förmigen Schenkelfeder gebildet. Die doppelte Führung der beiden Schenkel sichert die Funktion der Abzugssicherung zusätzlich. Die beiden Schenkel werden jeweils durch eine der beiden Steuerkurven, d. h. durch eine der beiden Ausnehmungen geführt. Die Steuerkurven sind bevorzugt spiegelsymmetrisch zueinander ausgebildet. Durch einen Wechsel der Sicherungswelle von deren Abschussstellung in deren Sicherungsstellung werden durch die beiden spiralartig ausgebildeten Ausnehmungen bzw. durch die beiden spiralartig ausgebildeten Abschnitte der Ausnehmungen die beiden Schenkel der U-förmigen Schenkelfeder entgegen ihrer Federkraft bevorzugt auseinander, d. h. voneinander weg gedrängt.

[0031] In einer vorteilhaften Ausführungsform besteht die Sicherungswelle aus Metall oder Kunststoff. Metallausführungen können, auch durch geeignete Oberflächenbehandlung, verschleißfester ausgebildet sein, während Kunststoffausführungen ein geringeres Gewicht aufweisen und kostengünstig, zum Beispiel durch ein Spritzgussverfahren, hergestellt werden können. Je nach Anwendungsfall kann das geeignete Material gewählt werden.

[0032] Der Abzugshebel einer erfindungsgemäßen Abzugseinheit kann ggf. einzelne Komponenten, wie eine Abzugsstange, ein Abzugsblatt und ein Abzugszüngel umfassen. Die erfindungsgemäße Abzugseinheit ist mit der erfindungsgemäßen Abzugssicherung ausgestattet.

[0033] In einer weiteren Ausführungsform hat es sich als günstig erwiesen, den Abzugshebel mit mindestens einem Niederhalteelement auszubilden. Das Niederhalterelement sichert die Position des Abstandshalteelementes auf dem Abzugshebel und verhindert, dass sich das Abstandshalteelement in einer ungünstigen Stellung vom Abzugshebel abhebt. Insofern zwei der Abstandshalteelemente als Schenkel einer U-förmigen Schenkelfeder gegeben sind, so sind bevorzugt zwei der Niederhalteelemente ausgebildet, die jeweils an einer Seite des Abzugshebels angeordnet sind.

[0034] In einer weiteren möglichen Ausführungsform

Atrius Ex. 1002--0129

kann ein tunnelförmiger Niederhalter ausgebildet sein, durch den die Schenkel der U-förmigen Schenkelfeder hindurchgesteckt sind. Eine solche Ausführung sichert die Schenkelposition auch im Fall eines Bruchs der Schenkelfeder. Es besteht somit die Möglichkeit, dass mindestens einer der beiden Schenkel der Schenkelfeder funktionsfähig erhalten bleibt und die Handfeuerwaffe weiterhin voll funktionsfähig verwendbar ist.

[0035] Der Betätigungshebel besteht bevorzugt aus einem Metall oder aus einem Kunststoff. Kunststoffausführungen haben ein geringeres Gewicht und sind, wie die Sicherungswelle kostengünstig, zum Beispiel durch Spritzgussverfahren, herstellbar. Betätigungshebel aus Metall sind, auch durch mögliche geeignete Oberflächenbehandlung, verschleißfester als Kunststoff ausbildbar und können eine höhere Bruchfestigkeit haben. Gerade im militärischen Einsatz, in welchem mit rustikalen Umgebungs- und Handhabungsbedingungen zu rechnen ist, kann die Metallausführung von Vorteil sein.

[0036] Die erfindungsgemäße Handfeuerwaffe umfasst die erfindungsgemäße Abzugssicherung, insbesondere als Komponente der erfindungsgemäßen Abzugseinheit. Bevorzugt umfasst die erfindungsgemäße Handfeuerwaffe bevorzugte Ausführungsformen der erfindungsgemäßen Abzugssicherung. Auch weist die erfindungsgemäße Handfeuerwaffe bevorzugt solche Merkmale auf, die im Zusammenhang mit der erfindungsgemäßen Abzugssicherung beschrieben sind. Die erfindungsgemäße Handfeuerwaffe ist bevorzugt durch eine halbautomatische Langwaffe gebildet.

[0037] Weitere Einzelheiten der Erfindung ergeben sich aus der nachfolgenden Beschreibung der bevorzugten Ausführungsform, unter Bezugnahme auf die Zeichnung. Es zeigen:

Fig. 1: eine Abzugseinheit in einer ersten perspektivischen Ansicht in einer entspannten ungesicherten Waffenstellung mit einer erfindungsgemäßen Abzugssicherung;

Fig. 2: die Abzugseinheit gemäß Fig. 1 in einer Seitenansicht;

Fig. 3: die Abzugseinheit gemäß Fig. 1 in einer zweiten perspektivischen Ansicht in einer entspannten gesicherten Waffenstellung;

Fig. 4: die Abzugseinheit gemäß Fig. 3 in einer Seitenansicht;

Fig. 5: die in Fig. 1 gezeigte Abzugssicherung in einer perspektivischen Ansicht in ungesicherter Waffenstellung;

Fig. 6: die in Fig. 1 gezeigte Abzugssicherung in einer perspektivischen Ansicht in gesicherter Waffenstellung;

Fig. 7: die Abzugseinheit gemäß Fig. 3 in einer perspektivischen Ansicht mit Darstellung eines axial verdrängten Federelements;

Fig. 8: die in Fig. 7 gezeigte Abzugseinheit in einer perspektivischen Ansicht in gespannter und gesicherter Waffenstellung mit dem Federelement in nicht verdrängtem Zustand; und

Fig. 9: die in Fig. 7 gezeigte Abzugseinheit in einer seitlichen Ansicht in gespannter und entsicherter Waffenstellung.

[0038] Fig. 1 und Fig. 2 zeigen eine bevorzugte Ausführungsform einer erfindungsgemäßen Abzugssicherung 01 für Schusswaffen, insbesondere für Langwaffen, mit einem abstandshaltenden Federelement 02 in einer Abzugseinheit 03. Fig. 1 stellt die Abzugseinheit 03 in einer perspektivischen Ansicht dar. Fig. 2 zeigt die Abzugseinheit 03 ergänzend aus einer Seitenansicht. Die Abzugssicherung 01 zeigt eine Sicherungswelle 04 mit einem Betätigungshebel 10, mit dem die Sicherungswelle 04 verdrehbar ist. Der Betätigungshebel 10 ist zwischen seinen Stellungen hin und her schwenkbar. Die Abzugseinheit 03 ist in einer entspannten ungesicherten Waffenstellung dargestellt. Die Sicherungswelle 04 weist zwei spiegelsymmetrisch gleich dimensionierte Steuerkurven 05 auf, die in Form von Ausnehmungen 11 die Sicherungswelle 04 mit jeweils einem spiralartig ausgebildeten umfänglichen Abschnitt umlaufen. Dabei umlaufen die Steuerkurven 05 gegeneinander gespiegelt die Sicherungswelle 04. Ein axialer Abschnitt der Sicherungswelle 04, der zwischen den axialen Abschnitten der Ausnehmungen 11 angeordnet ist, ist als eine Vollwelle 12 ausgebildet. Dabei weist jede der beiden Ausnehmungen 11 zwei Tiefen und zwei Breiten auf.

[0039] Fig. 1 und Fig. 2 zeigen jeweils weiterhin einen Abzugshebel 13, der um eine Abzugsachse 14 schwenkbar ist, einen Unterbrecher 19 und einen schwenkbaren Schlaghebel 20. Der Abzugshebel 13 befindet sich in einer ersten Schwenkstellung, die der entspannten Waffenstellung entspricht. Der Betätigungshebel 10 und die Sicherungswelle 04 befinden sich in einer ersten Drehstellung, die der ungesicherten Waffenstellung, d. h. einer Feuerstellung bzw. Abschussstellung der Schusswaffe entspricht. In Gebrauchshaltung der Waffe befindet sich die Sicherungswelle 04 oberhalb des Abzugshebels 13 und des Federelements 02. Dabei ist sie quer zur Längsrichtung des Abzugshebels 13 angeordnet und befindet sich an dem Ende des Abzugshebels 13, das dem Schlaghebel 20 gegenüberliegt.

[0040] Das abstandshaltende Federelement 02, das in dieser bevorzugten Ausführung als U-förmige Schenkelfeder mit zwei Federschenkeln ausgebildet ist, liegt in Längsrichtung des Abzugshebels 13 auf dem Abzugshebel 13 auf. Das Federelement 02 ist an demjenigen Ende, an dem die beiden Federschenkel verbunden sind, zwischen dem Abzugshebel 13 und dem Unterbrecher

Atrius Ex. 1002--0130

19, und in Richtung der Sicherungswelle 04 zur Abzugsachse 14 beabstandet, schwenkbar gelagert. Das andere Ende des Federelements 02 ist zwischen der Sicherungswelle 04 und dem Abzugshebel 13 angeordnet, wo es einen Abstandshalter zwischen der Sicherungswelle 04 und dem Abzugshebel 13 bildet. In dieser Darstellung befindet es sich in einer entspannten Federstellung. In dieser Stellung der Sicherungswelle 04 befindet sich ein erster gemeinsamer Teilabschnitt 21 (gezeigt in Fig. 6) der Ausnehmungen 11 mit einer ersten Tiefe und einer ersten Breite oberhalb des Federelements 02.

[0041] Die Federschenkel des Federelementes 02 gleichen einen Teilabstand zwischen der Sicherungswelle 04 und dem Abzugshebel 13 aus, wobei der Abzugshebel 13 betätigbar bleibt, da ein Abzugsabstand verbleibt.

[0042] Fig. 3 und Fig. 4 zeigen die Abzugseinheit 03 aus den Fig. 1 und 2 in einer entspannten und gesicherten Waffenstellung. Fig. 3 zeigt die Abzugseinheit 03 in einer perspektivischen Ansicht, während Fig. 4 die Abzugseinheit 03 aus Fig. 3 ergänzend in einer Seitenansicht zeigt. Im Vergleich zu Fig. 1 und Fig. 2 befinden sich der Betätigungshebel 10 und die Sicherungswelle 04 in der zweiten Drehstellung, die der gesicherten Waffenstellung, d. h. einer Sicherungsstellung der Schusswaffe entspricht. In dieser Stellung der Sicherungswelle 04 befinden sich die Federschenkel des Federelements 02 jeweils in einem zweiten Teilabschnitt 22 (gezeigt in Fig. 5) der Ausnehmungen 11, der eine zweite Tiefe und eine zweite Breite aufweist. Die zweite Tiefe entspricht einem größeren Durchmesser der Sicherungswelle 04 als der Durchmesser der ersten Tiefe. Das Federelement 02 ist bei der Drehung der Sicherheitswelle 04 in der Ausnehmung 11 geführt und in Richtung des Abzugshebels 13 sowie in axialer Richtung bezogen auf die Sicherungswelle 04 in eine gespannte Federstellung verdrängt. Das verdrängte Federelement 02 gleicht den Abstand zwischen der Sicherungswelle 04 und dem Abzugshebel 13 aus, wobei kein Abzugsabstand verbleibt. Der Abzugshebel 13 ist somit nicht schwenkbar und die Schusswaffe gesichert.

[0043] Ergänzend zeigt Fig. 7 die Abzugseinheit 03 in einem entspannten gesicherten Waffenzustand und stellt das Federelement 02 in der axialen Verdrängungsstellung dar, das mit seinen Federschenkeln jeweils in einem der beiden zweiten Teilabschnitte 22 (gezeigt in Fig. 5) der Ausnehmungen 11 sitzt. Weiterhin sind in Fig. 7 zwei Niederhalteelemente 23 gezeigt, welche die Federschenkel des Federelementes 02 daran hindern, sich vom Abzugshebel 13 abzuheben.

[0044] Es sei zusätzlich auf Fig. 5 hingewiesen, die die beiden zweiten Teilabschnitte 22 der Ausnehmungen 11 in einer Stellung der Sicherungswelle 04 zeigt, die einer ungesicherten Waffenstellung entspricht. Der Betätigungshebel 10 befindet sich in der ersten Drehstellung.

[0045] Fig. 8 zeigt die Abzugseinheit 03 in gespannter und gesicherter Waffenstellung. Der Abzugshebel 13 befindet sich in einer zweiten Schwenkstellung. Der Abstand zwischen der Sicherungswelle 04 und dem Abzugshebel 13 ist gegenüber der ersten Schwenkstellung des Abzugshebels 13 in entspanntem Waffenzustand vergrößert, wodurch sich die Federschenkel des Federelementes 02 in Richtung ihrer Federkraft aus den zweiten Teilabschnitten 22 (gezeigt in Fig. 5) der Ausnehmungen 11 herausbewegen und aufeinander zu bewegen konnten. Der Schlaghebel 20 ist in seiner gespannten Stellung. Die Sicherungswelle 04 ist in die Sicherungsstellung gedreht. Bei Gebrauchshaltung der Schusswaffe befindet sich der Abschnitt der Vollwelle 12 oberhalb der Federschenkel des entspannten Federelements 02 und gleicht zusammen mit den Federschenkeln des Federelementes 02 den Abstand zwischen der Sicherungswelle 04 und dem Abzugshebel 13 aus, wobei kein Abzugsabstand verbleibt. Der Abzugshebel 13 ist blockiert und kann nicht betätigt werden. Die Waffe ist gesichert.

[0046] Fig. 9 zeigt die Abzugseinheit 03 in gespannter und entsicherter Waffenstellung. Der Abzugshebel 13 befindet sich weiterhin in der zweiten Schwenkstellung. Der Schlaghebel 20 befindet sich weiterhin in seiner gespannten Stellung. Die Sicherungswelle 04 ist in die Abschussstellung gedreht.

[0047] Die Ausnehmungen 11 sind mit ihrem ersten Teilabschnitt 21 dem Federelement 02 zugewandt, sodass das Federelement 02 nur einen ersten Teil eines Abstandes zwischen der Sicherungswelle 04 und dem Abzugshebel 13 ausgleicht und ein Abzugsabstand 15 verbleibt. Somit kann der Abzugshebel 13 zum Auslösen einen Schusses geschwenkt werden, wodurch der Schlaghebel 20 seine gespannte Stellung verlässt.

Bezugszeichenliste

[0048]

01	Abzugssicherung
02	abstandshaltendes Federelement
03	Abzugseinheit
04	Sicherungswelle
05	Steuerkurve
06	-
07	-
08	-
09	-
10	Betätigungshebel
11	Ausnehmung
12	Vollwelle
13	Abzugshebel
14	Abzugsachse
15	Abzugsabstand
16	-
17	-
18	-
19	Unterbrecher
20	Schlaghebel
21	erster Teilabschnitt

Atrius Ex. 1002--0131

22 zweiter Teilabschnitt
23 Niederhalteelement

Patentansprüche

1. Abzugssicherung (01) für eine Handfeuerwaffe, insbesondere für eine halbautomatische Langwaffe, mit einer Sicherungswelle (04), die eine Steuerkurve (05) trägt und über einen Betätigungshebel (10) von einer Sicherheitsstellung in eine Abschussstellung und zurück verdrehbar ist; wobei die Abzugssicherung (01) an einen um eine Abzugsachse (14) schwenkbaren Abzugshebel (13) anschlagbar ist; und wobei die Sicherungswelle (04) in einem gespannten Zustand der Handfeuerwaffe den Abzugshebel (13) in der Sicherheitsstellung blockiert und in der Abschussstellung freigibt, **dadurch gekennzeichnet, dass** sie weiterhin mindestens ein federkraftbelastetes Abstandshalteelement (02) umfasst;

   - wobei im gespannten Zustand der Handfeuerwaffe das federkraftbelastete Abstandshalteelement (02) zwischen dem Abzugshebel (13) und der in ihrer Sicherheitsstellung befindlichen Sicherungswelle (04) angeordnet ist, wodurch ein Schwenken des Abzugshebels (13) zur Sicherungswelle (04) blockiert ist;
   - wobei die Steuerkurve (05) durch mindestens eine zumindest abschnittsweise spiralartig ausgebildete Ausnehmung (11) in der Sicherungswelle (04) gebildet ist, welche in der Abschussstellung der Sicherungswelle (04) im gespannten Zustand der Handfeuerwaffe dem Abstandshalteelement (02) zugewandt ist, sodass das Abstandshalteelement (02) nur einen ersten Teil eines Abstands zwischen der Sicherungswelle (04) und dem Abzugshebel (13) ausgleicht und ein Abzugsabstand (15) verbleibt;
   - wobei das Abstandshalteelement (02) im entspannten Zustand der Handfeuerwaffe durch einen Wechsel der Sicherungswelle (04) von deren Abschussstellung in deren Sicherungsstellung durch die zumindest abschnittsweise spiralartig ausgebildete Ausnehmung (11) axial bezogen auf die Sicherungswelle (04) entgegen der Federkraft in einen axialen Sperrbereich verdrängt ist, in welchem das Abstandshalteelement (02) einen Abstand zwischen dem Abzugshebel (13) und der Sicherungswelle (04) ausgleicht, sodass ein Schwenken des Abzugshebels (13) zur Sicherungswelle (04) blockiert ist; und
   - wobei im gespannten Zustand der Handfeuerwaffe eine Bewegung des Abstandshalteelementes (02) gegenüber der in der Sicherungsstellung befindlichen Sicherungswelle (04) aus dem Sperrbereich in Richtung der Federkraft freigegeben ist, sodass sich das Abstandshalteelement (02) aus dem Sperrbereich zurückbewegt und ein Schwenken des Abzugshebels (13) blockiert.

2. Abzugssicherung (01) nach Anspruch 1, **dadurch gekennzeichnet, dass** das mindestens eine Abstandshalteelement durch einen beweglichen Schenkel (02) gebildet ist.

3. Abzugssicherung (01) nach Anspruch 2, **dadurch gekennzeichnet, dass** sie zwei der beweglichen Schenkel umfasst, die an einer Schenkelfeder (02) ausgebildet sind.

4. Abzugssicherung (01) nach Anspruch 3, **dadurch gekennzeichnet, dass** die Schenkelfeder (02) aus einem Federstahldraht, einem Edelstahldraht oder aus einem verzinktem Federstahldraht besteht.

5. Abzugssicherung (01) nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** die Sicherungswelle (04) und das Abstandshalteelement (02) in einer Gebrauchshaltung der Handfeuerwaffe oberhalb und an einem Ende des Abzugshebels (13) angeordnet sind, wobei an einem gegenüberliegenden Ende des Abzugshebels (13) ein Schlaghebel (20) angeordnet ist.

6. Abzugssicherung (01) nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die Sicherungswelle (04) rechtwinklig zu einer Längsrichtung des Abzugshebels (13) angeordnet ist.

7. Abzugssicherung (01) nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** im gespannten Zustand der Handfeuerwaffe das federkraftbelastete Abstandshalteelement (02) zwischen dem Abzugshebel (13) und einem Vollwellenabschnitt (12) der in ihrer Sicherheitsstellung befindlichen Sicherungswelle (04) angeordnet ist.

8. Abzugssicherung (01) nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** das Abstandshalteelement (02) und die Steuerkurve (05) jeweils paarig ausgebildet sind.

9. Abzugssicherung (01) nach einem der Ansprüche 1 bis 8, **dadurch gekennzeichnet, dass** die Sicherungswelle (04) aus einem Metall oder einem Kunststoff besteht.

10. Handfeuerwaffe, umfassend eine Abzugssicherung (01) nach einem der Ansprüche 1 bis 9.

Atrius Ex. 1002--0132

Claims

1. A trigger safety mechanism (01) for a handheld weapon, in particular for a semiautomatic long weapon, with a safety shaft (04), which carries a control cam (05), and via an actuation lever (10) can be rotated from a safety position into a firing position and back, wherein the trigger safety mechanism (01) can abut against a trigger lever (13) that can be pivoted about a trigger axis (14), and wherein in a cocked state of the handheld weapon the safety shaft (04) blocks the trigger lever (13) in the safety position, and releases it in the firing position, **characterised in that**, it furthermore comprises at least one spring-loaded spacer element (02), wherein

   - in the cocked state of the handheld weapon the spring-loaded spacer element (02) is arranged between the trigger lever (13) and the safety shaft (04), located in its safety position, as a result of which a pivoting of the trigger lever (13) towards the safety shaft (04) is blocked, wherein
   - the control cam (05) is formed by at least one recess (11) in the safety shaft (04), designed at least in some sections in the form of a spiral, which recess, in the firing position of the safety shaft (04), in the cocked state of the handheld weapon, is facing towards the spacer element (02), such that the spacer element (02) only offsets a first part of a clearance between the safety shaft (04) and the trigger lever (13), and a trigger clearance (15) remains, wherein
   - in the uncocked state of the handheld weapon the spacer element (02), by means of a changeover of the safety shaft (04) from its firing position into its safety position by means of the recess (11), designed at least in some sections in the form of a spiral, is displaced axially relative to the safety shaft (04) against the spring force into an axial blocking region, in which the spacer element (02) offsets a clearance between the trigger lever (13) and the safety shaft (04), such that a pivoting of the trigger lever (13) towards the safety shaft (04) is blocked, and wherein
   - in the cocked state of the handheld weapon a movement of the spacer element (02) relative to the safety shaft (04) located in the safety position from the blocking region in the direction of the spring force is released, so that the spacer element (02) moves back from the blocking region and blocks a pivoting of the trigger lever (13).

2. The trigger safety mechanism (01) in accordance with claim 1, **characterised in that** the at least one spacer element is formed by means of a movable arm (02).

3. The trigger safety mechanism (01) in accordance with claim 2, **characterised in that** it comprises two of the movable arms, which are designed on an arm spring (02).

4. The trigger safety mechanism (01) in accordance with claim 3, **characterised in that** the arm spring (02) consists of a spring steel wire, a stainless steel wire or of a galvanised spring steel wire.

5. The trigger safety mechanism (01) in accordance with one of the claims 1 to 4, **characterised in that** in an operating position of the handheld weapon, the safety shaft (04) and the spacer element (02) are arranged above, and at one end of, the trigger lever (13), wherein a hammer (20) is arranged at an opposite end of the trigger lever (13).

6. The trigger safety mechanism (01) in accordance with one of the claims 1 to 5, **characterised in that** the safety shaft (04) is arranged at right angles to a longitudinal direction of the trigger lever (13).

7. The trigger safety mechanism (01) in accordance with one of the claims 1 to 6, **characterised in that** in the cocked state of the handheld weapon the spring-loaded spacer element (02) is arranged between the trigger lever (13) and a solid shaft section (12) of the safety shaft (04) located in its safety position.

8. The trigger safety mechanism (01) in accordance with one of the claims 1 to 7, **characterised in that** the spacer element (02) and the control cam (05) are respectively designed in pairs.

9. The trigger safety mechanism (01) in accordance with one of the claims 1 to 8, **characterised in that** the safety shaft (04) consists of a metal or a plastic.

10. A handheld weapon, comprising a trigger safety mechanism (01) in accordance with one of the claims 1 to 9.

Revendications

1. Blocage de détente (01) pour une arme à feu de poing, en particulier pour une arme d'épaule semi-automatique, avec un arbre de sécurité (04) qui porte une came de commande (05) et que l'on peut faire tourner via un levier de commande (10) d'une position de sécurité vers une position de tir et inversement ; dans lequel le blocage de détente (01) peut buter contre un levier de détente (13) pouvant pivoter autour d'un axe de détente (14) ; et dans lequel l'arbre de sécurité (04), dans un état armé de l'arme à feu de poing, bloque le levier de détente

Atrius Ex. 1002--0133

(13) dans la position de sécurité et le libère dans la position de tir, **caractérisé en ce qu'**il comprend en outre au moins un élément d'espacement (02) contraint par une force élastique ;

- dans lequel, à l'état armé de l'arme à feu de poing, l'élément d'espacement (02) contraint par une force élastique est disposé entre le levier de détente (13) et l'arbre de sécurité (04) se trouvant dans sa position de sécurité, moyennant quoi un pivotement du levier de détente (13) vers l'arbre de sécurité (04) est bloqué ;
- dans lequel la came de commande (05) est formée par au moins un évidement (11) réalisé au moins partiellement à la manière d'une spirale dans l'arbre de sécurité (04) lequel évidement, dans la position de tir de l'arbre de sécurité (04) à l'état armé de l'arme à feu de poing, est tourné vers l'élément d'espacement (02) de manière à ce que l'élément d'espacement (02) compense seulement une première partie d'un espacement entre l'arbre de sécurité (04) et le levier de détente (13) et qu'une distance d'espacement (15) subsiste ;
- dans lequel, à l'état non armé de l'arme à feu de poing, l'élément d'espacement (02) est refoulé, grâce à un changement de l'arbre de sécurité (04) de sa position de tir vers sa position de sécurité grâce à l'évidement (11) réalisé au moins partiellement de façon spiralée de manière axiale par rapport à l'arbre de sécurité (04) à l'encontre de la force élastique, dans une zone de verrouillage axiale dans laquelle l'élément d'espacement (02) compense un espacement entre le levier de détente (13) et l'arbre de sécurité (04) de manière à ce qu'un pivotement du levier de détente (13) vers l'arbre de sécurité (04) soit bloqué ; et
- dans lequel, à l'état armé de l'arme à feu de poing, un déplacement de l'élément d'espacement (02) par rapport à l'arbre de sécurité (04) se trouvant dans la position de sécurité hors de la zone de sécurité en direction de la force élastique est libéré de manière à ce que l'élément d'espacement (02) se déplace en retour hors de la zone de verrouillage et bloque un pivotement du levier de détente (13).

2. Blocage de détente (01) selon la revendication 1, **caractérisé en ce que** l'au moins un élément d'espacement est formé par une branche mobile (02).

3. Blocage de détente (01) selon la revendication 2, **caractérisé en ce qu'**il comprend deux des branches mobiles qui sont formées sur un ressort à branches (02).

4. Blocage de détente (01) selon la revendication 3, **caractérisé en ce que** le ressort à branches (02) se compose d'un fil en acier à ressorts, d'un fil en acier noble ou d'un fil en acier à ressorts galvanisé.

5. Blocage de détente (01) selon l'une des revendications 1 à 4, **caractérisé en ce que**, dans une posture d'utilisation de l'arme à feu à poing, l'arbre de sécurité (04) et l'élément d'espacement (02) sont disposés au-dessus du levier de détente (13) et à une extrémité de celui-ci, dans lequel un levier de percussion (20) est disposé à une extrémité située en vis-à-vis du levier de détente (13).

6. Blocage de détente (01) selon l'une des revendications 1 à 5, **caractérisé en ce que** l'arbre de sécurité (04) est disposé en angle droit par rapport à une direction longitudinale du levier de détente (13).

7. Blocage de détente (01) selon l'une des revendications 1 à 6, **caractérisé en ce que**, à l'état armé de l'arme à feu à poing, l'élément d'espacement contraint par une force élastique (02) est disposé entre le levier de détente (13) et un tronçon d'arbre plein (12) de l'arbre de sécurité (04) se trouvant dans sa position de sécurité.

8. Blocage de détente (01) selon l'une des revendications 1 à 7, **caractérisé en ce que** l'élément d'espacement (02) et la came de commande (05) sont respectivement réalisés par paires.

9. Blocage de détente (01) selon l'une des revendications 1 à 8, **caractérisé en ce que** l'arbre de sécurité (04) se compose d'un métal ou d'une matière plastique.

10. Arme à feu de poing comprenant un blocage de détente (01) selon l'une des revendications 1 à 9.

Atrius Ex. 1002--0134

Fig.1

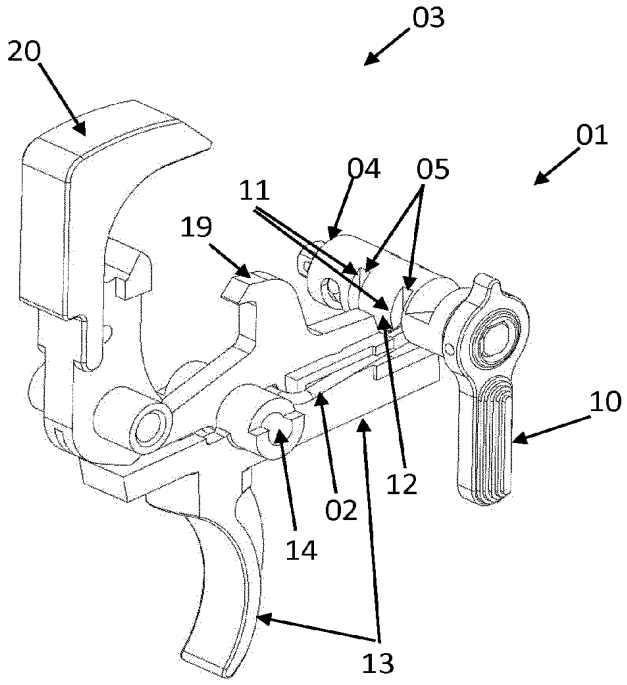
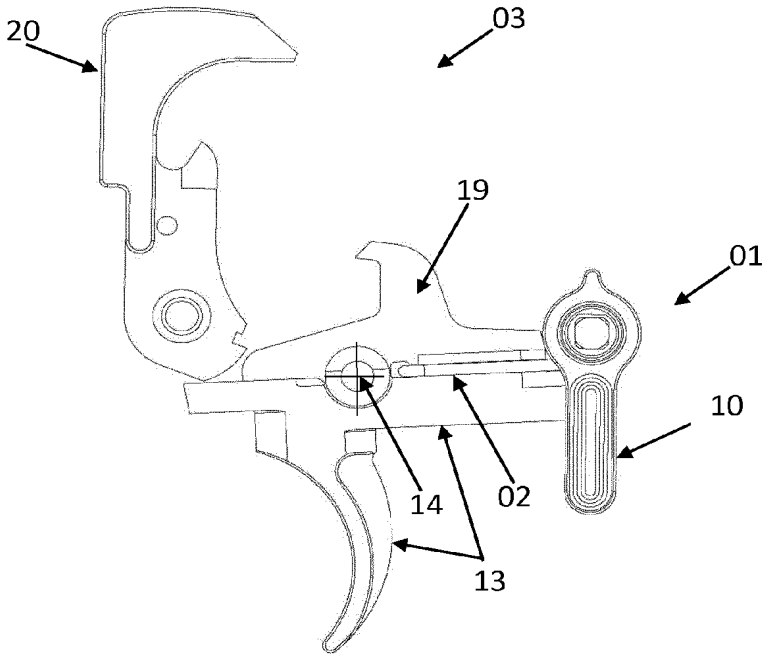


Fig.2



Atrius Ex. 1002--0135

Fig.3

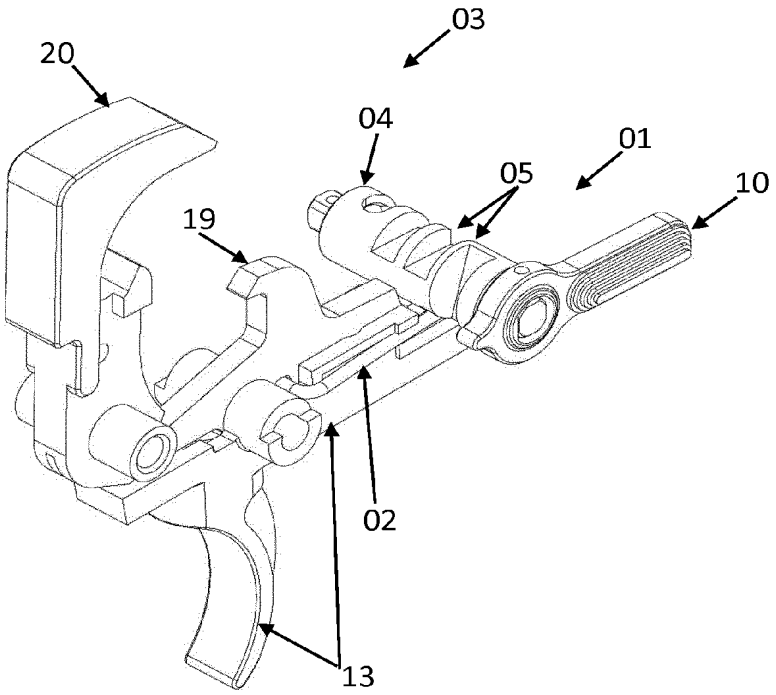
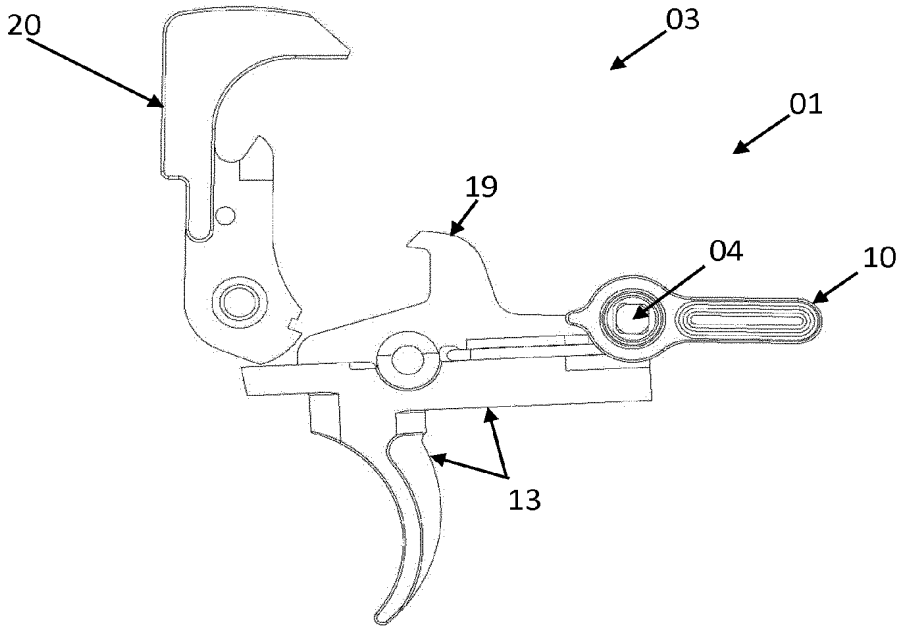


Fig.4



Atrius Ex. 1002--0136

Fig.5

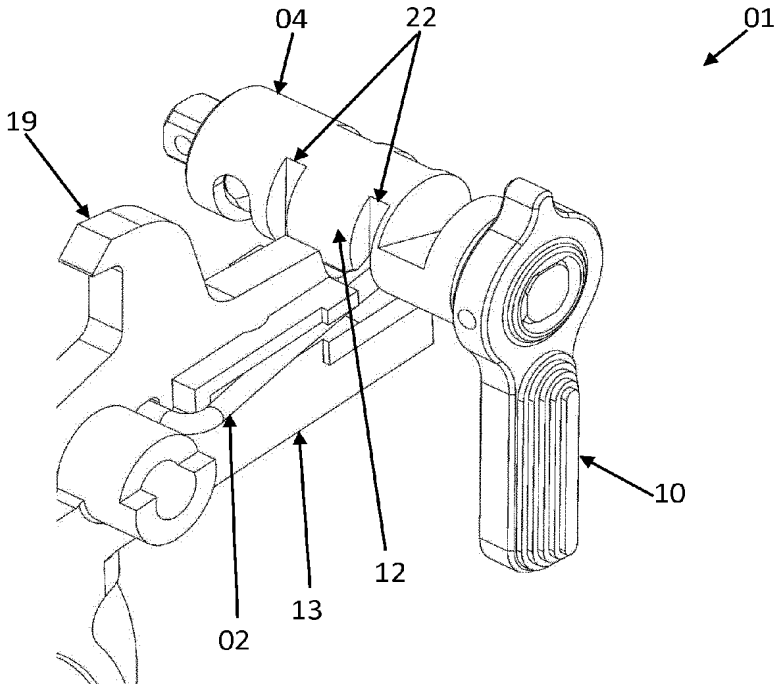
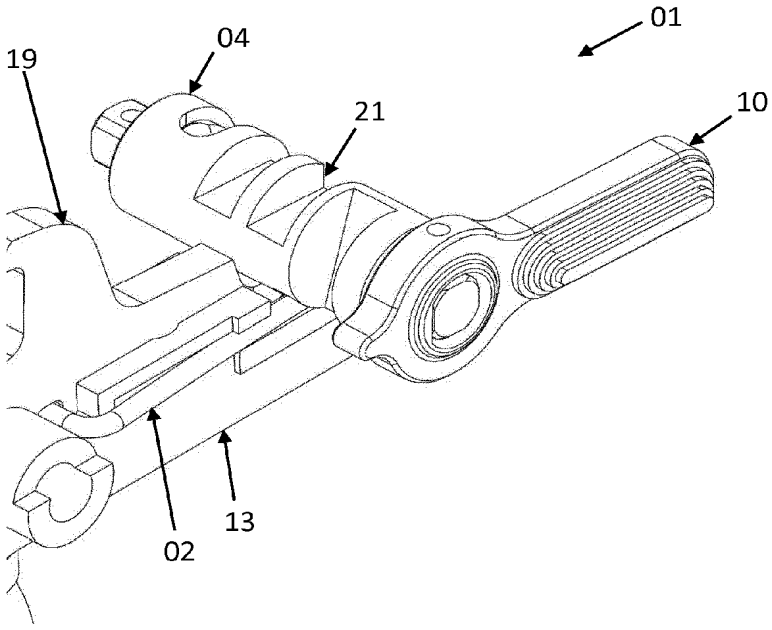
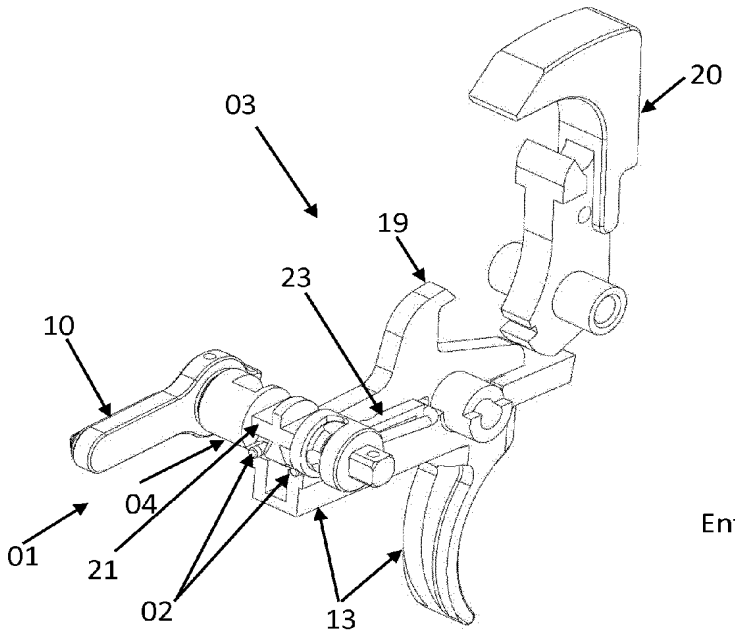


Fig.6



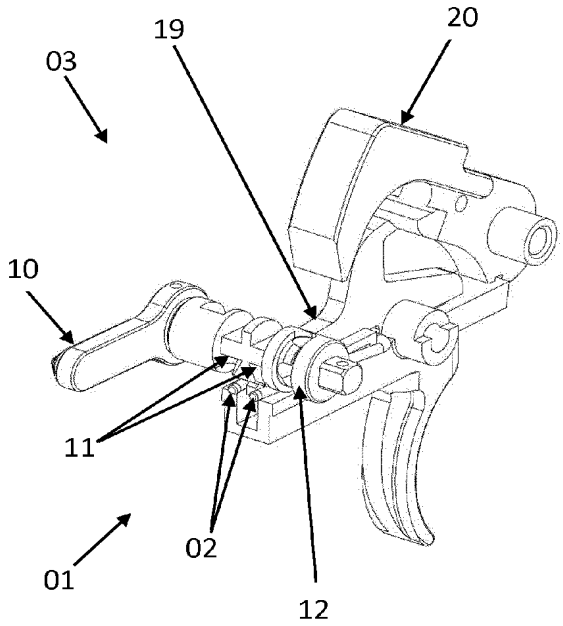
Atrius Ex. 1002--0137

Fig.7



Entspannt + gesichert

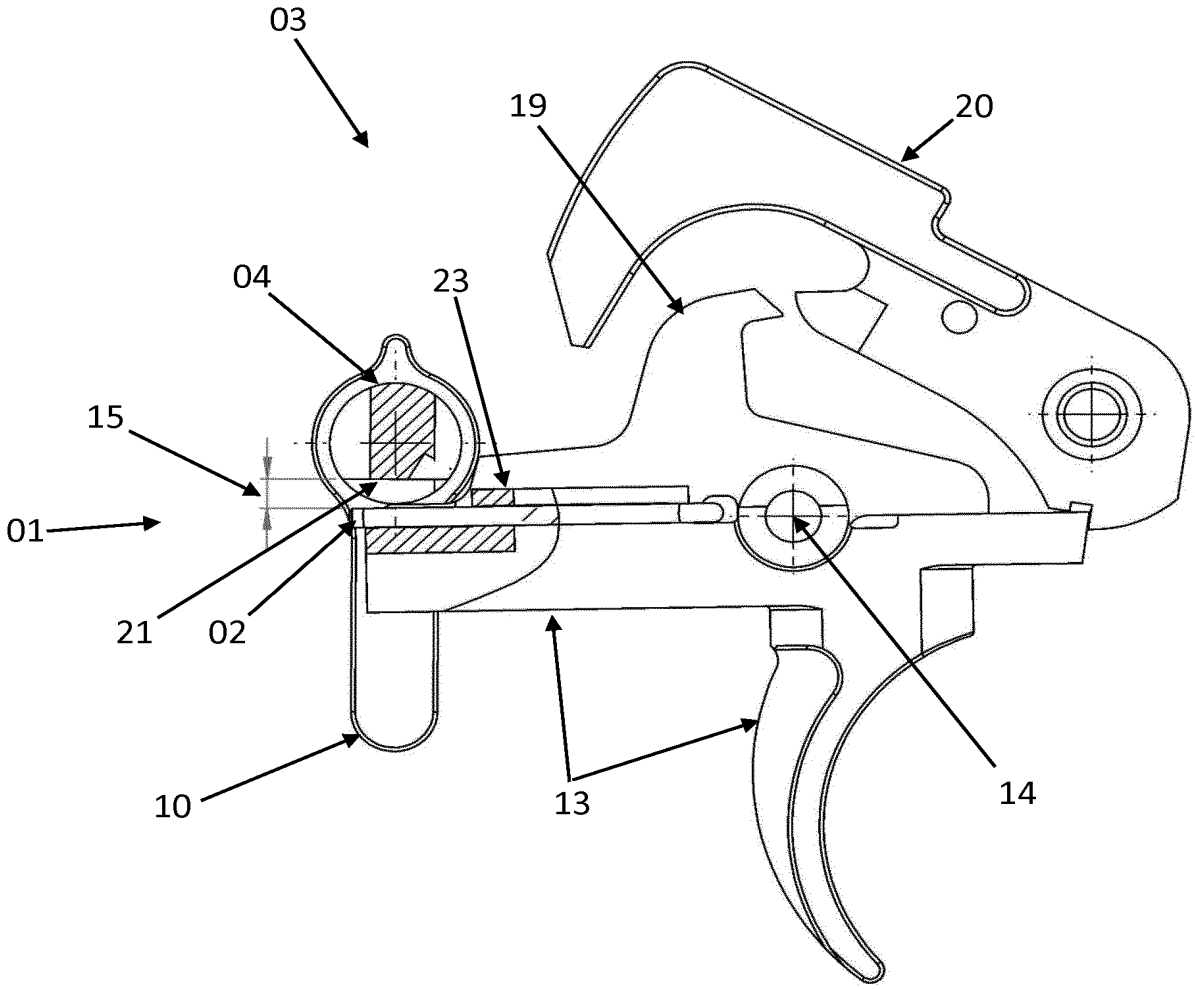
Fig.8



Gespannt + gesichert

Atrius Ex. 1002--0138

Fig.9



Gespannt + entsichert

Atrius Ex. 1002--0139

IN DER BESCHREIBUNG AUFGEFÜHRTE DOKUMENTE

Diese Liste der vom Anmelder aufgeführten Dokumente wurde ausschließlich zur Information des Lesers aufgenommen und ist nicht Bestandteil des europäischen Patentdokumentes. Sie wurde mit größter Sorgfalt zusammengestellt; das EPA übernimmt jedoch keinerlei Haftung für etwaige Fehler oder Auslassungen.

In der Beschreibung aufgeführte Patentdokumente

- DE 202007004747 U1 **[0003]**
- DE 202011004556 U1 **[0004]**
- DE 102007004588 B3 **[0005]**
- DE 102006048436 B4 **[0006]**
- DE 1453913 A **[0007]**
- DE 202011004556 U **[0010]**

Atrius Ex. 1002--0140

公告本

409847

89.5.23 修正補充

申請日期：88.4.13	案號：88205701
類別：F41A 19/06	

（以上各欄由本局填註）

新型專利說明書

一、新型名稱	中文	自動武器之擊發機構模組
	英文	409847
二、創作人	姓名（中文）	1. 李德華
	姓名（英文）	1. Lee, Der Haw
	國籍	1. 中華民國
	住、居所	1. 高雄市前鎮區瑞平里26鄰武慶一路2之6號9樓
三、申請人	姓名（名稱）（中文）	1. 聯勤第205廠
	姓名（名稱）（英文）	1. The 205th Arsenal, Ordnance Production Service, Combined Service Forces
	國籍	1. 中華民國
	住、居所（事務所）	1. 高雄市中山三路98號
	代表人姓名（中文）	1. 鄭昌頻
	代表人姓名（英文）	1. Cheng, Chung-Ping

Atrius Ex. 1002--0141

四、中文創作摘要　（創作之名稱：自動武器之擊發機構模組）

本創作是將傳統自動武器之擊發機構予以模組化，改善分解與結合的難度，提高妥善率。擊發機構總成含有擊錘、扳機、單發扳機扣、三發扳機扣、擊錘簧、棘輪、棘輪制簧、扣機及扣機簧等零件，獨立組裝在盒狀構架中；與自動武器結合時，擊發機構總成自下節套上方向下插入下節套腹槽內，選擇器自下節套側方插入，然後再將選擇器定位簧自上方插入擊發機構總成中的間槽內，即完成組裝，並達到射擊控制的目的。

英文創作摘要　（創作之名稱：）

Atrius Ex. 1002--0142

五、創作說明（1）

傳統上，自動武器的擊發機構零件都是直接裝配在下節套腹槽內，要維修保養或故障排除時，常需使用特殊工具將擊發機構零件一一分解，待更換損壞零件後再依序結合，然而要將擊發機構各零件分解結合實屬不易且費時，造成武器系統妥善率無法有效提昇。

為了改善此一缺點，本創作將故障時不易更換之擊發機構零件予以模組化，意即將擊發機構之零件簡化分為選擇器、選擇器定位簧及盒狀之擊發機構總成等三大部份。在組裝時，盒狀擊發機構總成自下節套上方向下插入下節套腹槽內，選擇器自下節套側方插入，然後再將選擇器定位簧自上方插入擊發機構總成中的間槽內，完成組裝；拆解時，僅需依相反程序將選擇器定位簧及選擇器取出，即可輕易將擊發機構總成取出，予以維修或更換新品，因此，可提高武器系統的妥善率。

以下將依圖示說明本創作之結構特徵及運作方式。

<圖示的簡單說明>

第一圖為擊發機構總成分解圖；

第二圖為擊發機構總成結合圖；

第三圖為下節套結合擊發機構模組之腹槽圖；

第四圖為安裝擊發機構總成示意圖；

第五圖為選擇器裝配示意圖；

第六圖為擊發機構模組裝配於下節套總成剖面圖。

第七圖為擊發機構模組圖。

圖示中之參照號數

Atrius Ex. 1002--0143

五、創作說明 (2)

1 擊發機構架
2 左側孔
3 左側孔
4 左側孔
5 左側孔
6 方槽
7 扳機簧
8 扳機簧孔套
9 扳機簧孔套
10 扳機
11 凸耳
12 凸耳
13 凸耳孔
14 扳機槽
15 扳機面
16 扳機扣簧
17 單發扳機扣
18 單發扳機扣槽
19 單發扳機扣孔
20 三發扳機扣
21 三發扳機扣槽
22 三發扳機扣孔
23 柱銷
24 柱銷
25 擊錘
26 擊錘凸耳
27 擊錘凸耳
28 擊錘孔
29 擊錘槽
30 棘輪制簧
31 棘輪
32 擊錘簧
33 擊錘簧孔
34 擊錘簧孔
35 扣機
36 扣機孔
37 扣機槽
38 扣機簧
39 扣機簧孔
40 扣機銷
41 下節套
42 下節套腹槽
43 下節套側孔
44 選擇器
45 選擇器定位簧
46 擊發機構總成
47 擊發機構模組

Atrius Ex. 1002--0144

五、創作說明（3）

＜實例說明＞

第一圖係擊發機構總成分解圖，包含有以下幾個主要組件：擊發機構架（１）、扳機（１０）、單發扳機扣（１７）、三發扳機扣（２０）、柱銷（２３）、擊錘（２５）、棘輪（３１）、扣機（３５）及扣機銷（４０）等。

擊發機構總成組裝依序為扳機部份、擊錘部份及扣機部份等，如下所示：

扳機（１０）部份，先將扳機簧孔（８）、（９）套在扳機兩凸耳（１１）、（１２）上，扳機扣簧（１６）分別卡入單發扳機扣槽（１８）及三發扳機扣槽（２１）中，然後將單發扳機扣（１７）與三發扳機扣（２０）併攏放入扳機槽（１４）內，將以上部份組裝好放入擊發機構架（１）中，柱銷（２３）自擊發機構架左側孔（２）穿出，並同時穿過單發扳機扣孔（１９）、三發扳機扣孔（２２）及凸耳孔（１３），即完成扳機（１０）部份與擊發機構架（１）之組裝。

擊錘（２５）部份，將棘輪制簧（３０）及棘輪（３１）套入擊錘凸耳（２６）上，擊錘簧孔（３３）、（３４）套入擊錘凸耳（２６）、（２７）上，將以上組裝完成部份壓入擊發機構架（１）中，擊錘簧（３２）之兩腳需朝後，將柱銷（２４）自擊發機構架左側孔（３）穿出，並同時穿過擊錘孔（２８），即完成擊錘（２５）部份與擊發機構架（１）之組裝。當擊錘（２５）向後壓下，擊錘槽（２９）卡入扳機面（１５），此時擊錘（２５）即呈備擊狀態。

扣機（３５）部份，將扣機簧（３８）放入扣機槽（３７）

Atrius Ex. 1002--0145

五、創作說明（4）

內，將此部份放入擊發機構架（１）中，將扣機銷（４０）自擊發機構架左側孔（４）穿出，並同時穿過扣機簧孔（３９）及扣機孔（３６），即完成扣機部份與擊發機構架（１）之組裝。

將扳機（１０）部份、擊錘（２５）部份與扣機（３５）部份依順序與擊發機構架（１）組裝即成擊發機構模總成（４６），如第二圖所示。

第四圖為下節套結合擊發機構總成之示意圖，將第二圖之擊發機構總成（４６）由第三圖下節套（４１）上方往下壓入其腹槽（４２）內，使擊發機構架（１）上緣與下節套（４１）上緣齊平；推動扣機（３５）上緣向前，將選擇器（４４）自下節套側孔（４３）穿入，穿過擊發機構架（１）之左側孔（５），使選擇器緊貼下節套左側面，再放鬆扣機，此時下節套與擊發機構總成（４６）即固定在一起，其裝配情形請參考第五圖。再將選擇器定位簧（４５）自擊發機構總成（４６）上方向下插入擊發機構架（１）之方槽（６）內，即完成全部組裝，其裝配完成之剖面圖請參考第六圖。

當要更換擊發機構總成，僅需依相反程序，將選擇器定位簧（４５）與選擇器（４４）取出，即可將擊發機構總成與下節套分開；在緊急時可快速更換擊發機構總成，對自動武器妥善率的提昇有相當大的助益。

Atrius Ex. 1002--0146

五、創作說明 (5)







Atrius Ex. 1002--0147

89. 6. -5 修正
年 月 日 補充

六、申請專利範圍

1. 一種自動武器的擊發機構模組（４７），其係包含一擊發機構總成（４６），一固定下節套與擊發機構總成之選擇器（４４），以及選擇器定位簧（４５）；此一擊發機構模組可與下節套輕易分離與結合，結合後即具有多功能射擊之擊發裝置。

2. 依據申請專利範圍第１項所述之擊發機構模組，其中選擇器（４４）形狀似L型圓柱，其上有多個方向的凹槽，直柄部份有防滑條紋及箭頭。

3. 依據申請專利範圍第１項所述之擊發機構模組，其中選擇器定位簧（４５）可準確放置在擊發機構總成（４６）內之方槽（６）中，連接選擇器，並壓迫選擇器尾部弧形凹槽，以有限度的限制選擇器任意轉動。

4. 依據申請專利範圍之第１項所述之擊發機構模組，其中選擇器定位簧（４５）形狀似魚鉤，當放入正確位置運動時，具有剛性與彈性。

5. 依據申請專利範圍第１項所述之擊發機構模組，其中擊發機構總成（４６）其盒狀面之最大孔洞，能作為側向插入選擇器（４４）以固定擊發機構總成（４６）與下節套（４１）。

6. 依據申請專利範圍第１項所述之擊發機構模組，其中擊發機構總成（４６）其軸向前端凸出平板可作為擊錘（２５）向前旋轉運動時阻止擊錘（２５）過度旋轉，使擊錘（２５）與軸向保持90度夾角。

7. 依據申請專利範圍第１項所述之擊發機構模組，其中擊

Atrius Ex. 1002--0148

六、申請專利範圍

發機構總成（４６）內之方槽（６）其寬度與選擇器（４４）尾部四個弧型凹槽配合並利用選擇器定位簧（４５）結合及定位。

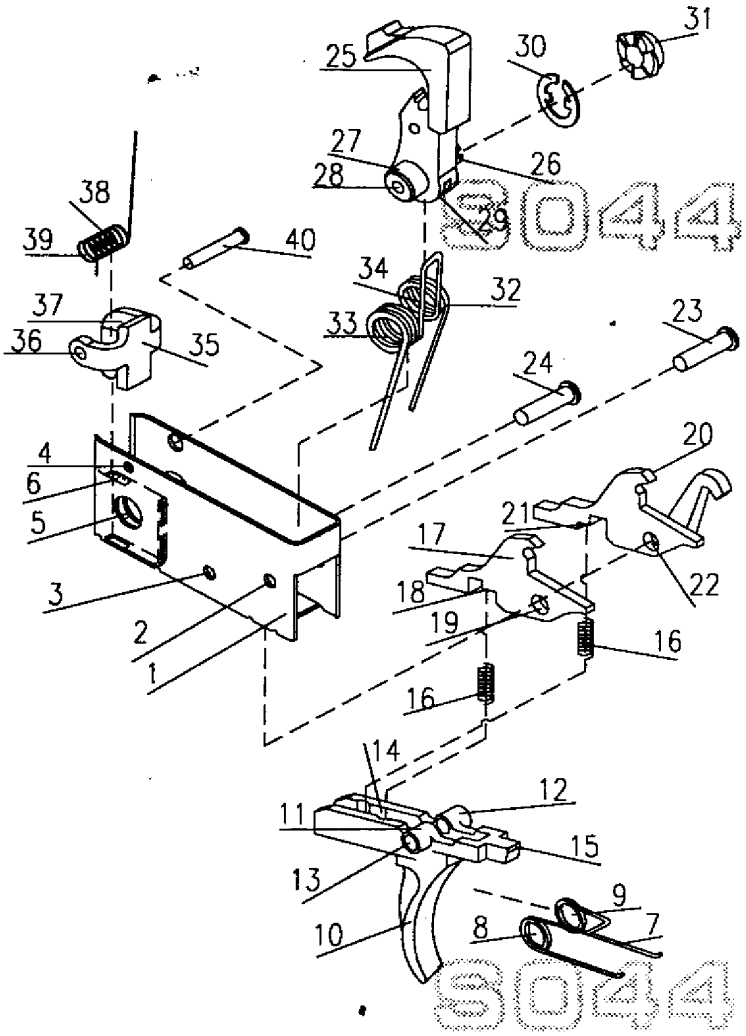
8. 依據申請專利範圍第１項所述之擊發機構模組，其中選擇器（４４）尾部四個弧型凹槽係位於同一切面並互相平行對稱。

8044

8044

Atrius Ex. 1002--0149

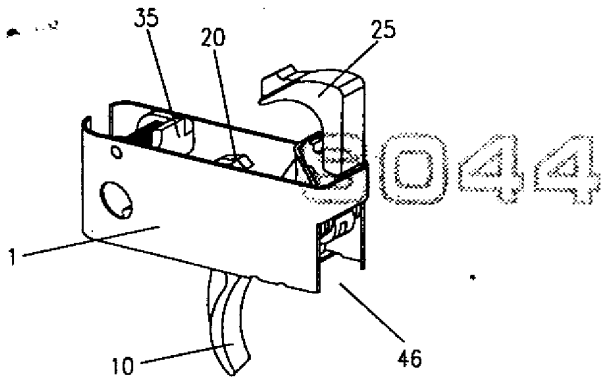
圖式簡單說明



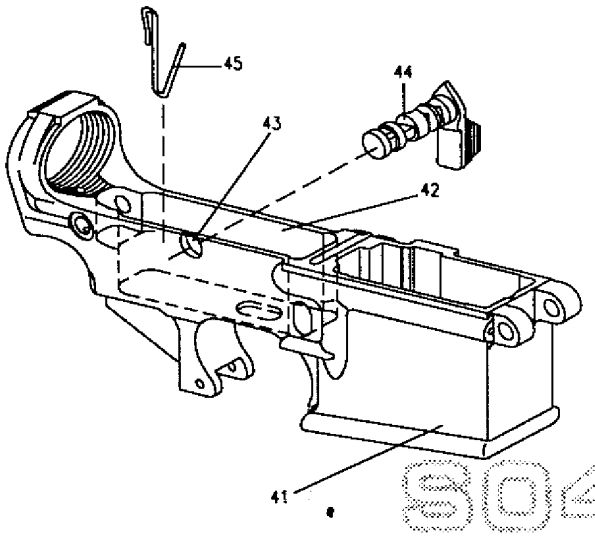
第一圖

Atrius Ex. 1002--0150

圖式簡單說明



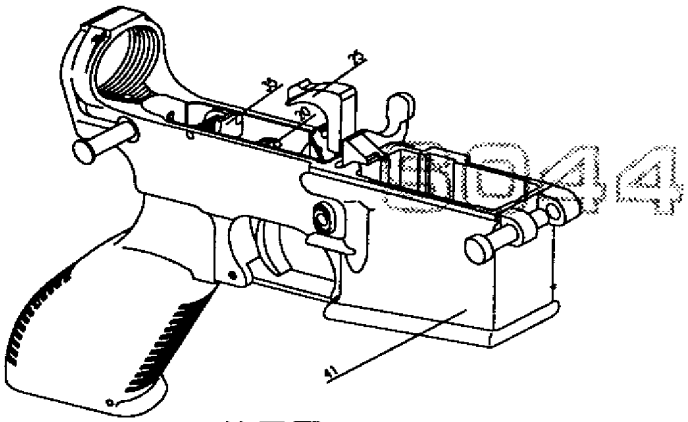
第二圖



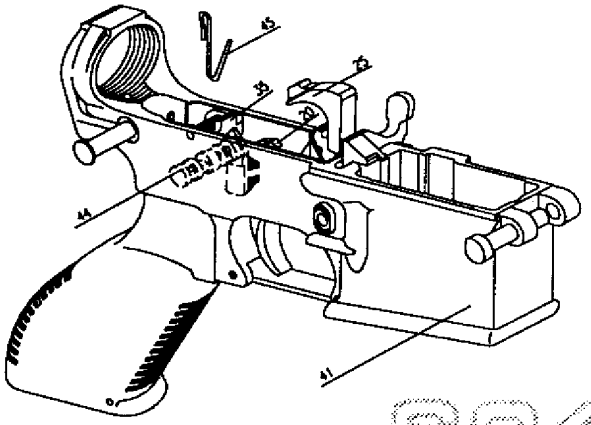
第三圖

Atrius Ex. 1002--0151

圖式簡單說明



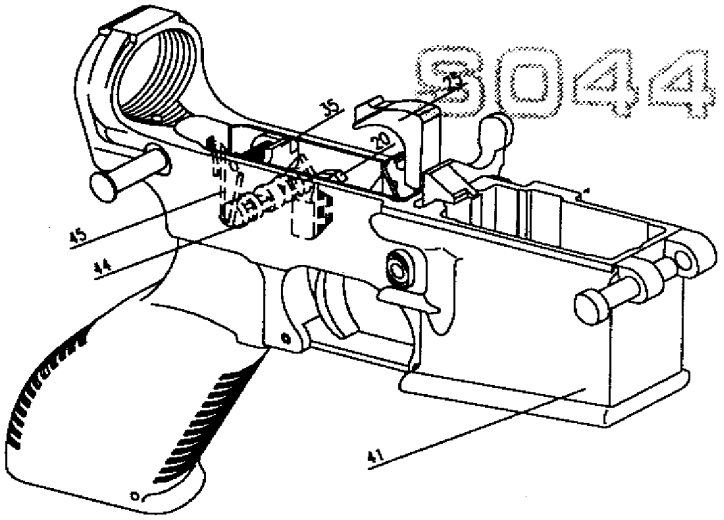
第四圖



第五圖

Atrius Ex. 1002--0152

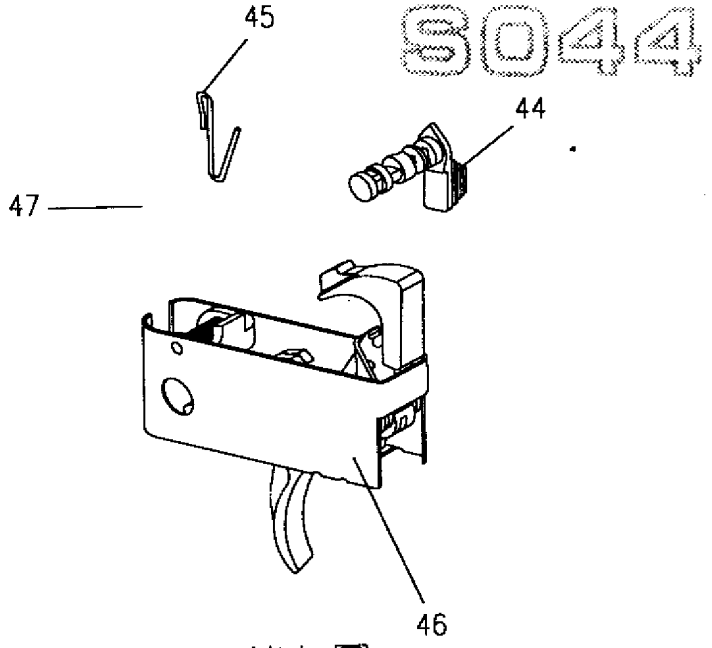
圖式簡單說明



第六圖

Atrius Ex. 1002--0153

圖式簡單說明



第七圖

Atrius Ex. 1002--0154

公告本

409847

89.5.23 修正補充

申請日期：88.4.13	案號：88205701
類別：F41A 19/06	

（以上各欄由本局填註）

新型專利說明書

一、新型名稱	中文	自動武器之擊發機構模組
	英文	409847
二、創作人	姓名（中文）	1. 李德華
	姓名（英文）	1. Lee, Der Haw
	國籍	1. 中華民國
	住、居所	1. 高雄市前鎮區瑞平里26鄰武慶一路2之6號9樓
三、申請人	姓名（名稱）（中文）	1. 聯勤第205廠
	姓名（名稱）（英文）	1. The 205th Arsenal, Ordnance Production Service, Combined Service Forces
	國籍	1. 中華民國
	住、居所（事務所）	1. 高雄市中山三路98號
	代表人姓名（中文）	1. 鄭昌頻
	代表人姓名（英文）	1. Cheng, Chung-Ping

Atrius Ex. 1002--0155

89.6.-5 修正
年 月 日 補充

六、申請專利範圍

1. 一種自動武器的擊發機構模組（４７），其係包含一擊發機構總成（４６），一固定下節套與擊發機構總成之選擇器（４４），以及選擇器定位簧（４５）；此一擊發機構模組可與下節套輕易分離與結合，結合後即具有多功能射擊之擊發裝置。

2. 依據申請專利範圍第１項所述之擊發機構模組，其中選擇器（４４）形狀似L型圓柱，其上有多個方向的凹槽，直柄部份有防滑條紋及箭頭。

3. 依據申請專利範圍第１項所述之擊發機構模組，其中選擇器定位簧（４５）可準確放置在擊發機構總成（４６）內之方槽（６）中，連接選擇器，並壓迫選擇器尾部弧形凹槽，以有限度的限制選擇器任意轉動。

4. 依據申請專利範圍之第１項所述之擊發機構模組，其中選擇器定位簧（４５）形狀似魚鉤，當放入正確位置運動時，具有剛性與彈性。

5. 依據申請專利範圍第１項所述之擊發機構模組，其中擊發機構總成（４６）其盒狀面之最大孔洞，能作為側向插入選擇器（４４）以固定擊發機構總成（４６）與下節套（４１）。

6. 依據申請專利範圍第１項所述之擊發機構模組，其中擊發機構總成（４６）其軸向前端凸出平板可作為擊錘（２５）向前旋轉運動時阻止擊錘（２５）過度旋轉，使擊錘（２５）與軸向保持90度夾角。

7. 依據申請專利範圍第１項所述之擊發機構模組，其中擊

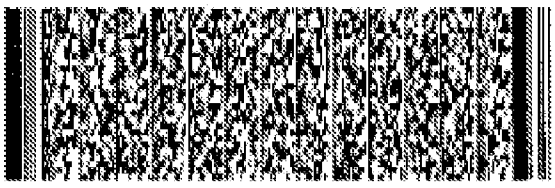
Atrius Ex. 1002--0156

Publication	409847	Amended on May 23, 89th year of the Republic

Application date: April 13, 88th year of the Republic	Application No.: 88205701
IPC: F41A 19/06	

(The office fills in the form above)

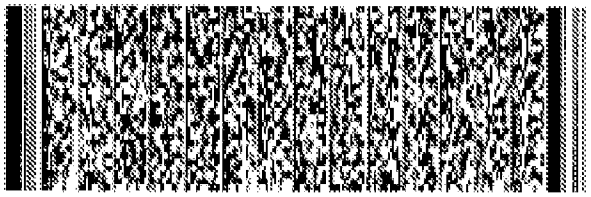
Description of Patent Application for Utility Model		
I. Title of Utility model	Chinese	Firing mechanism module of automatic firearms
	English	409847
II. Inventor(s)	Name (Chinese)	1. Dehua Li
	Name (English)	1. Lee, Der Haw
	Nationality	1. Republic of China
	Residence	1. 2-6-9, Wuqing First Rd, Ruiping Li 26, Qianzhen District, Kaohsiung
III. Applicant(s)	Title or Name (Chinese)	1. 205th Factory, Combined Service Forces
	Title or Name (English)	1. The 205th Arsenal, Ordnance Production Service, Combined Service Forces
	Nationality	1. Republic of China
	Residence	1. No. 98 Zhongshan San Rd, Kaohsiung
	Representative (Chinese)	1. Changpin Zhang
	Representative (English)	1. Cheng, Chung Ping



IV. Abstract of Disclosures in Chinese (Title of the Utility Model: Firing mechanism module of automatic firearms)

The present utility model has modularized the firing mechanism of traditional automatic firearms, reduced the difficulties of disassembling and assembling the device, as well as improved its reliability. The assembly of a firing mechanism comprises a firing hammer, a trigger, a single round button, a three round button, a firing hammer spring, a ratchet, a ratchet spring, a sear and a sear spring, and other parts, which have been independently assembled into a boxed structure. When it is mounted to an automatic firearm, the assembly of the firing mechanism is inserted downwards from above the lower section sheath into the lower section sheath, and then the selector is inserted into the lower section sheath from a lateral direction, next the positioning spring of the selector is inserted from above into the slot of the firing mechanism. In this way, the assembling process is finished, so as to achieve the aim of firing control.

Abstract of Disclosures in English (Title of the Utility Model:)



Atrius Ex. 1002--0158

V. Description of the Utility Model (1)

Traditionally, the parts of the firing mechanism of an automatic firearm are mounted directly inside the lower section sheath. As a result, when performing maintenance or repair, certain special tools are needed to disassemble each individual part of the firing mechanism. Later on, when the broken part is replaced, these parts of the firing mechanism need to be sequentially mounted back. It is noted that it is pretty difficult and time-consuming to disassemble these parts of the firing mechanism and then reassemble them again, which comprises the reliability of firearms.

In order to improve the abovementioned deficiency, the present utility model has modularized the parts of the firing mechanism which cannot be replaced easily; that is to say, simplified the parts of the firing mechanism into three major portions, namely selector, selector positioning spring and the boxed assembly of the firing mechanism. During the assembling process, the boxed assembly of the firing mechanism is inserted downwards from above the lower section sheath into the lower section sheath, and then the selector is inserted into the lower section sheath from a lateral direction, next the positioning spring of the selector is inserted from above into the slot of the firing mechanism. In this way, the assembling process is finished. During the disassembling process, the foregoing steps only need to be performed in reverse order, in which the selector positioning spring and selector are firstly removed, and then the assembly of the firing mechanism can be easily taken out, which is then either repaired or replaced with a new one. In this way, the reliability of firearms has been improved.

In reference to the drawings, the structural features and operation process of the present utility model will be further described in detail.

<Brief Description of the Drawings>

Figure 1 is an exploded view of the assembly of a firing mechanism.

Figure 2 is an assembling view of the assembly of a firing mechanism.

Figure 3 is a view showing the firing mechanism module combined with the lower section sheath.

Figure 4 is a schematic view of mounting the assembly of a firing mechanism.

Figure 5 is a schematic view of mounting the selector.

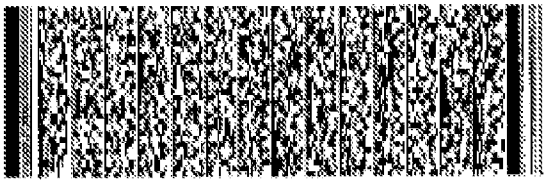
Figure 6 is a sectional view showing the firing mechanism module mounted into the lower

Atrius Ex. 1002--0159

section sheath.

Figure 7 is a view of the firing mechanism module.

Description of the symbol numerals shown in the drawings.

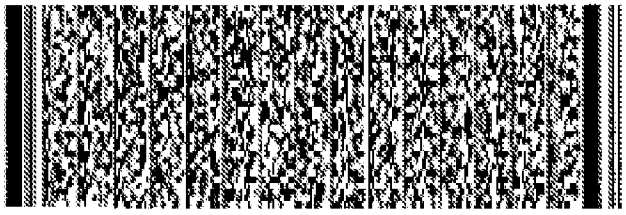




Atrius Ex. 1002--0160

V. Description of the Utility Model (2)

1 firing mechanism
2 left hole
3 left hole
4 left hole
5 left hole
6 square slot
7 trigger spring
8 trigger spring hole cover
9 trigger spring hole cover
10 trigger
11 protrusion
12 protrusion
13 protrusion hole
14 trigger slot
15 trigger face
16 trigger holding spring
17 single round trigger button
18 single round trigger button slot
19 single round trigger button hole
20 three round trigger button
21 three round trigger button slot
22 three round trigger button hole
23 column pin
24 column pin
25 firing hammer
26 firing hammer protrusion
27 firing hammer protrusion
28 firing hammer hole
29 firing hammer slot
30 ratchet spring
31 ratchet
32 firing hammer spring
33 firing hammer spring hole
34 firing hammer spring hole
35 sear
36 sear hole
37 sear slot
38 sear spring
39 sear spring hole
40 sear pin
41 lower section sheath
42 lower section sheath recess
43 lower section sheath side hole
44 selector
45 selector positioning spring
46 firing mechanism assembly
47 firing mechanism module



Atrius Ex. 1002--0161

V. Description of the Utility Model (3)

<Description of the Embodiments>

Figure 1 is an exploded view of the assembly of a firing mechanism. It shows the major components as follows: firing mechanism (1), trigger (10), single round trigger button (17), three round trigger button (20), column pin (23), firing hammer (25), ratchet (31), sear (35) sear pin (40) and so on.

The assembling order of the assembly of a firing mechanism is as follows: trigger portion, firing hammer portion and sear portion, which are shown below:

For the trigger (10) portion, first trigger spring hole covers (8) and (9) are put on the two protrusions (11) and (12), the trigger holding spring (16) is inserted into the single round trigger button slot (18) and three round trigger button slot (21), respectively, and then the single round trigger button (17) and three round trigger button (20) are combined together and put into the trigger slot (14); after the foregoing parts are assembled, the assembled structure is placed into the firing mechanism (1), and column pin (23) is pushed out through the left hole (2) of the firing mechanism and then passed through the single round trigger button hole (19), three round trigger button hole (22) and protrusion hole (23), so as to finish the assembly of the trigger (10) portion and the firing mechanism (1).

Regarding the firing hammer (25) portion, first the ratchet spring (30) and ratchet (31) are placed on the firing hammer protrusion (26), and then the firing hammer protrusions (26) and (27) are put into the firing hammer spring holes (33) and (34), next the foregoing finished assembly is pushed into the firing mechanism (1), the two extensions of firing hammer spring (32) should be facing backwards, next the column pin (24) is pushed out through the left hole (3) of the firing mechanism, and then passes through the firing hammer hole (28), so as to finish the assembly of the firing hammer (25) portion and the firing mechanism (1). Further, the firing hammer (25) is pushed backward to allow the firing hammer (25) to engage into the trigger face (15). At this moment, the firing hammer (25) is in a prepared state.

For the sear (35) portion, first the sear spring is placed into the sear slot (37), and the foregoing finished assembly is put into the firing mechanism (1), next the sear pin (40) is pushed out through the left hole (4) of the firing mechanism, and then passes through the sear spring hole (39) and the sear hole (36), so as to finish the assembly of the sear portion and the firing

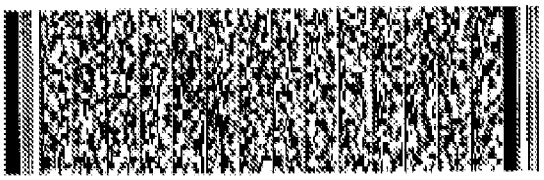
Atrius Ex. 1002--0162

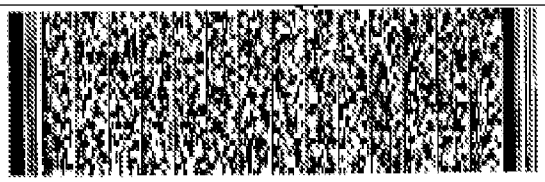
mechanism (1).

Next the tripper (10) portion, the firing hammer (25) portion and the sear (35) portion are sequentially mounted to the firing mechanism (1), so as to finish the assembly of firing mechanism (46), as shown in Figure 2.

Figure 4 is a schematic view of mounting the assembly of a firing mechanism. The assembly of a firing mechanism (46) shown in Figure 2 is pushed downward from above the lower section sheath (41) shown in Figure 3 into the lower section sheath recess (42) to make the upper end of the firing mechanism (1) flush with the upper end of the lower section sheath (41), and then push the upper end of the sear (35) forward to allow the selector (44) to pass through the lower section sheath side hole (43), which then passes through the left hole (5) of the firing mechanism (1), which enables the selector to tightly attach to the left side of the lower section sheath, and then release the sear, which allows the lower section sheath and the assembly of firing mechanism (46) to be secured together. Please refer to Figure 5 for assembling details. Next, the selector positioning spring (45) is inserted downward from above the assembly of the firing mechanism (46) into the square slot (6) of the firing mechanism (1), so as to finish the entire assembling process. Please refer to Figure 6, which is a sectional view showing the firing mechanism module mounted into the lower section sheath.

In the case when the assembly of a firing mechanism needs to be replaced, it can be easily achieved by performing the foregoing steps in a reverse order, in which first the selector positioning spring (45) and the selector (44) are removed, which allows the assembly of a firing mechanism to be removed from the lower section sheath. In an urgent situation, it allows a quick replacement of the assembly of a firing mechanism, which helps to significantly improve the reliability of automatic firearms.





Atrius Ex. 1002--0163

V. Description of the Utility Model (5)



Atrius Ex. 1002--0164

VI. Claims

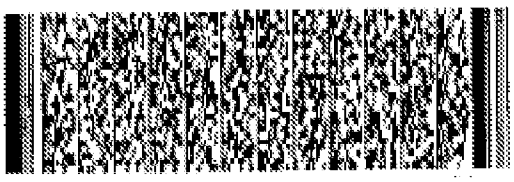
What is claimed is:

1. A firing mechanism module of an automatic firearm (47), comprising a firing mechanism assembly (46), a selector (44) for securing a lower section sheath and the firing mechanism assembly together, and a selector positioning spring (45); the firing mechanism module can be easily disassembled from or assembled to the lower section sheath, and after being assembled together, a multi-functional firing mechanism is formed.
2. The firing mechanism module as set forth in claim 1, wherein the selector (44) is in an L shaped cylindrical form, a plurality of grooves in multiple directions are provided thereon, and the straight portion thereof is further provided with anti-sliding strips and arrows.
3. The firing mechanism module as set forth in claim 1, wherein the selector positioning spring (45) is adapted to be accurately inserted in the square slot (6) of the firing mechanism assembly (46), which is connected to the selector, pressing the curved recess at the tail portion of the selector, so as to restrict the selector from rotating freely.
4. The firing mechanism module as set forth in claim 1, wherein the selector positioning spring (45) is in a hook shape, and when it is placed in a right position and then moves, it has both rigidity and flexibility.
5. The firing mechanism module as set forth in claim 1, wherein the biggest hole on the surface of the boxed firing mechanism assembly (46) can be used for insertion of the selector (44), so as to secure the firing mechanism assembly (46) with the lower section sheath (41).
6. The firing mechanism module as set forth in claim 1, wherein a plate extending from an axial front end of the firing mechanism assembly (46) is adapted to block the firing hammer (25) from over-rotating when the firing hammer (25) is making a forward rotating movement, which allows the firing hammer (25) to maintain an angle of 90 degrees from the axial direction.
7. The firing mechanism module as set forth in claim 1, wherein the square slot (6) of the firing mechanism assembly (46) has a width that is corresponding to the four curved

Atrius Ex. 1002--0165

recesses on the tail of the selector (44), which works along with the selector positioning spring (45) for positioning.

8. The firing mechanism module as set forth in claim 1, wherein the four curved recesses on the tail of the selector (44) are on the same tangent plane and are parallel to each other.



Atrius Ex. 1002--0166

409847

Drawings

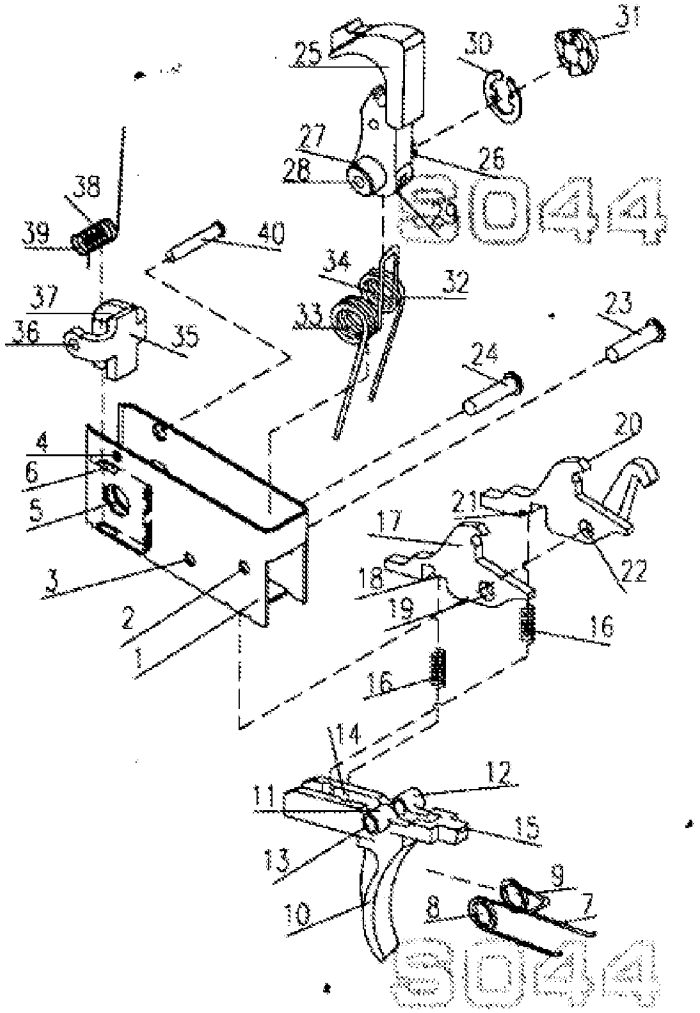


Figure 1

Atrius Ex. 1002--0167

Drawings

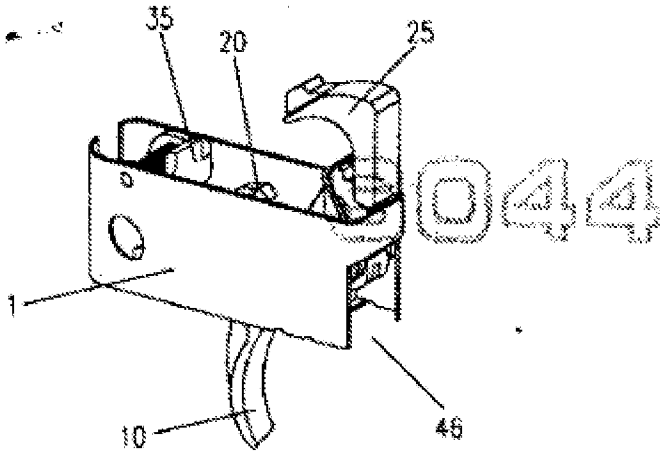


Figure 2

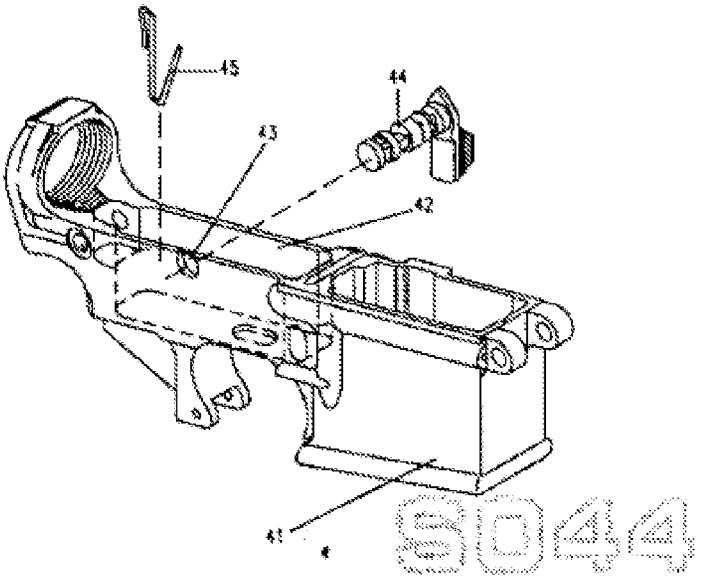


Figure 3

Atrius Ex. 1002--0168

Drawings

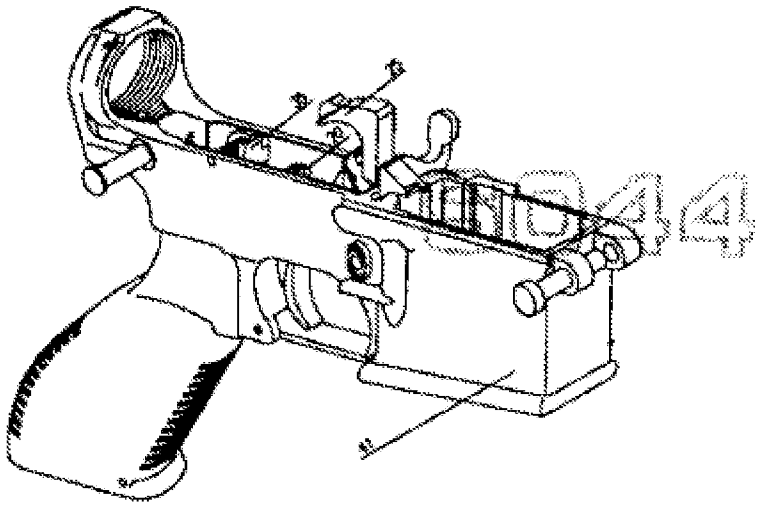


Figure 4

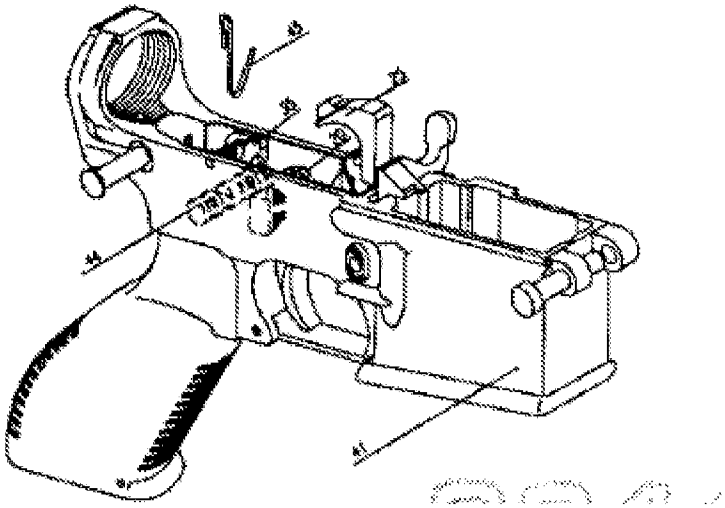


Figure 5

Atrius Ex. 1002--0169

Drawings

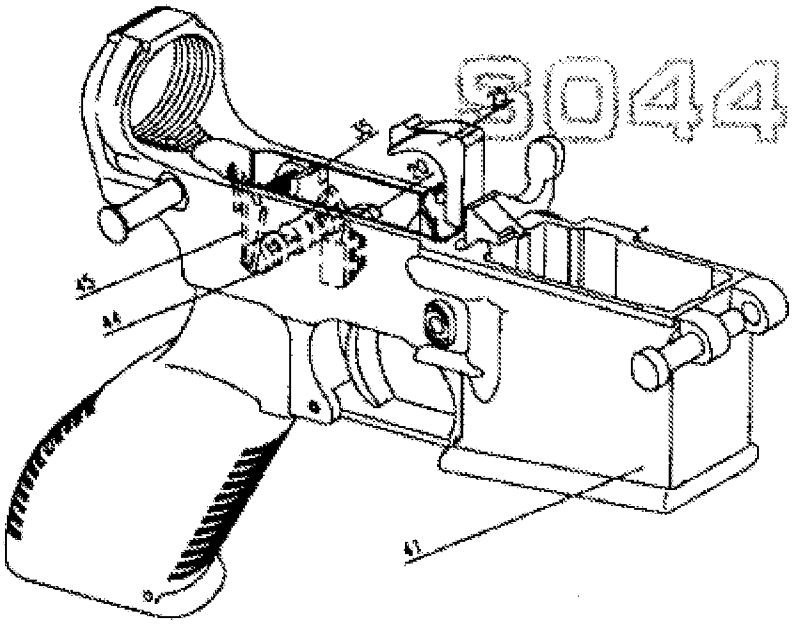


Figure 6

Atrius Ex. 1002--0170

Drawings

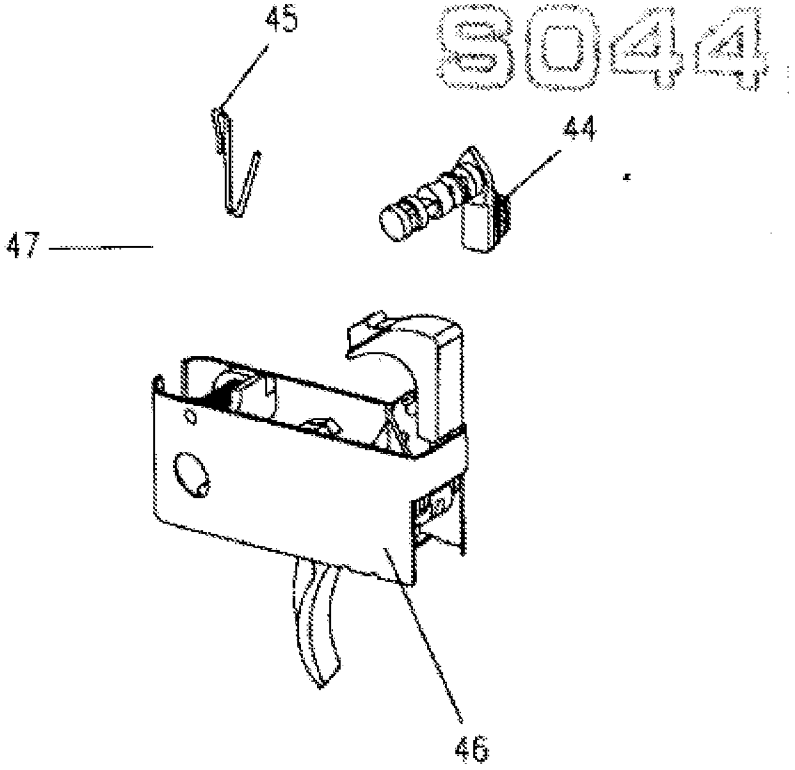


Figure 7

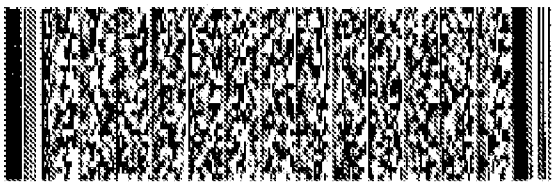
Atrius Ex. 1002--0171

Publication	409847	Amended on May 23, 89th year of the Republic

Application date: April 13, 88th year of the Republic	Application No.: 88205701
IPC: F41A 19/06	

(The office fills the form above)

Description of Patent Application for Utility Model		
I. Title of Utility model	Chinese	Firing mechanism module of automatic firearms
	English	409847
II. Inventor(s)	Name (Chinese)	1. Dehua Li
	Name (English)	1. Lee, Der Haw
	Nationality	1. Republic of China
	Residence	1. 2-6-9, Wuqing First Rd, Ruiping Li 26, Qianzhen District, Kaohsiung
III. Applicant(s)	Title or Name (Chinese)	1. 205th Factory, Combined Service Forces
	Title or Name (English)	1. The 205th Arsenal, Ordnance Production Service, Combined Service Forces
	Nationality	1. Republic of China
	Residence	1. No. 98 Zhongshan San Rd, Kaohsiung
	Representative (Chinese)	1. Changpin Zhang
	Representative (English)	1. Cheng, Chung Ping



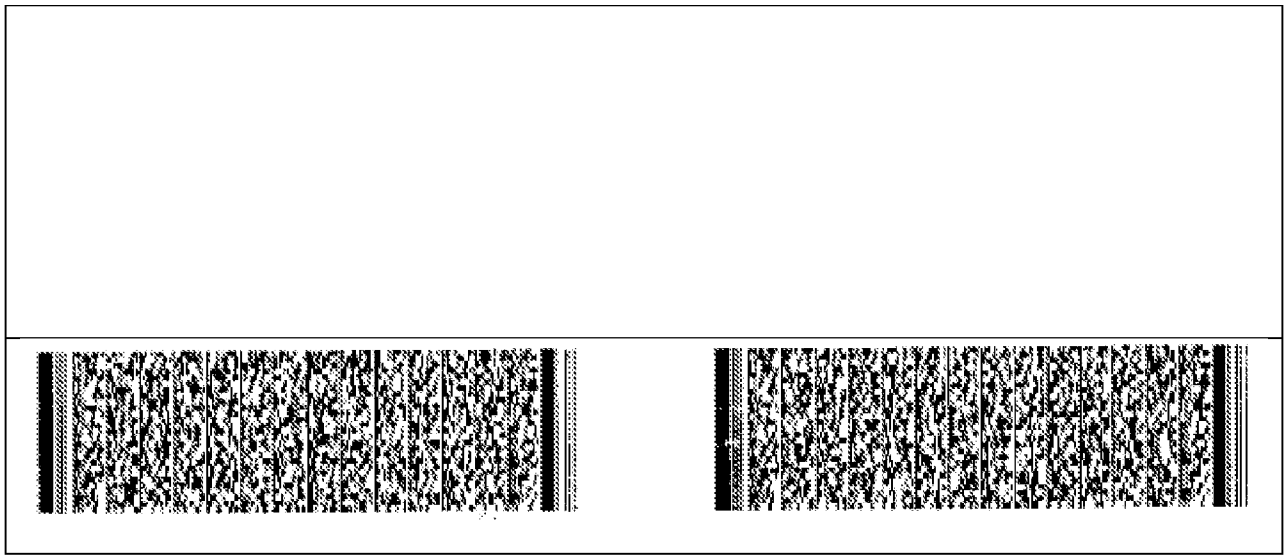
Atrius Ex. 1002--0172

VI. Claims

What is claimed is:

1. A firing mechanism module of an automatic firearm (47), comprising a firing mechanism assembly (46), a selector (44) for securing a lower section sheath and the firing mechanism assembly together, and a selector positioning spring (45); the firing mechanism module can be easily disassembled from or assembled to the lower section sheath, and after being assembled together, a multi-functional firing mechanism is formed.
2. The firing mechanism module as set forth in claim 1, wherein the selector (44) is in an L shaped cylindrical form, a plurality of grooves in multiple directions are provided thereon, and the straight portion thereof is further provided with anti-sliding strips and arrows.
3. The firing mechanism module as set forth in claim 1, wherein the selector positioning spring (45) is adapted to be accurately inserted in the square slot (6) of the firing mechanism assembly (46), which is connected to the selector, pressing the curved recess at the tail portion of the selector, so as to restrict the selector from rotating freely.
4. The firing mechanism module as set forth in claim 1, wherein the selector positioning spring (45) is in a hook shape, and when it is placed in a right position and then moves, it has both rigidity and flexibility.
5. The firing mechanism module as set forth in claim 1, wherein the biggest hole on the surface of the boxed firing mechanism assembly (46) can be used for insertion of the selector (44), so as to secure the firing mechanism assembly (46) with the lower section sheath (41).
6. The firing mechanism module as set forth in claim 1, wherein a plate extending from an axial front end of the firing mechanism assembly (46) is adapted to block the firing hammer (25) from over-rotating when the firing hammer (25) is making a forward rotating movement, which allows the firing hammer (25) to maintain an angle of 90 degrees from the axial direction.
7. The firing mechanism module as set forth in claim 1, wherein

Atrius Ex. 1002--0173



Espacenet

Bibliographic data: WO2016028337 (A1) — 2016-02-25

DROP-IN ADJUSTABLE TRIGGER ASSEMBLY WITH CAMMING SAFETY LINKAGE

Inventor(s): TUBB GEORGE WYATT [US] ± (TUBB, GEORGE, WYATT)

Applicant(s): TUBB GEORGE WYATT [US] ± (TUBB, GEORGE, WYATT)

Classification: - international: *F41A19/00*
- cooperative: F41A17/56 (EP); F41A19/16 (EP)

Application number: WO2015US11336 20150114 Global Dossier

Priority number(s): US201414462348 20140818

Abstract of WO2016028337 (A1)

A drop-in adjustable trigger assembly (50) has a camming safety linkage (74) to selectively move and engage a bolt sear to positively prevent movement of the bolt sear. The drop-in trigger assembly housing (52) carries a pivoting bolt sear engagement member (70) which is connected to a sear safety linkage (74). The housing side plate (64) has a sear safety linkage slot (82) defined therein which guides the pivoting sear safety linkage in response to actuation of an upwardly projecting thumb safety lever's actuation. Trigger bracket (102) is configured to pivot within the housing (52) about a pivot point (108) within the housing, and the trigger bracket (102) carries an adjustable rocker (130) having a first stage movement adjustment and a second stage length adjustment.

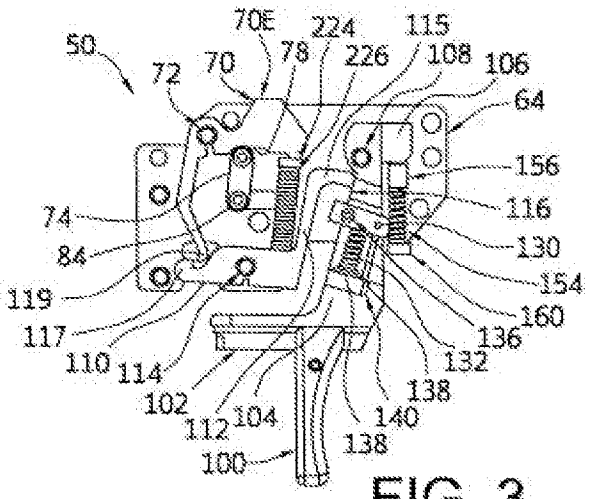


FIG. 3

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
25 February 2016 (25.02.2016)

WIPO | PCT

(10) International Publication Number
WO 2016/028337 A1

(51) International Patent Classification:
F41A 19/00 (2006.01)

(21) International Application Number:
PCT/US2015/011336

(22) International Filing Date:
14 January 2015 (14.01.2015)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
14/462,348 18 August 2014 (18.08.2014) US

(72) Inventor; and
(71) Applicant : **TUBB, George, Wyatt** [US/US]; 14227 N. Hills Village Dr., San Antonio, TX 78249 (US).

(74) Agent: **MCKINNEY, Andrew, J.**; J. A. McKinney & Assoc., LLC, P.O. Box 1290, Millersville, MD 21108 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

(54) **Title**: DROP-IN ADJUSTABLE TRIGGER ASSEMBLY WITH CAMMING SAFETY LINKAGE

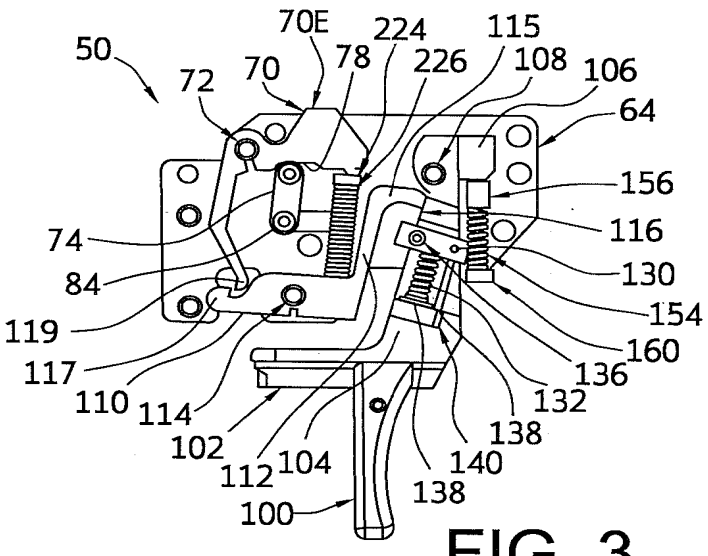


FIG. 3

(57) **Abstract**: A drop-in adjustable trigger assembly (50) has a camming safety linkage (74) to selectively move and engage a bolt sear to positively prevent movement of the bolt sear. The drop-in trigger assembly housing (52) carries a pivoting bolt sear engagement member (70) which is connected to a sear safety linkage (74). The housing side plate (64) has a sear safety linkage slot (82) defined therein which guides the pivoting sear safety linkage in response to actuation of an upwardly projecting thumb safety lever's actuation. Trigger bracket (102) is configured to pivot within the housing (52) about a pivot point (108) within the housing, and the trigger bracket (102) carries an adjustable rocker (130) having a first stage movement adjustment and a second stage length adjustment.

WO 2016/028337 A1

Drop-in Adjustable Trigger Assembly with Camming Safety Linkage

BACKGROUND OF THE INVENTION

[0001] The present application is related to Provisional Application No. 61/867,049, filed August 17, 2013, the disclosure of which is hereby incorporated herein in its entirety by reference and claims priority to prior Non-provisional Application No. 14/462,348, filed August 18, 2014, the disclosure of which is hereby incorporated herein in its entirety by reference.

Field of the Invention:

[0002] The present invention relates to firearms and more particularly to trigger mechanisms for use in rifles and other manually actuable instruments.

Discussion of the Prior Art:

[0003] Rifle marksmanship has been continuously developing over the last few hundred years, and now refinements in materials and manufacturing processes have made increasingly accurate aimed fire possible. These refinements have made previously ignored ergonomic or human factors more significant as sources of error.

[0004] The term "rifle" as used here, means a projectile controlling instrument or weapon configured to aim and propel or shoot a projectile, and triggers or firearm actuator systems are discussed principally with reference to their use on rifles and embodied in mechanisms commonly known as trigger assemblies. It will become apparent, however, that trigger mechanisms for manually actuable instruments may include devices other than rifles, and may be used on instruments or weapons other than rifles which are capable of controlling and propelling projectiles (e.g., rail guns or cannon). The prior art provides a richly detailed library documenting the process

of improving the ergonomics of actuating rifles and other firearms (e.g., as shown in Fig. 1) and other manually actuable instruments.

[0005] Modern firearms such as rifles make use of cartridges that include a projectile seated in a casing. The casing has an internal cavity defined therein that contains a charge of rapidly combusting powder. A primer is seated in a recess formed in a rear portion of the casing. A hole in the primer casing places the primer in communication with the internal cavity containing the power. A projectile is seated in the front portion of the casing such that the powder is more or less sealingly contained in the casing between the primer and the projectile.

[0006] An action, such as a bolt action, is used to fire the cartridge. For example, the action can include a striker that carriers a firing pin. The striker can be coupled to a biasing member, such as a spring. The spring provides a motive force for the striking to cause the firing pin to impact the primer. More specifically, the spring can be compressed, or cocked, by drawing the striker rearwardly. Engagement between a sear and the striker can maintain the striker in a cocked position.

[0007] The action can then be used to advance the cartridge into a firing chamber ahead of firing. While in the firing chamber, a trigger mechanism can be used to release the sear to cause the firing pin to strike the primer, causing the primer to ignite. The ignition is directed to the powder, which burns within the casing. The powder burns within the casing to generate a rapidly expanding gas, which propels the projectile out of the casing and through the barrel.

[0008] Safety mechanisms are often used in the trigger mechanism to selectively control whether the trigger mechanism may release the sear. However,

safety mechanisms may interfere with trigger feel, trigger pull or other factors which directly and adversely affect the shooter's ability to precisely control trigger actuation.

[0009] When firing a shot, a trained shooter will carefully control breathing motions, check sight alignment as part of the continuous aiming process, and then carefully squeeze the trigger to "break" the shot at a moment which is chosen by the shooter to maximize the likelihood of a "hit" on the target. The shooter's ability to repeatably and precisely execute this planned sequence of steps is determined in part by the trigger assembly's ergonomics and consistent, repeatable operation. Bad triggers exhibit uneven response to trigger finger pressure (or "creep") and do not actuate or "break" cleanly and consistently. Often, a marksman or precision shooter will struggle to adjust the performance on a trigger to maximize that specific shooter's ability to precisely control trigger actuation or "break".

[0010] Traditional rifle triggers have been categorized as single stage triggers or two stage triggers. Two-stage triggers are often used on military weapons. As the name implies, the trigger take-up is in two stages. The first stage is usually about 1/4" of lighter "slack", before the second stage trigger pull begins, which ends with the trigger break. There is a difference in the weight of the trigger pull between the two stages which can be easily felt, where the first stage travel is light and the second stage requires notably greater force. A single-stage trigger does not typically have nearly as much travel as a two-stage trigger, so the shooter simply applies trigger pressure or force until the trigger breaks. Single stage triggers are more often used on sporting rifles.

[0011] Product liability lawsuits have exacerbated the shooter's ergonomics problems by forcing most manufacturers to design trigger assemblies which are

nearly impossible for the shooter or user to tune or adjust. Some shooters will replace the entire trigger assembly in a rifle having a "lawyer's trigger" in the hopes of improving trigger adjustability.

[0012] There is a need, therefore, for a drop-in trigger assembly which can be used to enhance the ergonomics of trigger actuation and allow the shooter or user to tune or customize the trigger for his or her needs.

[0013] The subject matter claimed herein is not limited to embodiments that solve any of the cited disadvantages or that operate only in environments such as those described above. Rather, this background is only provided to illustrate one exemplary technology area where some examples described herein may be practiced.

SUMMARY OF THE INVENTION

[0014] Briefly, and in accordance with preferred embodiments, the present invention incorporates a drop-in adjustable trigger assembly, comprising a camming safety linkage to selectively move and engage a bolt sear. The drop-in trigger assembly has a housing having an upper portion, a lower portion, a front portion, a rear portion, a first side portion and a second side portion. The housing carries a pivoting bolt sear which is connected to a sear safety linkage. The housing has a sear safety linkage slot defined therein which guides the pivoting sear safety linkage in response to actuation of an upwardly projecting thumb safety lever's actuation. A trigger bracket preferably carries a removable trigger shoe and is configured to pivot within the housing about a pivot point positioned within the housing's lower portion. This trigger bracket carries an adjustable rocker having (preferably) a first stage movement adjustment and a second stage length adjustment. The pivoting safety

mechanism's safety linkage pivots rearwardly to push upon or cam the bolt sear upwardly, thus disengaging the bolt sear from the trigger sear.

[0015] The drop-in adjustable trigger assembly of the present invention can be used to enhance the ergonomics of a rifle's trigger actuation and allows the shooter or user to tune or customize the trigger for his or her needs. The trigger assembly provides user adjustable controls for a first stage weight of pull, first stage travel or movement range, second stage break weight and second stage engagement length, each of which can be optimized separately for accurate shooting.

[0016] The trigger assembly has a camming safety linkage to selectively move and engage a bolt sear. The drop-in trigger assembly has a housing having an upper portion, a lower portion, a front portion, a rear portion, a first side portion and a second side portion. The housing includes left and right side plates which carry a pivoting bolt sear connected to a sear safety linkage. The housing's side plates have sear safety linkage slots defined therein which guide the pivoting sear safety linkage in response to actuation of an upwardly projecting thumb safety lever's actuation. A pivoting trigger bracket preferably carries a removable trigger shoe and is configured to pivot within the housing about a pivot point positioned within the housing's lower portion, the trigger bracket carries an adjustable rocker having (preferably) a first stage movement adjustment and a second stage length adjustment.

[0017] The pivoting safety mechanism's safety linkage pivots rearwardly to push upon or cam the bolt sear upwardly, thus disengaging the bolt sear from the trigger sear.

[0018] The drop-in trigger assembly of the present invention is compact and robust, due in part to the configuration of the housing's parallel, planar left side plate

and right side plate which carry, orient and support the fixed and moving components of the assembly, including the pivoting safety lever which is rotatable about a transverse pin's axis from a forward "safety off" position to a rearward "safety on" position. A sear safety linkage screw transversely inserted in the safety lever drives the lower end of the elongated sear safety linkage forwardly or rearwardly in elongated housing slots and the sear safety linkage's upper end moves or pivots forwardly and up in response to safety linkage movement which terminates when the upper end of the sear safety linkage presses against and engages the bolt sear at a bolt sear lower bearing surface, thus preventing the bolt sear from pivoting under force from a bolt firing pin spring connected to the cocking piece, and disengaging the bolt sear's distal tip from the trigger sear's engagement surface.

[0019] The pivoting trigger bracket carries the adjustable transverse rocker member, which has an internal threaded bore that engages a rocker set screw to raise or lower the rocker, and the lower the rocker is positioned, the smaller the trigger's 1st stage take-up, because of an angled forward face on the pivoting trigger sear. As the transverse rocker moves down, the mechanical advantage is decreased, thus increasing the 2nd stage weight of pull.

[0020] The housing also carries a transverse trigger sear pin which defines the pivot axis for the trigger sear. The trigger sear has a forward face on the forward side of the pivot and has its trigger sear engagement surface on the rearward side of the pivot.

[0021] When the shooter moves the pivoting safety lever from the rearward "safety on" position to the forward "safety off" position, the sear safety linkage screw drives the lower end of the sear safety linkage forward in the housing slots and the

sear safety linkage's upper end pivots back and down, disengaging from the bolt sear's lower bearing surface, thus allowing the bolt sear to pivot under force from the bolt firing pin spring via the cocking piece to "reset" the bolt sear's distal tip into engagement with the trigger sear's engagement surface.

[0022] When the shooter moves the pivoting safety lever from the forward "safety off" position to the rearward "safety on" position, the sear safety linkage screw drives the lower end of the sear safety linkage rearward in the housing slots and the sear safety linkage's upper end pivots forwardly and up, pressing against and engaging the bolt sear's lower bearing surface, thus preventing the bolt sear from pivoting under force from the bolt firing pin spring via the cocking piece, and disengaging the bolt sear's distal tip from the trigger sear's engagement surface.

[0023] The trigger assembly of the present invention can also be configured as a single stage trigger, by simplifying the adjustments.

[0024] The above and still further features and advantages of the present invention will become apparent upon consideration of the following detailed description of a specific embodiment thereof, particularly when taken in conjunction with the accompanying drawings, wherein like reference numerals in the various figures are utilized to designate like components.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] Figs. 1A and 1B illustrate a prior art firearm of the type which incorporates a trigger assembly of the general type provided by the present invention;

[0026] Fig. 2 is a top rear perspective view of the right side of a trigger mechanism in accordance with a first embodiment of the present invention;

[0027] Fig. 3 is a right side plan view of the mechanism of Fig. 2, with the right side housing plate and thumb safety linkage removed;

[0028] Fig. 4 is a top front perspective view of the left side of the trigger mechanism of Fig. 2;

[0029] Fig. 5 is a left side plan view of the trigger mechanism of Fig. 4;

[0030] Fig. 6 is an exploded top rear perspective view of the trigger mechanism of Fig. 5;

[0031] Fig. 7 is a perspective view the interior of a cast right side housing plate for the mechanism of Fig. 2, before machining;

[0032] Fig. 8 is an end view of the plate of Fig. 7;

[0033] Fig. 9 is a plan view of the casting of Fig. 7, showing typical casting dimensions;

[0034] Fig. 10 is a perspective view of the housing plate of Fig. 7, after machining;

[0035] Figs. 11 and 12 are plan views of the housing plate of Fig. 10, illustrating typical machining dimensions;

[0036] Fig. 13 is a top view of the element of Fig. 12;

[0037] Fig. 14 is an end view of the element of Fig. 12;

[0038] Figs. 15 and 16 illustrate typical machining dimensions for the left side housing plate of the trigger mechanism of Fig. 2;

[0039] Fig. 17 is a right side plan view of the trigger mechanism of Fig. 2, illustrating its thumb safety linkage in a "safety on" position;

[0040] Fig. 18 is a left side plan view of the trigger mechanism of Fig. 2 with the left side housing plate removed to illustrate the positions of the trigger

mechanism elements with its thumb safety linkage in the "safety on" position;

[0041] Fig. 19 illustrates the device of Fig. 18 in the "safety off" position;

[0042] Fig. 20 is a left side plan view of a second embodiment of the trigger mechanism of the present invention;

[0043] Fig. 21 is a left side plan view of the second embodiment of the trigger mechanism of the present invention, with the left side housing plate removed;

[0044] Fig. 22 is a right side plan view of the second embodiment of the trigger mechanism of the present invention;

[0045] Fig. 23 is a right side plan view of the second embodiment of the trigger mechanism of the present invention, with the right side housing plate and the thumb safety lever removed;

[0046] Fig. 24 is an exploded top front perspective view of the mechanism of Fig. 22;

[0047] Figs 25 and 26 illustrate a "safety on" condition of the mechanism of Fig 20; and

[0048] Figs. 27 and 28 illustrate a "safety off" condition of the mechanism of Fig. 20.

DESCRIPTION OF PREFERRED EMBODIMENTS

zpin cocking piece 32 of bolt assembly 30, when cocked and under spring pressure from the firing pin spring (not shown). Fig. 1B illustrates that when cocked, the bolt's firing pin cocking piece has a firing pin engagement surface 34, which is forced by the firing pin spring (not shown) into engagement with the prior art trigger sear at the trigger sear's bolt engagement surface, and the trigger sear prevents the cocking piece from forward travel until the trigger is pulled so that the bolt's firing pin

engagement surface slides past the trigger sear's engagement surface under the power of the firing pin spring's force.

[0050] The drop-in adjustable trigger assembly of the present invention is generally illustrated at 50 in Figs 2- 6 and 17 – 19, to which reference is now made. It should be noted that the exploded view of the mechanism 50 in Fig. 6 includes a number of conventional screws, E clips, washers, and the like that are used to secure the walls of the assembly together to form the trigger housing, but these are not described in detail for simplicity. As illustrated, the drop-in trigger assembly 50 has a housing 52 enclosing the assembly and having an upper portion 54, a lower portion 56, a forward portion 58, and a rearward portion 60, with the housing being formed by a first, or right-side wall plate 62 and a second or left-side wall plate 64. As best seen in Fig. 3, wherein plate 62 is removed, and in Fig. 6, the housing 52 carries a pivoting bolt sear member 70 mounted on a bolt sear pin 72 extending between plates 62 and 64. A pivoting sear safety linkage 74 is mounted between plates 62 and 64 and has an upper camming surface 76 (Fig 6) which engages a lower surface 78 of the pivoting bolt sear member 70. The housing has opposed sear safety linkage slots 80 and 82 in plates 62 and 64, respectively, which receive a lower pin 84 of linkage 74 to guide the pivoting sear safety linkage 74 in response to actuation of an upwardly projecting thumb safety linkage 90 actuated by a thumb safety lever 92.

[0051] As illustrated, the trigger assembly 50 includes a removable trigger shoe 100 beneath the housing which engages the bottom leg of a generally L-shaped trigger bar or bracket 102 which has an upwardly extending leg portion 104 pivotally mounted to a short pivot pin 108 which extends between and is supported

by the housing plates 62 and 64 so that the trigger bracket 102 is configured to pivot within the housing 52 about the transverse axis of pivot pin 108 when trigger shoe 100 is pressed or squeezed by the shooter. An L-shaped trigger sear 110 having an upwardly and forwardly extending neck portion 112 is pivotally mounted on a safety pin 114 which extends through corresponding opposed apertures in housing plates 62 and 64 and is secured by suitable E-clips. The forwardmost end 115 of the trigger sear 110 is angled, or v-shaped, and engages an oval point set screw 116 threaded into an aperture 116' on the rear surface of the upper end 104 of the trigger bracket 102. The rearwardmost end 117 of the L-shaped trigger sear 110 incorporates a latching trough or edge 118 which receives and engages the lowermost end 119 of the pivoting bolt sear member 70.

[0052] The upper portion 104 of the trigger bracket 102 carries on its right-hand surface a first rocker screw support 120 spaced from a second, lower rocker screw support 122 and the trigger bracket's spaced rocker screw supports 120 and 122 extend laterally through an opening in the housing plate 62 when the housing is assembled. The pair of spaced rocker screw supports 120 and 122 receive an adjustable transverse rocker 130 positioned according to the user's desire at a selected distance from the upper rocker support 120 by a rocker screw 132 which passes through a threaded internal bore 134 in rocker 130 and is secured by a set screw 136, with a disc spring 138 at the bottom of the screw securing the screw in the bracket and urging the screw upwardly. An L-shaped rocker spring 140 engages the rocker at its upper end. The rocker preferably has a first stage movement adjustment and a second stage length adjustment. The rocker screw 132 and set screw 136 are adjustable to raise or lower the rocker to provide first stage trigger

movement adjustment; the lower the rocker 130 is positioned, the smaller the trigger's 1st stage take-up, because of the angled forward face 112 on the pivoting trigger sear 110. Furthermore, as the transverse rocker 130 moves down, the mechanical advantage of the trigger mechanism is decreased, thus increasing the 2nd stage weight required to fire, or increasing the force needed to cause the trigger to actuate or "break" (also known as the "weight of pull").

[0053] The trigger bar or bracket 102 has a forward end which provides a trigger bracket distally projection member 106 (Figs. 3 and 6), and at the limit of the actuated movement of trigger bar or bracket 102, trigger bracket distally projection member 106 bears upon or rests on a plunger 156 and an adjustable spring 154 captured in an upper shoulder portion 150 of a support element 152 which is a part of, or is secured to, the wall plate 62 and spans the distance between right plate 62 and the opposing left wall plate 64. A spring 154 and a pin 156 extend through an aperture 158 of support element 152 and are adjustably secured therein by screw 160, with the top of the pin abutting the lower surface of trigger stop 106, to bias the trigger bar or bracket 102 in the unfired or rest position.

[0054] The pivoting safety mechanism 90, as best seen in Figs. 2, 6 and 17, includes a thumb safety linkage or lever 92 incorporating at its upper or distal end a knurled cylinder 170 secured by a screw 172 and at its lower or proximal end a connector plate 174 which pivotally mounts the lever 92 to the housing plate 62 by way of a safety lever pivot pin 176. Safety pivot pin 176 passes through aperture 178 in connector plate 174 and apertures 180 and 182 in housing plates 62 and 64, respectively, and is secured at opposite ends by E clips and 184 and 186. A ball-detent safety tab 190 is mounted on pin 176 and is secured against the outer surface

of the connector plate 174, with a bottom flange 194 of the tab engaging a bottom edge 196 of the plate 174 so that the tab 190 rotates with the plate 174. The tab provides a spring bias which bears against and secures a ball bearing 200 in an aperture 202 in safety connector plate 174, the ball bearing extending through the aperture to serve as a detent that engages one or the other of spaced apart side plate apertures 204 or 206 to provide a positive "feel" as the safety mechanism 90 pivots between "on" or "off" positions.

[0055] The connector plate 174 also incorporates a safety linkage aperture 210 which is aligned with slot 80 in housing plate 62 and receives the lower pin 84 of pivoting sear safety linkage 74, so that pivoting the thumb safety linkage lever 92 between on and off positions causes pin 84 to move back and forth in side plate slot 80 (and in its opposing slot 82 in housing plate 64). This motion causes the upper pin 212 of pivoting sear safety linkage 74 to move vertically in its corresponding vertical side plate slots 214 and 216 in housing plates 62 and 64, respectively.

[0056] Mounted between an upper surface 220 of the L-shaped trigger sear 110 and a downwardly facing surface 222 of pivoting bolt sear member 70 is a spring-biased reset pin 224 surrounded by a spring 226. The lower end of reset pin 224 is tapered and received in a depression 230 in upper surface 220 of the L-shaped trigger sear 110. The reset pin spring 226 causes the L-shaped trigger sear 110 to reset after the trigger mechanism has been operated to fire a shot.

[0057] The components of trigger assembly 50 are preferably manufactured from steel, aluminum, or a similarly durable material, using wire EDM machining methods, laser cutting, CNC machining, forming presses or casting methods. As an example of these methods, steps for manufacturing one of these components, the

right side housing plate 62, is illustrated in Figs 7 – 16, Fig. 7 is a perspective view the interior of a cast right side housing plate, before machining; Fig. 8 is an end view of the plate of Fig. 7;and Fig. 9 is a plan view of the casting of Fig. 7, showing typical casting dimensions. Fig. 10 is a perspective view of the housing plate of Fig. 7, after machining, while Figs. 11 and 12 are plan views of the housing plate of Fig. 10, illustrating typical machining dimensions. Fig. 13 is a top view of the element of Fig. 12 and Fig. 14 is an end view of the element of Fig. 12. Figs. 15 and 16 illustrate typical machining dimensions for the left side housing plate 64 of the trigger mechanism 50 of Fig. 2.

[0058] The trigger mechanism 50 works by closing the bolt 30 on a rifle or similar firearm which transfers firing pin spring force from bolt assembly 30 through a cocking piece's firing pin engagement surface 34 which then bears upon to the upper engagement surface 70E at the top of pivoting bolt sear member 70, which projects from the top portion of housing 50, as illustrated in Figs. 2 – 5 and in Figs. 17-19. With the trigger assembly of the present invention 50 installed in a firearm such as rifle 10 it will not fire until the cocking piece 32 forces the bolt sear's upper engagement surface 70E down and pivots the bolt sear 70 in a clockwise direction, as viewed in Fig. 3, sufficiently far to cause the distal tip 119 of bolt sear 70 to engage the latch 118 on the engagement surface of trigger sear 110 (best seen in Figs 3 and 6). The pivoting motion terminates when the upper end 76 of the sear safety linkage 74 presses against and engages bolt sear 70 at bolt sear lower bearing surface 78, thus preventing the bolt sear from pivoting further under force from the bolt sear reset spring 226 and disengaging the bolt sear's distal tip 119 from the trigger sear's engagement surface 118. The bolt sear 70 is thus configured to

work with and actuate cocking piece 32 in a rifle's bolt assembly (e.g., 30 such as used in rifle 10).

[0059] The drop-in trigger assembly of the present invention is compact and robust, due in part to the configuration of the housing's right side plate 62 and left side plate 64, which carry, orient and support the fixed and moving components of the assembly. Although not described, it will be evident from the exploded view of Fig. 6 that numerous screws and pins extend between the side plates to secure the movable parts within or on the housing. These components include the pivoting safety linkage 90 and its thumb safety lever 92 which is rotatable about the axis of transverse pivot pin 176 from a forward "safety off" position (see Fig. 19) to a rearward "safety on" position (see Figs 17 and 18). Pivoting sear safety linkage 74 is driven by sear safety linkage pin 84, which is transversely inserted in the safety lever connector plate aperture 210 which drives the lower end of the elongated pivoting sear safety linkage 74 forwardly or rearwardly in elongated housing slots 80 and 82 to cause the sear safety linkage's upper end 76 to be moved downwardly or upwardly, respectively, in slots 214 and 216 in response to safety linkage movement.

[0060] As described above, the internal threaded bore 134 of the pivoting transverse rocker 130 engages rocker screw 132 to raise or lower the rocker, and the lower the rocker is positioned, the smaller the trigger's 1st stage take-up distance, because rocker 130 then bears against the angled forward face 112 on the pivoting trigger sear 110. The housing also carries the transverse trigger sear pivot pin or safety pin 114 which defines the pivot axis for the L-shaped trigger sear 110 and trigger sear 110 has its forward face 112 on the forward side of the pivot. Trigger sear 110 has its trigger sear engagement surface 118 on the rearward side

of the pivot pin 114 (Fig. 3).

[0061] As best seen in Figs 17 - 19, when the shooter moves the pivoting safety lever 92 from the rearward "safety on" position (Figs. 17 and 18) to the forward "safety off" position (Fig. 19), the pivoting safety link's sear safety linkage pin 84 is shifted to its forward position in slots 80 and 82, and the pivoting safety link's upper pin 212 is pulled down in its corresponding slots 214 and 216. This disengages pivoting safety link 74 from the bolt sear's lower bearing surface 78, thus allowing the bolt sear 70 to pivot counter-clockwise, as viewed in Fig. 19, under force from the bolt assembly's firing pin spring, when the rifle is fired. Bolt sear reset spring 226 will "reset" the bolt sear's distal tip 119 into engagement with the trigger sear's engagement surface 118 when the rifle's bolt is cycled.

[0062] When the shooter moves the pivoting safety lever from the forward "safety off" position of Fig. 19 to the rearward "safety on" position of Figs. 17 and 18, the safety linkage pin 84 drives the lower end of pivoting safety link 74 rearwardly in the housing slots 80 and 82 so that the sear safety linkage's upper pin 212 pivots upwardly in slots 214 and 216, pressing pivoting safety link's upper surface 76 against and engaging the lower bearing surface 78 of the bolt sear 70. This prevents the bolt sear from pivoting under force from the cocked bolt assembly's firing pin spring (not shown) and disengages the bolt sear's distal tip119 from the engagement surface 118 of the trigger sear 110.

[0063] As noted above, trigger assembly 50 incorporates user adjustable controls for a first stage weight of pull, first stage travel or movement range, second stage break weight and second stage engagement length, each of which can be optimized separately for accurate shooting. In the illustrated embodiment of Figs. 2-

19, the trigger mechanism uses two springs, where first stage weight is adjusted by compressing spring 154 with adjustment screw 160, which preferably has a spring constant of approximately 15.8 lbs per inch. Trigger reset spring 226 serves to reset the connection between the bolt sear and the trigger sear for firing the next shot and reset spring 226 is constrained and guided by reset pin 224 which engages bolt sear 70 on the pin's (upper) while end trigger sear 110 bears on reset spring 226 at the spring's lower end. Reset spring 226 preferably has a spring constant of approximately 29 lbs per inch.

[0064] It will be appreciated by persons of skill in the art that the trigger assembly 50, when installed in a rifle (e.g., 10), is actuated when trigger shoe 100 is pressed, which pivots trigger bracket 102 rearward about pivot pin 108 (clockwise in Fig.3), causing the trigger bar or bracket 102 to force rocker 130 rearwardly toward the forward surface112 of trigger sear 110. In response, trigger sear 110 pivots slightly (counterclockwise in Fig. 3), reducing the 2nd stage engagement overlap between edges 118 and 119 to just a few thousandths of an inch (e.g., 0.002-0.005 in). At some point during this rearward travel, trigger bracket 102 stops pivoting rearwardly because rocker 130 has engaged the trigger sear 110, thus ending the length of the 1st stage of trigger pull. As the shooter or marksman continues to increase trigger pressure on trigger shoe 100, the rocker 130 begins rotating the trigger sear 110, until the last few thousandths of an inch of overlapping engagement length of its latching edge 118 is free of engagement with surface 119 of the bolt sear 70, thus breaking contact and enabling trigger actuation in that instant. In response to this release, the bolt sear 70 pivots forward and down (clockwise in Fig. 3), releasing cocking piece 32 in bolt assembly 30 to drive the firing pin (not shown)

into the cartridge, firing the rifle. The first stage weight for trigger assembly 50 is adjustable by the control or set screw 116 independently of the first stage length of travel, which is controlled by the rocker vertical position adjustment screw 132. The second stage weight is adjusted, in part, by the rocker adjustment screw 132 on the trigger bracket's side which moves rocker 130 up and down, changing its mechanical advantage. The second stage length of engagement is adjusted by the control screw or adjustment set screw 116 which is threaded into a bore 116' inside the upper end 104 of the trigger bracket 102 that defines the distal surface to push on the very upper end of the front surface 115 of trigger sear 110, pivoting it away from the bolt sear to set the "crisp" break (or actuation sensation) of trigger assembly 50. The second stage weight is also adjusted by the spring 154 and its adjustment screw 160, which oppose the rotation of the trigger bracket 102. Trigger assembly 50 thus has adjustable first stage length of pull, first stage weight, second stage length of pull and second stage weight. The total weight is the sum of first stage weight and second stage weight and is adjustable from 8 ounces to three and one half pounds. Using these adjustments, the trigger first stage weight and second stage weight can be adjusted by the user for to achieve, for example, a total weight of 30 ounces where either the first stage weight is 5 ounces (meaning the second stage weight is a relatively heavy 25 ounces) or where the first stage weight is 25 ounces (meaning the second stage weight is a relatively light 5 ounces).

[0065] The safety mechanism consists of thumb safety linkage 90 which cams pivoting safety link 74 past top dead center, pushing upward on the bolt sear 70 and locking it in place, while simultaneously disengaging from the trigger sear 110. The ball detent mechanism (190, 200 and apertures 204 and 206) captures the safety

linkage 90 and keeps it in place, providing an audible and tactile "click" sensation of positive control for the shooter. The pivoting safety link or sear safety linkage 74 and thumb safety linkage 90 comprise a "two-bar linkage" which cooperate to provide large mechanical advantage but require small safety actuating force from the user, and an "overcamming" action provided by the travel of sear safety linkage 74 in the slots of housing plates 62 and 64 serves as a failsafe adapted to prevent accidental release of the bolt assembly's firing pin and discharge. When the safety is on (Fig 18) the sear safety linkage 74 engages the bottom surface 78 of bolt sear 102, pivoting it up (clockwise in Fig 6) to disengage it from the trigger sear 110 and preventing it from rotating to fire the firearm. The illustrated trigger assembly 50 is adaptable for use with a left hand side safety lever which projects downwardly into the area proximate the trigger shoe.

[0066] A second embodiment of the trigger assembly of present invention is illustrated at 250 in Figs. 20 – 28, wherein components in common with the first embodiment are similarly numbered. It is noted that the exploded view of this embodiment illustrated in Fig 24 is a top-front perspective view instead of the rear perspective of the first embodiment of Fig. 6. The replacement trigger assembly 250 includes right and left side housing plates 62 and 64 supporting a thumb safety linkage 90 on right side-plate 62. A reversible (front to back) trigger shoe 100 is releasably secured to a trigger bracket 102 which is pivotably mounted between the housing's side plates 62, 64. As in the previous embodiment, the trigger bar or bracket 102 includes a laterally projecting pair of spaced rocker screw supports 120 and 122 between which is mounted a rocker 130 on an adjustment screw 132 held in place by an E clip and spring washer 138, with rocker 130 being carried and held

in position after adjustment by a set screw 136 and biased by a spring 140. In this embodiment, the upper portion of trigger bracket 102 is shaped slightly differently, but, as before trigger bracket distally projection member 260 bears upon or rests on a plunger 156 and an adjustable spring 154 captured in an upper shoulder portion 150 of a support element 152 which is a part of, or is secured to, the wall plate 62 and spans the distance between right plate 62 and the opposing left wall plate 64 (Fig. 23). Adjustment spring 154 and a plunger or pin 156 extend through an aperture 158 within support element 152 and are adjustably secured therein by adjustment screw 160, with the top of the pin abutting and bearing against the lower surface of trigger bar member 260. The lower end of adjustment spring 154 is centered on the screw 160 by a centering pin 261.

[0067] Also mounted within the sidewalls 62 and 64 are a pivotally mounted bolt sear 262 and a pivotally mounted trigger sear 264, slightly different in shape, but similar in function to the bolt sear 70 and the trigger sear 110 of the first embodiment. Reset pin 224 and reset spring 226 are mounted between bolt sear 262 and trigger sear 264 to reset the trigger sear, as previously described. As in the previously-described embodiment, the lower end 266 of bolt sear 262 incorporates a downwardly facing latching edge 268 which engages a corresponding upwardly facing edge 270 on trigger sear 264. The trigger mechanism 250 also incorporates a side safety bolt release lever 280 pivotally mounted on the housing's left side-plate 64.

[0068] A pivoting safety link or sear safety linkage 74 is mounted between plates 62 and 64 and has an upper camming surface 76 which engages a lower surface 272 of bolt sear 262. The housing has opposed horizontal sear safety

linkage slots 80 and 82 in plates 62 and 64, respectively, which receive a lower pin 84 of pivoting safety link 74 to guide the pivoting safety link's movement in response to actuation of the upwardly projecting thumb safety 90 actuated by the safety lever 92.

[0069] The pivoting safety mechanism 90 for this embodiment works in the same manner as the safety mechanism of first embodiment, and, as best seen in Figs. 22 and 24, includes a lever 92 incorporating at its upper end a thumb cylinder 170 secured by a screw 172 and at its lower end a connector plate 174 which pivotally mounts the lever 92 to the housing plate 62 by way of a pin 176. This pin passes through aperture 178 in connector plate 174 and apertures 180 and 182 in housing plates 62 and 64, respectively, and is secured at opposite ends by E clips and 184 and 186. A ball safety tab 190 is mounted on pin 176 and is secured against the outer surface of the connector plate 174 by clip 184. A bottom flange 194 engages a bottom edge 196 of the plate 174 so that the tab 190 rotates with the plate 174. The tab secures a ball bearing 200 in an aperture 202 in plate 174, the ball bearing extending through the aperture to serve as a detent that engages one or the other of apertures 204 or 206 to provide a positive "feel" as the safety mechanism pivots between "on" or "off" positions.

[0070] The connector plate 174 also incorporates a safety linkage aperture 210 which is aligned with slot 80 in housing plate 62 and receives the lower pin 84 of pivoting safety link 74, so that pivoting the thumb safety lever 92 between on and off positions causes pivoting safety link's pin 84 to move back and forth in slot 80 (and in its opposing slot 82 in housing plate 64). This motion causes the upper pin 212 of pivoting safety link 74 to move vertically in its corresponding slots 214 and 216 in

Atrius Ex. 1002--0197

housing plates 62 and 64, respectively.

[0071] Figs 25 and 26 illustrate the "safety on" position of the safety mechanism 90, for the second embodiment of the invention, with Fig. 25 illustrating the exterior of the right-hand side of the trigger assembly 250 and Fig. 26 illustrating the trigger assembly from the left-hand side with the housing plate 64 removed to make the interior of the assembly visible. Similarly, the "safety off" position of the safety mechanism 90 is illustrated in Figs. 27 and 28, which show the exterior and interior views, respectively of the assembly 250.

[0072] As with the first embodiment, trigger assembly 250 incorporates user adjustable controls for a first stage weight of pull, first stage travel or movement range, second stage break weight and second stage engagement length, each of which can be optimized separately for accurate shooting. As illustrated in Figs. 20-28, trigger mechanism 250 uses two springs, where first stage weight is adjusted by compressing spring 154 with adjustment screw 160, which preferably has a spring constant of approximately 15.8 lbs per inch. Trigger reset spring 226 serves to reset the connection between the bolt sear and the trigger sear for firing the next shot and reset spring 226 is constrained and guided by reset pin 224 which engages bolt sear 262 on the pin's (upper) while end trigger sear 264 bears on reset spring 226 at the spring's lower end. Reset spring 226 preferably has a spring constant of approximately 29 lbs per inch.

[0073] It will be appreciated by persons of skill in the art that the trigger assembly 250, when installed in a rifle (e.g., 10), is actuated when trigger shoe 100 is pressed, which pivots trigger bracket 102 rearward about pivot pin 108 (clockwise in Fig. 23), causing the trigger bar or bracket 102 to force rocker 130 rearwardly

toward the forward surface of trigger sear 264. In response, trigger sear 264 pivots slightly (counterclockwise in Fig. 23), reducing the 2nd stage engagement overlap between edges 268 and 270 to just a few thousandths of an inch (e.g., 0.002-0.005 in). At some point during this rearward travel, trigger bracket 102 stops pivoting rearwardly because rocker 130 has engaged the trigger sear 264, thus ending the length of the 1st stage of trigger pull. As the shooter or marksman continues to increase trigger pressure on trigger shoe 100, the rocker 130 begins rotating trigger sear 264, until the last few thousandths of an inch of overlapping engagement length of its latching edge 270 is free of engagement with surface 268 of the bolt sear 70; thus breaking contact and enabling trigger actuation in that instant. In response to this release, the bolt sear 262 pivots forward and down (clockwise in Fig. 3), releasing cocking piece 32 in bolt assembly 30 to drive the firing pin (not shown) into the cartridge, firing the rifle. The first stage weight for trigger assembly 250 is adjustable by the control or set screw 116 independently of the first stage length of travel, which is controlled by the rocker vertical position adjustment screw 132. The second stage weight is, in part, adjusted by the rocker adjustment screw 132 on the trigger bracket's side which moves rocker 130 up and down, changing its mechanical advantage. The second stage length of engagement is adjusted by the control screw or adjustment set screw 116 which is threaded into a bore 116' inside the upper end 104 of the trigger bracket 102 that defines the distal surface to push on the very upper end of the front surface 115 of trigger sear 110, pivoting it away from the bolt sear to set the "crisp" break (or actuation sensation) of trigger assembly 50. The second stage weight is also adjusted by the spring 154 and its adjustment screw 160, which oppose the rotation of the trigger bracket 102. Trigger assembly 250 thus

has adjustable first stage length of pull, first stage weight, second stage length of pull and second stage weight. The total weight is the sum of first stage weight and second stage weight and is adjustable from 8 ounces to three and one half pounds. Using these adjustments, the trigger first stage weight and second stage weight can be adjusted by the user for to achieve, for example, a total weight of 30 ounces where either the first stage weight is 5 ounces (meaning the second stage weight is a relatively heavy 25 ounces) or where the first stage weight is 25 ounces (meaning the second stage weight is a relatively light 5 ounces).

[0074] The safety mechanism consists of thumb safety linkage 90 which cams pivoting safety link 74 past top dead center, pushing upward on the bolt sear 262 and locking it in place, while simultaneously disengaging from trigger sear 264. The ball detent mechanism (190, 200 and apertures 204 and 206) captures the safety linkage 90 and keeps it in place, providing an audible and tactile "click" sensation of positive control for the shooter. The pivoting safety link or sear safety linkage 74 and thumb safety linkage 90 comprise a "two-bar linkage" which cooperate to provide large mechanical advantage but require small safety actuating force from the user, and an "overcamming" action provided by the travel of sear safety linkage 74 in the slots of housing plates 62 and 64 serves as a failsafe adapted to prevent accidental release of the bolt assembly's firing pin and discharge. When the safety is on (Figs 25, 26) the sear safety linkage 74 engages the bottom surface of bolt sear 262, pivoting it up (clockwise in Fig 26) to disengage it from trigger sear 264 and preventing it from rotating to fire the firearm. The illustrated trigger assembly 250 is adaptable for use with a left hand side safety lever which projects downwardly into the area proximate the trigger shoe.

[0075] The trigger assembly of the present invention (e.g., 50 or 250) provide a surprising range of tunable or adjustable features in a mechanism which will, even when adjusted for very light trigger weights, still provide safeguards against unintentional discharge due to the rifle being dropped or negligent handling, so long as camming safety mechanism 90 is "ON". Safety mechanism 90 blocks the bolt sear's movement, keeping it rigidly locked against the rifle's firing pin engagement surface 34 while simultaneously disconnecting the trigger sear from the bolt sear.

[0076] Having described preferred embodiments of a new and improved trigger assembly structure and method, it is believed that other modifications, variations and changes will be suggested to those skilled in the art in view of the teachings set forth herein. It is therefore to be understood that all such variations, modifications and changes are believed to fall within the true spirit and scope of the present invention as defined by the following claims.

Atrius Ex. 1002--0201

What is claimed is:

1. A drop-in adjustable trigger assembly, having a housing incorporating first and second spaced wall plates;

a trigger bracket pivotally mounted between said wall plates and configured to pivot within the housing about a pivot point positioned within the housing;

a removable trigger shoe carried by said trigger bracket;

an adjustable rocker mounted on said trigger bracket;

a bolt sear pivotally mounted between said wall plates and having a first latching end and a spaced second end;

a trigger sear pivotally mounted between said wall plates and having a first end engaging said rocker on said rocker and a second end engagable with said bolt sear latching end;

a reset spring extending between and engaging said bolt sear and said trigger sear;

a safety mechanism actuable by a thumb safety lever mounted on said housing and incorporating a pivotable sear safety linkage mounted between said housing wall plates and movable in corresponding safety linkage slots defined in the wall plates to guide the pivoting sear safety linkage to engage said bolt sear in response to actuation of said thumb safety lever;

a first stage movement adjustment for said rocker; and

a second stage length adjustment for said trigger sear.

2. The drop-in adjustable trigger assembly of claim 1, wherein said pivotable sear safety linkage incorporates an upper camming surface which, upon actuation, pivots the bolt sear to disengage the bolt sear latching end from the trigger sear.

3. The drop-in adjustable trigger assembly of claim 2, wherein said first stage movement adjustment for said rocker comprises a rocker adjustment screw mounted in said trigger bracket to move the rocker up and down to change its mechanical advantage when bearing against the trigger sear.

4. The drop-in adjustable trigger assembly of claim 2, wherein said second stage length adjustment comprises a control set screw which is threaded into a bore in the upper end of said trigger bracket to define a surface to push on the uppermost end of said trigger sear to pivot it away from said bolt sear to set the actuation sensation of said trigger assembly.

5. The drop-in adjustable trigger assembly of claim 1 wherein said first stage movement adjustment for said rocker comprises user adjustable controls for a first stage weight of pull and a first stage travel or movement range.

6. The drop-in adjustable trigger assembly of claim 1, wherein said second stage length adjustment for said trigger sear comprises user adjustable controls for second stage break weight and second stage engagement length.

7. The drop-in adjustable trigger assembly of claim 6, wherein said first stage movement adjustment for said rocker comprises user adjustable controls for a first stage weight of pull and a first stage travel or movement range.

8. The drop-in adjustable trigger assembly of claim 7, wherein said first stage weight for said trigger assembly is adjustable by a rocker set screw independently of said first stage length of travel.

9. The drop-in adjustable trigger assembly of claim 8, wherein said first stage of length of travel is controlled by a rocker adjustment screw to move the rocker along the trigger bracket to change its mechanical advantage.

10. The drop-in adjustable trigger assembly of claim 9, wherein said second stage weight is adjusted by a spring and adjustment screw to adjustably oppose the rotation of the trigger bracket when the trigger is actuated.

11. The drop-in adjustable trigger assembly of claim 10, wherein said second stage length of engagement is adjusted by a control set screw which is threaded into a bore in the upper end of said trigger bracket, said control set screw defining a distal surface to push on an uppermost end of said trigger sear to pivot it away from said bolt sear to set an actuation sensation of said trigger assembly.

12. The drop-in adjustable trigger assembly of claim 11, wherein said second stage weight is adjusted by a spring engaging said trigger bracket.

13. The drop-in adjustable trigger assembly of claim 7, wherein said second stage weight is adjusted by a spring engaging said trigger bracket.

14. A drop-in adjustable trigger assembly, comprising:

a drop-in housing including a first side-plate and a second side-plate;

a pivoting, spring-biased bolt sear engaging member movably suspended between said first side-plate and a second side-plate;

a pivoting, spring-biased trigger sear member movably suspended between said first side-plate and a second side-plate;

a pivoting, camming safety linkage movably suspended between said first side-plate and a second side-plate, said camming safety linkage being configured to selectively move between a safe position and a fire position and to selectively engage or disengage said bolt sear and said trigger sear;

wherein said camming safety mechanism is configured to selectively block the bolt sear's movement when in said safe position, keeping it rigidly locked against a rifle's firing pin engagement surface 34 while simultaneously disconnecting the trigger sear from the bolt sear.

15. The drop-in adjustable trigger assembly of claim 14, further comprising a pivoting, upwardly projecting thumb safety lever movably suspended between said first side-plate and a second side-plate;

wherein at least one of said first side plate and said second side plate includes a sear safety linkage slot defined therein which guides the pivoting sear safety linkage in response to actuation of said upwardly projecting thumb safety lever.

16. The drop-in adjustable trigger assembly of claim 15, further comprising a trigger bracket preferably configured to carry a removable trigger shoe and configured to pivot within the housing about a pivot point positioned within the housing to move said trigger sear surface;

wherein said trigger bracket carries an adjustable rocker preferably having a first stage movement adjustment and a second stage length adjustment.

17. The drop-in adjustable trigger assembly of claim 16, wherein said pivoting safety mechanism's safety linkage pivots rearwardly to push upon or cam the bolt sear upwardly, thus disengaging the bolt sear from the trigger sear surface.

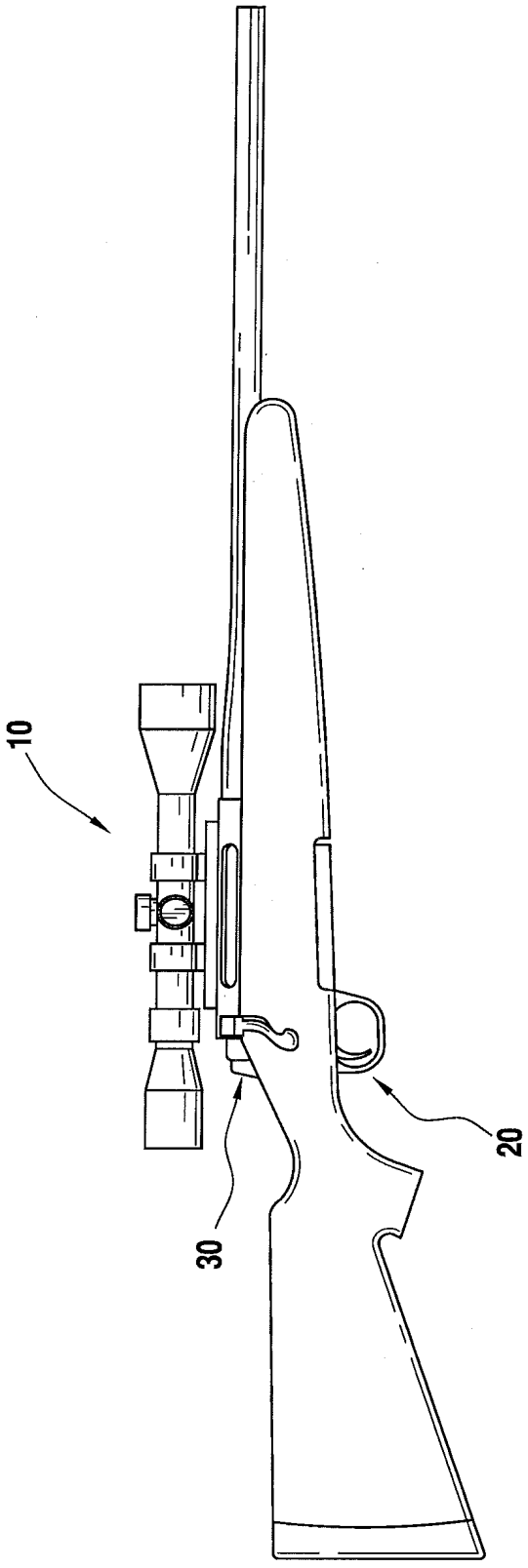


FIG. 1A
Prior Art

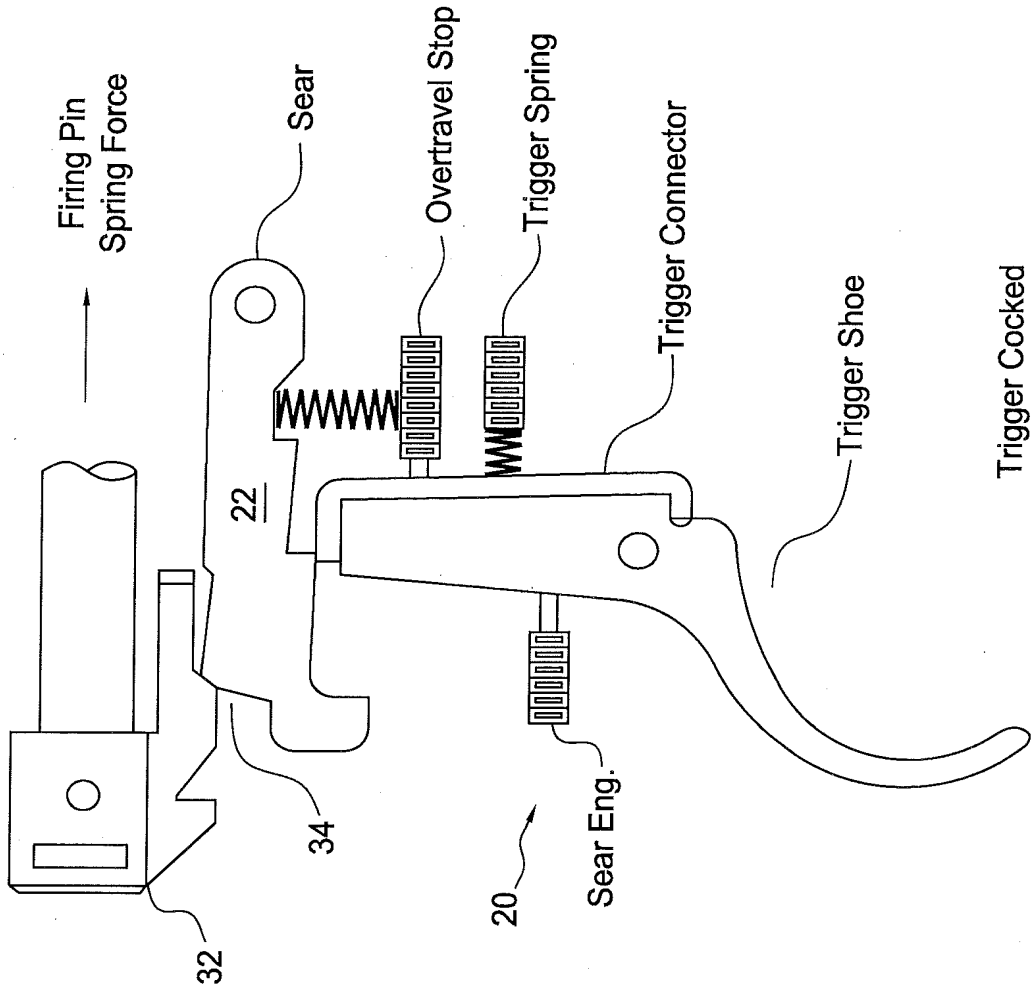


FIG. 1B
Prior Art

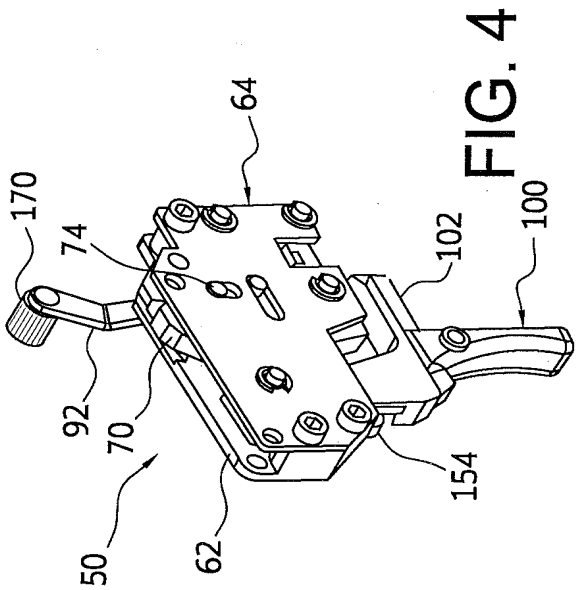


FIG. 4

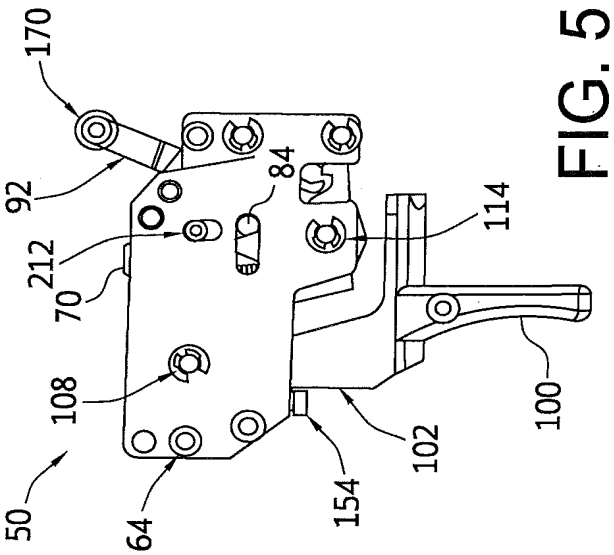


FIG. 5

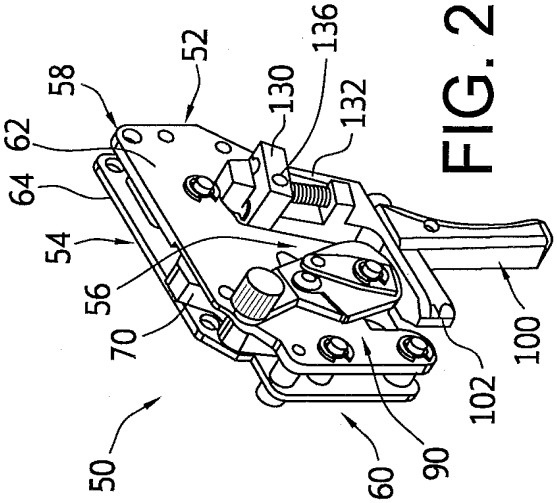


FIG. 2

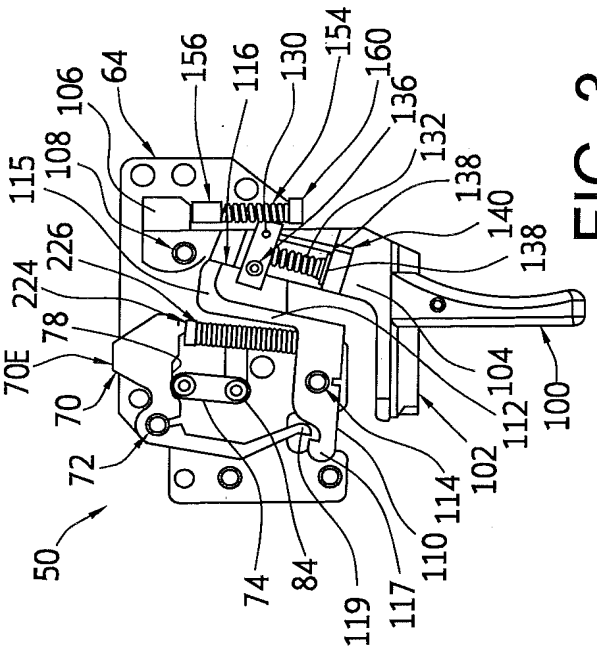


FIG. 3

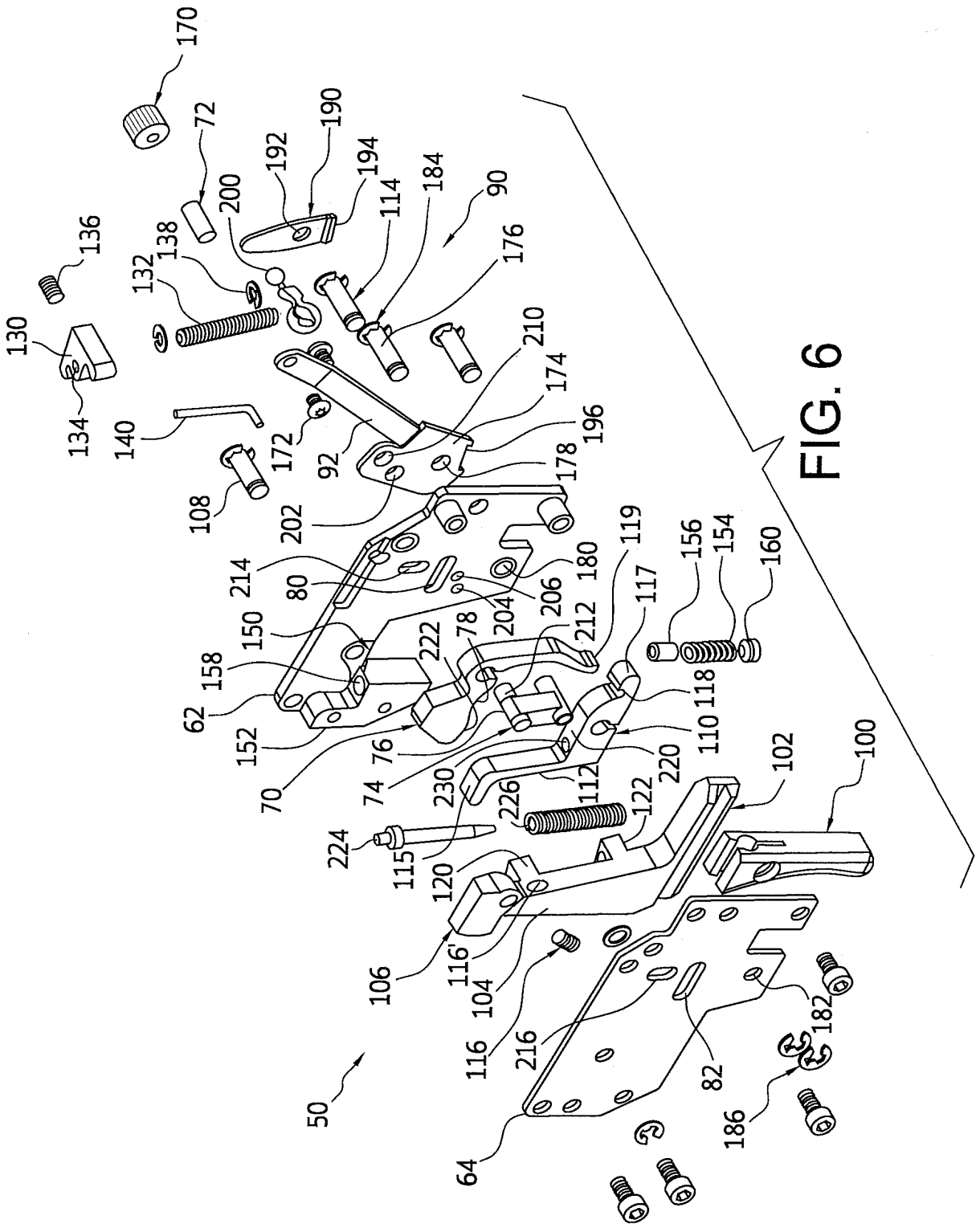

170
72
190
192
194
200
114
184
90
136
138
132
176
130
210
174
134
140
172
92
196
108
202
178
214
80
180
119
156
154
160
150
204
206
212
117
158
222
78
62
118
152
76
110
70
74
230
226
112
220
102
100
224
115
120
122
106
116'
104
216
116
182
82
50
186
64

FIG. 6

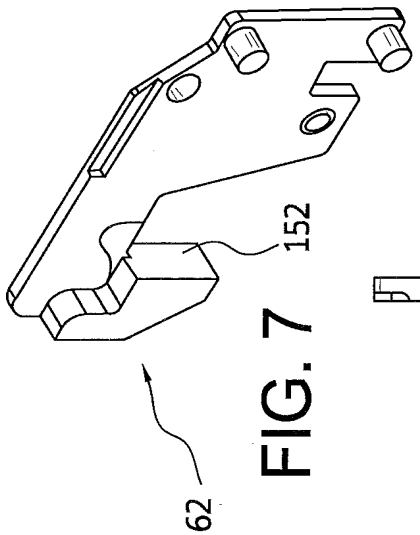


FIG. 7

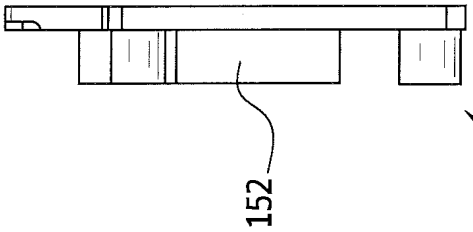


FIG. 8

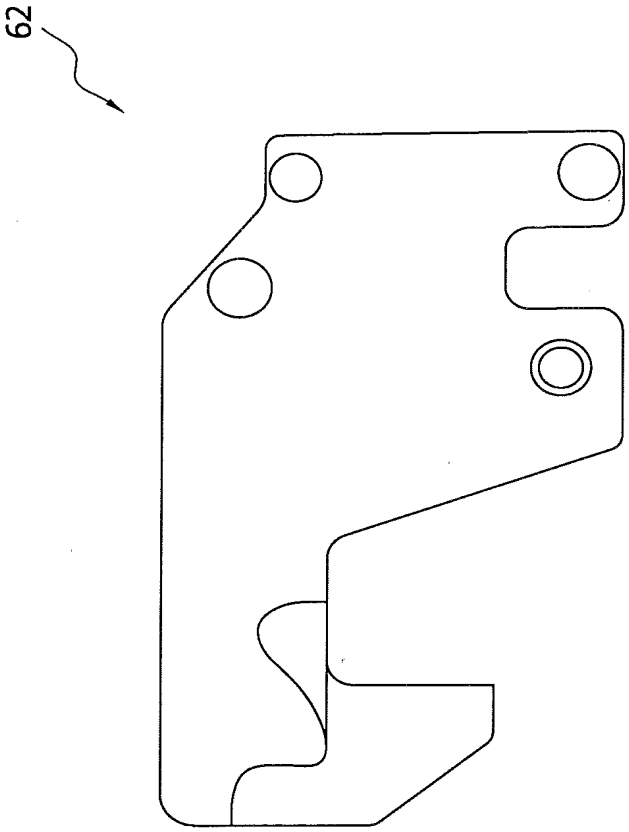


FIG. 9

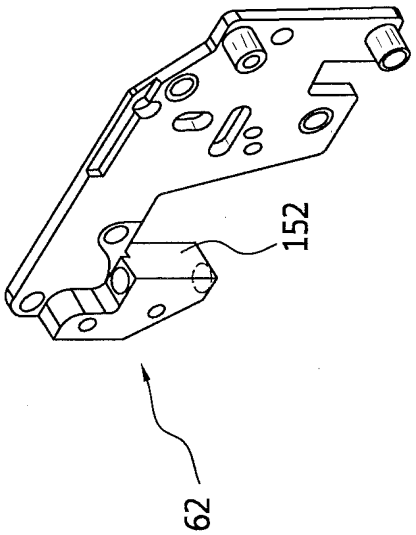


FIG. 10

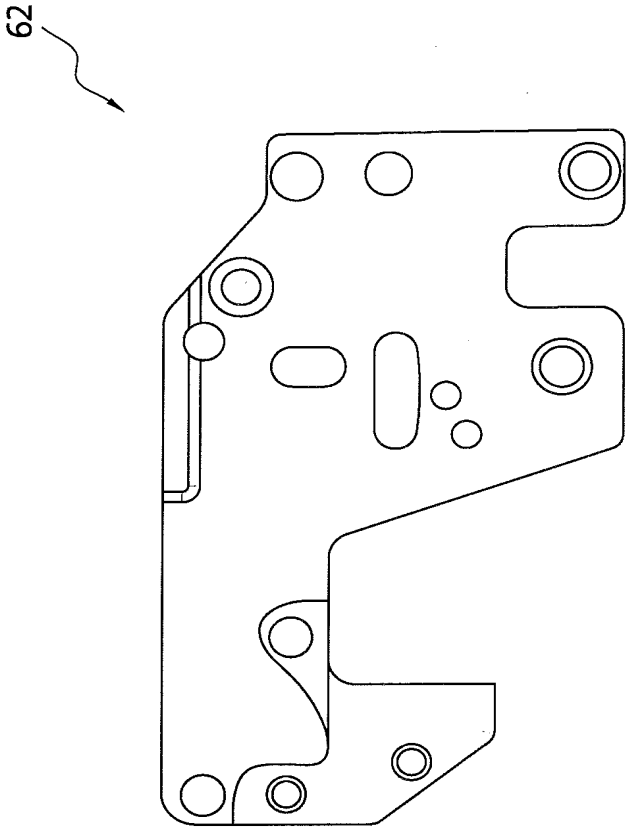


FIG. 11

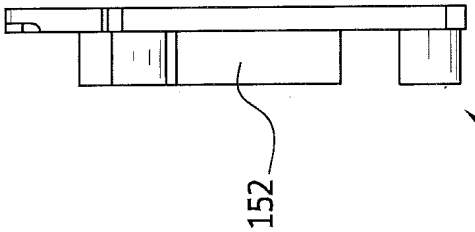


FIG. 14

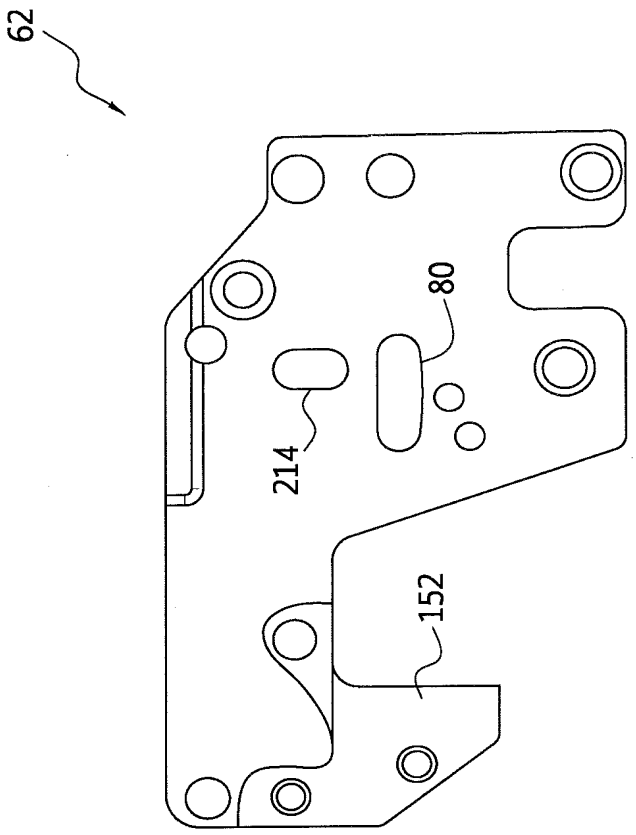


FIG. 12

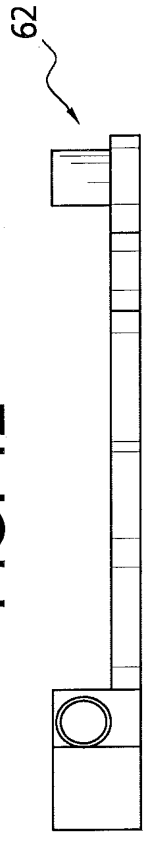


FIG. 13

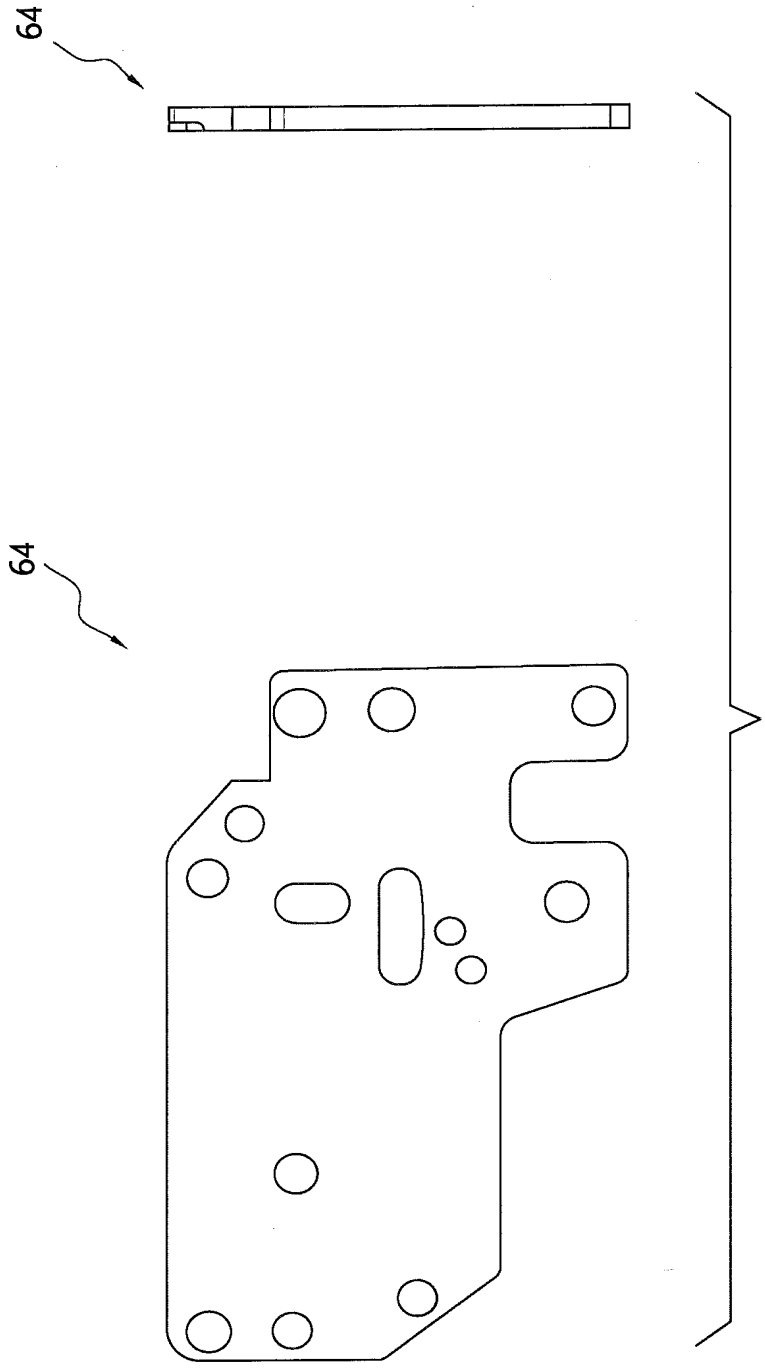


FIG. 15

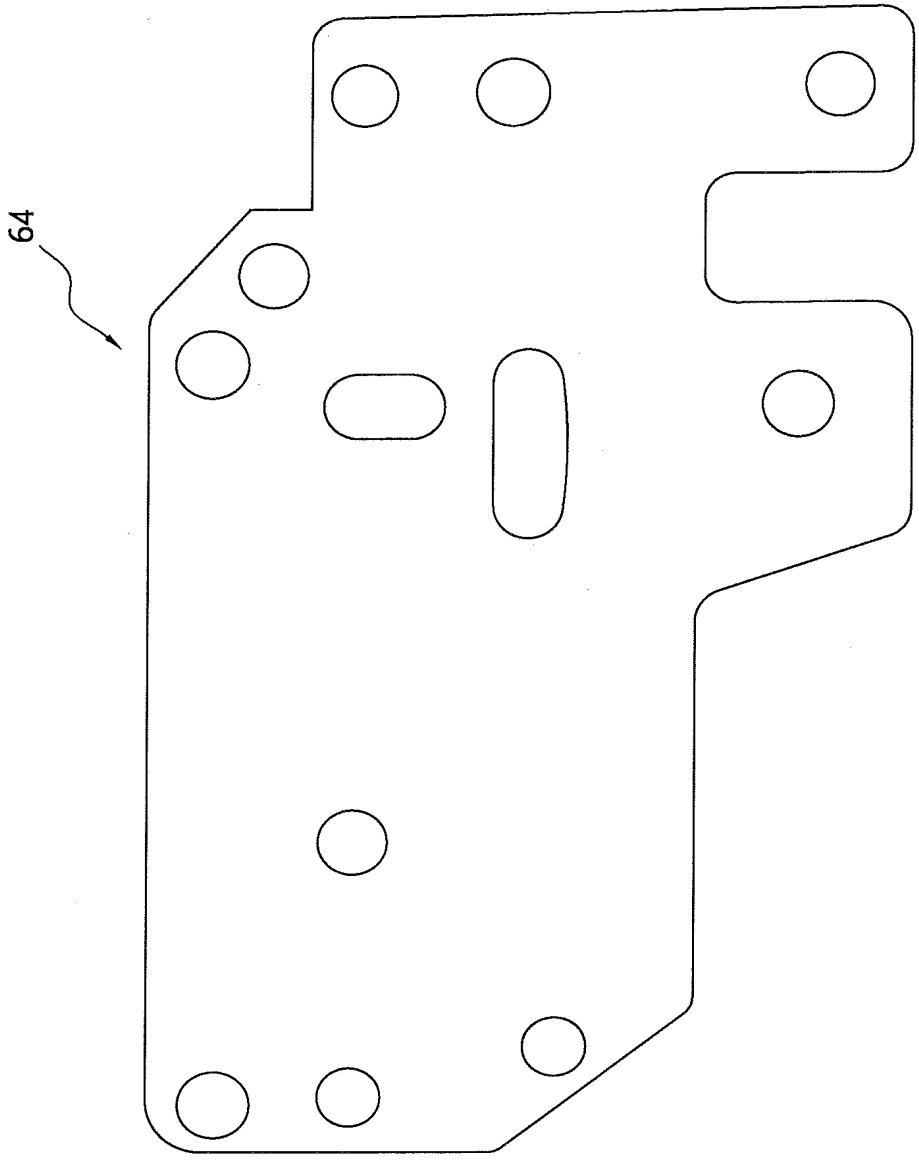
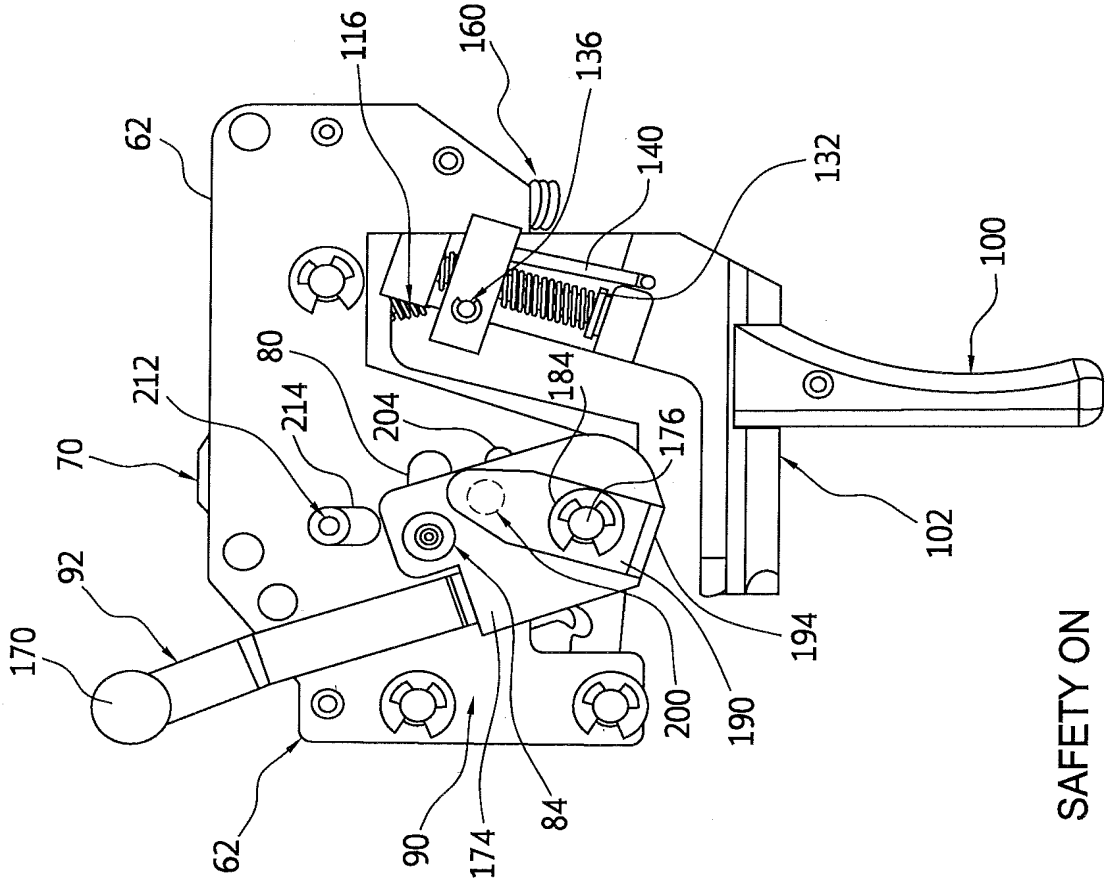
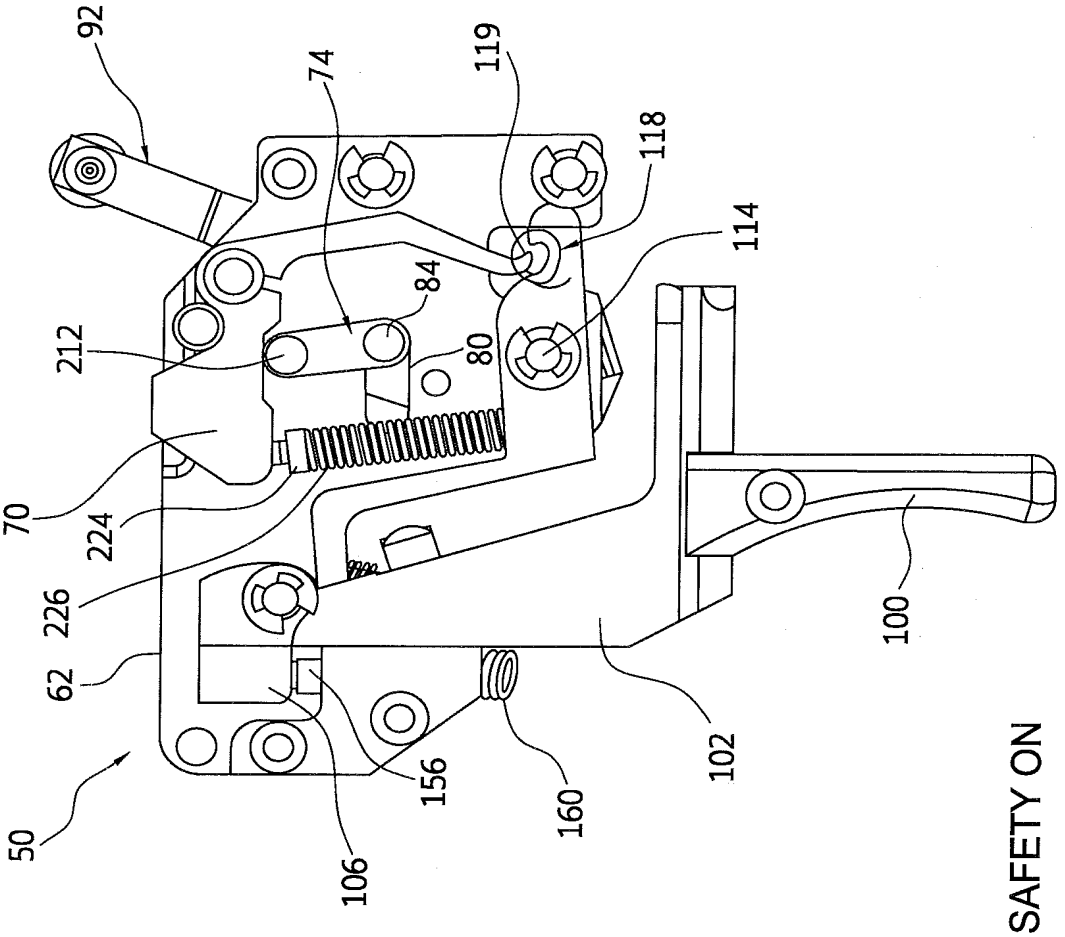


FIG. 16



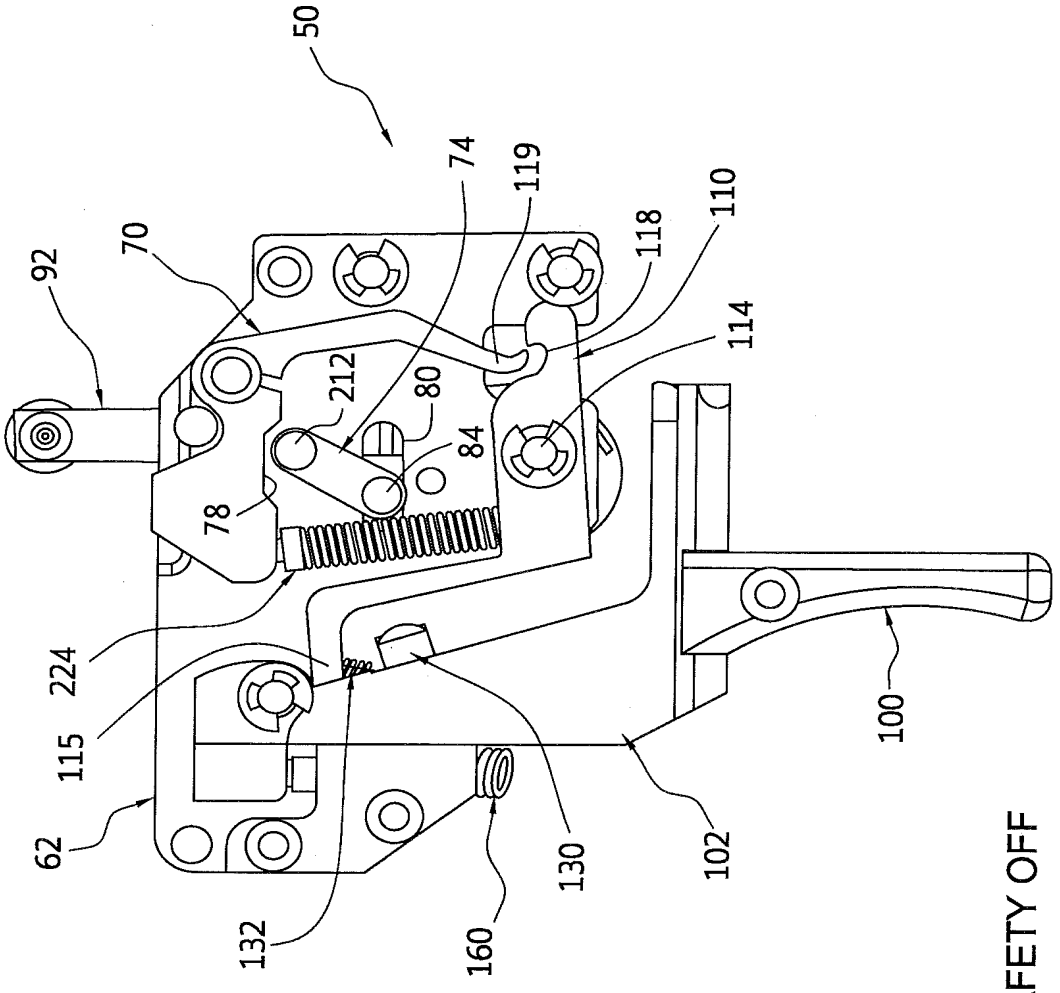
SAFETY ON

FIG. 17



SAFETY ON

FIG. 18



SAFETY OFF

FIG. 19

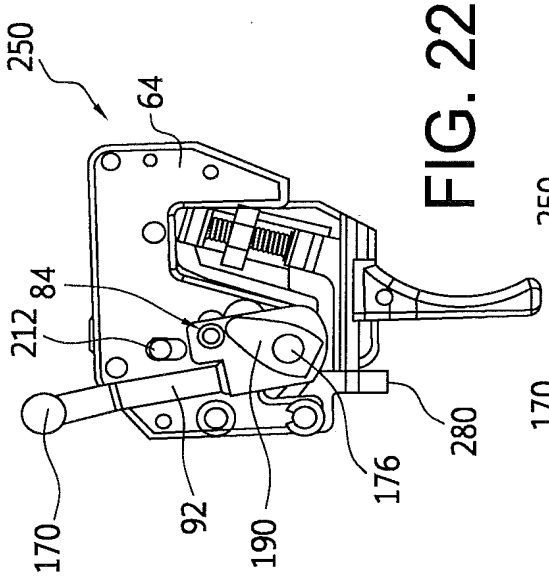


FIG. 22

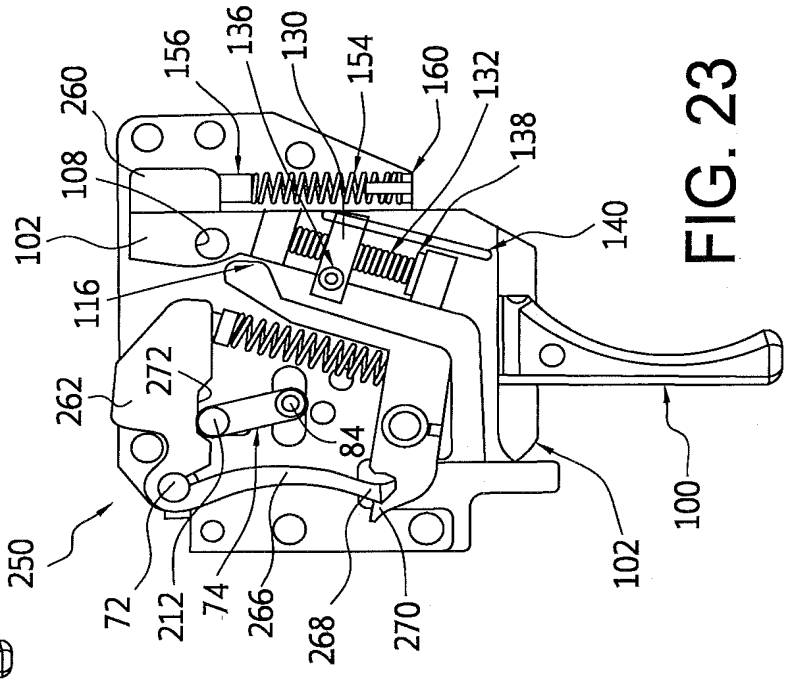


FIG. 23

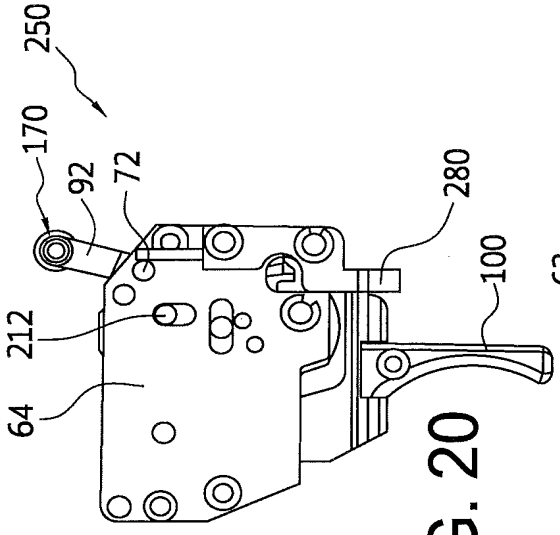


FIG. 20

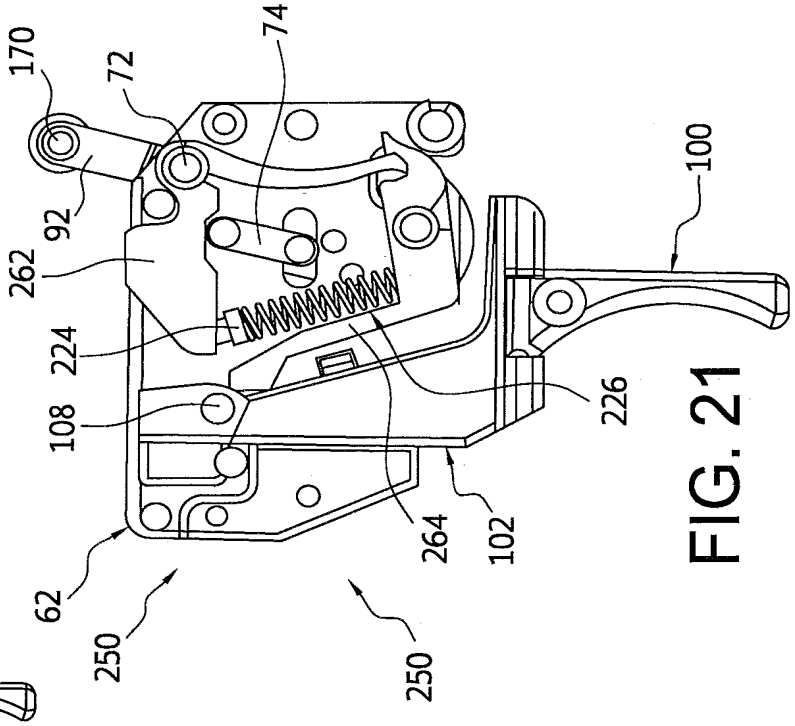


FIG. 21

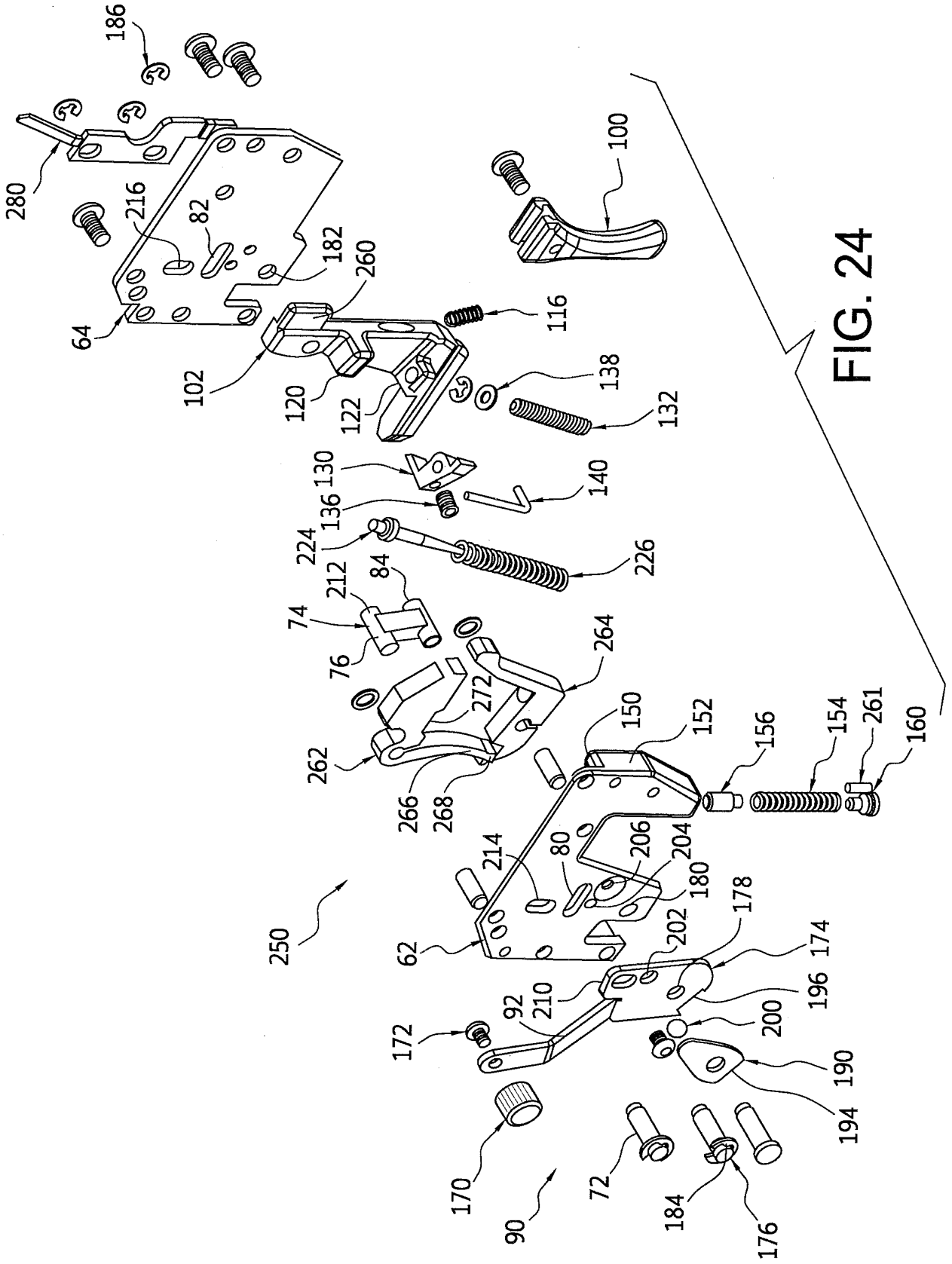

186
280
216
82
182
260
100
64
102
120
122
116
138
132
130
136
140
224
226
212
84
74
76
264
272
262
266
268
150
152
156
154
261
160
214
80
206
204
180
178
202
174
196
62
250
92
210
172
200
190
194
170
72
90
184
176

FIG. 24

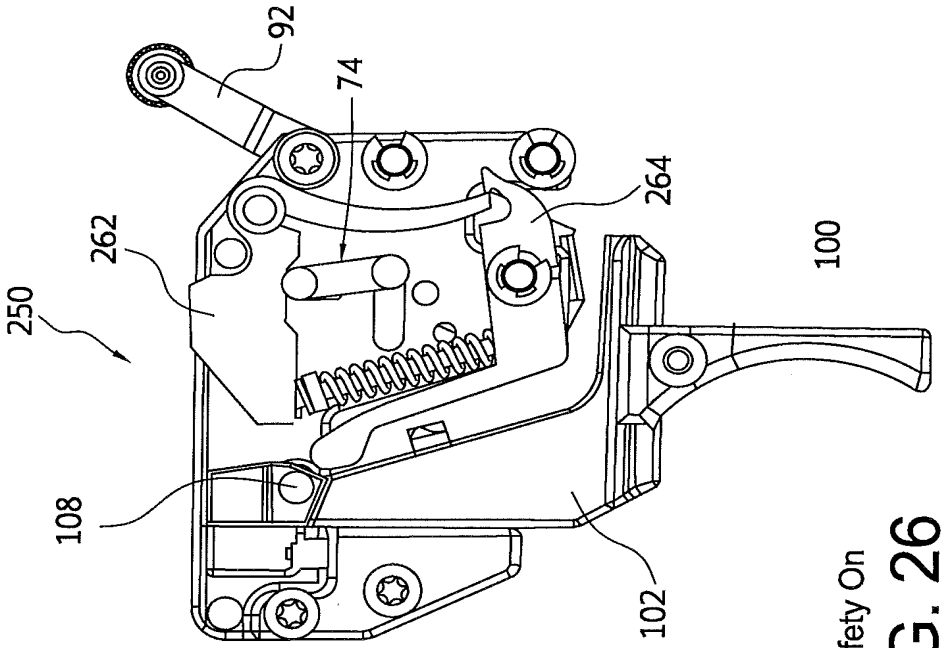

92
74
264
262
250
100
108
102
Safety On

FIG. 26

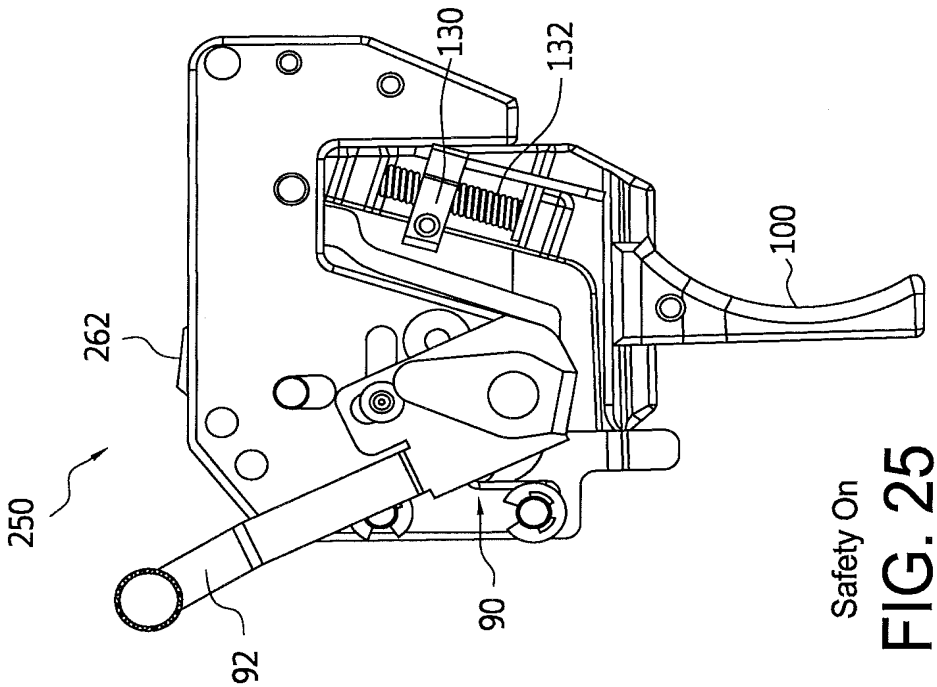

130
132
100
262
250
90
92
Safety On

FIG. 25

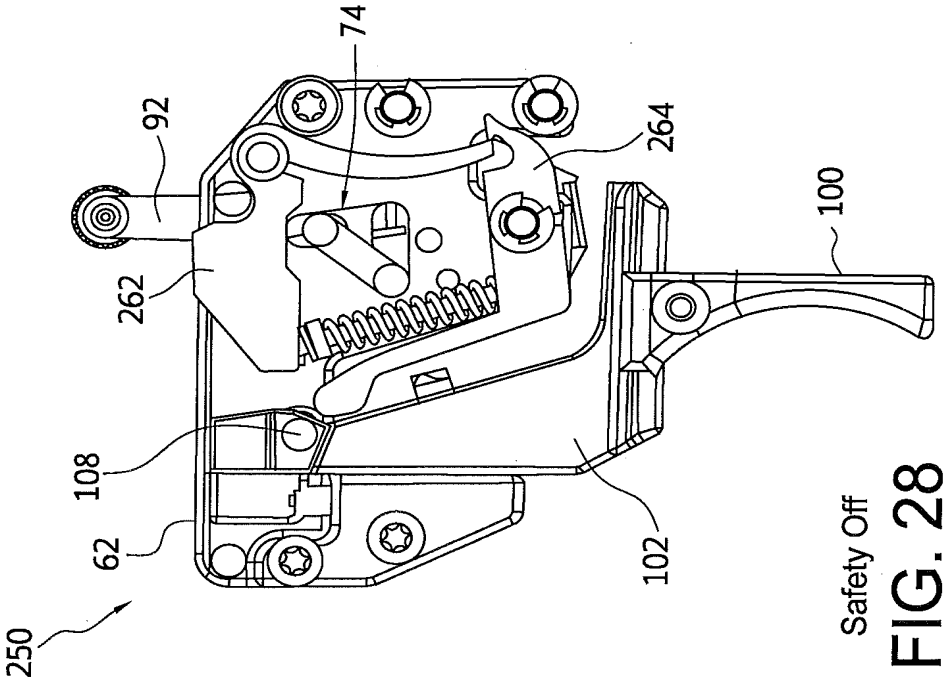

74
92
264
262
100
108
62
102
250
Safety Off

FIG. 28

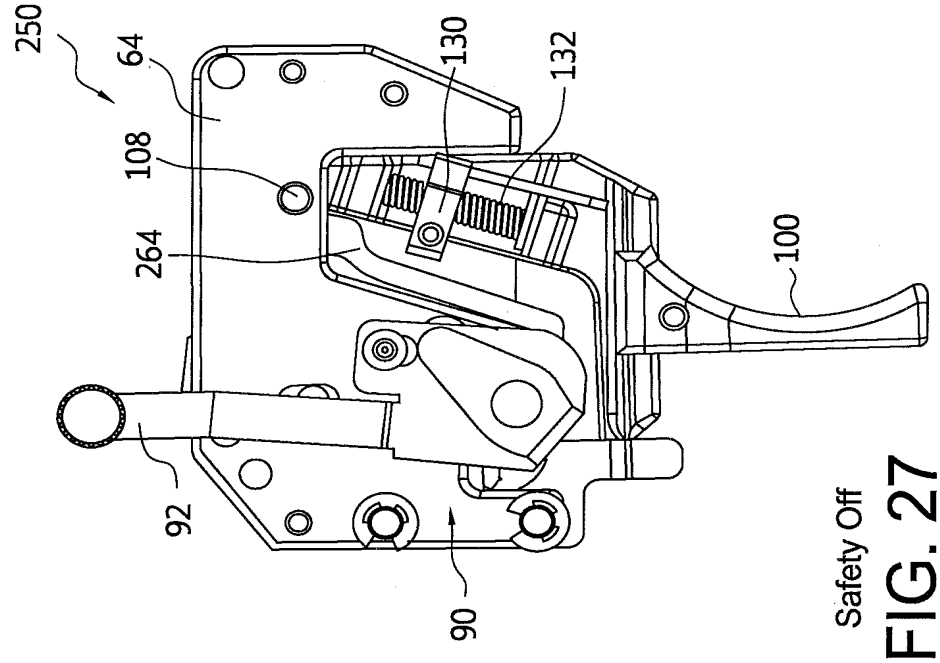

250
64
130
132
108
264
100
92
90
Safety Off

FIG. 27

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 15/11336

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - F41A 19/00 (2015.01)
CPC - F41A 19/00
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC (8): F41A 19/00 (2015.01)
CPC: F41A 19/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IPC (8): F41A 19/00 19/10 19/11 19/12 19/21 (2015.01);
CPC: F41A 19/00 19/10 19/11 19/12 19/21

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Google, Google Patents, PatBase Search terms used: gun, trigger, adjustable, mechanism, apparatus, assembly, sear, tension, wall, plate, safety, movement, length, bolt, safety, lever, pivot, tuning, reset, spring, rocker, parts, housing, support, brace, panel, sheet, layer, tune, alter, regulate, shoe, screw, set screw, correct, spin, swivel, adju

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2007/0266845 A1 (POLSTON) 22 November 2007 (22.11.2007), entire document, especially fig 3, 4; para [0051]	1-17
A	US 2011/0167696 A1 (GANGL) 14 July 2011 (14.07.2011), entire document, especially fig 1, 2, 4, 6; para [0006]	1-17
A	US 8,074,393 B2 (GEISSELE) 13 December 2011 (13.12.2011), entire document, especially fig 1, 4	1-17
A	US 7,047,685 B2 (DIAZ et al.) 23 May 2006 (23.05.2006), entire document, especially fig 2, 3	1-17
A	US 7,188,561 B1 (KELBLY) 13 March 2007 (13.03.2007), entire document	1-17
A	US 8,220,193 B1 (LYNCH.) 17 July 2012 (17.07.2012), entire document	1-17

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
03 September 2015 (03.09.2015)	30 SEP 2015
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (January 2015)

Espacenet

Bibliographic data: WO2018058174 (A1) — 2018-04-05

A BOLT ACTION RECEIVER ASSEMBLY FOR A SEMIAUTOMATIC LOWER RECEIVER

Inventor(s): BACON JEFFREY [AU] ± (BACON, Jeffrey)

Applicant(s): OCEANIA PREC PTY LIMITED [AU] ± (OCEANIA PRECISION PTY LIMITED)

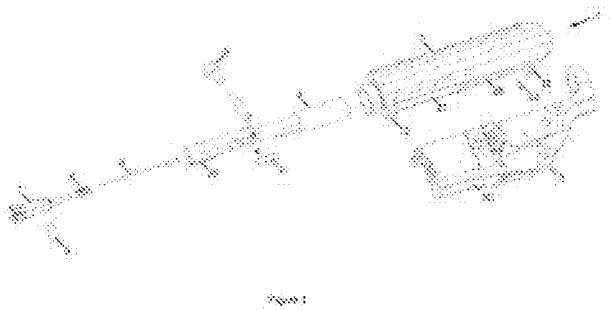
Classification: - international: ***F41A17/46; F41A17/64; F41A3/12; F41A3/66; F41A3/72***
- cooperative: **F41A17/46 (EP); F41A17/64 (EP); F41A3/12 (EP); F41A3/22 (EP); F41A3/26 (EP); F41A3/66 (EP); F41A3/72 (EP)**

Application number: WO2017AU50988 20170911 Global Dossier

Priority number (s): AU20160903970 20160930

Also published as: AU2017334260 (A1) AU2017334260 (B2)

Abstract of WO2018058174 (A1)



There is provided a bolt action receiver assembly for a semiautomatic lower receiver which may be used to convert a semiautomatic rifle to a bolt-action rifle by replacement of the upper receiver assembly, while retaining the remainder componentry of the semiautomatic rifle. The upper receiver has a magazine entrance corresponding to a magazine slot of the lower receiver; and a hammer entrance slot for a hammer of a trigger assembly of the semiautomatic lower receiver; and a bolt carrier engaging a co-axial firing pin. The bolt carrier reciprocates within the upper receiver under action of a handle. The handle guided within an upper receiver guide slot to rotate the bolt carrier with respect to the upper receiver between forward in-battery and forward out-of-battery positions and to slide lengthwise with respect to the upper receiver between the

forward out-of-battery position and a rearward position. The bolt carrier comprises a hammer depressing protrusion which depresses the hammer when in the rearward position and a lengthwise hammer firing clearance slot coinciding with the hammer entrance slot when the bolt carrier is the forward in-battery position to allow clearance for the hammer to strike a rear end of the firing pin to detonate a round.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
05 April 2018 (05.04.2018)

WIPO | PCT

(10) International Publication Number
WO 2018/058174 A1

(51) International Patent Classification:
F41A 3/66 (2006.01) *F41A 3/12* (2006.01)
F41A 17/64 (2006.01) *F41A 3/72* (2006.01)
F41A 17/46 (2006.01)

(21) International Application Number:
PCT/AU2017/050988

(22) International Filing Date:
11 September 2017 (11.09.2017)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2016903970 30 September 2016 (30.09.2016) AU

(71) Applicant: **OCEANIA PRECISION PTY LIMITED** [AU/AU]; C/- Patentec Patent Attorneys, L11, 65 York St, Sydney, New South Wales 2000 (AU).

(72) Inventor: **BACON, Jeffrey**; C/- Patentec Patent Attorneys, L11, 65 York St, Sydney, New South Wales 2000 (AU).

(74) Agent: **PATENTEC PATENT ATTORNEYS**; L11, 65 York St, Sydney, New South Wales 2000 (AU).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,

(54) Title: A BOLT ACTION RECEIVER ASSEMBLY FOR A SEMIAUTOMATIC LOWER RECEIVER

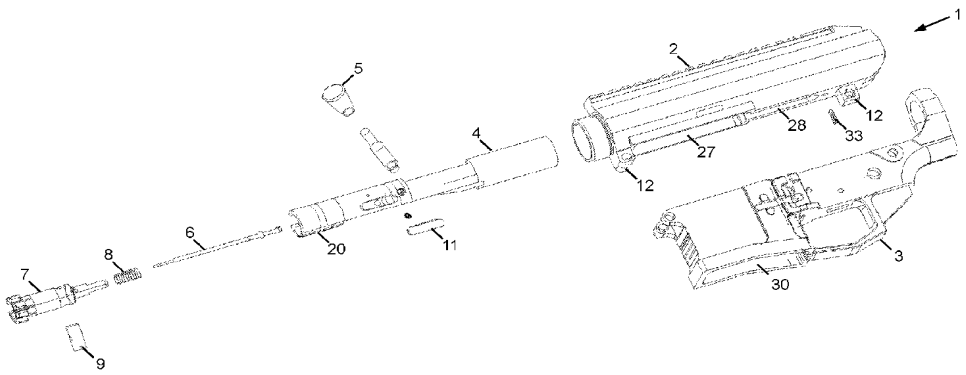


Figure 1

(57) Abstract: There is provided a bolt action receiver assembly for a semiautomatic lower receiver which may be used to convert a semiautomatic rifle to a bolt-action rifle by replacement of the upper receiver assembly, while retaining the remainder componentry of the semiautomatic rifle. The upper receiver has a magazine entrance corresponding to a magazine slot of the lower receiver; and a hammer entrance slot for a hammer of a trigger assembly of the semiautomatic lower receiver; and a bolt carrier engaging a co-axial firing pin. The bolt carrier reciprocates within the upper receiver under action of a handle. The handle guided within an upper receiver guide slot to rotate the bolt carrier with respect to the upper receiver between forward in-battery and forward out-of-battery positions and to slide lengthwise with respect to the upper receiver between the forward out-of-battery position and a rearward position. The bolt carrier comprises a hammer depressing protrusion which depresses the hammer when in the rearward position and a lengthwise

WO 2018/058174 A1

[Continued on next page]

SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

hammer firing clearance slot coinciding with the hammer entrance slot when the bolt carrier is the forward in-battery position to allow clearance for the hammer to strike a rear end of the firing pin to detonate a round.

A bolt action receiver assembly for a semiautomatic lower receiver

Field of the Invention

[1] This invention relates generally to a bolt action receiver assembly for a semiautomatic lower receiver. The present invention may be used to easily convert a semiautomatic rifle to a bolt-action rifle by replacement of the upper receiver assembly, while retaining the remainder componentry of the semiautomatic rifle.

[2] The present invention has been developed primarily for use with of any AR-15 & AR-10 (AR308) type rifle but may be applicable for use with other suitable semiautomatic rifles also.

Summary of the Disclosure

[3] There is provided herein a bolt action upper receiver assembly for a semiautomatic lower receiver.

[4] The bolt action assembly comprises an upper receiver having a magazine entrance corresponding to a magazine slot of the lower receiver and a hammer entrance slot for a hammer of a trigger assembly of the semiautomatic lower receiver.

[5] The bolt action assembly further comprises a bolt carrier engaging a co-axial firing pin.

[6] The bolt carrier reciprocates within the upper receiver under action of a handle. The handle is guided within an upper receiver guide slot to rotate the bolt carrier with respect to the upper receiver between forward in-battery and forward out-of-battery positions and to slide lengthwise with respect to the upper receiver between the forward out-of-battery position and a rearward position.

[7] The bolt carrier comprises a hammer depressing protrusion which depresses the hammer when in the rearward position. Furthermore, the bolt carrier comprises a lengthwise hammer firing clearance slot coinciding with the hammer entrance slot when the bolt carrier is the forward in-battery position.

[8] As such, the lengthwise hammer firing clearance slot allows clearance for the hammer to strike a rear end of the firing pin to detonate a round when in the forward in-battery position.

[9] US 2011/0168009 A1 (ROBB et al.) 14 July 2011 [hereinafter referred to as D1] discloses a bolt assembly for a rifle configured for recoil blowback operation and cooperation with a round of ammunition dispensed from a magazine into a firing chamber of the rifle. An extractor disposed in a lower, forward portion of the bolt assembly and an ejector disposed in an upper, forward portion of the bolt assembly further cooperate with the round of ammunition to extract a spent cartridge of the round of ammunition from the firing chamber and eject the spent cartridge downward from the firing chamber.

Atrius Ex. 1002--0228

[10] US 2010/0257768 A1 (BARRETT) 14 October 2010 [hereinafter referred to as D2] discloses bolt action rifle having a safety latching mechanism which has an upper receiver including a movable bolt assembly, a lower receiver having a trigger assembly and releasably attached to the upper receiver, the bolt assembly movable between a cocked position and an uncocked position, and the upper receiver and the lower receiver including a latching mechanism operable to prevent the lower receiver from being detached from the upper receiver while the bolt assembly is in the cocked position.

[11] None of the prior art discloses a bolt carrier wherein the bolt carrier is configured for rotation between in-battery and out-of-battery positions with respect to the upper receiver and comprising a hammer firing clearance slot along the length of the bolt carrier to allow the hammer to strike a rear end of the firing pin to detonate a round in a forward in-battery position.

[12] In embodiments, the present assembly may comprise firing pin restrictor safety enhancement to prevent inadvertent discharge when out of battery.

[13] The hammer depressing protrusion may be configured for depressing the hammer until the hammer may be engaged by a sear of the trigger assembly.

[14] The hammer depressing protrusion may pass between feed lips of the magazine when the bolt carrier transitions between the forward out-of-battery and rearward positions.

[15] The bolt carrier may comprise a hammer inhibition protrusion in line with the hammer depressing protrusion which inhibits the hammer contacting the firing pin when the bolt carrier may be in the forward out-of-battery position.

[16] The bolt action upper receiver assembly may further comprise a firing pin restrictor comprising a catch, which, when the bolt carrier may be in the forward out-of-battery position, the firing pin restrictor may be pressed in by the upper receiver such that the catch catches the firing pin to prevent the firing pin from moving forwardly with respect to the bolt carrier.

[17] An interior of the upper receiver may comprise a clearance indentation which, when the bolt carrier may be in the forward in-of-battery position, allows the catch to move away from the firing pin to disengage the firing pin.

[18] The catch may catch and annulus of the firing pin.

[19] The firing pin restrictor may pivot about a pivot within a firing pin restrictor slot.

[20] An edge of the clearance indentation may transition gradually to assist depressing of the firing pin restrictor when the bolt carrier rotates from the forward in-battery to out-of-battery positions.

[21] The bolt action upper receiver assembly may further comprise a bolt connected to the bolt carrier.

[22] The bolt may comprise barrel engagement teeth.

Atrius Ex. 1002--0229

[23] The bolt carrier may rotate through 67.5° between the forward out of battery and in battery positions.

[24] The upper receiver may comprise a detent acting on the bolt carrier to bias the bolt carrier in either the forward in-battery position or the forward out-of-battery and rearward positions.

[25] The bolt carrier may comprise an in-battery seat and an out-of-battery slot for selectively engaging the detent.

[26] The bolt carrier may comprise magazine facing surfaces which face the magazine orthogonally when in the forward-in-battery position and the forward out-of-battery position respectively.

[27] The magazine facing surfaces are offset by 67.5°.

[28] The upper receiver may comprise a spent cartridges ejection slot through which spent cartridges are ejected when the bolt carrier rotates from the forward in-battery position to the forward out-of-battery position.

[29] Other aspects of the invention are also disclosed.

Brief Description of the Drawings

[30] Notwithstanding any other forms which may fall within the scope of the present invention, preferred embodiments of the disclosure will now be described, by way of example only, with reference to the accompanying drawings in which:

[31] Figure 1 shows a disassembled view of a bolt action upper receiver assembly for a semiautomatic lower receiver in accordance with an embodiment;

[32] Figures 2 – 6 show a bolt in accordance with an embodiment;

[33] Figures 7 – 12 show a bolt carrier in accordance with an embodiment;

[34] Figures 13 – 17 show an upper receiver in accordance with an embodiment;

[35] Figure 18 and 19 so the upper receiver engaged by the lower receiver;

[36] Figure 20 – 21 show a lower semiautomatic rifle receiver;

[37] Figure 22 shows a firing pin; and

[38] Figure 23 shows a firing pin restrictor in accordance with an embodiment.

Description of Embodiments

[39] Figure 1 shows a bolt action upper receiver assembly 1 for a semiautomatic lower receiver 3.

[40] The conversion 1 comprises an upper receiver 2 and a bolt carrier 4 reciprocating therein.

[41] The bolt carrier 4 carries a bolt 7. The bolt 7 may be selectively fastened to the bolt carrier 4 utilising orthogonal barrel pin 9. The bolt 7 as is substantially shown in figure 2 may be standard and comprise a cartridge extractor pocket 15 except that the rear of bolt 7 may be machined to engage

the bolt carrier 4, including removal of the gas rings of conventional semiautomatic bolts, such as AR15/10 bolts.

[42] The upper receiver 2 connects to the semi-automatic lower receiver 3 utilising throughhole pin connection lugs 12.

[43] The upper receiver 2 defines a magazine entrance 27 corresponding to the magazine slot 30 of the lower receiver 3. The upper receiver 2 further comprises a hammer entrance slot 28 through which a hammer (not shown) of a trigger assembly of the lower receiver 3 acts.

[44] The conversion 1 comprises a firing pin 6 coaxially and slidably retained through the bolt carrier 4 and a bore 16 of the bolt 7. The hammer of the semi-automatic lower receiver 3 is able to strike the rear of the firing pin 6 through the hammer entrance slot 28 such that the tip of the firing pin 6 protrudes through the bolt 7 to detonate the round. The firing pin 6 may be biased rearwardly by bias compression spring 8 acting between the bolt 7 and the firing pin 6.

[45] The bolt carrier 4 is positionable within the upper receiver 2 under action of handle 5.

[46] The handle 5 is guided by an upper receiver slot (as is best shown in figure 17) so as to rotate the bolt carrier 4 between a forward in-battery position 32 and a forward out-of-battery position 35 and to slide lengthwise to a rearward position 31.

[47] Spent cartridges escape via ejection slot 34 when the bolt carrier 4 rotates from the forward in-battery position 32 to the forward out-of-battery position 35. The bolt carrier 4 may comprise magazine facing surfaces 38, 36 which face the magazine orthogonally when in the forward-in-battery position 32 and the forward out-of-battery position 35 respectively.

[48] A detent 33 may alternately engage an in-battery-position seat 26 and an out-of-battery channel 37 (as is best shown in figure 7) to biases the bolt carrier 4 in in-battery or out-of-battery positions.

[49] The bolt carrier 4 may comprise a forward cartridge extractor clearance 39 allowing the functioning of the cartridge extractor once the bolt 7 is pinned into the bolt carrier 4.

[50] A fire pin restrictor 11 may selectively interfere with the firing pin 6 to prevent inadvertent discharge when out-of-battery.

[51] Utilisation of the conversion 1 comprises removal of the upper receiver of a semiautomatic rifle.

[52] The upper receiver 2 is then connected to the lower receiver 3 of the semiautomatic rifle via throughhole pin connection lugs 12.

[53] A magazine is then loaded through the lower receiver magazine slot 30 such that the feed lips thereof reach through the upper receiver magazine entrance 27.

Atrius Ex. 1002--0231

[54] For loading, the handle 5 is pulled rearwardly to configure the carrier 4 in the rearward position.

[55] As the bolt 7 travels behind the magazine feed lips, a round is allowed to be pushed up in front of the bolt 7. A biasing spring (not shown) may reside within the stock to bias the bolt carrier 4 forwardly. Buffer spring pin clearance 17 may make allowance for a buffer spring engagement pin (not shown). Specifically, spring pin clearance 17 is cut in so that the bolt carrier 4 can be rotated 67.5 deg without contacting the buffer spring retention pin. This pin travels unobstructed in out-of-battery raceway 37 when the carrier/bolt is in out-of-battery rotation and pulled to the rearward position in the upper receiver.

[56] As is shown in figure 10, when the bolt carrier 4 transitions rearwardly a hammer depressing protrusion 20 pushes the hammer 2 downwardly so to reset the hammer.

[57] In a preferred embodiment, the hammer depressing protrusion 20 depresses the hammer sufficiently so as to be engaged by the sear of the trigger assembly so as to be operably disconnected until released.

[58] The hammer depressing protrusion 20 may pass between the feed lips of the magazine and therefore may be suitably narrow to fit between the feed lips.

[59] The handle 5 is then pushed forwardly to the forward out-of-battery position 35.

[60] As such, the bolt 7 pushes the engaged round forwards to the barrel, ready for firing.

[61] As the hammer depressing protrusion 20 leaves the hammer, the hammer may be left operably disconnected by the sear.

[62] When in the forward out-of-battery position 35, a hammer inhibition protrusion 18 may prevent the hammer from striking the firing pin 6.

[63] Additionally, the hammer inhibition protrusion 18 may keep the hammer down far enough past the sear such that that if the trigger is pulled in this out-of-battery rotation the trigger disconnect is tripped. As such, if the carrier 4 if then the out-of-battery position to the in-battery position whilst the trigger is held pulled, the hammer will not fall and strike the fire pin 6 as the disconnect has engaged the hammer. The interface 42 between the hammer inhibition protrusion 18 and the hammer clearance slot 19 keeps the hammer depressed past the disconnect when being rotated.

[64] As such, only when the trigger is released will the hammer now engage the sear requiring the trigger to be be pulled again to discharge the firearm.

[65] Such addresses problems of traditional bolt action designs, where it is possible to de-cock the firearm by pulling the trigger in the out-of-battery forward rotation and holding the trigger in while rotating to the in-battery rotation. This may cause the fire pin to hit the cartridge and, although not under full pressure, may dangerously cause accidental discharge.

Atrius Ex. 1002--0232

[66] The fire pin restrictor 11 may be utilised as an additional safety mechanism in embodiments.

[67] As is best shown in figure 10, firing pin restrictor 11 may comprise a catch 21. When the bolt carrier 4 is in the forward out-of-battery position 35, the fire pin restrictor 11 may be depressed by the upper receiver such that the catch 21 catches the firing pin 6 to prevent the firing pin from moving forwardly.

[68] As shown, the firing pin restrictor 11 may pivot about a pivot point 23 within a firing pin restrictor entrance slot 22. The firing pin restrictor 11 may be biased outwardly via a biasing spring engaged within biasing spring seat 24.

[69] The catch 21 may catch an annulus 29 (as is shown in figure 22) of the firing pin 6.

[70] An interior of the upper receiver 2 may comprise a clearance indentation 25 (as is shown in figure 16) which, when the bolt carrier 4 is in the forward out-of-battery position 35, allows the catch 21 to move away from the firing pin 6 to allow the firing pin 6 to move forwardly.

[71] When the bolt carrier 4 rotates to the out-of-battery position 35, the clearance indentation 25 may push the restrictor 11 inward to again interfere with the annulus 29 of the firing pin 6. Should the firing pin 6 have seized, the annulus 29 of the firing pin 6 prevents the restrictor 11 from moving inwardly and thereby prevents the bolt carrier 4 from moving to the out-of-battery position 35, requiring servicing.

[72] An edge of the clearance indentation 35 may transition gradually to assist in depressing the firing pin restrictor 11 when the bolt carrier 4 moves from the forward in-battery 35 to out-of-battery 35 positions.

[73] The bolt carrier may comprise a drilling 40 as is shown in figure 12 to retain a fire pin retention pin (not shown). This pin sets the reward position of the fire pin 6, and stops the fire pin 6 from extending rearwardly from the bolt carrier, especially as the fire pin 6 is under spring pressure of the biasing spring 8. Relatedly, the catch 21 serves two purposes as alluded to above, firstly stopping the fire pin 6 from hitting the cartridge when in out-of-battery rotation and preventing fouling on the fire pin 6 if the fire pin 6 where to seize in the forward fired position by not letting the carrier 4/bolt 7 be rotated into the out-of-battery rotation, as the fire pin restriction device 11 cannot be pressed in on account of being obstructed by the pin 6.

[74] The handle 5 is then moved down to rotate the bolt carrier 4 to the forward in-battery position 32.

[75] As the bolt carrier 4 rotates, the locking teeth 14 of the bolt 7 engage the barrel. In this manner, the battery slot 32 may allow the bolt carrier 4 to rotate by 67.5° so as to allow for the engagement and disengagement of the teeth 14 accordingly.

Atrius Ex. 1002--0233

[76] As the bolt carrier 4 rotates, hammer inhibition ramp 18 rotates away such that hammer firing clearance slot 19 coincides with the hammer entrance slot 28 of the upper receiver 2.

[77] As such, the trigger may be released to disengage the sear and then pulled so as to cause the hammer to strike through the hammer firing clearance slot 19 to strike the rear of the firing pin 6 to detonate the round.

[78] Angular cut 42 may allow the bolt carrier 4 to rotate from out-of-battery to in-battery when the last round is stripped from the magazine. Specifically, when the last round is stripped from the magazine, the magazine follower contacts the bolt hold open catch. The bolt hold open catch is part of the lower receiver and between the rear of the magazine and the front of the hammer. Without this angular cut 42, the carrier cannot depress the bolt catch without fouling and restricting the rotation of the bolt carrier on the last shot.

[79] Furthermore angular cut 43 allows the bolt carrier 4 to clear the front portion of the bullet that protrudes past the feed lips of the magazine while being rotated from out-of-battery to in-battery rotation.

[80] As is shown in Figure 12, the bolt carrier 4 may comprise a ramp 41 to move the hammer rearward after the trigger has been pulled and the hammer has contacted the rear of the fire pin 6 as the carrier 4/bolt 7 is rotated from in battery to out of battery rotation. The ramp 41 moving the hammer 2mm rearward in the rotation, takes pressure off the fire pin 6, and the fire pin 6 moves back under spring pressure of the biasing spring 8 to clear the catch 21 of the fire pin obstruction device 11.

[81] The foregoing description, for purposes of explanation, used specific nomenclature to provide a thorough understanding of the invention. However, it will be apparent to one skilled in the art that specific details are not required in order to practice the invention. Thus, the foregoing descriptions of specific embodiments of the invention are presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed; obviously, many modifications and variations are possible in view of the above teachings. The embodiments were chosen and described in order to best explain the principles of the invention and its practical applications, they thereby enable others skilled in the art to best utilize the invention and various embodiments with various modifications as are suited to the particular use contemplated. It is intended that the following claims and their equivalents define the scope of the invention.

Atrius Ex. 1002--0234

Claims

1. A bolt action upper receiver assembly for a semiautomatic lower receiver, the bolt action assembly comprising:

an upper receiver having:

a magazine entrance corresponding to a magazine slot of the lower receiver; and

a hammer entrance slot for a hammer of a trigger assembly of the semiautomatic lower receiver; and

a bolt carrier engaging a co-axial firing pin, the bolt carrier reciprocating within the upper receiver under action of a handle, the handle guided within an upper receiver guide slot to rotate the bolt carrier with respect to the upper receiver between forward in-battery and forward out-of-battery positions and to slide lengthwise with respect to the upper receiver between the forward out-of-battery position and a rearward position, wherein,

the bolt carrier comprises:

a hammer depressing protrusion which depresses the hammer when in the bolt carrier is in the rearward position; and

a lengthwise hammer firing clearance slot coinciding with the hammer entrance slot when the bolt carrier is the forward in-battery position to allow clearance for the hammer to strike a rear end of the firing pin to detonate a round.

2. A bolt action upper receiver assembly as claimed in claim 1, wherein the hammer depressing protrusion is configured for depressing the hammer until the hammer is engaged by a sear of the trigger assembly.

3. A bolt action upper receiver assembly as claimed in claim 1, wherein the hammer depressing protrusion passes between feed lips of the magazine when the bolt carrier transitions between the forward out-of-battery and rearward positions.

4. A bolt action upper receiver assembly as claimed in claim 1, wherein the bolt carrier comprises a hammer inhibition protrusion in line with the hammer depressing protrusion which inhibits the hammer contacting the firing pin when the bolt carrier is in the forward out-of-battery position.

5. A bolt action upper receiver assembly as claimed in claim 1, further comprising a firing pin restrictor comprising a catch, which, when the bolt carrier is in the forward out-of-battery position, the firing pin restrictor is pressed in by the upper receiver such that the catch catches the firing pin to prevent the firing pin from moving forwardly with respect to the bolt carrier.

Atrius Ex. 1002--0235

6. A bolt action upper receiver assembly as claimed in claim 5, wherein an interior of the upper receiver comprises a clearance indentation which, when the bolt carrier is in the forward in-of-battery position, allows the catch to move away from the firing pin to disengage the firing pin.

7. A bolt action upper receiver assembly as claimed in claim 5, wherein the catch catches and annulus of the firing pin.

8. A bolt action upper receiver assembly as claimed in claim 7, wherein the firing pin restrictor pivots about a pivot within a firing pin restrictor slot.

9. A bolt action upper receiver assembly as claimed in claim 6, wherein an edge of the clearance indentation transitions gradually to assist depressing of the firing pin restrictor when the bolt carrier rotates from the forward in-battery to out-of-battery positions.

10. A bolt action upper receiver assembly as claimed in claim 1, further comprising a bolt connected to the bolt carrier.

11. A bolt action upper receiver assembly as claimed in claim 10, wherein the bolt comprises barrel engagement teeth.

12. A bolt action upper receiver assembly as claimed in claim 11, wherein the bolt carrier rotates through 67.5° between the forward out of battery and in battery positions.

13. A bolt action upper receiver assembly as claimed in claim 1, wherein the upper receiver comprises a detent acting on the bolt carrier to bias the bolt carrier in either the forward in-battery position or the forward out-of-battery and rearward positions.

14. A bolt action upper receiver assembly as claimed in claim 13, wherein the bolt carrier comprises an in-battery seat and an out-of-battery slot for selectively engaging the detent.

15. A bolt action upper receiver assembly as claimed in claim 1, wherein the bolt carrier comprises magazine facing surfaces which face the magazine orthogonally when in the forward-in-battery position and the forward out-of-battery position respectively.

16. A bolt action upper receiver assembly as claimed in claim 15, wherein the magazine facing surfaces are offset by 67.5°.

17. A bolt action upper receiver assembly as claimed in claim 1, wherein the upper receiver comprises a spent cartridges ejection slot through which spent cartridges are ejected when the bolt carrier rotates from the forward in-battery position to the forward out-of-battery position.

Atrius Ex. 1002--0236

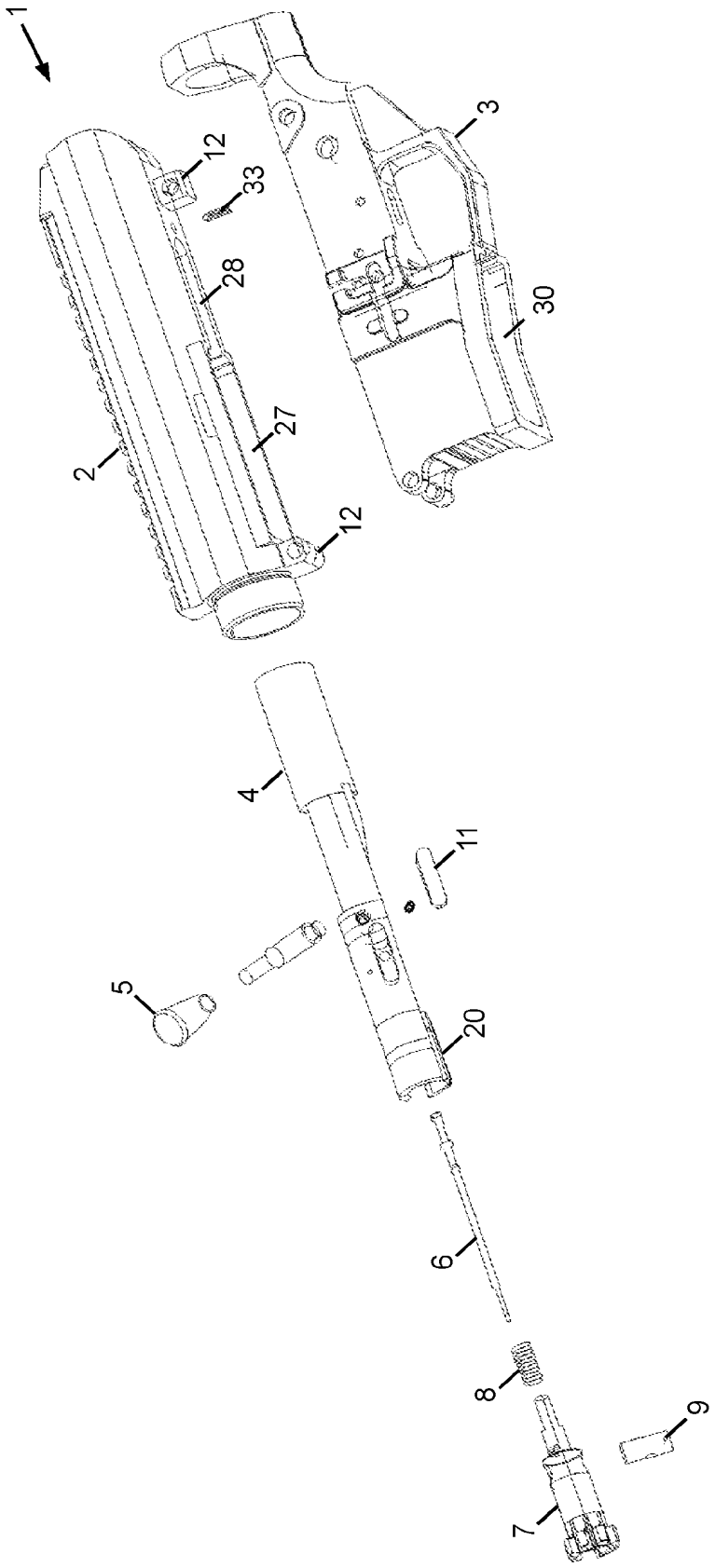


Figure 1

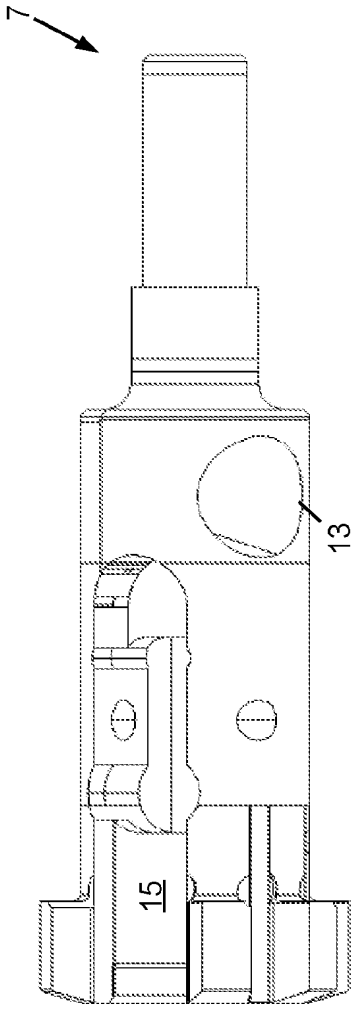


Figure 2

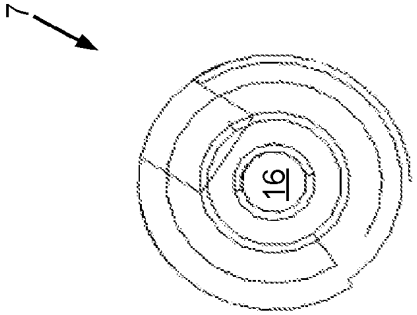


Figure 4

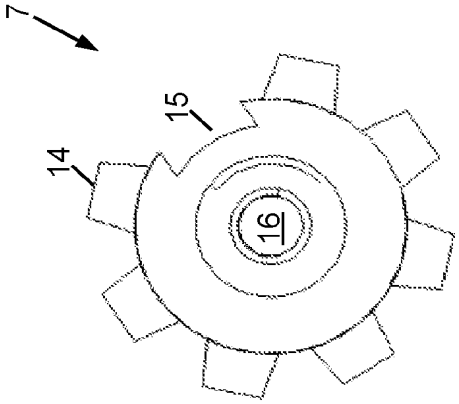


Figure 3

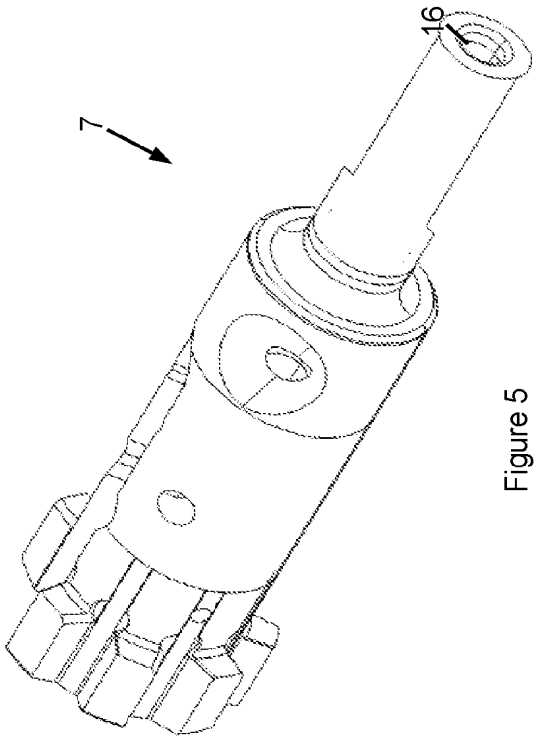


Figure 5

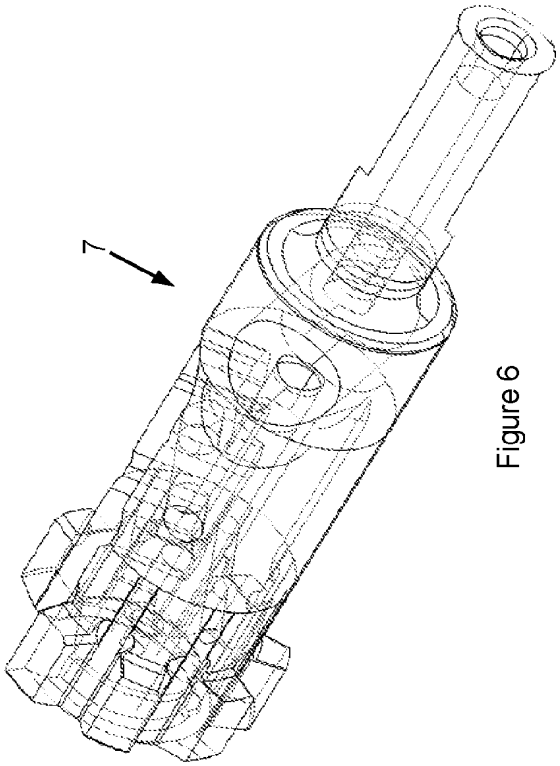


Figure 6

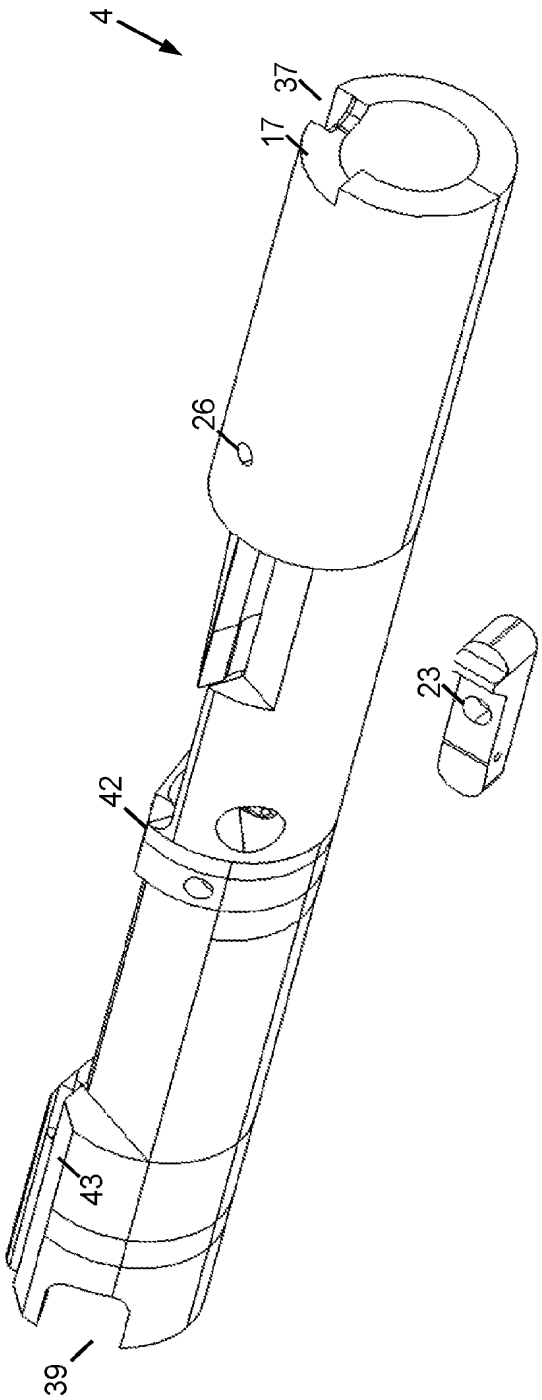


Figure 7

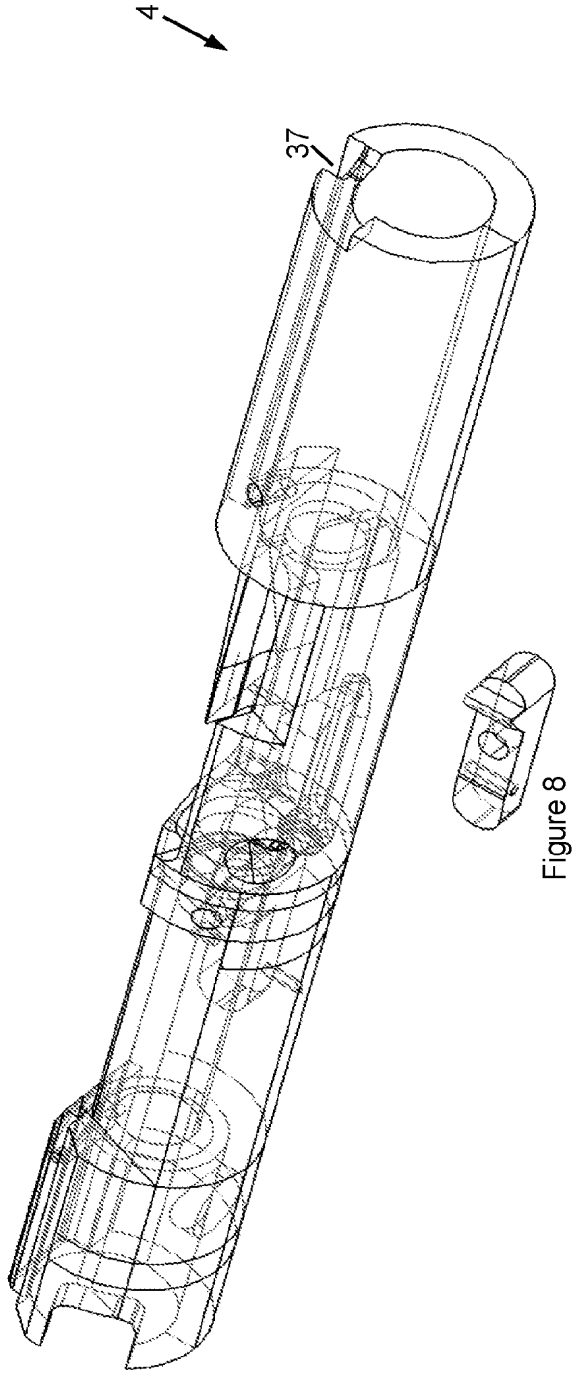


Figure 8

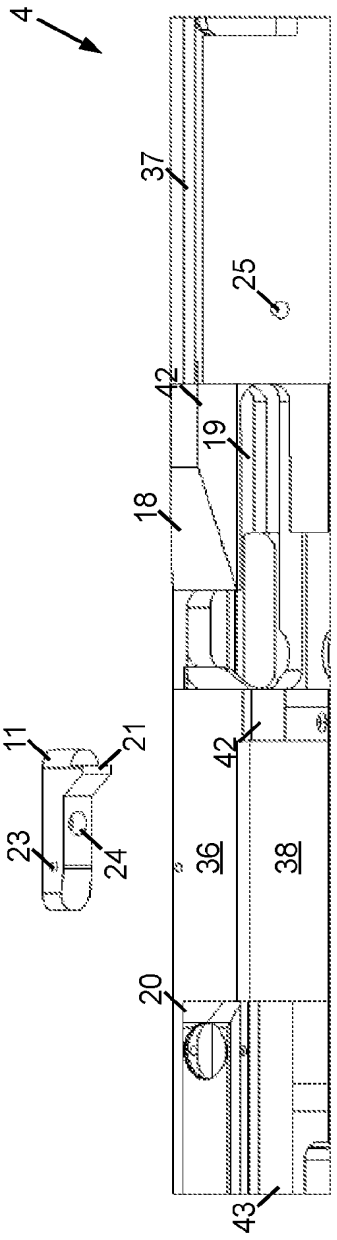


Figure 10

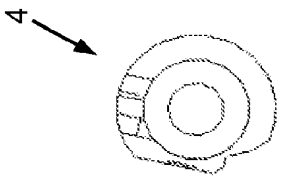


Figure 9

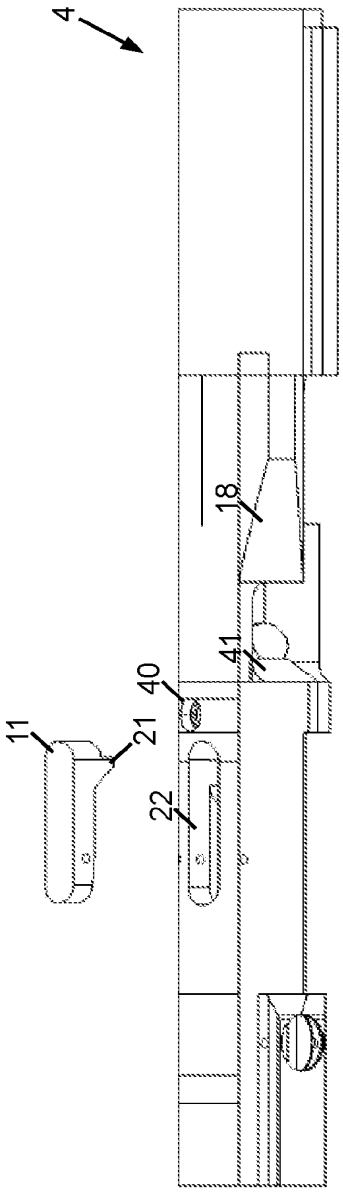


Figure 12

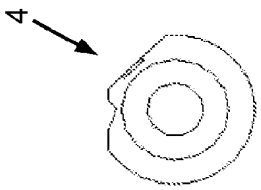


Figure 11

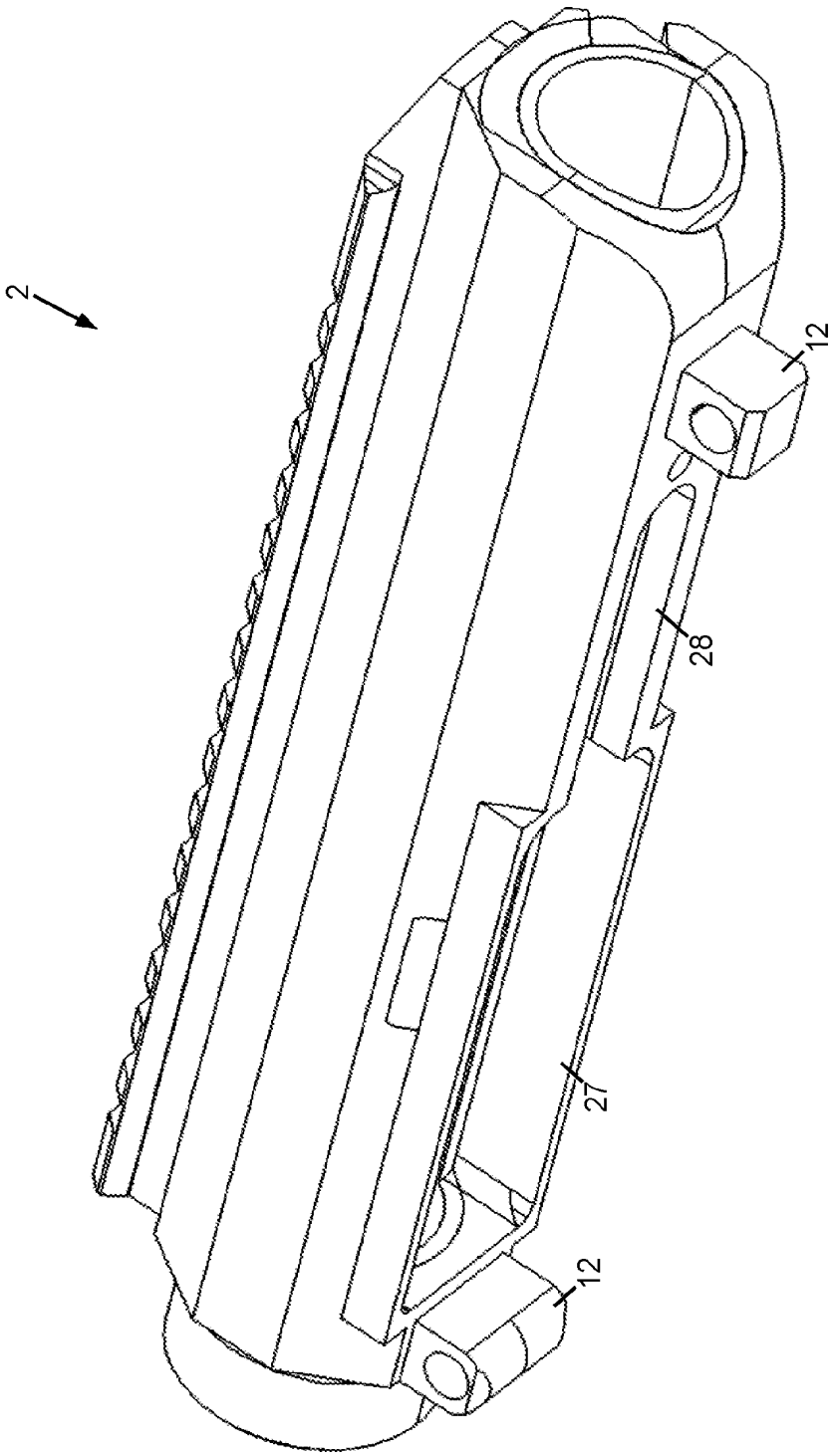


Figure 13

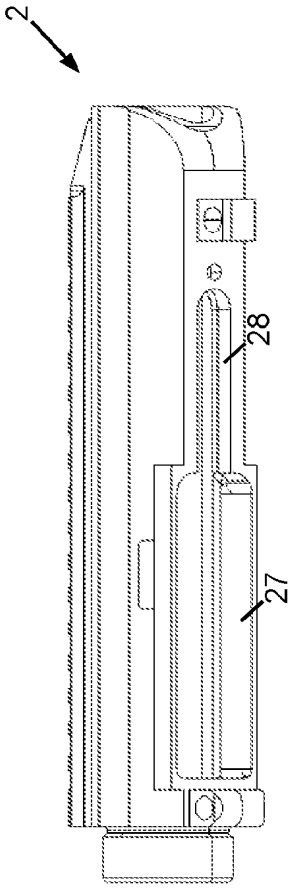


Figure 14

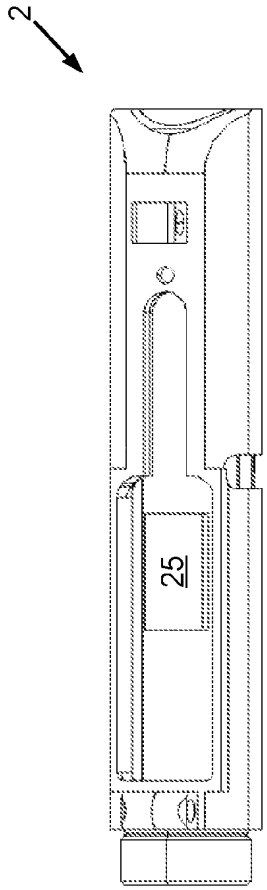


Figure 16

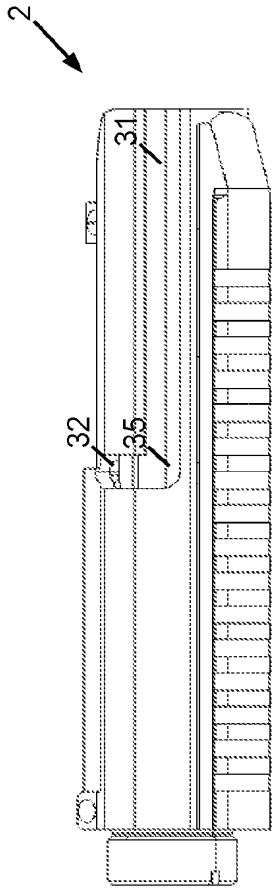


Figure 17

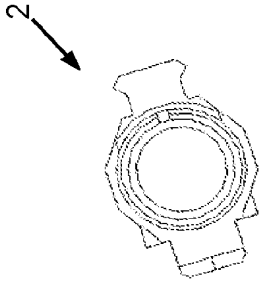


Figure 15

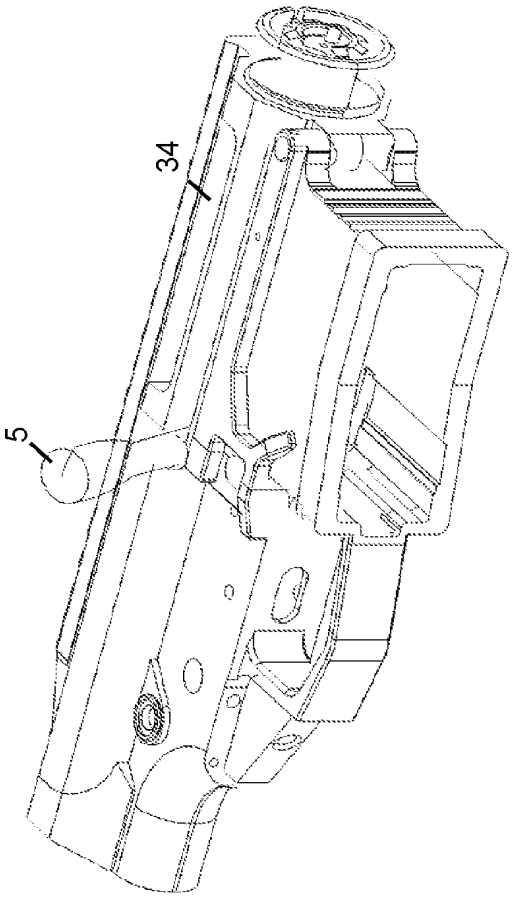


Figure 18

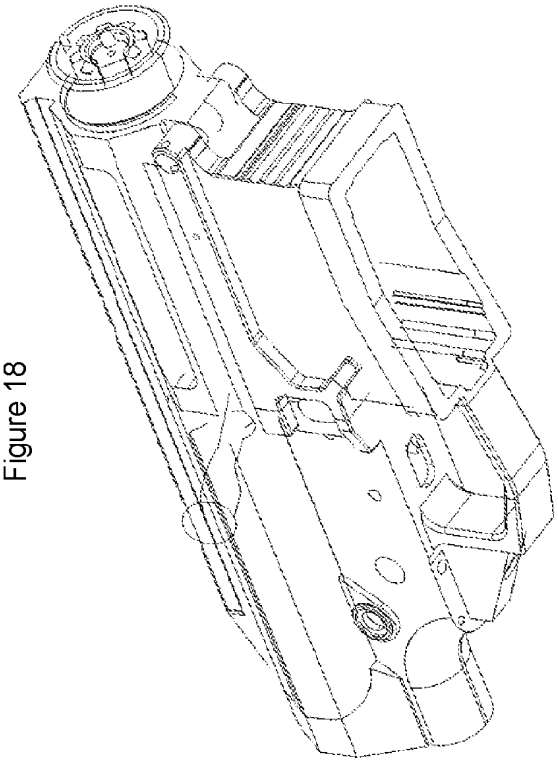


Figure 19

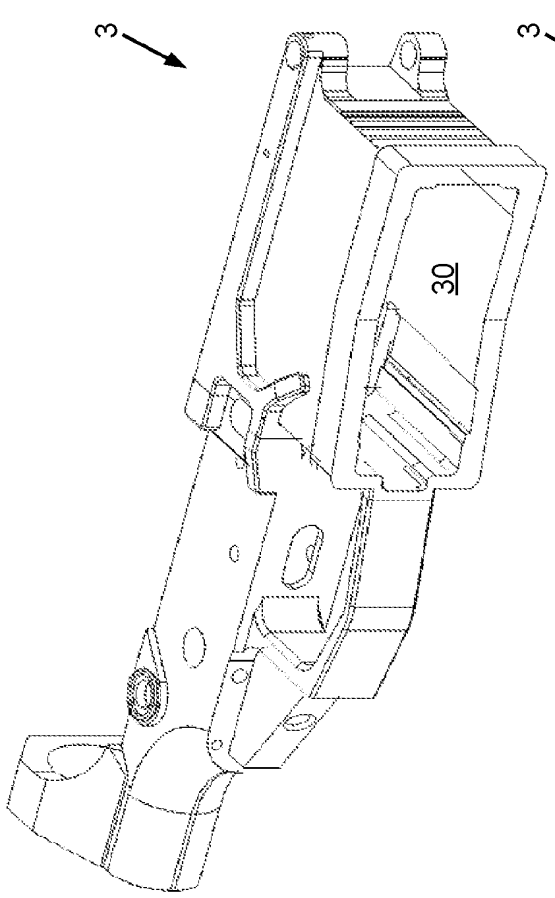


Figure 20

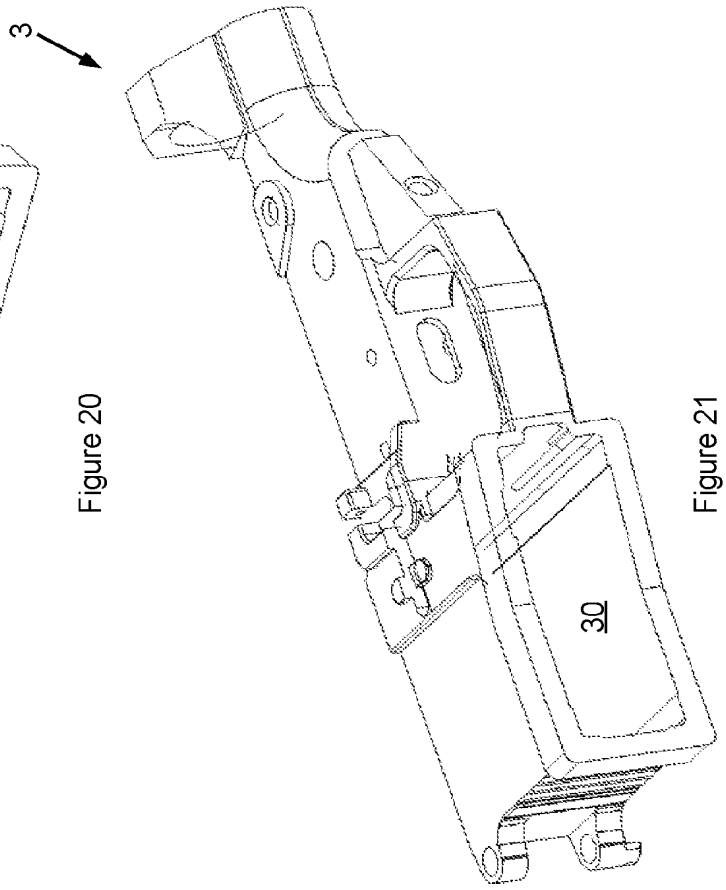


Figure 21

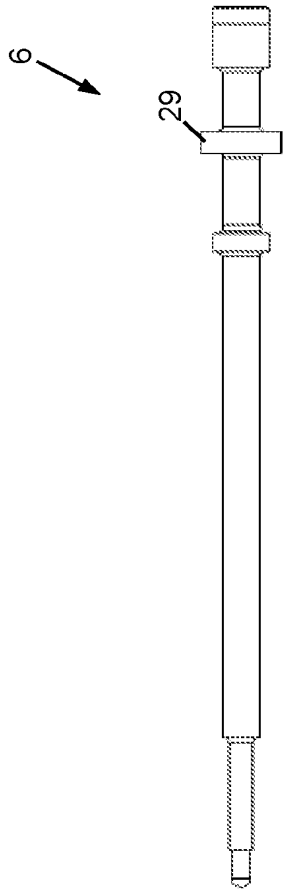


Figure 22

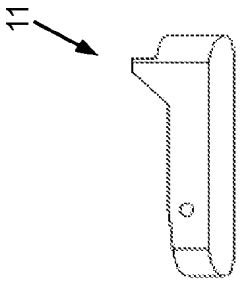


Figure 23

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2017/050988

A. CLASSIFICATION OF SUBJECT MATTER

F41A 3/66 (2006.01) F41A 17/64 (2006.01) F41A 17/46 (2006.01) F41A 3/12 (2006.01) F41A 3/72 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PATENW: IPC, CPC: F41A3/12/low, F41A3/16, F41A3/64/low, F41A3/66, F41A3/72/low, F41A9/52, F41A11/02/low, F41A17/46/low, F41A17/64/low, F41A17/74/low, F41A19/06, F41A19/42/low, F41A19/43, F41A35/low; keywords: bolt carrier, rotate, upper receiver, hammer, depress, catch, convert, bolt action (and like terms). WPIAP, EPODOC: applicant and inventor name searched.

Espacenet: CPC: F41A3/12/low, F41A3/66/low; keywords: receiver; applicant and inventor name searched.

Google Patents: Forward and backward citation search on US 2016/0047611.

Applicant(s)/Inventor(s) name searched in internal databases provided by IP Australia

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

[X] Further documents are listed in the continuation of Box C

[X] See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 December 2017	14 December 2017
Name and mailing address of the ISA/AU	**Authorised officer**
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustralia.gov.au	Eng Wei Soo AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. +61262832138

Atrius Ex. 1002--0247

INTERNATIONAL SEARCH REPORT		International application No.
C (Continuation).	DOCUMENTS CONSIDERED TO BE RELEVANT	**PCT/AU2017/050988**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2016/0047611 A1 (VINCENT P. BATTAGLIA) 18 February 2016 Abstract; figs. 1-16; paragraphs [0060]-[0067]	1-17
Y	WO 2015/103651 A1 (STEYR MANNLICHER GMBH) 16 July 2015 Abstract; fig. 5	1-17
A	US 9279628 B1 (CHRIS POLLACK) 08 March 2016 Entire document	1-17
A	US 5179245 A (STRAKA) 12 January 1993 Entire document	1-17
A	US 2010/0313459 A1 (GOMEZ) 16 December 2010 Abstract; figs. 2-4; paragraphs [0028]-[0039]	5-9
A	DE 319321 C (ELISE SCHMEISSER et al.) 09 March 1920 figs. 1-3	5-9

Atrius Ex. 1002--0248

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/AU2017/050988**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	**Publication Date**	**Publication Number**	**Publication Date**
US 2016/0047611 A1	18 February 2016	US 2016047611 A1	18 Feb 2016
		US 9534859 B2	03 Jan 2017
WO 2015/103651 A1	16 July 2015	WO 2015103651 A1	16 Jul 2015
		AT 514602 B1	15 Feb 2015
US 9279628 B1	08 March 2016	US 9279628 B1	08 Mar 2016
		US 9702648 B1	11 Jul 2017
US 5179245 A	12 January 1993	US 5179245 A	12 Jan 1993
US 2010/0313459 A1	16 December 2010	US 2010313459 A1	16 Dec 2010
		US 8245427 B2	21 Aug 2012
DE 319321 C	09 March 1920		

End of Annex

Espacenet

Bibliographic data: DE582963 (C) — 1933-08-26

Hahnschloss fuer Selbstladepistolen

Inventor(s):

Applicant(s): FRANZ STOCK FA ± (FIRMA FRANZ STOCK)

Classification: **- international:** *F41A17/74; F41A19/48*
- cooperative: F41A17/74 (EP); F41A19/48 (EP)

Application number: DE1931ST47788D 19310617

Priority number(s): DE1931ST47788D 19310617

Abstract not available for DE582963 (C)

Patent Translate
Powered by EPO and Google

Notice

This translation is machine-generated. It cannot be guaranteed that it is intelligible, accurate, complete, reliable or fit for specific purposes. Critical decisions, such as commercially relevant or financial decisions, should not be based on machine-translation output.

DESCRIPTION DE582963C

[0001]

13 The invention relates to self-loading guns, and more particularly to the known hammer locks for these guns with cocking means by trigger and pawl, in which the hammer is connected to the trigger bar by a single, separately arranged trigger pawl. Thus, in these models, both the direct actuation of the tap and the triggering of the latter after tension by the closure slide or by hand can be effected by turret tension take-off means. The said embodiments usually comprise safety devices which, when engaged, unlock the already cocked cock or prevent the cock from locking when tightened, while, moreover, the impact of the cock on the striker is avoided by inserting a locking piece. These involve relatively complicated cam members and sometimes the use of numerous elements which are sensitive or difficult to locate in the available space.

[0002]

25 The object of the invention is to improve locks of the type in question in order to achieve a limitation of the number while at the same time simplifying the parts, increased operational reliability also being achieved by the possibility of greater dimensioning.

28 Accordingly, according to the invention, the trigger pawl separately mounted between the cock and the trigger rod is in the form of a double-legged pivotable fork, one leg of which serves as a catch for the cock and the other leg of which bears against the cock and transfers the tensioning movement of the trigger rod directly to the cock. When securing the weapon, the double-legged fork is pivoted in the direction of its clamping movement by a securing element, specifically in such a way that the limb designed as a locking pawl cannot engage.

[0003]

37 The drawing shows a further embodiment of the invention, namely FIG. i is a section through a

Atrius Ex. 1002--0251

self-loading gun with a hoof lock according to the invention, FIG. 2 is a side view and a front view of the trigger pawl, FIG. 3 is a side view of the cock, FIG. q is a section corresponding to FIG. i with the cock tensioned.

[0004]

44 In the drawing a is the handle of the gun in which a cock b is pivotally mounted about a pin c.

45 The actuation of the hammer b is effected by a trigger d via a trigger rod e and a trigger pawl f.g is the closure slide of the pistol which is guided in the usual manner in longitudinal grooves and in which the striker h is located.

48 When the breech slide is lowered after firing of the shot or by clamping by hand, the hammer b is brought into the clamping position in the usual manner.

[0005]

53 The trigger pawl f is in the form of a double-legged fork and is pivotally mounted in the closure member about a pin i.

55 A spring also provided on the pin i tends to rotate the fork clockwise. The front limb f1 of the fork is designed as a catch and, in the tensioned position of the tap b, comes to rest against the front surface of a projection b' provided thereon.

[0006]

61 The rear leg f2 has at its free end two lugs, one of which comes to rest against the front side of the cock b at k (FIG. g), while for the other lug on the opposite side there are provided on the trigger rod e two notches in and ia, the notch of which comes to engage with the trigger pawl when the cock b is pulled and released from the rest position, whereas the other notch ia is provided when the already pulled cock is released.

[0007]

69 The trigger rod e is pivotally mounted in the trigger d and stands under the action of a spring o which serves to press the notches in the trigger rod against the shoulder of the fork f.

71 The hammer b engages in the usual manner a striker p which is under the action of a spring q housed in the handle and tends to move the hammer against the striker lt.

[0008]

76 The notches m and n provided on the trigger rod e act in such a way that, when the notch is engaged in the extension of the arm f2, an automatic tensioning of the hammer is brought about, while the notch n serves to release the already tensioned hammer d.

Atrius Ex. 1002--0252

[0009]

82 The operation of the closure is as follows: in the rest position of the cock b the catch m is in engagement with the shoulder of the leg f2.

84 If the trigger rod e is now moved forward by action on the trigger d, this causes the fork f to pivot in the counterclockwise direction.

86 At the same time, the projection opposite the surface k of the cock b transfers the movement of the fork to the cock b and clamps it against the action of the spring q.

88 When the cock b is in the extreme clamping position, the catch slides away from the extension of the fork leg f2 under the influence of a guide which moves along the pin c in the form of an extension r. The hammer is thus now released and strikes the striker h so that the cartridge is ignited.

[0010]

95 Under the influence of the reaction pressure, the slide g moves backward, bringing the cock b back into the cocking position.

97 In the extreme cocking position b, the catch f1 comes to rest against the lug bi of the cock and holds it in this position. At the same time, under the effect of a stop s provided on the hammer b, which stop cooperates with a hook-shaped projection on the free end of the rod, the trigger rod e has moved into such a position that the catch n can now engage with the projection of the fork limb f2 upon further movement of the trigger rod e under the influence of the trigger d. The engaging catch n now in turn tends to pivot the fork f counterclockwise, whereby the leg f1 and the stop b1 of the hammer b disengage, so that the latter can spring back towards the striker and causes the new cartridge which has been inserted into the barrel simultaneously during the previous return movement of the breech slide. This process is now repeatable until the magazine is empty.

107 If, after the delivery of the first shot, a tension of the hammer b takes place by means of the closure slide g, the hook-shaped extension of the trigger rod e also prevents the trigger d from moving into the outermost initial position, from which the tension of the hammer takes place, so that therefore only a short path of the trigger d is necessary for the triggering of the subsequent shot.

[0011]

115 Since, during the automatic firing of the gun, the operator always keeps the trigger d tensioned, care must be taken that the cock b tensioned by the returning breech slide can latch into the catch f by means of its projection b1.

[0012]

121 For this purpose, a further latch t is provided, one end of which engages in a recess of the

Atrius Ex. 1002--0253

closure slide.

123 When the slide is retracted, this bolt t and thus also the trigger rod e are pivoted downwardly, so that the catch n cannot engage in the shoulder of the fork leg f2 so that the fork f advances under the action of the spring until the catch f1 comes to rest against the stop b1 of the tap and thus retains the tap in its tensioned position.

[0013]

130 If the closure slide is again in its starting position, the latch t of the trigger rod e can correspondingly engage in the recess of the slide, i.e. the rod e can move upwards under the action of the spring o, so that the catch iz now comes into engagement with the trigger pawl again.

134 The spring o can simultaneously serve to hold the trigger d in its forwardmost position in the usual manner.

[0014]

139 The protection of the gun is effected in a manner known per se by either unlocking the cock in place or making it impossible to lock the cock in place during the clamping operation, and also by locking in the path of the cock after the striker, by the fact that the cock strikes against the outside diameter of a rotatable locking pin u.

143 This peg u is provided on part of its circumference with recesses ui, u2, of which the recess u1 extends over the length of the peg in such a way that the front side of the hammer b and of the leg f of the trigger pawl f can engage in the same in the unsecured position of the pistol, while the recess u2 is provided only for the leg f2.

[0015]

150 The pin u is introduced into the securing position or brought out of the latter in the usual manner by means of a lever mounted on the outside of the grip piece.

[0016]

155 If the gun is now to be secured, this is done by pivoting the securing lever, which is mounted on the outside of the handle piece, as a result of which the pin u is rotated.

157 The recess u1 of the pin moves out of the tap b and the leg f' so that the full circumference of the pin abuts against the front of the tap and against the leg f2 the recess u2.

159 Thus, once the cock b is moved away from the striker, and moreover, since the depth of the recess u' is smaller than that of the recess u1, the fork f is pivoted counterclockwise so that the leg fl can no longer engage the stop b1 when the cock is tensioned.

162 Although actuation of the cock b above the trigger d is possible per se, this has no further consequences, since contact with the striker is prevented in the manner described above; on

Atrius Ex. 1002--0254

the other hand, when the cock is tightened the cock immediately returns to its initial position by pulling back the closure slide by hand.

[0017]

169 This type of safety has the advantage that no damage to the parts can take place by forced tensioning and, moreover, the weapon can be loaded or unloaded without danger.

171 Upon release of the fuse, the gun is immediately in the standby position and can only be pulled off by actuation of the trigger d. The closing carriage itself of course operates in the manner usual in the case of self-loading guns and, moreover, has no further significance for the present invention.

Atrius Ex. 1002--0255

Patent Translate
Powered by EPO and Google

Notice

This translation is machine-generated. It cannot be guaranteed that it is intelligible, accurate, complete, reliable or fit for specific purposes. Critical decisions, such as commercially relevant or financial decisions, should not be based on machine-translation output.

CLAIMS DE582963C

1.

13 PATENTANSPRESSURE:. A taplock for self-loading guns with a cocking device by a trigger lever and pawl, in which the tap is connected to the trigger bar by means of a single trigger pawl separately mounted, characterised in that the trigger pawl (f) has the form of a double-legged pivotable fork, one leg (f1) of which serves as a pawl for the tap (b) and the other leg (f2) of which bears against the tap and transfers the tensioning movement of the trigger bar (e) directly to the tap. A tap lock according to claim z with a safety device which in engagement permits safe unclamping of the tap, characterised in that the fork (f) can be pivoted in the direction of its clamping movement by a safety member so that the limb (f1) serving as a locking pawl cannot engage. 3. Hatch lock according to claims z and z, with the direct actuation of the cock by the trigger or the release thereof after tension by the locking slide, characterised in that on "the trigger rod (e) there are provided two notches, one of which (m) engages with the trigger pawl (f) when the cock (b) is cocked and released from the rest position, whereas the other one (n) when the cock already cocked is released q.

26 Hatch lock according to claim 3, characterised in that the trigger rod (e) cooperates with a stop (s) of the tap (b) preferably by means of a hook-shaped projection provided at its free end in such a way that, when the tap is tensioned and locked by the trigger pawl (f), engagement of the claw catch (m) of the trigger rod (e) into the trigger pawl is prevented.

Atrius Ex. 1002--0256

DEUTSCHES REICH

AUSGEGEBEN AM
26. AUGUST 1933

REICHSPATENTAMT

PATENTSCHRIFT

№ 582963

KLASSE 72h GRUPPE 502

St 47788 XI/72h

Tag der Bekanntmachung über die Erteilung des Patents: 10. August 1933

Firma Franz Stock in Berlin-Neukölln

Hahnschloß für Selbstladepistolen

Patentiert im Deutschen Reiche vom 17. Juni 1931 ab

Die Erfindung bezieht sich auf Selbstladepistolen, und zwar insbesondere auf die bekannten Hahnschlösser für diese Pistolen mit Spanneinrichtung durch Abzugshebel und Klinke, bei denen der Hahn mit der Abzugsstange über eine einzelne, getrennt angeordnete Abzugsklinke in Verbindung steht. Es kann also bei diesen Modellen durch Revolverspannabzug sowohl die unmittelbare Betätigung des Hahnes als auch die Auslösung desselben nach Spannung durch den Verschlußschlitten bzw. von Hand erfolgen. Die genannten Ausführungen weisen zumeist Sicherungen auf, welche beim Einrücken den bereits gespannten Hahn entrasten oder ein Einrasten des Hahnes beim Spannen verhindern, während außerdem durch Einführung eines Sperrstückes das Auftreffen des Hahnes auf den Schlagbolzen vermieden wird. Diese bedingen verhältnismäßig komplizierte Schloßteile und mitunter die Verwendung zahlreicher Elemente, welche empfindlich sind oder nur schwer in dem zur Verfügung stehenden Raum untergebracht werden können.

Die Erfindung bezweckt eine Verbesserung bei Schlössern der in Frage stehenden Art, um eine Beschränkung der Anzahl bei gleichzeitiger Vereinfachung der Teile zu erzielen, wobei eine erhöhte Betriebssicherheit auch durch die Möglichkeit stärkerer Dimensionierung erreicht wird. Dementsprechend ist die zwischen dem Hahn und der Abzugsstange getrennt angebrachte Abzugsklinke erfindungsgemäß in Gestalt einer doppelschenkligen schwenkbaren Gabel ausgebildet, deren einer Schenkel als Sperrklinke für den Hahn dient und deren anderer Schenkel gegen den Hahn anliegt und die Spannbewegung der Abzugsstange unmittelbar auf den Hahn überträgt. Beim Sichern der Waffe wird die doppelschenklige Gabel durch ein Sicherungsorgan in der Richtung ihrer Spannbewegung verschwenkt, und zwar so, daß der als Sperrklinke ausgebildete Schenkel nicht eingreifen kann.

Die Zeichnung zeigt eine weitere Ausführungsform der Erfindung, und zwar ist

Fig. 1 ein Schnitt durch eine Selbstladepistole mit einem Hahnschloß gemäß der Erfindung,

Fig. 2 eine Seitenansicht sowie eine Vorderansicht der Abzugsklinke,

Fig. 3 eine Seitenansicht des Hahnes,

Fig. 4 ein Schnitt entsprechend Fig. 1 bei gespanntem Hahn.

In der Zeichnung ist *a* das Griffstück der Pistole, in welchem ein Hahn *b* um einen Zapfen *c* schwenkbar angebracht ist. Die Betätigung des Hahnes *b* erfolgt von einem Abzug *d* über eine Abzugsstange *e* sowie eine Abzugsklinke *f*. *g* ist der Verschlußschlitten der Pistole, welcher in der üblichen Weise in Längsnuten geführt ist und in welchem der Schlagbolzen *h* sich befindet. Beim Zurückgang des Verschlußschlittens nach dem Ab-

4

Atrius Ex. 1002--0257

feuern des Schusses bzw. durch Spannen mittels Hand wird der Hahn *b* in der üblichen Weise in die Spannstellung gebracht.

Die Abzugsklinke *f* ist in Form einer doppelschenkligen Gabel ausgebildet und in dem Verschlußstück um einen Zapfen *i* schwenkbar angebracht. Eine an dem Zapfen *i* ebenfalls vorgesehene Feder ist bestrebt, die Gabel im Sinne des Uhrzeigers zu drehen. Der vordere Schenkel f^1 der Gabel ist als Sperrklinke ausgebildet und kommt in der gespannten Stellung des Hahnes *b* gegen die vordere Fläche eines an diesem vorgesehenen Ansatzes b^1 zur Anlage.

Der rückwärtige Schenkel f^2 besitzt an seinem freien Ende zwei Ansätze, von denen der eine gegen die Vorderseite des Hahnes *b* bei *k* (Fig. 3) zur Anlage kommt, während für den anderen Ansatz auf der entgegengesetzten Seite an der Abzugsstange *e* zwei Rasten *m* und *n* vorgesehen sind, von denen die Raste *m* mit der Abzugsklinke in Eingriff kommt, wenn der Hahn *b* von der Ruhelage aus gespannt und ausgelöst wird, die andere Raste *n* dagegen, wenn der bereits gespannte Hahn ausgelöst wird.

Die Abzugsstange *e* ist in dem Abzug *d* schwenkbar gelagert und steht unter der Einwirkung einer Feder *o*, welche dazu dient, die Rasten *m* bzw. *n* der Abzugsstange gegen den Ansatz der Gabel *f* zu drücken. An dem Hahn *b* greift in der üblichen Weise ein Schlagstück *p* an, welches unter der Einwirkung einer in dem Griffstück untergebrachten Feder *q* steht und den Hahn gegen den Schlagbolzen *h* zu bewegen trachtet.

Die an der Abzugsstange *e* vorgesehenen Rasten *m* und *n* wirken in der Weise, daß bei Eingriff der Raste *m* in den Ansatz des Armes f^2 ein selbsttätiges Spannen des Hahnes herbeigeführt wird, während die Raste *n* dazu dient, den bereits gespannten Hahn *d* auszulösen.

Die Wirkungsweise des Verschlusses ist nun folgende:

In der Ruhelage des Hahnes *b* befindet sich die Raste *m* in Eingriff mit dem Ansatz des Schenkels f^2. Wird nun die Abzugsstange *e* durch Einwirkung auf den Abzug *d* vorbewegt, so erfolgt durch diese ein Schwenken der Gabel *f* im entgegengesetzten Sinne des Uhrzeigers. Gleichzeitig wird durch den der Fläche *k* des Hahnes *b* gegenüberliegenden Ansatz die Bewegung der Gabel auf den Hahn *b* übertragen und dieser entgegen der Wirkung der Feder *q* gespannt. Befindet sich der Hahn *b* in der äußersten Spannlage, so gleitet die Raste *m* unter dem Einfluß einer Führung, welche in Form eines Ansatzes *r* sich an dem Zapfen *c* entlang bewegt, von dem Ansatz des Gabelschenkels f^2 ab. Der Hahn ist also nunmehr ausgelöst und schlägt auf den Schlagbolzen *h*, so daß die Patrone zur Entzündung gebracht wird.

Unter dem Einfluß des Reaktionsdruckes bewegt sich nun der Verschlußschlitten *g* nach rückwärts und bringt hierbei den Hahn *b* wieder in die Spannlage. In der äußersten Spannstellung des Hahnes *b* gelangt die Klinke f^1 gegen den Ansatz b^1 des Hahnes zur Anlage und hält ihn in dieser Stellung fest. Gleichzeitig ist die Abzugsstange *e* unter der Einwirkung eines an dem Hahn *b* vorgesehenen Anschlages *s*, welcher mit einem hakenförmigen Ansatz an dem freien Ende der Stange zusammenwirkt, in eine derartige Stellung gelangt, daß nunmehr die Raste *n* bei weiterer Bewegung der Abzugsstange *e* unter dem Einfluß des Abzugs *d* mit dem Ansatz des Gabelschenkels f^2 in Eingriff gelangen kann. Die eingreifende Raste *n* ist nun ihrerseits bestrebt, die Gabel *f* entgegen dem Uhrzeigersinn zu verschwenken, wodurch der Schenkel f^1 und der Anschlag b^1 des Hahnes *b* außer Eingriff kommen, so daß dieser wieder nach dem Schlagbolzen hin vorschnellen kann und die bei der vorhergehenden Zurückbewegung des Verschlußschlittens gleichzeitig in den Lauf eingeführte neue Patrone zur Entzündung bringt. Dieser Vorgang ist nun so lange wiederholbar, bis das Magazin leer ist. Erfolgt nach der Abgabe des ersten Schusses eine Spannung des Hahnes *b* mittels des Verschlußschlittens *g*, so verhindert der hakenförmige Ansatz der Abzugsstange *e* außerdem ein Vorgehen des Abzuges *d* in die äußerste Anfangsstellung, von welcher aus die Spannung des Hahnes erfolgt, so daß also für die Auslösung des folgenden Schusses nur ein kurzer Weg des Abzuges *d* erforderlich ist.

Da nun bei dem selbsttätigen Abfeuern der Pistole der Bedienende stets den Abzug *d* gespannt hält, so ist Vorsorge zu treffen, daß der durch den zurückgehenden Verschlußschlitten gespannte Hahn *b* mittels seines Ansatzes b^1 in die Klinke f^1 einrasten kann.

Hierfür ist ein weiterer Riegel *t* vorgesehen, dessen eines Ende in eine Aussparung des Verschlußschlittens eingreift. Beim Rückgang des Verschlußschlittens wird dieser Riegel *t* und somit auch die Abzugsstange *e* abwärts geschwenkt, so daß die Raste *n* nicht in den Ansatz des Gabelschenkels f^2 eingreifen kann, damit die Gabel *f* sich unter der Einwirkung der Feder so weit vorbewegt, bis die Klinke f^1 gegen den Anschlag b^1 des Hahnes zur Anlage kommt und den Hahn somit in seiner gespannten Lage festhält.

Befindet sich der Verschlußschlitten wieder in seiner Ausgangsstellung, so kann der Riegel *t* der Abzugsstange *e* entsprechend in die Aussparung des Schlittens eingreifen, d. h.

Atrius Ex. 1002--0258

die Stange *e* kann sich unter dem Einfluß der Feder *o* aufwärts bewegen, so daß nunmehr die Raste *n* mit der Abzugsklinke wieder in Eingriff kommt. Die Feder *o* kann gleichzeitig dazu dienen, den Abzug *d* in der üblichen Weise in seiner vordersten Stellung zu halten.

Die Sicherung der Pistole erfolgt in der an sich bekannten Weise dadurch, daß der gespannte Hahn entweder entrastet oder ein Einrasten des Hahnes während des Spannens unmöglich gemacht wird, wobei außerdem eine Sperrung in dem Weg des Hahnes nach dem Schlagbolzen zu angebracht wird, dadurch, daß der Hahn gegen den Außendurchmesser eines drehbaren Sicherungszapfens *u* schlägt. Dieser Zapfen *u* ist an einem Teil seines Umfanges mit Aussparungen u^1, u^2 versehen, von denen sich die Aussparung u^1 so über die Länge des Zapfens erstreckt, daß die Vorderseite des Hahnes *b* sowie des Schenkels f^2 der Abzugsklinke *f* in der ungesicherten Stellung der Pistole in diese eingreifen kann, während die Aussparung u^2 lediglich für den Schenkel f^2 vorgesehen ist.

Der Zapfen *u* wird in der üblichen Weise mittels eines an der Außenseite des Griffstückes angebrachten Hebels in die Sicherungsstellung eingeführt bzw. aus derselben wieder herausgebracht.

Soll nun die Pistole gesichert werden, so erfolgt dies durch Schwenkung des außen am Griffstück angebrachten Sicherungshebels, wodurch der Zapfen *u* verdreht wird. Hierbei bewegt sich die Aussparung u^1 des Zapfens aus dem Hahn *b* und dem Schenkel f^2 heraus, derart, daß der volle Umfang des Zapfens gegen die Vorderseite des Hahnes und gegen den Schenkel f^2 die Aussparung u^2 zur Anlage gelangt. Somit wird einmal der Hahn *b* von dem Schlagbolzen wegbewegt, während außerdem, da die Tiefe der Aussparung u^2 geringer ist als die der Aussparung u^1, die Gabel *f* entgegen dem Uhrzeigersinn geschwenkt wird, und zwar so, daß der Schenkel f^1 bei gespanntem Hahn nicht mehr in den Anschlag b^1 einrasten kann. Eine Betätigung des Hahnes *b* über dem Abzug *d* ist an sich zwar noch möglich, jedoch hat dies keine weiteren Folgen, da ja eine Berührung mit dem Schlagbolzen in der eben dargelegten Weise verhindert wird; andererseits geht aber beim Spannen des Hahnes durch Zurückziehen des Verschlußschlittens von Hand der Hahn sofort wieder in seine Anfangsstellung zurück.

Diese Art der Sicherung hat den Vorteil, daß keinerlei Beschädigung der Teile durch gewaltsames Spannen erfolgen kann und außerdem die Waffe ohne Gefahr ge- bzw. entladen werden kann. Nach Ausrücken der Sicherung befindet sich die Pistole sofort in der Bereitschaftslage und kann lediglich durch Betätigung des Drückers *d* abgezogen werden. Der Verschlußschlitten selbst arbeitet natürlich in der bei Selbstladepistolen üblichen Weise und hat im übrigen für die vorliegende Erfindung keine weitere Bedeutung.

Patentansprüche:

1. Hahnschloß für Selbstladepistolen mit Spanneinrichtung durch Abzugshebel und Klinke, bei dem der Hahn mit der Abzugsstange über eine einzelne, getrennt angebrachte Abzugsklinke in Verbindung steht, dadurch gekennzeichnet, daß die Abzugsklinke (*f*) die Gestalt einer doppelschenkligen schwenkbaren Gabel besitzt, deren einer Schenkel (f^1) als Sperrklinke für den Hahn (*b*) dient und deren anderer Schenkel (f^2) gegen den Hahn anliegt und die Spannbewegung der Abzugsstange (*e*) unmittelbar auf den Hahn überträgt.

2. Hahnschloß nach Anspruch 1 mit Sicherungseinrichtung, die eingerückt ein gefahrloses Entspannen des Hahnes ermöglicht, dadurch gekennzeichnet, daß die Gabel (*f*) durch ein Sicherungsorgan in Richtung ihrer Spannbewegung schwenkbar ist, so daß der als Sperrklinke dienende Schenkel (f^1) nicht eingreifen kann.

3. Hahnschloß nach Anspruch 1 und 2 mit unmittelbarer Betätigung des Hahnes durch den Abzug oder Auslösung desselben nach Spannung durch den Verschlußschlitten, dadurch gekennzeichnet, daß an der Abzugsstange (*e*) zwei Rasten vorgesehen sind, von denen die eine (*m*) mit der Abzugsklinke (*f*) in Eingriff kommt, wenn der Hahn (*b*) von der Ruhelage aus gespannt und ausgelöst, die andere (*n*) dagegen, wenn der bereits gespannte Hahn ausgelöst wird.

4. Hahnschloß nach Anspruch 3, dadurch gekennzeichnet, daß die Abzugsstange (*e*) vorzugsweise mittels eines an ihrem freien Ende vorgesehenen hakenförmigen Ansatzes mit einem Anschlag (*s*) des Hahnes (*b*) zusammenwirkt, derart, daß bei gespanntem und durch die Abzugsklinke (*f*) gesperrten Hahn ein Eingriff der Spannraste (*m*) der Abzugsstange (*e*) in die Abzugsklinke verhindert wird.

Hierzu 1 Blatt Zeichnungen

BERLIN. GEDRUCKT IN DER REICHSDRUCKEREI

Atrius Ex. 1002--0259

Zu der Patentschrift 582963
Kl. 72h Gr. 502

Fig. 1.

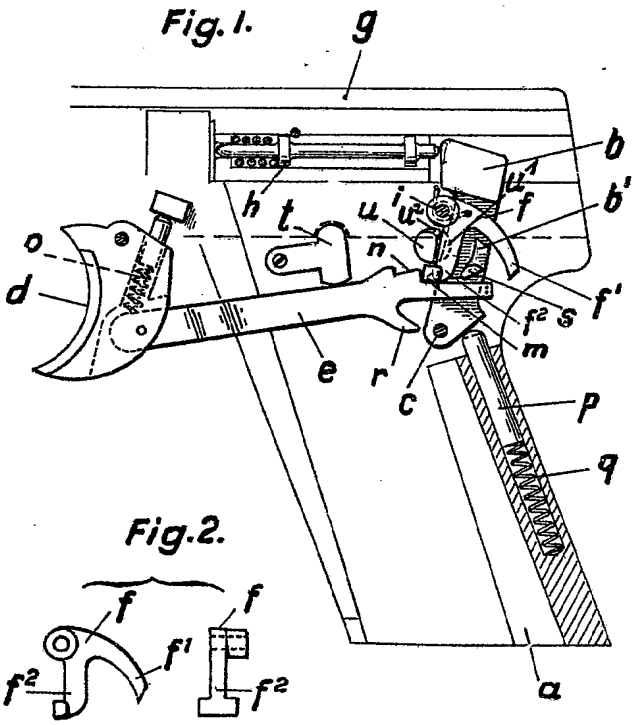


Fig. 2.

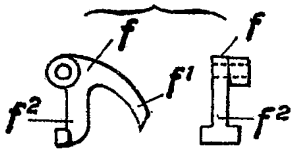


Fig. 3.

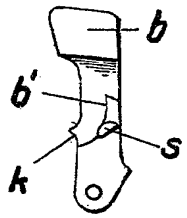
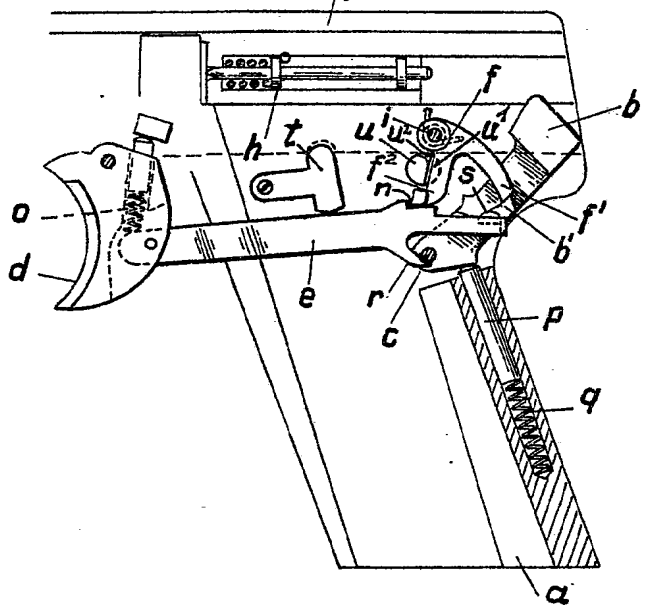


Fig. 4.



Atrius Ex. 1002--0260

United States Statutory Invention Registration [19]

[11] **Reg. Number: H107**

Bauer [45] **Published: Aug. 5, 1986**

[54] **TRIGGER MECHANISM**

[75] Inventor: **Kevin T. Bauer**, Warwick, N.Y.

[73] Assignee: **The United States of America as represented by the Secretary of the Army**, Washington, D.C.

[21] Appl. No.: **777,793**

[22] Filed: **Sep. 19, 1985**

[51] **Int. Cl.**[4] **F41D 11/02**

[52] **U.S. Cl.** **89/149**; 89/148

Primary Examiner—Stephen C. Bentley

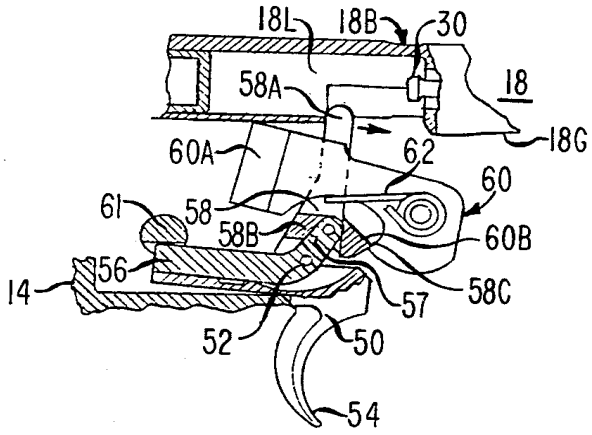
Attorney, Agent, or Firm—Anthony Lane; Robert Gibson; Edward F. Costigan

[57] **ABSTRACT**

A trigger mechanism for an automatic weapon which has a bolt carrier reciprocatably mounted in a receiver and biased to slide from a recoiled position to a firing position. The mechanism has a hammer positioned alongside the bolt carrier and pivotally mounted on the receiver for reciprocating between a retracted and a striking position. Also included are a bias spring, a trigger and a catch. The trigger is rotatably mounted on the receiver while the bias spring is attached to the hammer for urging it into a striking position. The catch is connected between the trigger and the hammer for releasably holding the hammer. The catch can retract the hammer in response to rotation of the trigger. The bolt carrier has a stop for engaging the hammer and holding the bolt carrier at its recoiled position. The catch is operable to release the bolt carrier from the stop by retracting the hammer. The bolt carrier also has a shoulder positioned for engaging the catch and causing it to release the hammer as the bolt carrier arrives at the firing position.

10 Claims, 13 Drawing Figures

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.



WIDE OPEN 002343 Atrius Ex. 1002--0261

FIG. 2

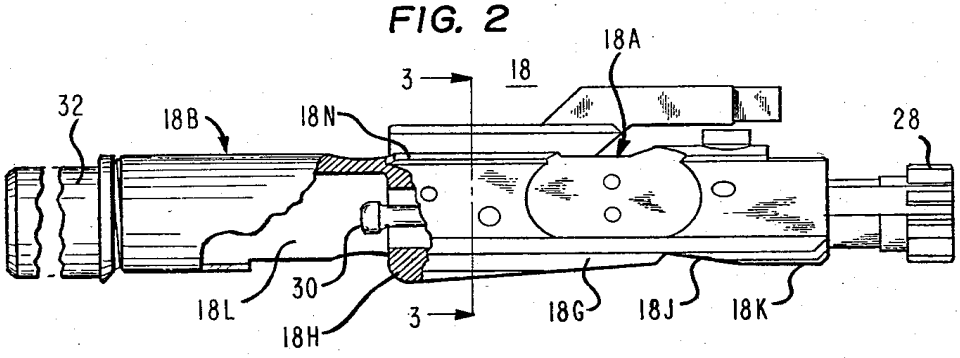


FIG. 3

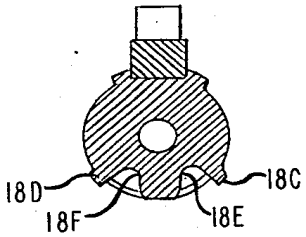


FIG. 5

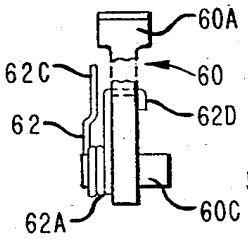


FIG. 6

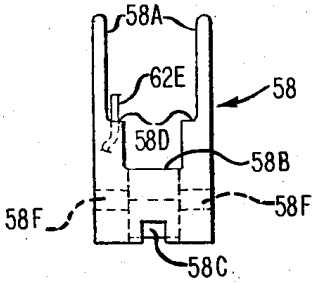
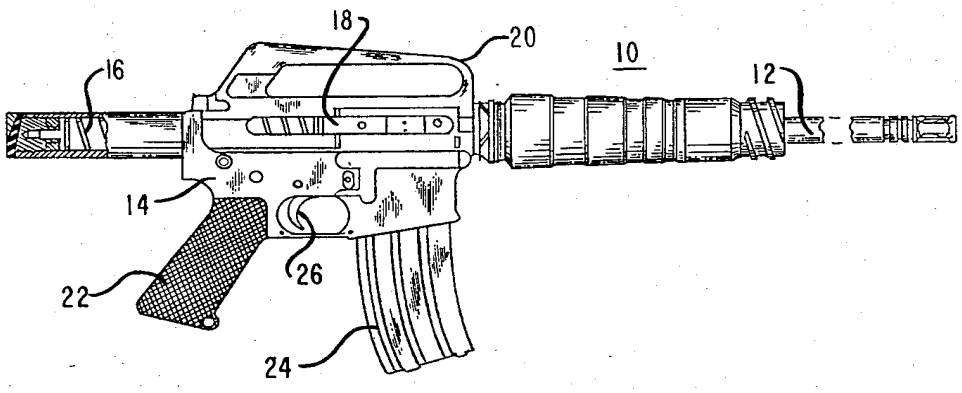


FIG. 1



WIDE OPEN 002344
Atrius Ex. 1002--0262

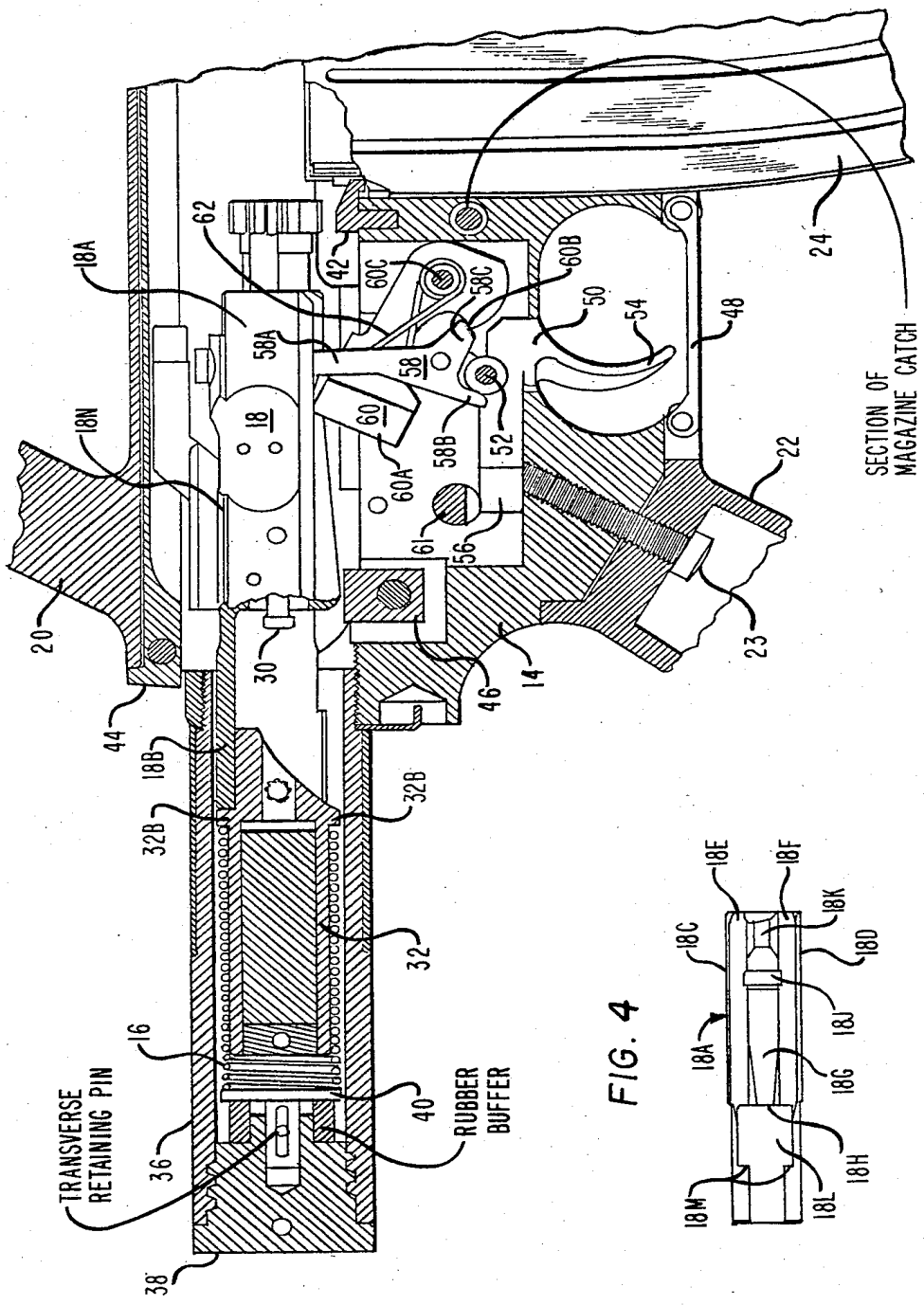


FIG. 7

FIG. 4

WIDE OPEN 002345
Atrius Ex. 1002--0263

FIG. 8A

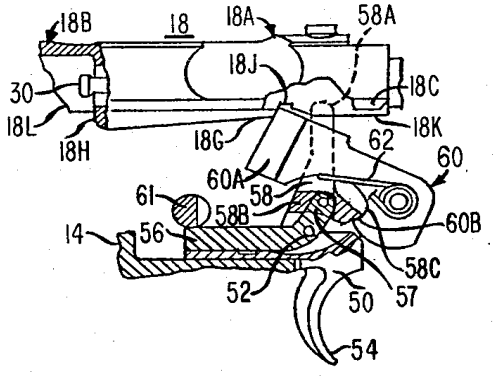


FIG. 8B

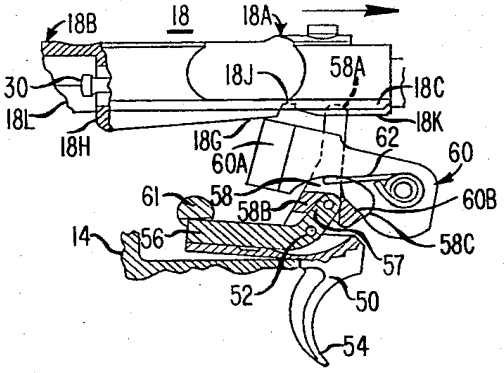


FIG. 8C

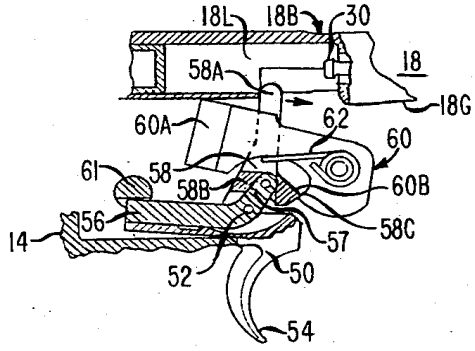


FIG. 8D

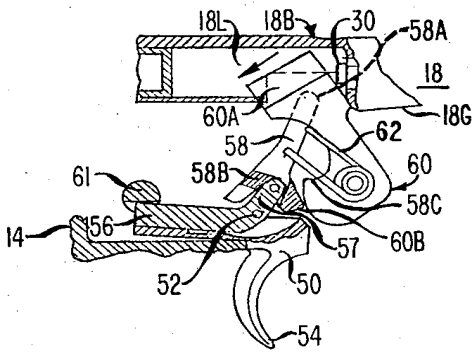


FIG. 8E

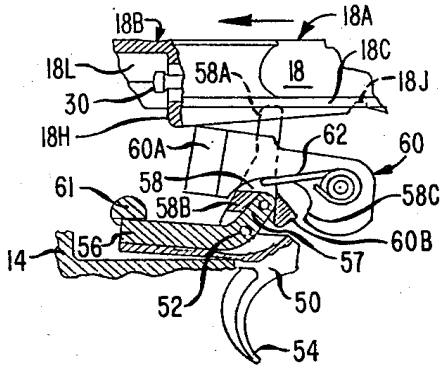
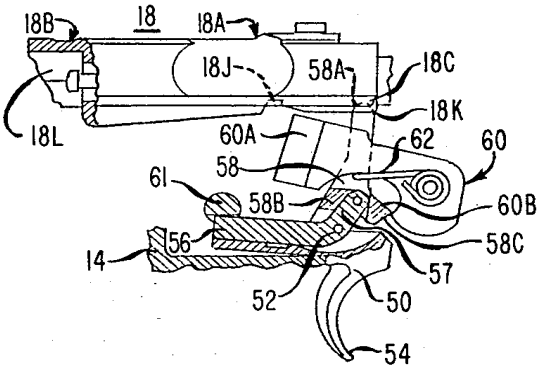


FIG. 8F



WIDE OPEN 002346
Atrius Ex. 1002--0264

TRIGGER MECHANISM

GOVERNMENT INTEREST

The invention described herein may be manufactured, used and licensed by or for the Government of governmental purposes without the payment to me of any royalties thereon.

BACKGROUND OF THE INVENTION

The present invention relates to trigger mechanisms for an automatic weapon and, in particular, to a device having a rapidly operable hammer for firing a weapon.

It is known to have a spring-biased bolt carrier that reciprocates with the assistance of a gas system driven by high pressure gas from the firing of a cartridge. These known systems allow the weapon to rapidly fire successive rounds without the need for operator intervention, provided the trigger is continuouslly depressed.

A disadvantage with the known mechanisms is that their components are too numerous and therefore unreliable and prone to jamming.

Accordingly, there is a need for a triggering mechanism useful for rapidly triggering an automatic weapon and employing relatively few parts.

SUMMARY OF THE INVENTION

In accordance with the illustrative embodiment demonstrating features and advantages of the present invention, there is provided a trigger mechanism for an automatic weapon having a receiver and a bolt carrier reciprocatably mounted in the receiver. The bolt carrier is biased to slide from a recoiled position to a firing position. The mechanism also has a hammer positioned alongside the bolt carrier and pivotally mounted on the receiver for reciprocating between a retracted and a striking position. Also included is a bias means attached to the hammer for urging it into a striking position. The mechanism also has a trigger rotatably mounted on the receiver and a catch means connected between the trigger and the hammer. The catch means can releasably hold the hammer and can retract the hammer in response to rotation of the trigger. The bolt carrier has a stop means and a toggle means. The stop means can engage the hammer and hold the bolt carrier at the recoiled position. The catch means is operable to release the bolt carrier from the stop means by retracting the hammer. The toggle means is positioned for engaging the catch means and causing it to release the hammer as the bolt carrier arrives at the firing position.

By employing such apparatus, a highly improved trigger mechanism is provided. In the preferred embodiment, an automatic weapon uses a spring loaded bolt carrier that uses a gas system to recoil the bolt carrier backwardly to compress the spring. This preferred mechanism employs a pivotally mounted trigger from which a lever articulates. This lever is used as a catch to hold a hammer. The hammer itself is used to hold the bolt carrier.

The preferred mechanism uses the trigger to rotate the lever and thus the hammer, causing it to retreat from a notch on the bolt carrier so that latter is driven forward. When the bolt carrier is driven to a firing position, preferably, a ridge on the carrier strikes the catch lever to release the hammer. Afterward the bolt carrier is returned by the preferred gas system and the hammer and lever are restored to a prefiring position by a ramp on the preferred bolt carrier. It will be noticed that this mechanism can work quickly with relatively few parts.

BRIEF DESCRIPTION OF THE DRAWING

The above brief description as well as other features and advantages of the present invention will be more fully appreciated by reference to the following detailed description of a presently preferred but nonetheless illustrative embodiment in accordance with the present invention when taken in conjunction with the accompanying drawings, wherein:

FIG. **1** is a side view of an automatic weapon incorporating principles of the present inventions;

FIG. **2** is a side view of the bolt carrier in the weapon in FIG. **1**;

FIG. **3** is a cross-sectional view through lines **3—3** of FIG. **2**;

FIG. **4** is a bottom view (reduced scale) of the carrier of FIG. **2**;

FIG. **5** is a front view of the hammer used in the weapon of FIG. **1**;

FIG. **6** is a back view of a lever used in the weapon of FIG. **1**;

FIG. **7** is a side view, partially in sections of the receiver and associated components of FIG. **1**;

FIG. **8A** shows a portion of the mechanism of FIG. **7** placed in a safe, seared position;

FIG. **8B** shows the condition of the mechanism of FIG. **8A** immediately after pulling the trigger;

FIG. **8C** shows the mechanism of FIG. **8B** just prior to release of the hammer;

FIG. **8D** shows the position of the mechanism of FIG. **8C** at the instant of firing;

FIG. **8E** shows the mechanism of FIG. **8D** as the gas system causes the bolt carrier to recoil; and

FIG. **8F** shows the mechanism of FIG. **8E** with the bolt carrier recoiled backwardly to the maximum extent.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. **1**, a weapon **10** is shown having a barrel **12**, a receiver **14** and a compression spring **16** for forwardly biasing bolt carrier **18**. The receiver **14** has a carrying handle **20** associated with it. Receiver **14** also has a butt handle **22** and a cartridge clip **24**. The trigger **26** is rotatably mounted within the body of receiver **14**.

Referring to FIG. **2**, the bolt carrier **18** is shown separately and in further detail. Generally the bolt carrier has a cylindrical shape and supports on its forward end a breech member **28** for locking a bullet or cartridge (neither shown) into the chamber of the barrel of the weapon.

Coaxially mounted in the central body **18A** of bolt carrier **18**, is firing pin **30**. Firing pin **30** extends forwardly through bolt carrier **18** to engage the cartridge that may lodge against the forward end of the breech **28**. In a well known fashion, striking the firing pin **30** can cause a firing of the cartridge.

Referring to FIGS. **2** and **3**, bolt carrier **18** is seen to have a pair of flanges or splines **18C** and **18D** bordering a pair of longitudinal grooves **18E** and **18F** running the length of the section **18A** of bolt carrier **18**.

Referring to FIGS. **2**, **3** and **4**, an axial ramp **18G** is shown on the underside of bolt carrier section **18A**. Axial ramp **18G** diverges from bolt carrier section **18A** in a rearward direction. Ramp **18G** terminates at its aft

WIDE OPEN 002347 Atrius Ex. 1002--0265

end in a rounded, hammer-driving surface **18H**. The opposite end of ramp **18G** is bordered by a stop means, shown herein as notch **18J**. Forward of notch **18J** is another ramp **18K** similar in construction to ramp **18G**.

Aft of bolt section **18A** is section **18B**. Bolt section **18B** is a hollow cylindrical member having on its underside an opening into an aft recess **18L**. This opening is illustrated in FIG. **4** as having a narrow rear portion and a wider forward portion. A toggle means is shown herein as a pair of shoulder **18M** forming what is referred to herein as the ridge of the aft recess **18L**. Connected to the aft end of section **18B** is the spring carrier **32** (FIG. **2**) described hereinafter in further detail.

Referring to FIGS. **5**, **6** and **7**, previously mentioned receiver **14** is shown in a longitudinal, cross sectional view. The receiver **14** has an upper frame **44** connected to receiver **14** by bosses such as boss **46**. Threaded to a rear aperture of receiver **14** is a spring case **36** closed at its aft end by threaded plug **38**. Previously mentioned compression spring **16** is shown mounted around previously mentioned spring carrier **32**. Carrier **32** is shown mounted on the open end of bolt section **18B**, the insertion length being limited by flange **32B**. The aft end of compression spring **16** is lodged against the head of support plate **40**, which has a dependent central pin fitting into the illustrated bore of plug **38**.

Bolt carrier **18** is illustrated with several splines, such as spline **18N**. These and the other splines are the sliding surfaces which contact a cylindrical bore through upper frame **44**.

Butt handle **22** is attached to receiver **14** by screw **23**. Clip **24** is held to receiver **14** by a magazine latch. Receiver **14** has an outline formed into a alcove spanned by trigger guard **48**. A trigger **50** is shown rotatably mounted to receiver **14** at pivot point **52**. The outwardly projecting, fingering portion **54** of trigger **50** is approximately at right angles to tang **56**. The remaining arm of trigger **50** (shown more clearly hereinafter) projecting upwardly at an angle of approximately 110° with respect to tang **56**. An eccentric **61** is rotatably mounted in receiver **14**. The eccentric **61** is in the form of a cylindrical rod having a central flattened surface. As illustrated the eccentric faces the outer end of tang **56** and acts as a stop against clockwise motion of the tang.

This upper arm of trigger **50** has articulating from it a lever **58**, also referred to as a catch means. From the side, lever **58** generally has an inverted Y shape. Lever **58** also has upper bifurcated arm **58A** (bifurcation a pair of members shown more clearly hereinafter). The aft, notched, lower arm **58B** acts as a stop against the central hub of trigger **50** while the forward, lower arm **58C** acts as a spur.

Rotatably mounted in receiver **14** is hammer **60** having a thickened outer end **60A**. Projecting at an acute angle with respect to the thickened end **60A** is a tripping arm **60B**, sized and positioned to engage the spur **58C**.

A bias means is shown herein as coil spring **62**, coaxially mounted around the hub **60C** of hammer **60**. As disclosed hereinafter in further detail, spring **62** urges hammer **60** and lever **58** to rotate in opposite directions, clockwise and counterclockwise, respectively.

Referring to FIG. **5**, the forward side of hammer **60** is shown with spring **62** coiled about hub **60C**. Spring **62** is a symmetrical spring with the right portion (this view) broken away for clarity. The left coil **62***a* terminates in an upper arm **62C**. Coil **62A** and a right coil (not shown) is spanned by inverted, U-shaped wired **62D**.

Referring to FIG. **6**, the previously illustrated lever **58** is shown having a pair of arms **58A** forming a bifurcation in this rear view. Spur **58C** is partially visible through a lower notch in aft arm **58B**. Members **58A** are shown with their upper reaches narrowed to provide shoulders **58D**. Shoulders **58D**, act as a surface against which the upper end **62E** of the spring can act. (End **62E** is the end complementing end **62C** of FIG. **5**). The bore **58F** for journaling lever **58** is shown herein in phantom.

Referring to FIG. **8A** a partially sectioned view of some of the components from FIG. **7** are given, special attention being given to trigger **50**, hammer **60** and bolt carrier **18**. A portion of spline **18C** is broken away for illustrative purposes and to reveal more clearly the notch **18G**. Because it is sectional, lever **58** is seen as composed of two symmetrical, Y-shaped halves spanned by transverse spur **58C** and the transverse element composing arm **58B**. The tip of the upper portion of lever **58A** is shown in phantom since it is on the far side of carrier section **18A**, riding in the groove flanked by spline **18D** (not visible this view but complementary to spline **18C**).

Also clearly shown in this view is that trigger **50** is formed by a lower fingering portion **54** that extends backwardly and underlies the bulk of the tang section **56**. Tang section **56** essentially lays in a U-shaped channel cut into the upper surface of triggering portion **54**. The tang portion **56** extends forwardly and is crooked upwardly at about 110°, pivot **52** being located at the crook. The upper end **57** of tang portion **56** has a transverse bore for pivotally supporting lever **58**. It is noted that the upper reach of portion **57** is surrounded on all sides by the framework of lever **58**. Due to the proximity of the transverse members **58B** and **58C**, the freedom of motion of lever **58** about portion **57** is limited.

In this view, eccentric **61** is shown rotated 90° in comparison to the position shown in FIG. **7**. Accordingly, the eccentric bears upon the rearmost end of tang **56**, thereby holding it against the wall of receiver **14**. Under these circumstances, trigger **50**, including its tang section **56**, cannot move. Therefore, the striking face of hammer head **60A** remains lodged in notch **18G**. Although bolt carrier **18** is urged forward by compression spring **16** (FIG. **7**) the connection between hammer head **60A** and notch **18G** prevents any movement.

To facilitate an understanding of the principles associated with the foregoing apparatus its operation will now be brief described. To allow firing of the weapon, eccentric **61** is rotated 90° to the position shown in FIG. **8B**. It will be noticed the coil of spring **62**, is translationally fixed at the pivot of hammer **60** and urges lever **58** and hammer **60** in opposite directions. Spring **62** urges lever **58** to rotate counterclockwise so that the stop **58B** of the lever is driven fully against the rearward face of arm **57**. Similarly, hammer **60** is urged to rotate clockwise but the contact between tripping arm **60***b* and spur **58***c* prevents further rotation.

When the trigger **50** is pulled, it rotates arm **57** clockwise to drive spur **58C** into arm **60B** and rotates hammer **60** counterclockwise. The rotation of hammer **60** is sufficient to draw it away from notch **18J** so that bolt carrier **18** begins to move into the position illustrated in FIG. **8B**. As bolt carrier **18** travels forwardly, it does not immediately disturb lever **58**. Accordingly, the spur

Atrius Ex. 1002--0266

58C remains in contact with the arm 60B so that hammer 60 is not free to rotate clockwise.

As bolt carrier 18 travels forwardly, it does, to a limited extent, drive hammer 60 counterclockwise through the inclined surface of axial ramp 18G. Eventually, hammer head 60A rides past the rounded edge 18H marking the transition between the forward and rear sections 18A and 18B, respectively, of bolt carrier 18. However, hammer 60 does not rotate into recess 18L because of the previously described holding action provided by spur 58C. It will be noted that as bolt carrier 18 travels forwardly, the upper sections 58A of the lever 58 are not immediately disturbed since they ride in the grooves flanked by the splines such as spline 18C.

Eventually, bolt carrier 18 travels sufficiently forward that the upper portions 58A of lever 58 and hammer 60 are protruding into recess 18L. It will be noted that for the positions illustrated in FIG. 8C, the corner of hammer 60 protruding into recess 18L does not touch the sides of recess 18L since hammer head 60A is sized to fit within the narrower opening on the underside of recess 18L. The shoulder 18M of recess 18L, however, engages the tip of lever arm 58A. Consequently, continued forward motion of bolt carrier 18 from the position illustrated in FIG. 8C causes clockwise rotation of lever 58, in opposition spring 62. As a result, spur 58C begins to move away from its seared position on arm 60B of hammer 60.

Eventually hammer 60 is released and is driven clockwise under the driving force of spring 62 against firing pin 30, as illustrated in FIG. 8D. Lever 58 has also rotated clockwise somewhat due to the momentum imparted to it by its collision with the shoulder 18M of bolt carrier 18. The striking of firing pin 30 causes a shock that fires the cartridge adjacent to the forward end of the bolt carrier 18. Such firing produces high pressure gas from the combustion of the explosives of the cartridge. In a well known fashion, this explosive gas may be used to drive bolt carrier 18 backwards as shown in FIG. 8E. This backward motion causes the shoulder 18H of bolt carrier 18 to engage the forward face of hammer head 60A and drive it counterclockwise as shown.

Since hammer head 60A is now riding on the elevated portion of axial ramp 18G, it has freed itself from the connection to spur 58C of lever 58. Therefore, lever 58 is free to rotate counterclockwise under the driving action of spring 62 until stopped by element 58*b* touching trigger 50. Trigger 50 has cylindrical bosses protruding coaxially with pivot pin 52, through which pin 52 passes. Element 58*b* contacts these bosses. As hammerhead 60A rides down axial ramp 18G, its spur 58G returns clockwise against hammer arm 60B returns clockwise against spur 58C so that hammer 60 is now seared.

The inertia of bolt carrier 18 due to the force from the gas driving system (not shown) drives carrier 18 fully backwards to the position illustrated in FIG. 8F, the rearward travel being limited by impact with a rubber buffer through support plate 40. If the trigger 50 is kept in the position shown then hammer head 60A will remain sufficiently withdrawn to escape notch 18J. Consequently, hammer head 60A will pass notch 18J and return to the position shown in FIG. 8B to repeat another cycle. If the trigger 50 is released before hammer head 60A reaches notch 18J, a different result occurs. In particular, trigger arm 57 will rotate counterclockwise to so move spur 58C that hammer head 60A will descend onto ramp 18K. Consequently, the forward motion of carrier 18 will result in hammer head 60A sliding down ramp 18K into notch 18J to prevent further motion of bolt carrier 18. If the eccentric 61 is now engaged, the apparatus returns to the condition initially illustrated in FIG. 8A.

It is to be appreciated that various modifications may be implemented with respect to the above described preferred embodiment. While a single spring is shown for driving the lever, hammer and trigger, in some embodiments two or more springs may be used to separately drive these components. While a torsional spring is shown, in some embodiments a compression spring may be linked to various extensions of the components to drive them in the desired direction. Also while the hammer is shown engaging a notch, in some embodiments it may engage a shoulder of a simple protusion. Furthermore, the trigger tang illustrated for safety purposes may be eliminated where an alternate safety is employed. While a bifurcated lever is shown as a catch, in some embodiments bifurcation may be unnecessary and a single, upwardly extended lever arm may be employed instead. Moreover, various shapes, sizes and dimensions of the various illustrated components can be altered depending upon the desired strength, capacity, speed of operation, reliability, etc.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A trigger mechanism for an automatic weapon comprising:
   - a receiver;
   - a bolt mechanism reciprocatably mounted in said receiver and biased to slide from a recoiled position to a firing position;
   - a hammer positioned alongside said bolt mechanism and pivotally mounted on said receiver for reciprocating between a retracted and a striking position;
   - bias means attached to said hammer for urging it into a striking position;
   - a trigger rotatably mounted on said receiver; and
   - catch means connected between said trigger and said hammer for releasably holding said hammer, said catch means being operable to retract said hammer in response to rotation of said trigger, said bolt mechanism including:
   - stop means for engaging said hammer and holding said bolt mechanism at said recoiled position, said catch means being operable to release said bolt mechanism from said stop means by retracting said hammer; and
   - toggle means positioned for engaging said catch means and causing it to release said hammer as said bolt mechanism arrives at said firing position.

2. A trigger mechanism according to claim 1 wherein said catch means comprises:
   - a lever pivotally mounted on said trigger and extending toward said bolt mechanism.

3. A trigger mechanism according to claim 2 wherein said hammer includes:
   - an arm projecting toward said lever when said hammer is in said retracted position, said lever having a spur sized to engage said arm and keep said hammer in said retracted position.

WIDE OPEN 002349 Atrius Ex. 1002--0267

4. A trigger mechanism according to claim 3 wherein said toggle means of said bolt mechanism has a ridge projecting toward said lever for rotating it and causing said spur to release said hammer upon said bolt mechanism arriving at said firing position.

5. A trigger mechanism according to claim 4 wherein said stop means includes a notch on the surface of said bolt mechanism sized to receive said hammer, said spur being mounted to articulate from said trigger and sized to rotate said hammer retractively in response to rotation of said trigger.

6. A trigger mechanism according to claim 5 wherein said bias means is operable to urge said hammer and said lever to rotate in opposite directions, said lever having limited freedom of rotation, said bias means being operable to rotate said lever to the extent its freedom allows when said spur of said lever is engaging said arm of said hammer, said bias means being operable to retractively rotate said trigger.

7. A trigger mechanism according to claim 6 wherein said bolt mechanism includes an axial ramp positioned to retractively drive said hammer and lift its arm beyond interference with said spur of said lever, so that said bias means can return said lever to the full extent permitted by its freedom of rotation during mechanism recoil of said bolt mechanism.

8. A trigger mechanism according to claim 7 wherein said ridge of said bolt mechanism borders an aft recess in said mechanism, said bolt mechanism also including:

a coaxial firing pin positioned to be struck by said hammer upon said bolt mechanism arriving at said firing position and said ridge rotating said lever.

9. A trigger mechanism according to claim 8 wherein said lever includes:

a pair of members straddling said hammer, said aft recess in said bolt mechanism having an opening comprising a narrow portion contiguous to a wider portion, said ridge comprising the transition from said wider portion to said narrower portion to form a pair of shoulders, said members of said lever being sized and positioned to be driven by said shoulders upon said bolt mechanism arriving at said firing position.

10. A trigger mechanism according to claim 9 wherein said trigger includes:

a tang; and

a manually rotatable eccentric mounted in said receiver alongside said tang for rotating against said tang and eliminating the freedom of rotation of said trigger.

* * * * *

Atrius Ex. 1002--0268

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 18/325,225

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	64		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	280		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	320		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	14 minus 20 =	* 0	x =	0	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	* 1	x 192 =	192			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	856		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
18/325,225	05/30/2023		856	RARETRG 12US	14	4

CONFIRMATION NO. 5749

FILING RECEIPT

26875
WOOD, HERRON & EVANS, LLP
600 VINE STREET
SUITE 2800
CINCINNATI, OH 45202



Date Mailed: 07/05/2023

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Brian A. Blakley, Pinellas Park, FL;

Applicant(s)

ABC IP, LLC, Dover, DE;

Power of Attorney: The patent practitioners associated with Customer Number 26875

Domestic Priority data as claimed by applicant

This appln claims benefit of 63/374,941 09/08/2022

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 07/03/2023

Atrius Ex. 1002--0270

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/325,225**

Projected Publication Date: 03/14/2024

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

FIREARM TRIGGER MECHANISM

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

Atrius Ex. 1002--0271

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
Approved for use through 03/31/2021. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	Not Yet Assigned
Filing Date	Concurrently Herewith
First Named Inventor	Brian A. Blakley
Title	FIREARM TRIGGER MECHANISM
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	RARETRG 12US

SIGNATURE of Applicant or Patent Practitioner

Signature	/Glenn D. Bellamy/	Date (Optional)	May 30, 2023
Name	Glenn D. Bellamy	Registration Number	32,887
Title (if Applicant is a juristic entity)	Attorney of Record		
Applicant Name (if Applicant is a juristic entity)	ABC IP, LLC		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ *Total of 1 forms are submitted.

Doc Code: PA
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
Approved for use through 6/30/2021. OMB 0651-0035
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date
Not Yet Assigned	Concurrently Herewith

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

[x] I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 26875

OR

[ ] I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

[ ] The address associated with the above-mentioned Customer Number

OR

[ ] The address associated with Customer Number:

OR

[ ] Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

ABC IP, LLC

[ ] Inventor or Joint Inventor (title not required below)

[ ] Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

[x] Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

[ ] Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	
Name	LAWRENCE A. DEMINICO		
Title	PRESIDENT		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

[ ] Total of 1 forms are submitted.

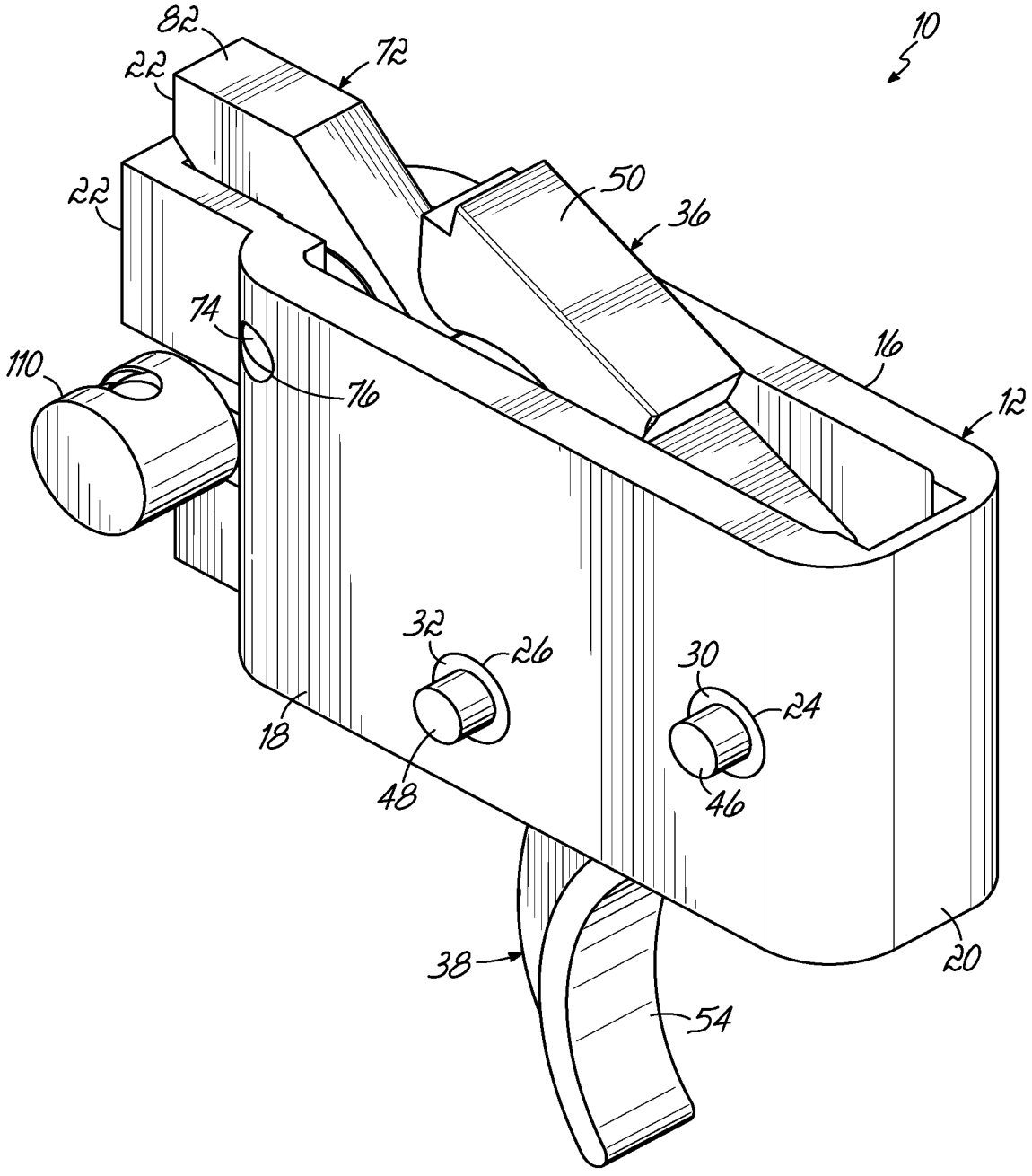


FIG. 1

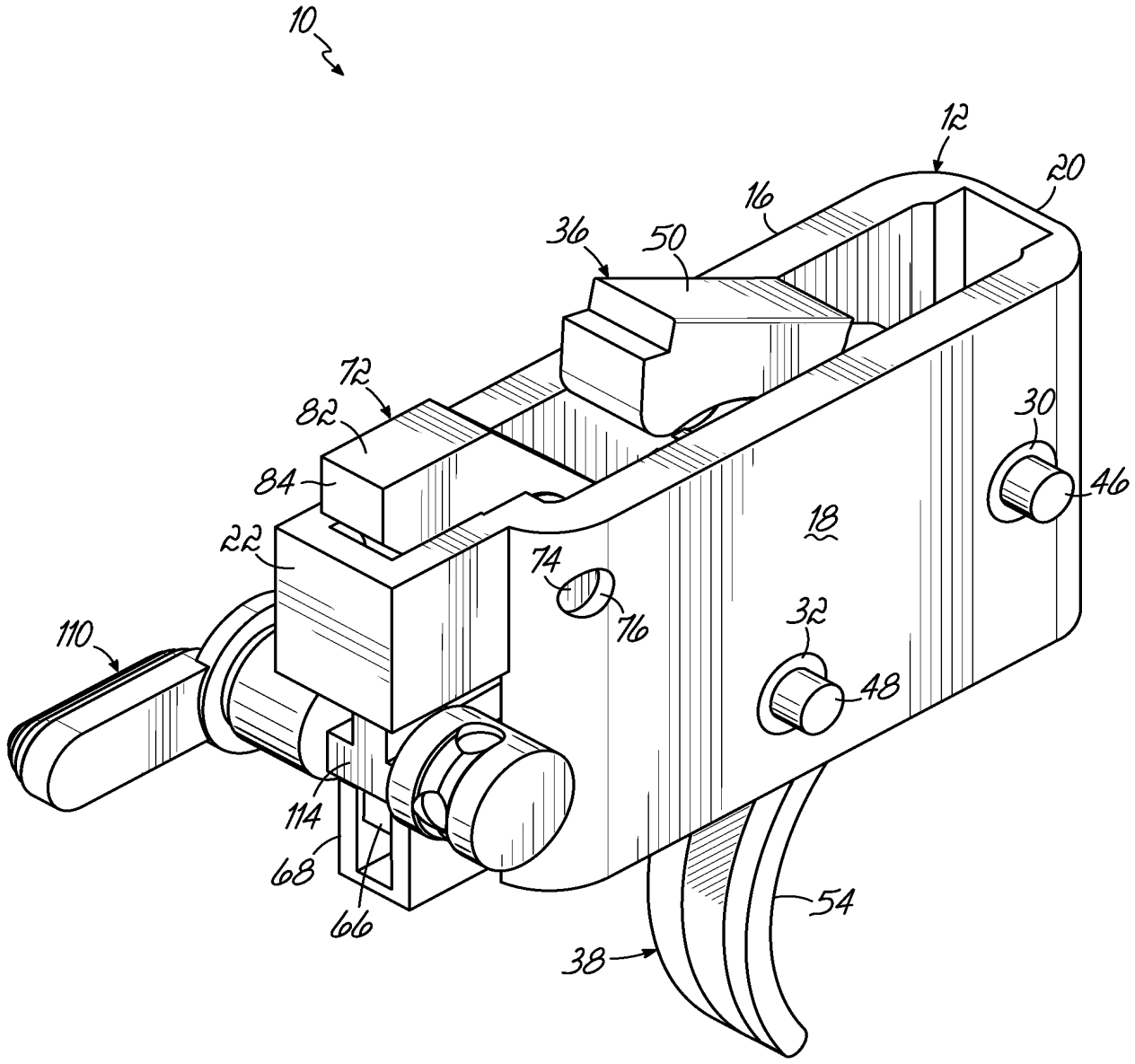


FIG. 2

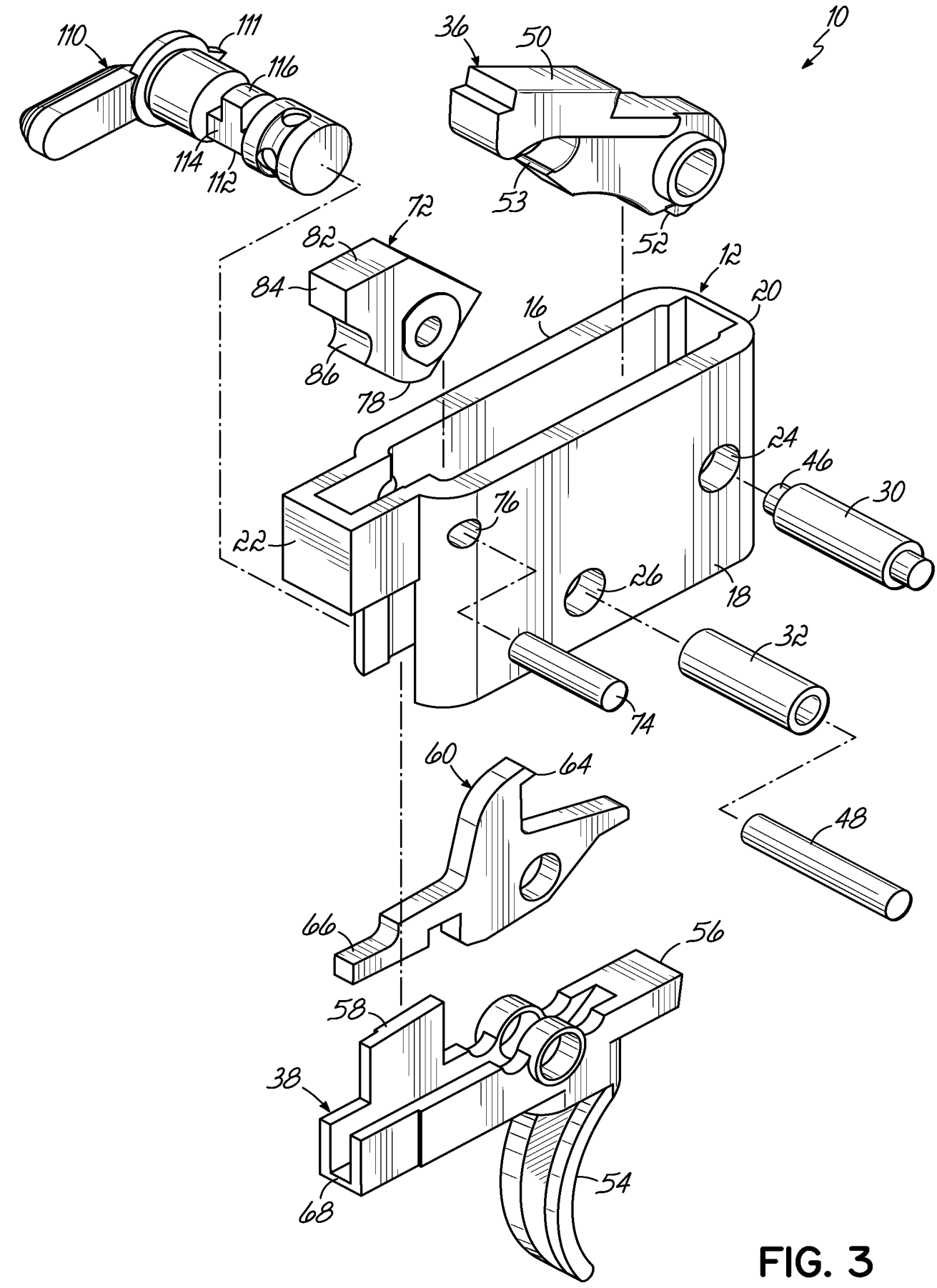


FIG. 3

Atrius Ex. 1002--0277

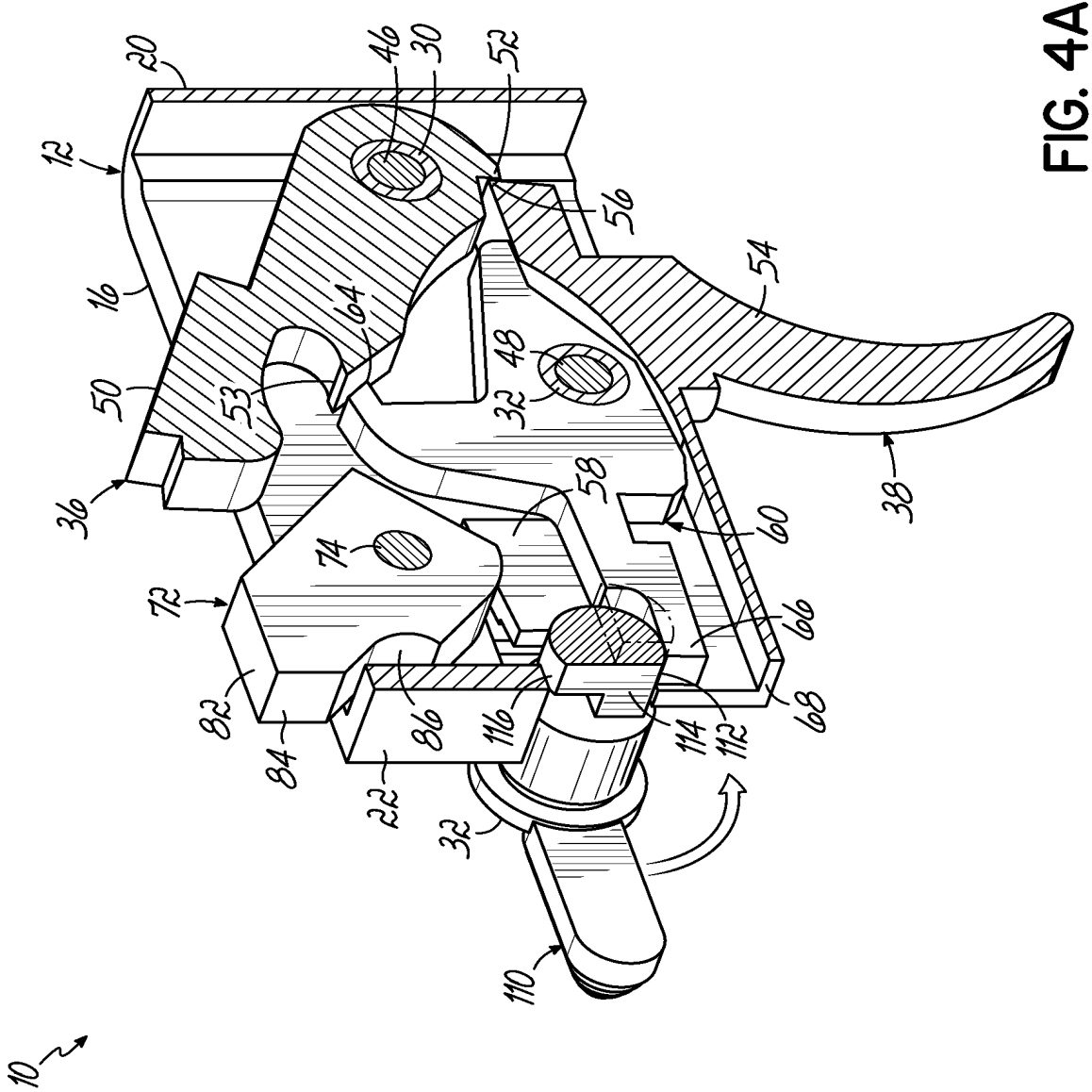

10
12
16
20
30
32
36
38
46
48
50
52
53
54
56
58
60
64
66
68
72
74
82
84
86
110
112
114
116
22

FIG. 4A

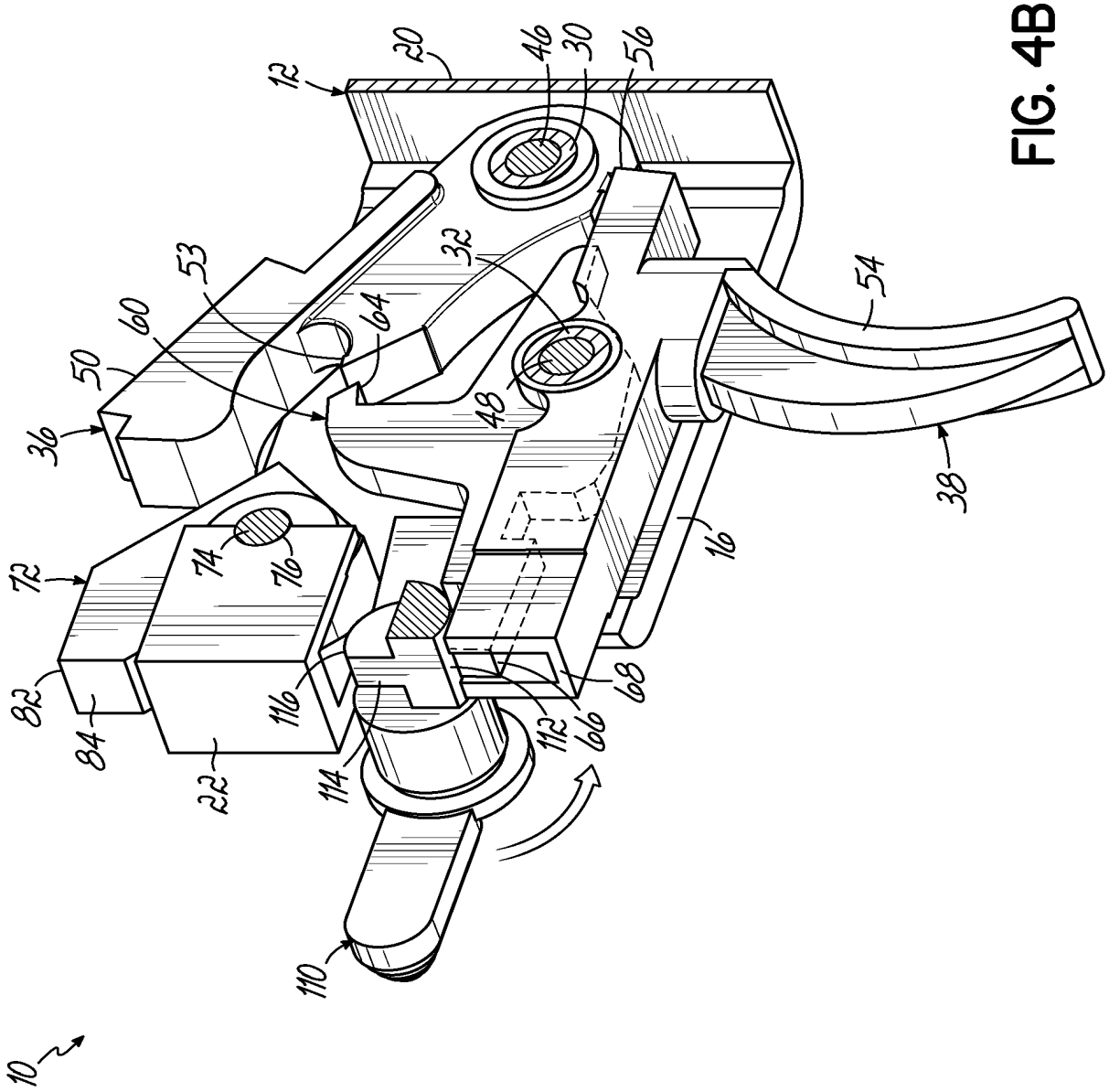

10
12
20
46
30
56
53
32
54
60
64
50
36
48
38
72
74
76
16
82
84
116
68
112
66
22
114
110

FIG. 4B

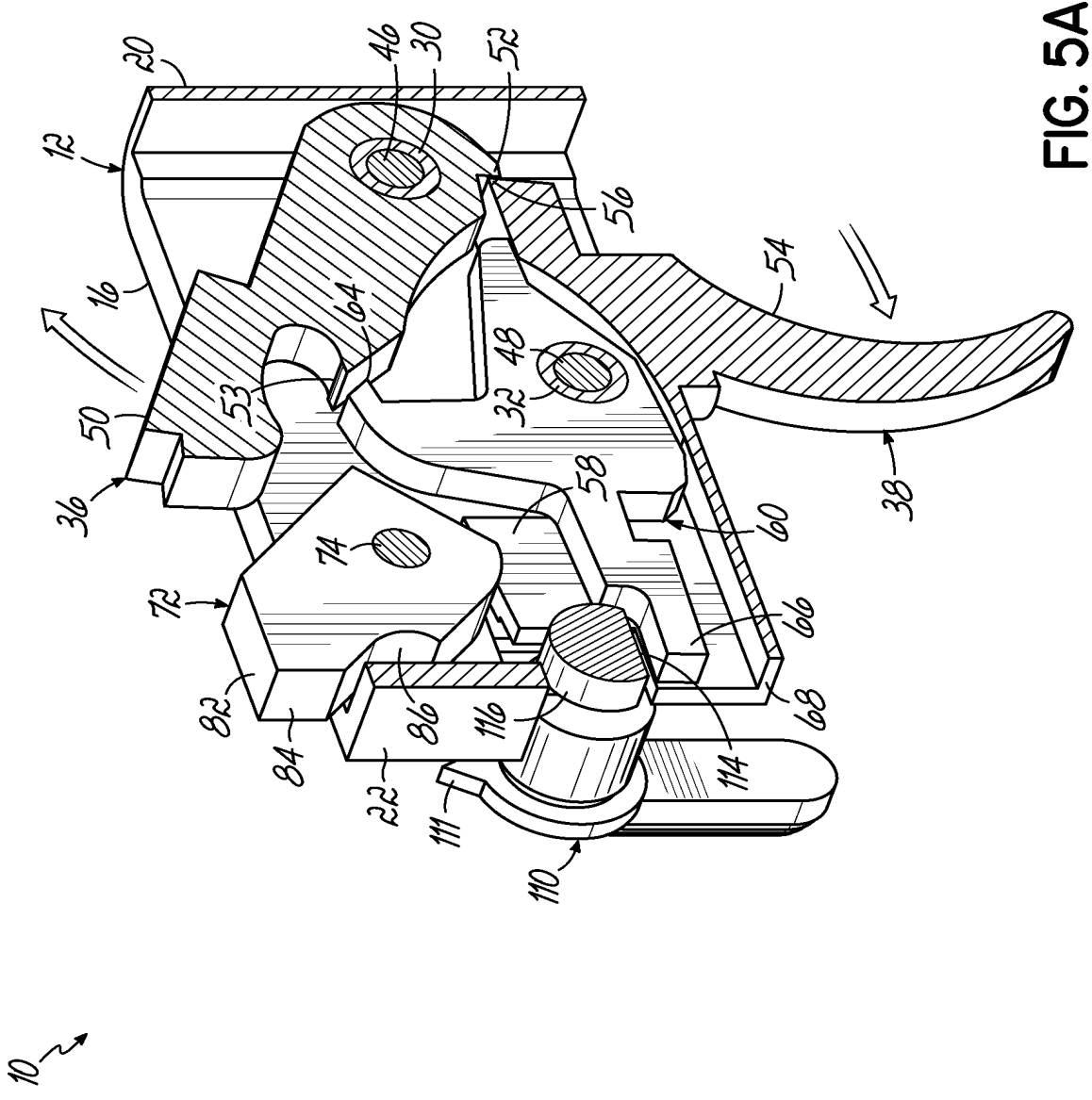

10
12
16
20
22
30
32
36
38
46
48
50
52
53
54
56
58
60
64
66
68
72
74
82
84
86
110
111
114
116

FIG. 5A

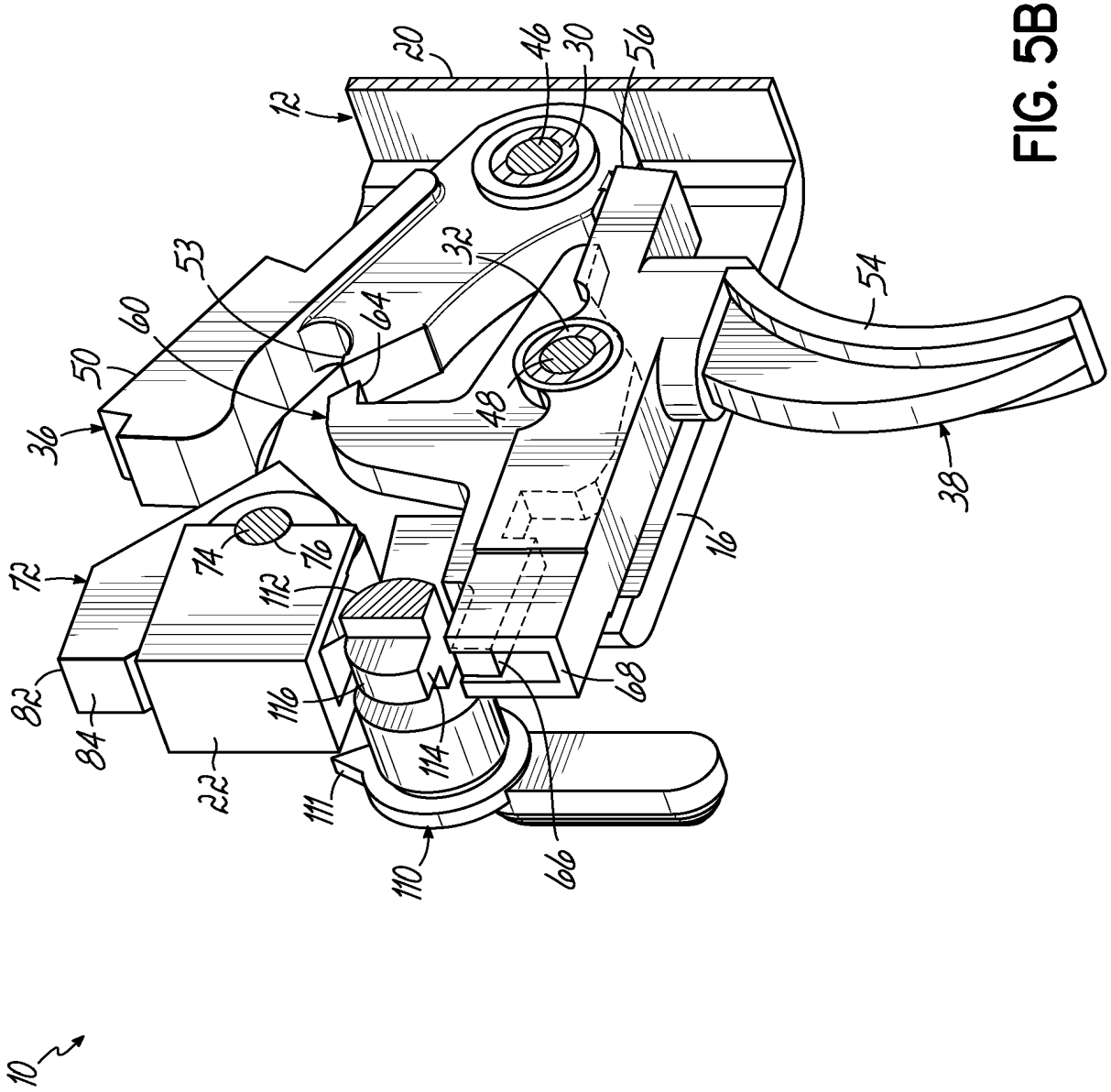

10
12
20
46
30
56
53
32
54
60
64
50
36
48
38
72
74
76
112
16
82
68
116
84
114
22
111
110
66

FIG. 5B

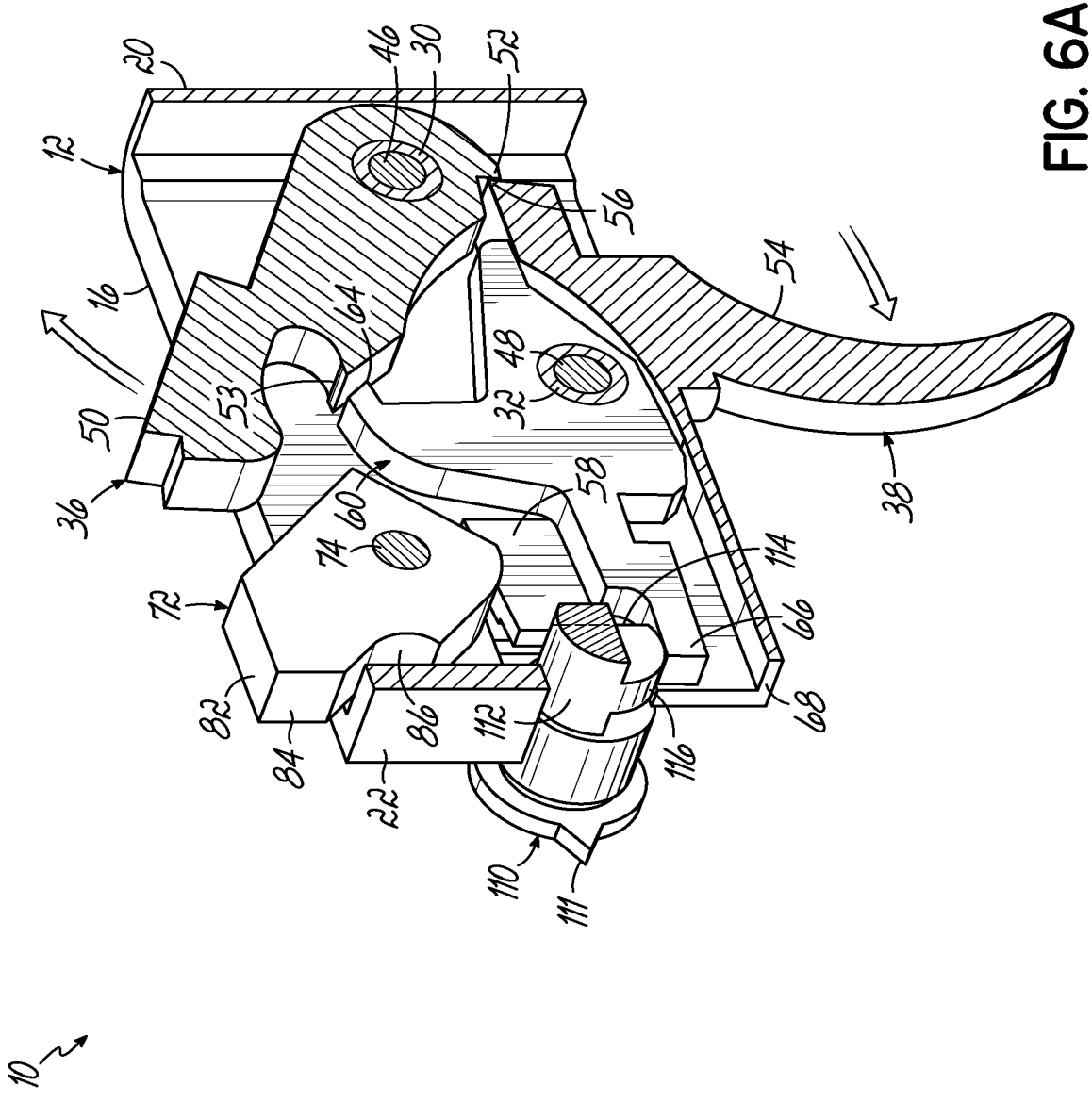

10
12
16
20
22
30
32
36
38
46
48
50
52
53
54
56
58
60
64
66
68
72
74
82
84
86
110
111
112
114
116

FIG. 6A

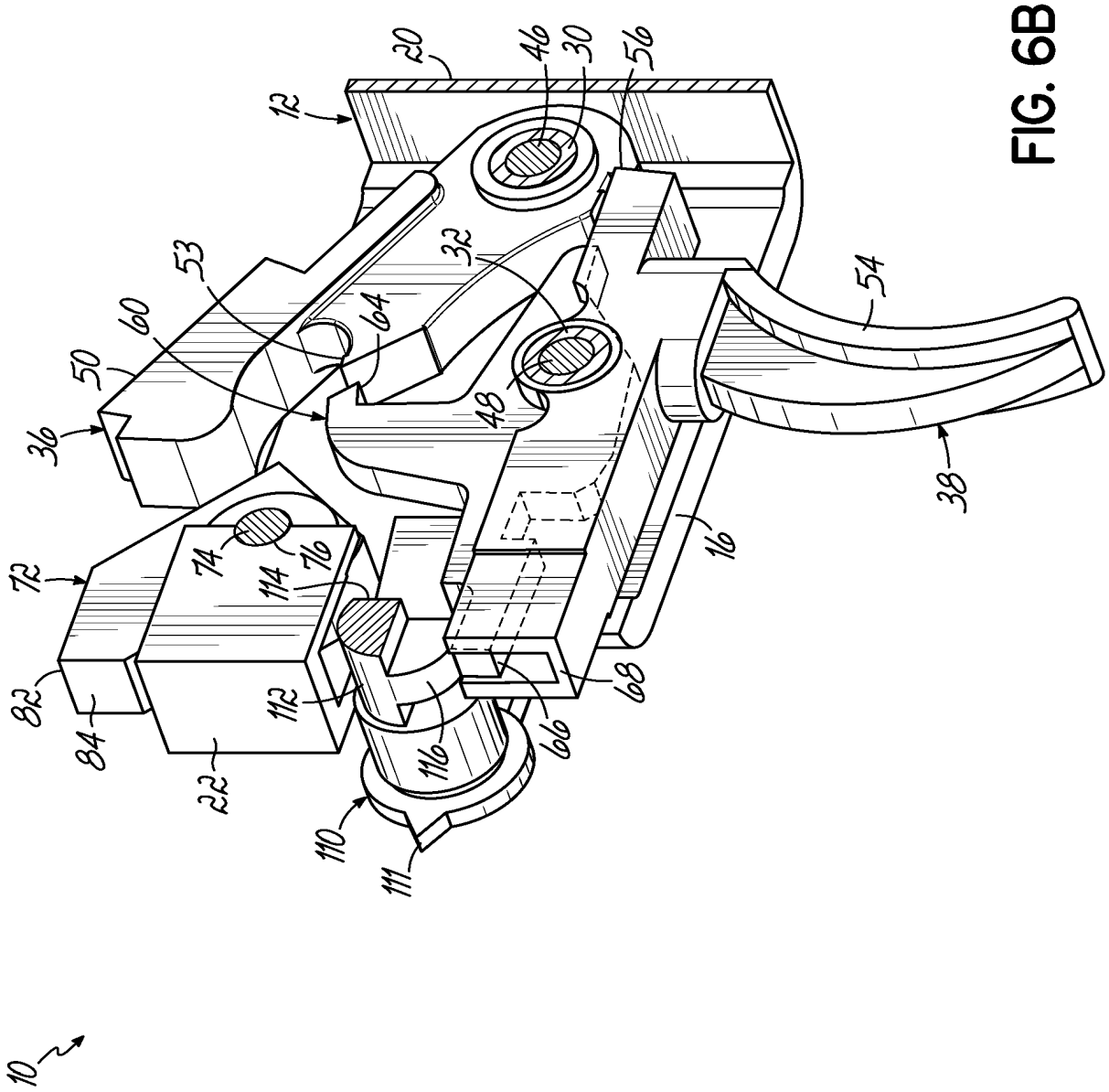

10
12
20
46
30
56
53
32
54
60
64
50
36
48
38
72
74
76
114
16
82
84
112
68
66
116
22
110
111

FIG. 6B

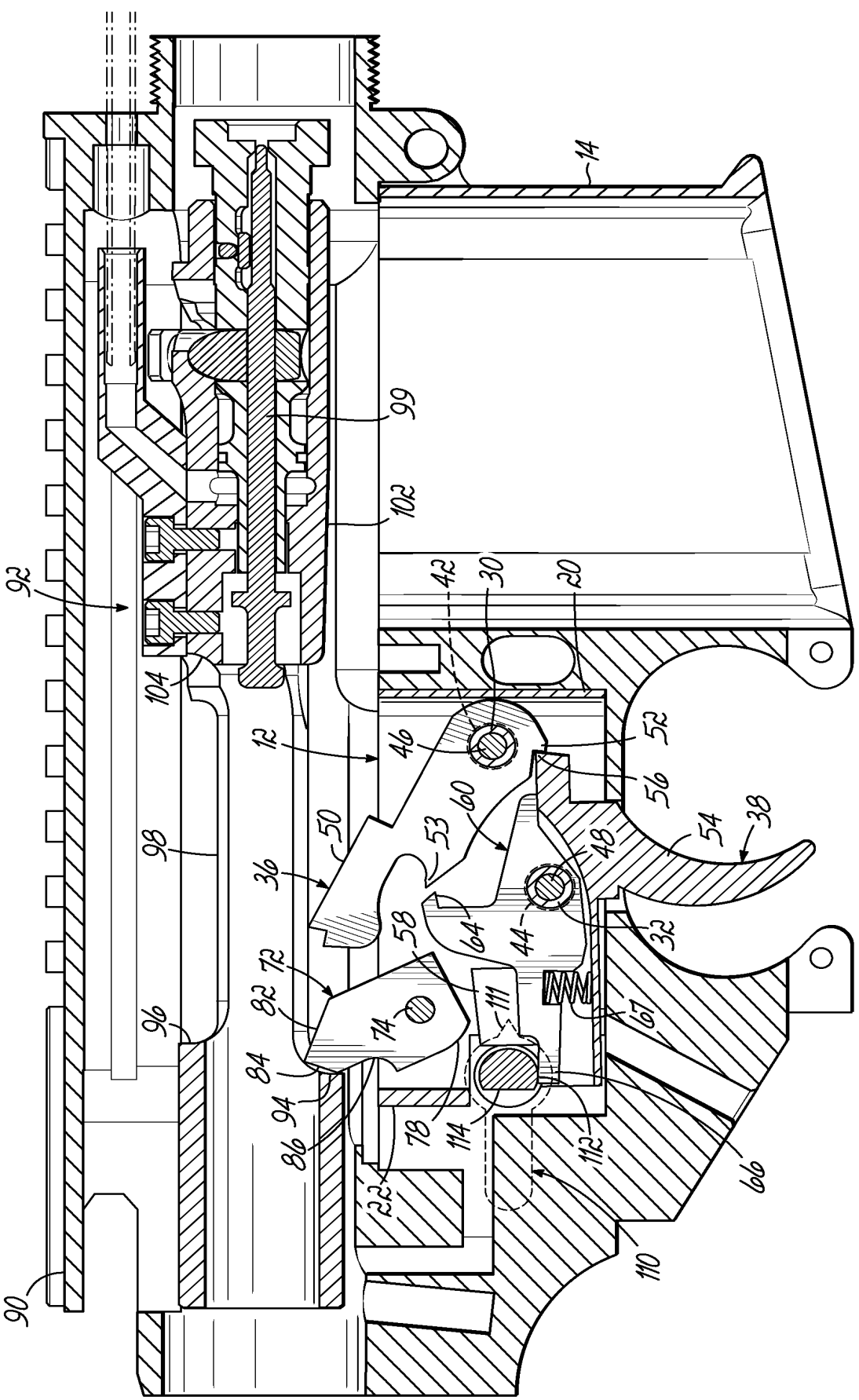

14
99
102
92
42
30
20
104
12
46
52
56
60
53
50
98
36
54
38
48
58
64
44
32
72
82
74
111
67
96
84
94
86
78
114
112
66
22
110
90

FIG. 7

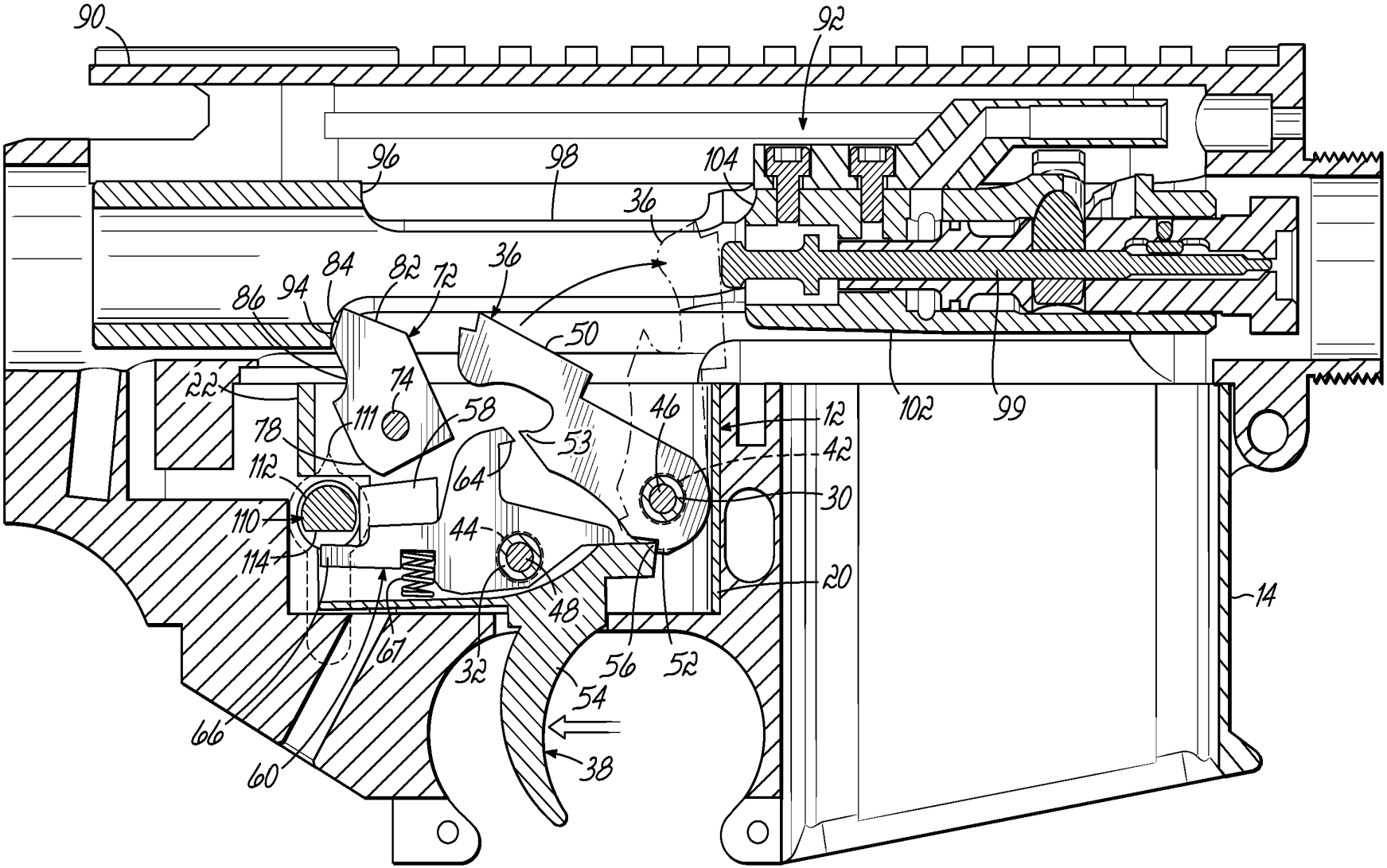


FIG. 8A

Atrius Ex. 1002--0285

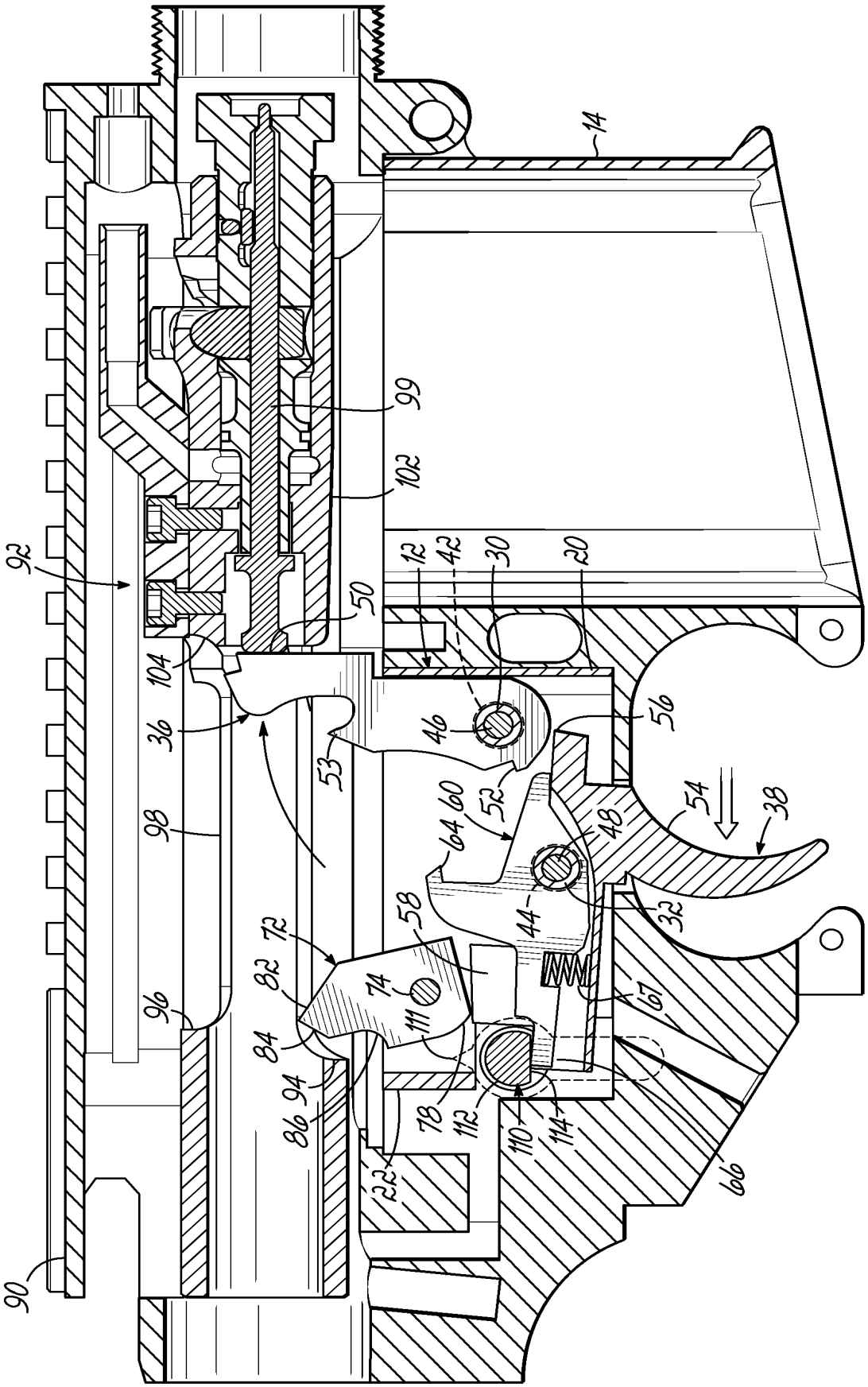

14
99
102
92
12
42
30
20
50
104
36
53
46
56
60
52
54
38
98
64
48
58
44
32
72
82
74
111
96
84
94
86
78
112
110
114
22
66
90

FIG. 8B

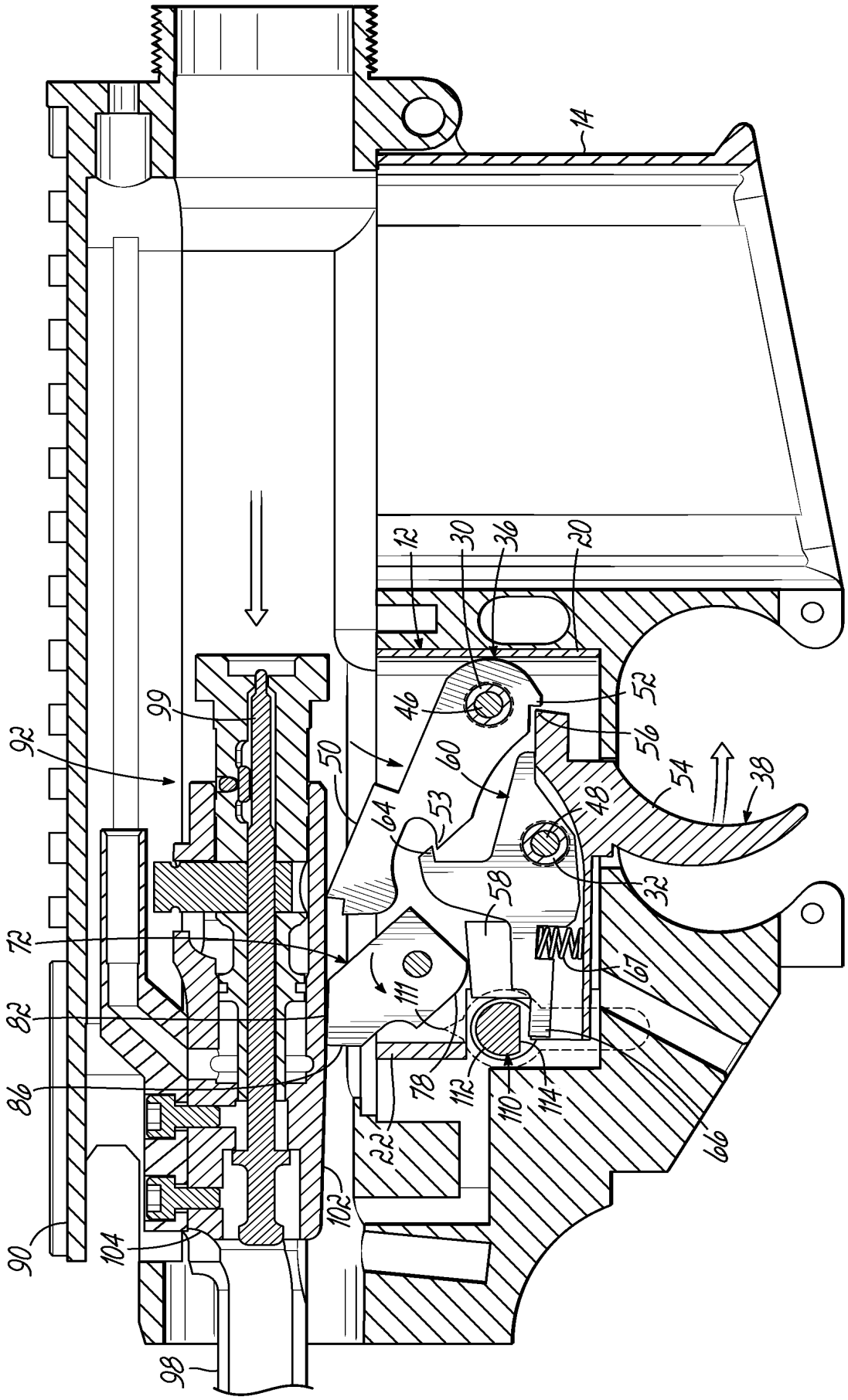

14
12
30
36
20
99
92
46
52
56
50
60
54
38
64
53
48
58
32
72
111
67
82
86
78
112
110
114
66
22
102
90
104
98

FIG. 8C

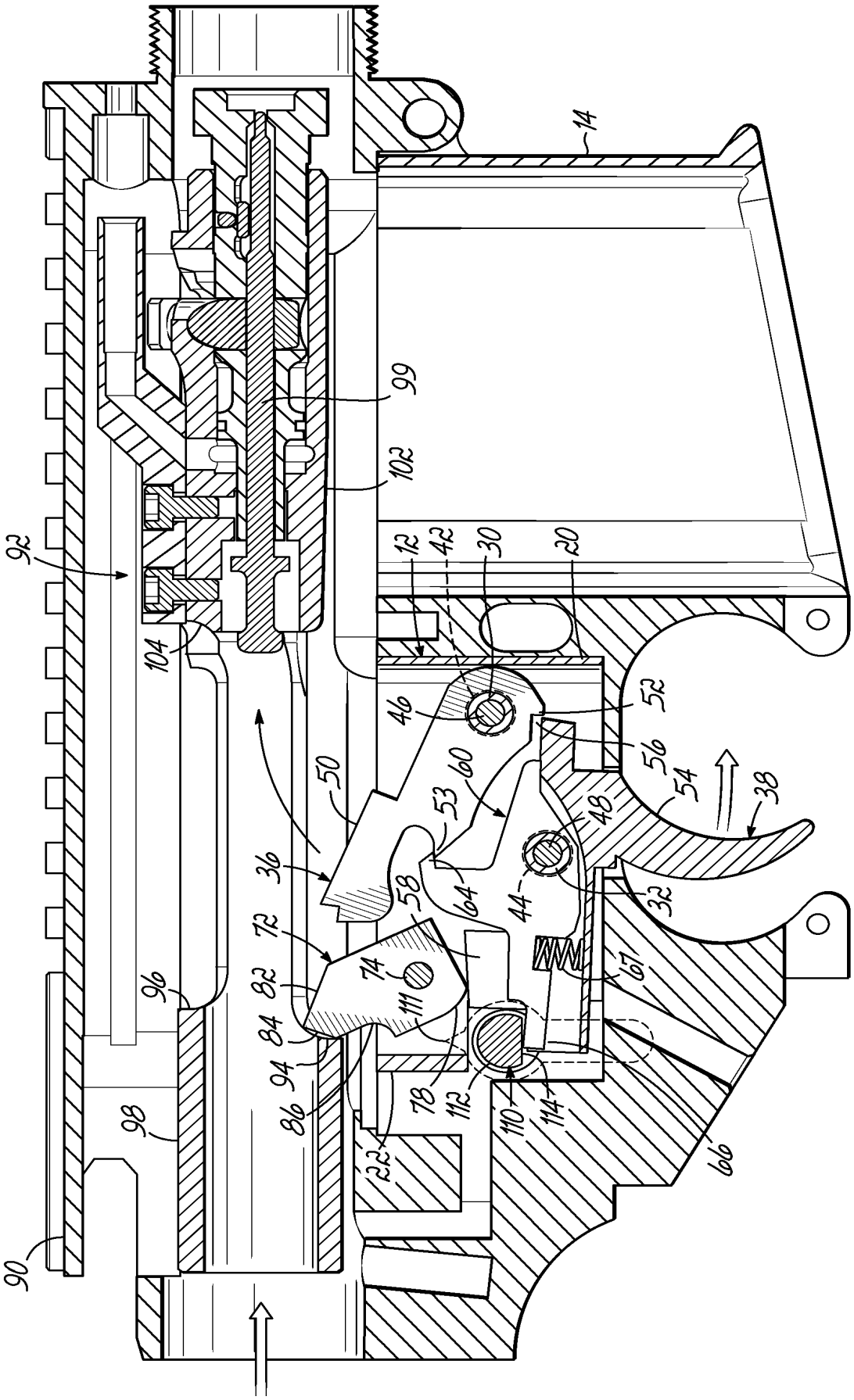

14
99
102
92
12
42
30
20
104
46
52
56
54
38
50
60
53
48
36
58
64
44
32
72
74
82
111
67
96
84
94
86
78
112
110
114
98
22
66
90

FIG. 8D

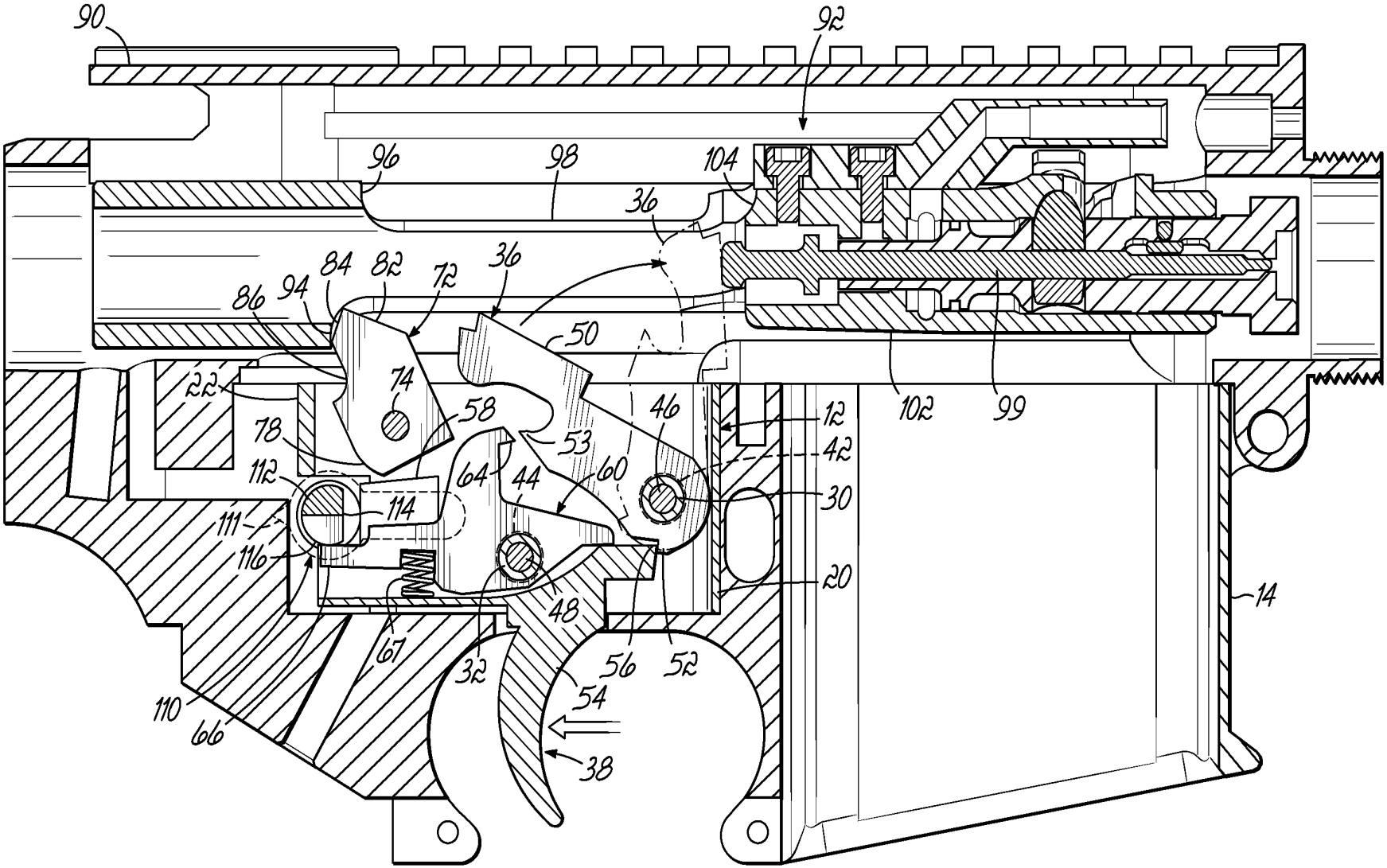


FIG. 9A

Atrius Ex. 1002--0289

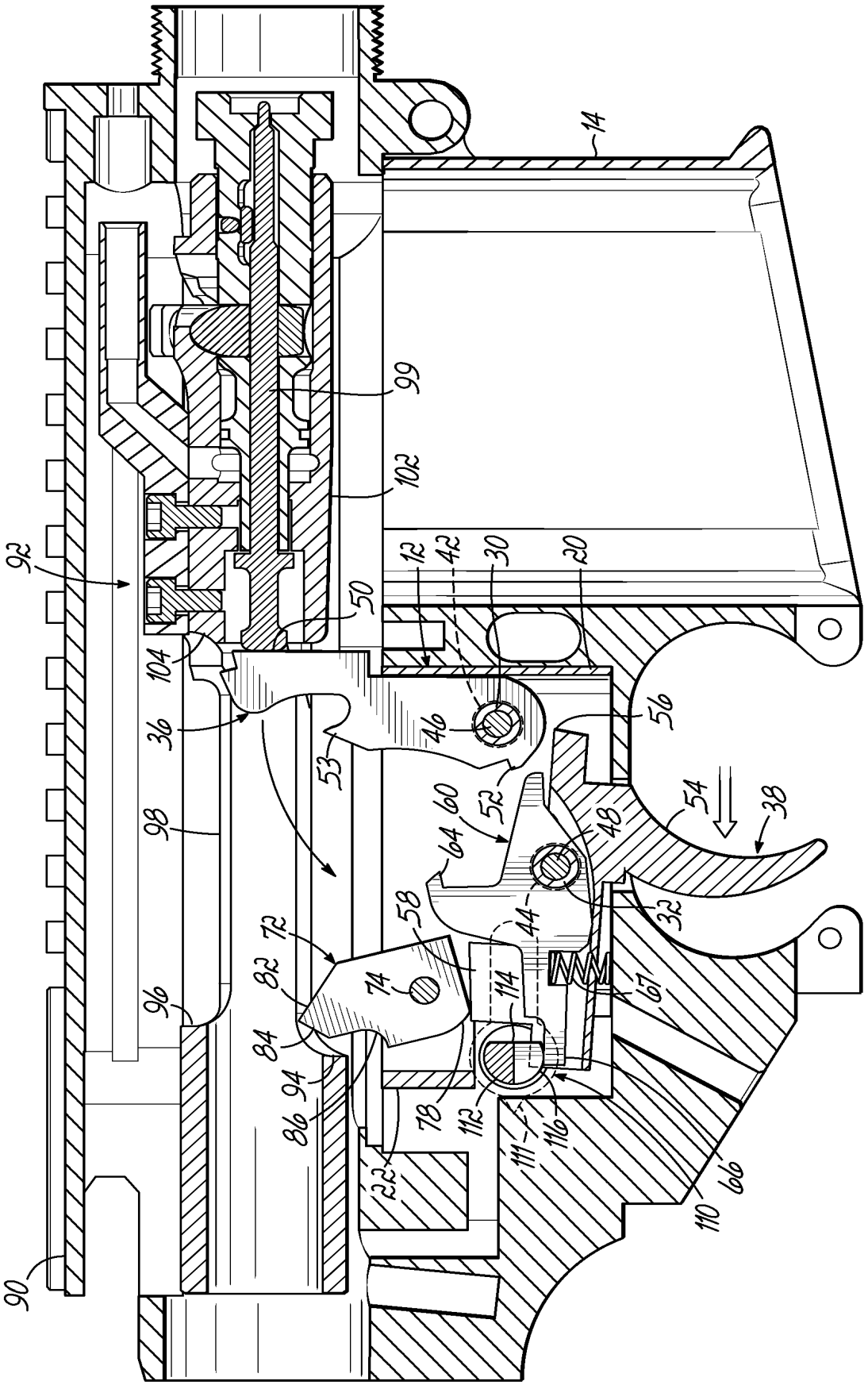

14
99
102
92
12
42
30
20
50
104
36
46
56
53
60
52
48
54
38
98
64
58
44
32
72
82
74
114
67
96
84
94
86
78
112
111
116
22
110
66
90

FIG. 9B

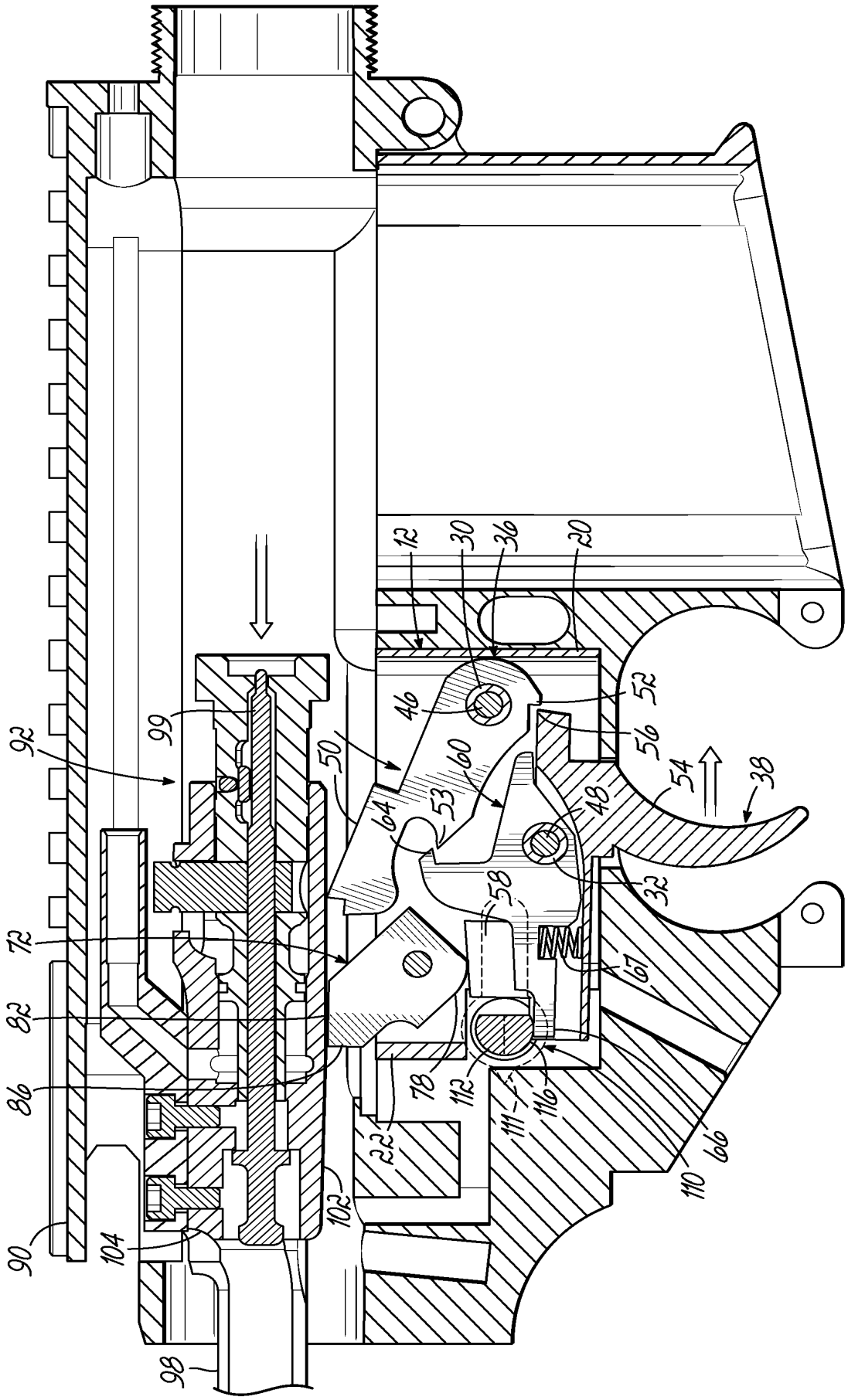

12
30
36
20
46
52
56
54
38
40
32
60
53
64
50
99
92
72
82
86
90
104
98
102
58
78
112
111
116
22
110
66
67

FIG. 9C

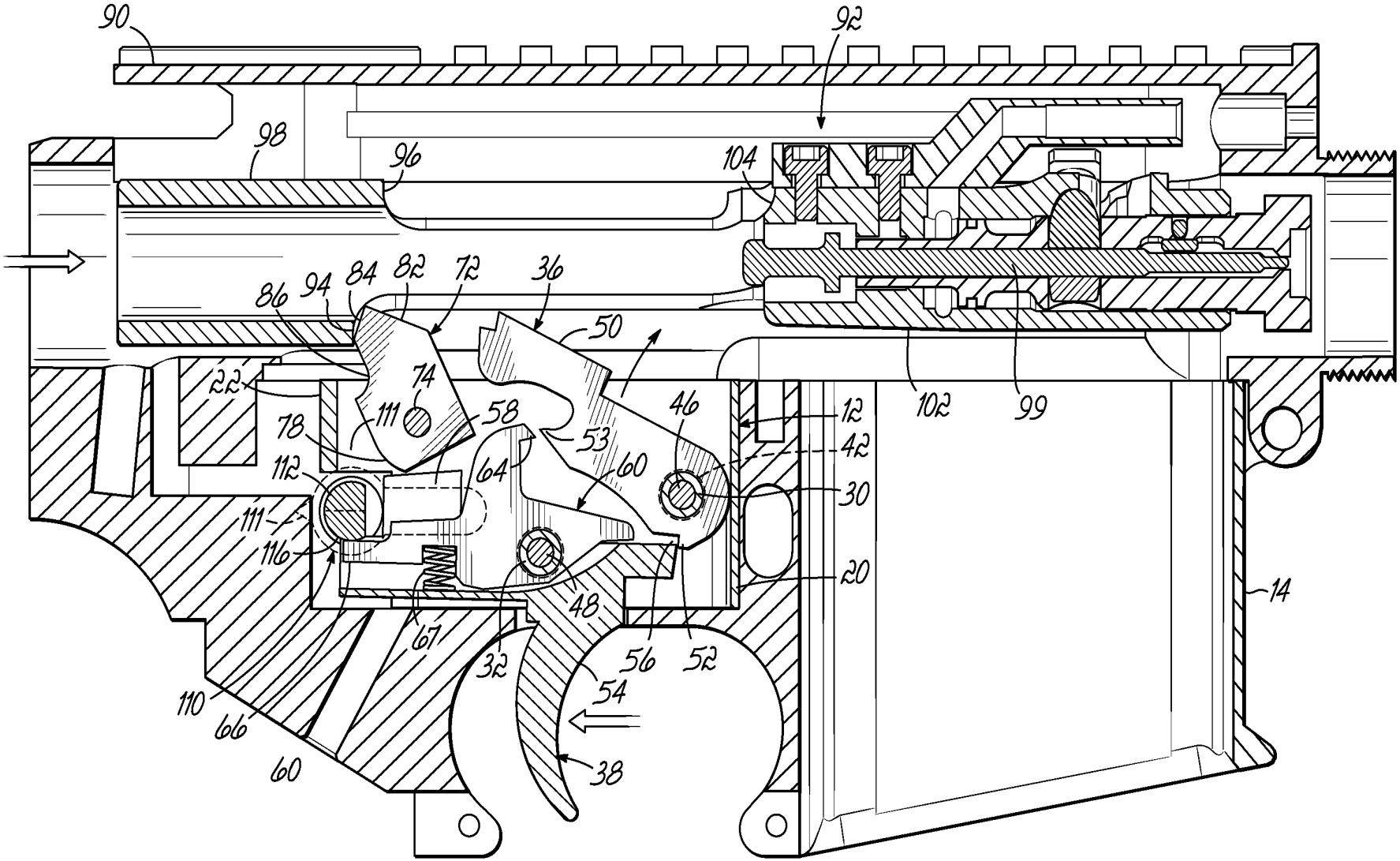


FIG. 9D

Atrius Ex. 1002--0292

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/325,225	05/30/2023 11:41:11 AM ET	RARETRG 12US

Title of Invention

FIREARM TRIGGER MECHANISM

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5749	FILED BY	Jane Walker
PATENT CENTER #	62172026	AUTHORIZED BY	Glenn Bellamy
CUSTOMER #	26875	FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Mr. Brian A. Blakley

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 8789	E20235TB42176613	Jane Walker

PRE-AUTHORIZED ACCOUNT	PRE-AUTHORIZED CATEGORY
233000	37 CFR 1.16 (National application filing, search, and examination fees); 37 CFR 1.17 (Patent application and reexamination processing fees)

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
2111	UTILITY PATENT APPL. SEARCH FEE	280.00	1	280.00
4011	BASIC FILING FEE- UTILITY	64.00	1	64.00
2311	EXAMINATION OF ORIGINAL PATENT APPLICATION	320.00	1	320.00
2201	EACH INDEPENDENT CLAIM IN EXCESS OF THREE	192.00	1	192.00
			TOTAL AMOUNT:	$856.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized

by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RARETRG 12US
	Application Number	
Title of Invention	FIREARM TRIGGER MECHANISM	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
Mr.	Brian	A.	Blakley	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	Pinellas Park	State/Province	FL	Country of Residence	US

Mailing Address of Inventor:

Address 1	8 The Green, Suite A
Address 2	

City	Dover	State/Province	DE
Postal Code	19901	**Country**	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	26875		
Email Address	whedock@whe-law.com	Add Email	Remove Email

Application Information:

Title of the Invention	FIREARM TRIGGER MECHANISM		
Attorney Docket Number	RARETRG 12US	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	18	**Suggested Figure for Publication (if any)**	

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RARETRG 12US
	Application Number	
Title of Invention	FIREARM TRIGGER MECHANISM	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	26875		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Claims benefit of provisional	63/374941	2022-09-08

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RARETRG 12US
	Application Number	
Title of Invention	FIREARM TRIGGER MECHANISM	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RARETRG 12US
	Application Number	
Title of Invention	FIREARM TRIGGER MECHANISM	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RARETRG 12US
	Application Number	
Title of Invention	FIREARM TRIGGER MECHANISM	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	ABC IP, LLC		
Mailing Address Information For Applicant:			
Address 1	8 The Green, Suite A		
Address 2			
City	Dover	**State/Province**	DE
Country	US	Postal Code	19901
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RARETRG 12US
	Application Number	
Title of Invention	FIREARM TRIGGER MECHANISM	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Glenn D. Bellamy/			Date (YYYY-MM-DD)	2023-05-30
First Name	Glenn	Last Name	Bellamy	Registration Number	32,887

Additional Signature may be generated within this form by selecting the Add button. Add

PTO/AIA/14 (01-22)
Approved for use through 05/31/2024. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	RARETRG 12US
	Application Number	
Title of Invention	FIREARM TRIGGER MECHANISM	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

FIREARM TRIGGER MECHANISM

Related Applications

[0001] This application claims the priority benefit of US Provisional Patent Application No. 63/374,941 filed September 8, 2022, which is hereby incorporated by reference herein as if fully set forth in its entirety.

Field of the Invention

[0002] The present invention relates generally to a firearm trigger mechanism, and more particularly to a semiautomatic trigger that is selectively mechanically reset by movement of the bolt carrier.

Background of the Invention

[0003] In a standard semiautomatic firearm, actuation of the trigger releases a sear, allowing a hammer or striker to fire a chambered ammunition cartridge. Part of the ammunition's propellant force is used to cycle the action, extracting and ejecting a spent cartridge and replacing it with a loaded cartridge. The cycle includes longitudinal reciprocation of a bolt and/or carrier, which also resets the hammer or striker.

[0004] A standard semiautomatic trigger mechanism includes a disconnector, which holds the hammer or striker in a cocked position until the trigger member is reset to engage the sear. This allows the firearm to be fired only a single time when the trigger is pulled and held, because the user is not typically able to release the trigger rapidly enough so that the sear engages before the bolt or bolt carrier returns to its in-battery position. The disconnector prevents the firearm from either firing multiple rounds on a single pull

of the trigger, or from allowing the hammer or striker to simply "follow" the bolt as it returns to battery without firing a second round, but leaving the hammer or striker uncocked.

[0005] For various reasons, shooters desire to increase the rate of semiautomatic fire. Sometimes this is simply for entertainment and the feeling of shooting a machine gun. In the past, users have been known to employ "bump firing" to achieve rapid semiautomatic fire. Bump firing uses the recoil of the semiautomatic firearm to fire shots in rapid succession. The process involves bracing the rifle with the non-trigger hand, loosening the grip of the trigger hand (but leaving the trigger finger in its normal position in front of the trigger), and pushing the rifle forward in order to apply pressure on the trigger from the finger while keeping the trigger finger stationary. When fired with the trigger finger held stationary, the firearm will recoil to the rear and allow the trigger to reset as it normally does. When the non-trigger hand pulls the firearm away from the body and back forward toward the original position, it causes the trigger to be pressed against the stationary finger again, firing another round as the trigger is pushed back.

[0006] Devices for increasing the rate of semiautomatic fire are shown in U.S. Patent Nos. 9,568,264, 9,816,772, and 9,939,221, issued to Thomas Allen Graves. The devices shown in these patents forcefully reset the trigger with rigid mechanical contact between the trigger member and the bolt as the action cycles. To adapt this invention to an AR-pattern firearm, for example, would require not only a modified fire control mechanism, but also a modified bolt carrier.

[0007] Other devices for increasing the rate of semiautomatic fire are shown in the assignee's US Patent Nos. 10,514,223 and 11,346,627 and US Patent Application No.

18/048,572 filed October 21, 2022, all of which are hereby incorporated by reference as if fully set forth in their entirety. In these devices the hammer forces the trigger to the set position, and a locking bar prevents early hammer release.

[0008] Another device for increasing the rate of semiautomatic fire is shown in U.S. Patent No. 7,398,723, issued on July 15, 2008, to Brian A. Blakley, and is hereby incorporated by reference herein as if fully set forth in its entirety. The device shown in this patent has a pivoting cam which is contacted by the rearwardly traveling bolt carrier, pivoting the cam rearwardly such that the bottom surface of the cam presses downward on the trigger-extension, forcing the rear of the trigger down, and thereby moving forward the surface of the trigger that an operator's finger engages.

[0009] Further improvement in forced reset triggers is desired.

Summary of Invention

[0010] The present invention provides a semiautomatic trigger mechanism for increasing rate of fire that can be retrofitted into popular existing firearm platforms. In particular, this invention provides a trigger mechanism that can be used in AR-pattern firearms with an otherwise standard M16-pattern bolt carrier assembly. Embodiments of the present invention are particularly adaptable for construction as a "drop-in" replacement trigger module that only requires insertion of two assembly pins and the safety selector. Advantageously, the present invention provides a "three position" trigger mechanism having safe, standard semi-automatic, and forced reset semi-automatic positions.

[0011] In one aspect, a firearm trigger mechanism comprises a housing adapted to be installed in a fire control mechanism pocket of a receiver and having a first pair of transversely aligned openings for receiving a hammer pin, a second pair of transversely aligned openings for receiving a trigger pin, and a third pair of transversely aligned openings for receiving a cam pin, a hammer having a sear catch and a hook for engaging a disconnector and mounted in the housing to pivot on the hammer pin between set and released positions, the hammer adapted to be pivoted rearward by rearward movement of a bolt carrier, a trigger member having a sear and mounted in the housing to pivot on the trigger member pin between set and released positions, wherein the sear and sear catch are in engagement in the set positions of the hammer and trigger member and are out of engagement in the released positions of the hammer and trigger member, a disconnector having a hook for engaging the hammer and mounted in the housing to pivot on the trigger member pin, a cam having a cam lobe and mounted in the housing to pivot on the cam pin, the cam being pivotable between a first position at which the cam lobe does not force the trigger member towards the set position and a second position at which the cam lobe does force the trigger member towards the set position, and a safety selector adapted to be mounted in the fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions. In the standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of the hammer and pivoting of the cam from the first position to the second position such that the cam lobe forces the trigger member towards the set position but prior to reaching the set position the disconnector hook catches the hammer hook, and thereafter forward movement of the bolt carrier causes the cam to pivot to the first position, at which time a

user must manually release the trigger member to free the hammer from the disconnector to permit the hammer and trigger member to pivot to the set positions so that the user can pull the trigger member to fire the firearm. In the forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of the hammer and pivoting of the cam from the first position to the second position such that the cam lobe forces the trigger member to the set position, the safety selector preventing the disconnector hook from catching the hammer hook, and thereafter forward movement of the bolt carrier causes the cam to pivot to the first position, at which time the user can pull the trigger member to fire the firearm without manually releasing the trigger member.

[0012] The safety selector can have a protuberance thereon which, when the safety selector is in the forced reset semi-automatic position, contacts the disconnector preventing the disconnector hook from catching the hammer hook. The trigger mechanism can further include a spring which biases the trigger member towards the set position.

[0013] In another aspect, a firearm trigger mechanism comprises a housing adapted to be installed in a fire control mechanism pocket of a receiver and having a first pair of transversely aligned openings for receiving a hammer pin, a second pair of transversely aligned openings for receiving a trigger pin, and a third pair of transversely aligned openings for receiving a cam pin, a hammer having a sear catch and a hook for engaging a disconnector and mounted in the housing to pivot on the hammer pin between set and released positions, the hammer adapted to be pivoted rearward by rearward movement of a bolt carrier, a trigger member having a sear and mounted in the housing to pivot on the trigger member pin between set and released positions, wherein the sear and sear

catch are in engagement in the set positions of the hammer and trigger member and are out of engagement in the released positions of the hammer and trigger member, a disconnector having a hook for engaging the hammer and mounted in the housing to pivot on the trigger member pin, a cam having a cam lobe and mounted in the housing to pivot on the cam pin, the cam being pivotable between a first position at which the cam lobe does not force the trigger member towards the set position and a second position at which the cam lobe does force the trigger member towards the set position, and a safety selector adapted to be mounted in the fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions. In the standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of the hammer and pivoting of the cam from the first position to the second position such that the cam lobe forces the trigger member towards the set position but prior to reaching the set position the disconnector hook catches the hammer hook, and thereafter forward movement of the bolt carrier causes the cam to pivot to the first position, at which time a user must manually release the trigger member to free the hammer from the disconnector to permit the hammer and trigger member to pivot to the set positions so that the user can pull the trigger member to fire the firearm. In the forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of the hammer and pivoting of the cam from the first position to the second position such that the cam lobe forces the trigger member to the set position, the safety selector preventing the disconnector hook from catching the hammer hook, and thereafter forward movement of the bolt carrier causes the cam to pivot to the first position, at which

time the user can pull the trigger member to fire the firearm without manually releasing the trigger member.

[0014] The safety selector can have a protuberance thereon which, when the safety selector is in the forced reset semi-automatic position, contacts the disconnector preventing the disconnector hook from catching the hammer hook. The first and second pairs of transversely aligned openings in the housing can be adapted to be aligned with first and second pairs of transversely aligned assembly pin openings in the fire control mechanism pocket. The trigger mechanism can include a spring which biases the trigger member towards the set position. The spring can be a torsion spring.

[0015] In another aspect, a firearm comprises a receiver having a fire control mechanism pocket therein, a reciprocating bolt carrier, a hammer having a sear catch and a hook for engaging a disconnector and mounted in the fire control mechanism pocket to pivot on a transverse hammer pivot axis between set and released positions, the hammer adapted to be pivoted rearward by rearward movement of the bolt carrier, a trigger member having a sear and mounted in the fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions, wherein the sear and sear catch are in engagement in the set positions of the hammer and trigger member and are out of engagement in the released positions of the hammer and trigger member, a disconnector having a hook for engaging the hammer and mounted in the fire control mechanism pocket to pivot on the transverse trigger member pivot axis, a cam having a cam lobe and mounted in the fire control mechanism pocket to pivot on a transverse cam pivot axis, the cam being pivotable between a first position at which the cam lobe does not force the trigger member towards the set position and a second

position at which the cam lobe does force the trigger member towards the set position, and a safety selector mounted in the fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions. In the standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of the hammer and pivoting of the cam from the first position to the second position such that the cam lobe forces the trigger member towards the set position but prior to reaching the set position the disconnector hook catches the hammer hook, and thereafter forward movement of the bolt carrier causes the cam to pivot to the first position, at which time a user must manually release the trigger member to free the hammer from the disconnector to permit the hammer and trigger member to pivot to the set positions so that the user can pull the trigger member to fire the firearm. In the forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of the hammer and pivoting of the cam from the first position to the second position such that the cam lobe forces the trigger member to the set position, the safety selector preventing the disconnector hook from catching the hammer hook, and thereafter forward movement of the bolt carrier causes the cam to pivot to the first position, at which time the user can pull the trigger member to fire the firearm without manually releasing the trigger member.

[0016] The firearm can further comprise a housing having a first pair of transversely aligned openings with a hammer pin therethrough and a second pair of transversely aligned openings with a trigger member pin therethrough, the hammer mounted on the hammer pin, the trigger member and disconnector mounted on the trigger member pin. The receiver can have a first pair of transversely aligned assembly pin openings and a second pair of transversely aligned assembly pin openings, the housing first pair of

openings coaxial with the receiver first pair of openings and the housing second pair of openings coaxial with the receiver second pair of openings, a first assembly pin passing through the receiver first pair of openings and through the housing first pair of openings, and a second assembly pin passing through the receiver second pair of openings and through the housing second pair of openings. The firearm can further comprise a spring which biases the trigger member towards the set position. The spring can be a torsion spring.

[0017] In another aspect, a firearm trigger mechanism comprises a hammer having a sear catch and a hook for engaging a disconnector and adapted to be mounted in a fire control mechanism pocket of a receiver to pivot on a transverse hammer pivot axis between set and released positions, the hammer adapted to be pivoted rearward by rearward movement of a bolt carrier, a trigger member having a sear and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions, wherein the sear and sear catch are in engagement in the set positions of the hammer and trigger member and are out of engagement in the released positions of the hammer and trigger member, a disconnector having a hook for engaging the hammer and adapted to be mounted in the fire control mechanism pocket to pivot on the transverse trigger member pivot axis, a cam having a cam lobe and adapted to be movably mounted in the fire control mechanism pocket, the cam being movable between a first position at which the cam lobe does not force the trigger member towards the set position and a second position at which the cam lobe does force the trigger member towards the set position, and a safety selector adapted to be mounted in the fire control mechanism pocket to pivot between safe, standard semi-

automatic, and forced reset semi-automatic positions. In the standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of the hammer and movement of the cam from the first position to the second position such that the cam lobe forces the trigger member towards the set position but prior to reaching the set position the disconnector hook catches the hammer hook, and thereafter forward movement of the bolt carrier causes the cam to move to the first position, at which time a user must manually release the trigger member to free the hammer from the disconnector to permit the hammer and trigger member to pivot to the set positions so that the user can pull the trigger member to fire the firearm. In the forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of the hammer and movement of the cam from the first position to the second position such that the cam lobe forces the trigger member to the set position, the safety selector preventing the disconnector hook from catching the hammer hook, and thereafter forward movement of the bolt carrier causes the cam to move to the first position, at which time the user can pull the trigger member to fire the firearm without manually releasing the trigger member.

[0018] Other aspects, features, benefits, and advantages of the present invention will become apparent to a person of skill in the art from the detailed description of various embodiments with reference to the accompanying drawing figures, all of which comprise part of the disclosure.

Brief Description of the Drawings

[0019] Like reference numerals are used to indicate like parts throughout the various drawing figures, wherein:

[0020] FIG. 1 is a top front right perspective view of a drop-in trigger module for an AR-pattern firearm according to one embodiment of the invention.

[0021] Fig. 2 is a top rear right perspective view thereof.

[0022] Fig. 3 is a top rear right exploded perspective view thereof.

[0023] Fig. 4A is a top rear right cross-sectional view thereof with the safety selector in the safe position and with the hammer and trigger member in their set postions.

[0024] Fig. 4B is a bottom rear right cross-sectional view thereof with the safety selector in the safe position and with the hammer and trigger member in their set positions.

[0025] Fig. 5A is a top rear right cross-sectional view thereof with the safety selector in the standard semi-automatic position and with the hammer and trigger member in their set positions.

[0026] Fig. 5B is a bottom rear right cross-sectional view thereof with the safety selector in the standard semi-automatic position and with the hammer and trigger member in their set positions.

[0027] Fig. 6A is a top rear right cross-sectional view thereof with the safety selector in the forced reset semi-automatic position and with the hammer and trigger member in their set positions.

[0028] Fig. 6B is a bottom rear right cross-sectional view thereof with the safety selector in the forced reset semi-automatic position and with the hammer and trigger member in their set positions.

[0029] Fig. 7 is a cross-sectional view showing the trigger module installed in a typical AR15-pattern lower receiver, with the hammer and trigger member in their set positions and with the bolt carrier in an in-battery position, and with the safety selector in the safe position.

[0030] Fig. 8A is a view similar to Fig. 7 but with the safety selector in the standard semi-automatic position.

[0031] Fig. 8B is a view similar to Fig. 8A but after the trigger has been pulled to drop the hammer.

[0032] Fig. 8C is a view similar to Fig. 8B but with the bolt carrier cycling to the rear to pivot the hammer and cam.

[0033] Fig. 8D is a view similar to Fig. 8C but with the bolt carrier having returned to battery and the disconnector having caught the hammer.

[0034] Fig. 9A is a view similar to Fig. 7 but with the safety selector in the forced reset semi-automatic position.

[0035] Fig. 9B is a view similar to Fig. 9A but after the trigger has been pulled to drop the hammer.

[0036] Fig. 9C is a view similar to Fig. 9B but with the bolt carrier cycling to the rear to pivot the hammer and cam.

[0037] Fig. 9D is a view similar to Fig. 9C but with the bolt carrier having returned to battery and the hammer and trigger having returned to their set positions.

Detailed Description of the Drawings

[0038] With reference to the drawing figures, this section describes particular embodiments and their detailed construction and operation. Throughout the specification, reference to "one embodiment," "an embodiment," or "some embodiments" means that a particular described feature, structure, or characteristic may be included in at least one embodiment. Thus, appearances of the phrases "in one embodiment," "in an embodiment," or "in some embodiments" in various places throughout this specification are not necessarily all referring to the same embodiment. Furthermore, the described features, structures, and characteristics may be combined in any suitable manner in one or more embodiments. In view of the disclosure herein, those skilled in the art will recognize that the various embodiments can be practiced without one or more of the specific details or with other methods, components, materials, or the like. In some instances, well-known structures, materials, or operations are not shown or not described in detail to avoid obscuring aspects of the embodiments. “Forward” will indicate the direction of the muzzle and the direction in which projectiles are fired, while “rearward” will indicate the opposite direction. “Lateral” or “transverse” indicates a side-to-side direction generally perpendicular to the axis of the barrel. Although firearms may be used in any orientation, “left” and “right” will generally indicate the sides according to the user’s orientation, “top” or “up” will be the upward direction when the firearm is gripped in the

ordinary manner. QAs used herein, "transverse" means a side-to-side direction generally perpendicular to the longitudinal axis of the barrel.

[0039] Referring first to Figs. 1-6B, there is illustrated a "drop-in" trigger module 10 adapted for use in an AR-pattern firearm according to a first embodiment of the present invention. As used herein, "AR-pattern" firearm includes the semiautomatic versions of the AR10 and AR15 firearms and variants thereof of any caliber, including pistol caliber carbines or pistols using a blow-back bolt. While select fire (fully automatic capable) versions of this platform, such as the M16 and M4, are also AR-pattern firearms, this invention only relates to semiautomatic firearm actions. The concepts of this invention may be adaptable to other popular semiautomatic firearm platforms, such as the Ruger 10/22™, AK-pattern firearms, and HK-pattern firearms.

[0040] The module 10 includes a frame or housing 12 sized and shaped to fit within the internal fire control pocket of an AR-pattern lower receiver 14. Lower receiver parts not important to the present invention are well-known in the art and are omitted from the figures for clarity. The housing 12 includes left and right sidewalls 16, 18 which extend substantially vertically and parallel to one another in a laterally spaced-apart relationship. The sidewalls 16, 18 may be interconnected by front and rear sidewalls 20, 22. The sidewalls 16, 18 include first and second pairs of aligned openings 24, 26 for receiving hollow transverse pins 30, 32 upon which a hammer 36 and trigger member 38 pivot. The openings 24, 26 are located coaxially with openings 42, 44 in the lower receiver 14. Standard AR-pattern hammer and trigger pins 46, 48 pass through the openings 42, 44 in the lower receiver 14 and through the hollow transverse pins 30, 32 to assemble the housing 12 into the lower receiver 14. Thus, the pins 30, 32 retain the hammer 36 and

trigger member 38 in the housing 12 in modular fashion, whereas the pins 46, 48 retain the trigger module 10 in the lower receiver 14.

[0041] The hammer 36 has a hammer head 50, a sear catch 52, and a hammer hook 53. The hammer 36 is spring biased towards a forward position by a standard AR-pattern hammer torsion spring (not shown).

[0042] The trigger member 38 has a trigger blade 54 that extends downwardly. The trigger blade 54 is the part of the trigger member 38 contacted by a user's finger to actuate the trigger mechanism. The trigger blade 54 may be curved (as shown) or straight, as desired. The trigger member 38 has a sear 56. When the sear 56 and the sear catch 52 are engaged, the hammer 36 and trigger member 38 are in their set positions. When the sear 56 and sear catch 52 are not engaged, the hammer 36 and trigger member 38 are in their released positions. The trigger member 38 also has a cam follower 58. The trigger member 38 is spring biased by a standard AR-pattern trigger member torsion spring (not shown) so that the trigger blade 54 is spring biased towards a forward position.

[0043] A disconnector 60 is pivoted on the hollow transverse pin 32 upon which the trigger member 38 pivots. The disconnector 60 has a disconnector hook 64 and a tail 66. The tail 66 of the disconnector 60 is spring biased upwardly away from a tail 68 of the trigger member 38 by a standard AR-pattern disconnector compression spring 67.

[0044] A cam 72 is movably mounted to the housing 12. For example, the cam 72 can be pivoted on a cam pin 74 that is installed in aligned openings 76 in the sidewalls 16, 18 of the housing 12. The cam 72 has a cam lobe 78 that interacts with the cam follower 58, in a manner to be described below. The cam 72 has a first contact surface 82 on an

upper forward portion thereof and a second contact surface 84 on an upper rearward portion thereof. The cam 72 has a notch 86 below the second contact surface 84 to provide clearance for the rear wall 22 of the housing 12. Alternatively, the cam 72 can be slidably mounted to the housing 12 with or without spring bias.

[0045] An upper receiver 90 houses a bolt carrier assembly 92. As is well-known in the art, the bolt carrier assembly 92 (or blow-back bolt) slidably reciprocates in the upper receiver 90 and engages the breach of a barrel or barrel extension. As used herein, "bolt carrier" and "bolt carrier assembly" may be used interchangeably and include a blow-back type bolt used in pistol caliber carbine configurations of the AR-platform. The bolt carrier assembly 92 used with the embodiments of this invention can have either a standard mil-spec M16-pattern bolt carrier, a standard AR15-pattern bolt carrier, or some variation of the two, depending on the design of the cam 72, and whether operated by a gas direct impingement system or a gas piston system. The bolt carrier assembly 92 has an engagement surface 94 in a rear portion 96 of the bolt carrier body 98. As in an ordinary AR15-pattern configuration, during rearward travel of the bolt carrier assembly 92 a lower surface 102 in a forward portion 104 of the bolt carrier body 98 contacts the face of the hammer head 50 causing the hammer 36 to pivot rearward. During further rearward travel of bolt carrier assembly 92 the lower surface 102 of the bolt carrier body 98 contacts the surface 82 of the cam 72 to the pivot cam 72 in a first direction from a first position to a second position. During forward travel of the bolt carrier assembly 92 the engagement surface 94 of the bolt carrier body 98 contacts the surface 84 of the cam 72 to pivot the cam 72 in a second opposite direction from the second position to the first position.

[0046] A three position safety selector 110 has safe, standard semi-automatic, and forced reset semi-automatic positions. When in the safe position (safety selector indicator 111 pointing forward), a wide semi-circular portion 112 of the safety selector 110 prevents the trigger blade 54 from being pulled (Figs. 4A, 4B, and 7). When in the standard semi-automatic position (safety selector indicator 111 pointing upward), a flat portion 114 of the safety selector 110 permits the trigger blade 54 to be pulled. The disconnector 60 can pivot with the trigger member 38 and the disconnector hook 64 can catch the hammer hook 53 during rearward pivoting travel of the hammer head 50. (Figs. 5A and 5B). When in the forced reset semi-automatic position (safety selector indicator 111 pointing rearward), a narrow semi-circular portion 116 permits the trigger blade 54 to be pulled but prevents the disconnector 60 from pivoting with the trigger member 38 thus preventing the disconnector hook 64 from catching the hammer hook 53 during rearward pivoting travel of the hammer head 50. (Figs. 6A and 6B). In other words, in the forced reset semi-automatic position, the disconnector 60 is "disabled" in that the disconnector hook 64 is unable to catch the hammer hook 53 during cycling of the bolt carrier assembly 92.

[0047] Referring now to Figs. 8A-8D, with the safety selector 110 set in the standard semi-automatic position, rearward finger pressure on the trigger blade 54 causes the trigger member 38 to rotate clockwise. Depending on the position of the cam 72, the cam follower 58 may or may not act upon the cam lobe 78 to pivot the cam 72 clockwise. Rotation of the trigger member 38 causes the sear 56 to disengage from the sear catch 52 of the hammer 36. This allows the hammer 36 to drop by spring force onto the firing pin 99 of the bolt carrier assembly 92, discharging an ammunition cartridge (not shown), and causing the action to cycle by moving the bolt carrier assembly 92 rearward.

Rearward travel of the bolt carrier assembly 92 causes the lower surface 102 to contact the face of the hammer head 50 and pivot the hammer 36 counter-clockwise. During pivoting travel of the hammer 36 the disconnector hook 64 catches the hammer hook 53. During further rearward travel of the bolt carrier assembly 92 the lower surface 102 contacts the surface 82 of the cam 72 to pivot the cam 72 counter-clockwise. As the cam 72 pivots counter-clockwise, the cam lobe 78 may acts upon the cam follower 58 to pivot the trigger member 38 counter-clockwise. Forward travel of the bolt carrier assembly 92 returning to battery causes the surface 94 to contact the surface 84 of the cam 72 to pivot the cam 72 clockwise. At this point rearward finger pressure on the trigger blade 54 must be released to allow the sear 56 to engage the sear catch 52, returning the hammer 36 and trigger member 38 to their set positions. Thereafter the user can reapply rearward finger pressure on the trigger blade 54 to fire another round.

[0048] Referring now to Figs. 9A-9D, with the safety selector 110 set in the forced reset semi-automatic position, rearward finger pressure on the trigger blade 54 causes the trigger member 38 to rotate clockwise. The narrow semi-circular portion 116 of the safety selector 110 prevents the disconnector 60 from rotating with the trigger member 38, thus "disabling" the disconnector 60, preventing the disconnector hook 64 from catching the hammer hook 53. Depending on the position of the cam 72, the cam follower 58 may or may not act upon the cam lobe 78 to pivot the cam 72 clockwise. Rotation of the trigger member 38 causes the sear 56 to disengage from the sear catch 52 of the hammer 36. This allows the hammer 36 to drop by spring force onto the firing pin 99 of the bolt carrier assembly 92, discharging an ammunition cartridge, and causing the action to cycle by moving the bolt carrier assembly 92 rearward. Rearward travel of the bolt

carrier assembly 92 causes the lower surface 102 to contact the face of the hammer head 50 and pivot the hammer 36 counter-clockwise. During further rearward travel of the bolt carrier assembly 92 the lower surface 102 contacts the surface 82 of the cam 72 to pivot the cam 72 counter-clockwise. As the cam 72 pivots counter-clockwise, the cam lobe 78 acts upon the cam follower 58 to the pivot trigger member 38 counter-clockwise. The bolt carrier assembly 92 thereby forces the hammer 36 and trigger member 38 to their set positions wherein the sear 56 engages the sear catch 52. Forward travel of the bolt carrier assembly 92 returning to battery causes the surface 94 to contact the surface 84 of the cam 72 to pivot the cam 72 clockwise. At this point the user can reapply rearward finger pressure on the trigger blade 54 to fire another round, without first manually releasing rear finger pressure on the trigger blade 54.

[0049] Thus, as the bolt carrier assembly 92 returns forward, the trigger member 38 is held in its set position by cam 72. The trigger member 38 cannot be pulled to release the sear/sear catch engagement, thus precluding early hammer release or "hammer follow" against the bolt carrier assembly 92 and firing pin 99 as the bolt carrier assembly 92 is returning to battery. When the bolt carrier assembly 92 has reached (or nearly reached) its closed, in-battery position, the engagement surface 94 contacts and forwardly displaces the contact surface 84 of cam 72, disengaging the cam lobe 78 from the cam follower 58, allowing the trigger blade 54 to be pulled. Again, this prevents early hammer release and contact of the hammer against the firing pin before the bolt is completely locked and in-battery.

[0050] While various embodiments of the present invention have been described in detail, it should be apparent that modifications and variations thereto are possible, all of

which fall within the true spirit and scope of the invention. Therefore, the foregoing is intended only to be illustrative of the principles of the invention. The invention resides in each individual feature described herein, alone, and in any and all combinations and subcombinations of any and all of those features. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not intended to limit the invention to the exact construction and operation shown and described. Accordingly, all suitable modifications and equivalents may be included and considered to fall within the scope of the invention, defined by the following claim or claims.

Atrius Ex. 1002--0322

WHAT IS CLAIMED IS:

1. A firearm trigger mechanism comprising:

a hammer having a sear catch and a hook for engaging a disconnector and adapted to be mounted in a fire control mechanism pocket of a receiver to pivot on a transverse hammer pivot axis between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of a bolt carrier,

a trigger member having a sear and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions,

wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member,

a disconnector having a hook for engaging said hammer and adapted to be mounted in the fire control mechanism pocket to pivot on said transverse trigger member pivot axis,

a cam having a cam lobe and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse cam pivot axis, said cam being pivotable between a first position at which said cam lobe does not force said trigger member towards said set position and a second position at which said cam lobe does force said trigger member towards said set position, and

a safety selector adapted to be mounted in the fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions,

whereupon in said standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member towards said set position but prior to reaching said set position said disconnector hook catches said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to pivot to said first position, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire the firearm, and

whereupon in said forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member to said set position, said safety selector preventing said disconnector hook from catching said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to pivot to said first position, at which time the user can pull said trigger member to fire the firearm without manually releasing said trigger member.

2. The trigger mechanism of claim 1, wherein said safety selector has a protuberance thereon which, when said safety selector is in said forced reset semi-automatic position, contacts said disconnector preventing said disconnector hook from catching said hammer hook.

3. The trigger mechanism of claim 1 further including a spring which biases said trigger member towards said set position.

4. A firearm trigger mechanism comprising:

a housing adapted to be installed in a fire control mechanism pocket of a receiver and having a first pair of transversely aligned openings for receiving a hammer pin, a second pair of transversely aligned openings for receiving a trigger pin, and a third pair of transversely aligned openings for receiving a cam pin,

a hammer having a sear catch and a hook for engaging a disconnector and mounted in said housing to pivot on said hammer pin between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of a bolt carrier,

a trigger member having a sear and mounted in said housing to pivot on said trigger member pin between set and released positions,

wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member,

a disconnector having a hook for engaging said hammer and mounted in said housing to pivot on said trigger member pin,

a cam having a cam lobe and mounted in said housing to pivot on said cam pin, said cam being pivotable between a first position at which said cam lobe does not force said trigger member towards said set position and a second position at which said cam lobe does force said trigger member towards said set position, and

a safety selector adapted to be mounted in the fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions,

whereupon in said standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said

first position to said second position such that said cam lobe forces said trigger member towards said set position but prior to reaching said set position said disconnector hook catches said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to pivot to said first position, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire the firearm, and

whereupon in said forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member to said set position, said safety selector preventing said disconnector hook from catching said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to pivot to said first position, at which time the user can pull said trigger member to fire the firearm without manually releasing said trigger member.

5. The trigger mechanism of claim 4, wherein said safety selector has a protuberance thereon which, when said safety selector is in said forced reset semi-automatic position, contacts said disconnector preventing said disconnector hook from catching said hammer hook.

6. The trigger mechanism of claim 4, wherein said first and second pairs of transversely aligned openings in said housing are adapted to be aligned with first and second pairs of transversely aligned assembly pin openings in the fire control mechanism pocket.

7. The trigger mechanism of claim 4 further including a spring which biases said trigger member towards said set position.

8. The trigger mechanism of claim 7 wherein said spring is a torsion spring.

9. A firearm comprising:

a receiver having a fire control mechanism pocket therein,

a reciprocating bolt carrier,

a hammer having a sear catch and a hook for engaging a disconnector and mounted in said fire control mechanism pocket to pivot on a transverse hammer pivot axis between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of said bolt carrier,

a trigger member having a sear and mounted in said fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions,

wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member,

a disconnector having a hook for engaging said hammer and mounted in said fire control mechanism pocket to pivot on said transverse trigger member pivot axis,

a cam having a cam lobe and mounted in said fire control mechanism pocket to pivot on a transverse cam pivot axis, said cam being pivotable between a first position at which said cam lobe does not force said trigger member towards said set position and a

second position at which said cam lobe does force said trigger member towards said set position, and

a safety selector mounted in said fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions,

whereupon in said standard semi-automatic position, rearward movement of said bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member towards said set position but prior to reaching said set position said disconnector hook catches said hammer hook, and thereafter forward movement of said bolt carrier causes said cam to pivot to said first position, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire said firearm, and

whereupon in said forced reset semi-automatic position, rearward movement of said bolt carrier causes rearward pivoting of said hammer and pivoting of said cam from said first position to said second position such that said cam lobe forces said trigger member to said set position, said safety selector preventing said disconnector hook from catching said hammer hook, and thereafter forward movement of said bolt carrier causes said cam to pivot to said first position, at which time the user can pull said trigger member to fire said firearm without manually releasing said trigger member.

10. The firearm of claim 9 further comprising:

a housing having a first pair of transversely aligned openings with a hammer pin therethrough and a second pair of transversely aligned openings with a trigger member pin therethrough,

said hammer mounted on said hammer pin, said trigger member and disconnector mounted on said trigger member pin.

11. The firearm of claim 10 further comprising:

said receiver having a first pair of transversely aligned assembly pin openings and a second pair of transversely aligned assembly pin openings,

said housing first pair of openings coaxial with said receiver first pair of openings and said housing second pair of openings coaxial with said receiver second pair of openings,

a first assembly pin passing through said receiver first pair of openings and through said housing first pair of openings, and

a second assembly pin passing through said receiver second pair of openings and through said housing second pair of openings.

12. The firearm of claim 10 further comprising a spring which biases said trigger member towards said set position.

13. The firearm of claim 12 wherein said spring is a torsion spring.

14. A firearm trigger mechanism comprising:

a hammer having a sear catch and a hook for engaging a disconnector and adapted to be mounted in a fire control mechanism pocket of a receiver to pivot on a transverse hammer pivot axis between set and released positions, said hammer adapted to be pivoted rearward by rearward movement of a bolt carrier,

a trigger member having a sear and adapted to be mounted in the fire control mechanism pocket to pivot on a transverse trigger member pivot axis between set and released positions,

wherein said sear and sear catch are in engagement in said set positions of said hammer and trigger member and are out of engagement in said released positions of said hammer and trigger member,

a disconnector having a hook for engaging said hammer and adapted to be mounted in the fire control mechanism pocket to pivot on said transverse trigger member pivot axis,

a cam having a cam lobe and adapted to be movably mounted in the fire control mechanism pocket, said cam being movable between a first position at which said cam lobe does not force said trigger member towards said set position and a second position at which said cam lobe does force said trigger member towards said set position, and

a safety selector adapted to be mounted in the fire control mechanism pocket to pivot between safe, standard semi-automatic, and forced reset semi-automatic positions,

whereupon in said standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and movement of said cam from said first position to said second position such that said cam lobe forces said trigger member towards said set position but prior to reaching said set position said disconnector

hook catches said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to move to said first position, at which time a user must manually release said trigger member to free said hammer from said disconnector to permit said hammer and trigger member to pivot to said set positions so that the user can pull said trigger member to fire the firearm, and

whereupon in said forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of said hammer and movement of said cam from said first position to said second position such that said cam lobe forces said trigger member to said set position, said safety selector preventing said disconnector hook from catching said hammer hook, and thereafter forward movement of the bolt carrier causes said cam to move to said first position, at which time the user can pull said trigger member to fire the firearm without manually releasing said trigger member.

Abstract

A trigger mechanism that can be used in AR-pattern firearms has a hammer, a trigger member, a disconnector, a cam, and a "three position" safety selector having safe, standard semi-automatic, and forced reset semi-automatic positions. In the standard semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of the hammer and pivoting of the cam from a first position to a second position such that a cam lobe forces the trigger member towards the set position, but prior to reaching the set position the disconnector hook catches the hammer hook, at which time a user must manually release the trigger member to free the hammer from the disconnector to permit the hammer and trigger member to pivot to their set positions so that the user can pull the trigger member to fire the firearm. In the forced reset semi-automatic position, rearward movement of the bolt carrier causes rearward pivoting of the hammer and pivoting of the cam from the first position to the second position such that the cam lobe forces the trigger member to the set position, the safety selector preventing the disconnector hook from catching the hammer hook, at which time the user can pull the trigger member to fire the firearm without manually releasing the trigger member.

3861403.2

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/325,225	**05/30/2023 11:41:11 AM ET**	**RARETRG 12US**

Title of Invention

FIREARM TRIGGER MECHANISM

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	5749	FILED BY	Jane Walker
PATENT CENTER #	62172026	FILING DATE	-
CUSTOMER #	26875	FIRST NAMED INVENTOR	Mr. Brian A. Blakley
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Glenn Bellamy

Documents

TOTAL DOCUMENTS: 5

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
RARETRG-12US_ApplicationDataSheet.pdf	8	Application Data Sheet	2220 KB
RARETRG-12US_Specification-APP.TEXT.docx	32	Application body structured text document	64 KB
Warning: Word count in abstract section is over 150 words.			
RARETRG-12US_Executed_POA.pdf	2	Power of Attorney	1204 KB
RARETRG-	2	Oath or Declaration filed	1187 KB

12US_Executed_Declaration-Assign.pdf			
RARETRG-12US_Drawings.pdf	18	Drawings-only black and white line drawings	1480 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
RARETRG-12US_ApplicationDataSheet.pdf	439276E9624A53FEFB177BAB8E14E3CD182A24126A408477C86740E34B00F61C45F8084607232CF6120B135ED23B6C6A17F015A2D9E889D756855F60330EE366
RARETRG-12US_Specification-APP.TEXT.docx	3F24F88ABACE6837059BD0330FB17F7CB316970A0AF2510372E95E4E26D9797C6FF5F8D7BAF024B9B2735C3AE12667EC234E89D316962679A46799A91A9B916A
RARETRG-12US_Executed_POA.pdf	4BCD64A59D61CBF2F2CFB2E3ACD731A318B22A7EDDAFCAFFA5A257F9251FBBBF3F987B9C2DD6EE41B083807FB9C7E787BA193ADB6F5A047877366AC02E8A52E9
RARETRG-12US_Executed_Declaration-Assign.pdf	5155BA943736F537FAD81A1BD846B681C37D692C5C2F877F3CC571532482A8047FC3C14768AC372D568C1BEE3B68C23942BAA809FA9741E2607FD81A7566DE23
RARETRG-12US_Drawings.pdf	61ED7301539EFD2800760AA306D5FF1BCCF7E5258D0865AC0A8AFBAE5D72A65B5B26C69C3C3D4093617C0A65C2B52815A196730F3E7EABBCF60FCD2AE58A973F

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN PATENT APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76) AND ASSIGNMENT

Title of Invention: FIREARM TRIGGER MECHANISM

As the below named inventor, I hereby declare that:

This Declaration is directed to:

[x] The attached application

OR

[ ] United States Application Number or PCT International Application Number _____ filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the above-identified application.

I have reviewed and understand the contents of the above-identified application, including the claims.

I am aware of the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 C.F.R. § 1.56.

Whereas, the undersigned inventor(s) has/have made certain inventions, improvements and discoveries (herein referred to as the "Invention") disclosed in the above-identified patent application;

Whereas, ABC IP, LLC , a Limited Liability Company of Delaware, having a place of business at 8 The Green, Suite A, Dover, Delaware 19901 (herein referred to as the "ASSIGNEE"), desires to acquire, and each undersigned inventor desires to grant to the ASSIGNEE, the entire worldwide right, title, and interest in and to the Invention and in and to any and all patent applications and patents directed thereto;

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, each undersigned inventor ("ASSIGNOR") hereby sells or has sold, assigns or has assigned, and otherwise transfers or has transferred to the ASSIGNEE, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, each undersigned inventor hereby authorizes and requests the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to the

Atrius Ex. 1002--0336

ASSIGNEE, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by the ASSIGNEE, its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by the undersigned had this Assignment not been made; and each undersigned inventor agrees to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in the ASSIGNEE, its successors, legal representatives, and assigns, whenever requested by the ASSIGNEE, its successors, legal representatives, or assigns.

Each undersigned inventor acknowledges their prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to the ASSIGNEE and is unaware of any reason why they may not have the full and unencumbered right to sell, assign, and transfer the rights hereby sold, assigned, and transferred, and has not executed, and will not execute, any document or instrument in conflict herewith. Each undersigned inventor also hereby grants the ASSIGNEE, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent Application Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of Delaware, and any disputes will be resolved in a court sited in Delaware.

I hereby acknowledge that any willful false statement made in this Declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

Legal name of Inventor: Brian A. Blakley

Inventor's Signature: _____ Date: 5/28/2023

Residence City/State/Country: Pinellas Park, FL, United States of America

Mailing Address: 8 The Green, Suite A
Dover, Delaware 19901

Citizenship: US

Atrius Ex. 1002--0337