

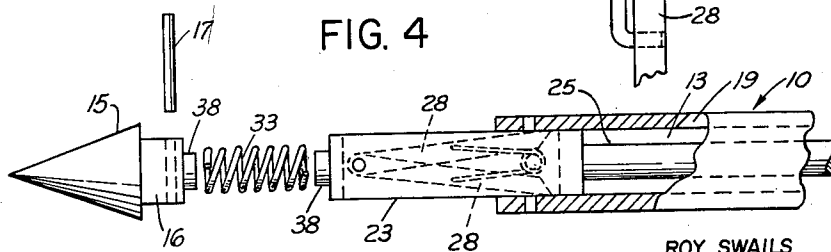
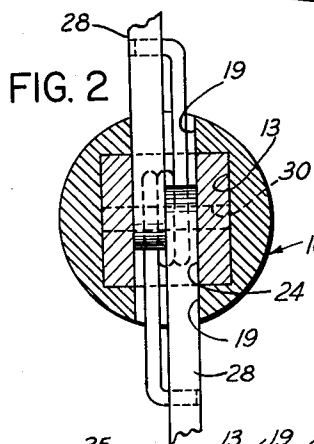
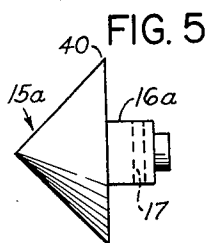
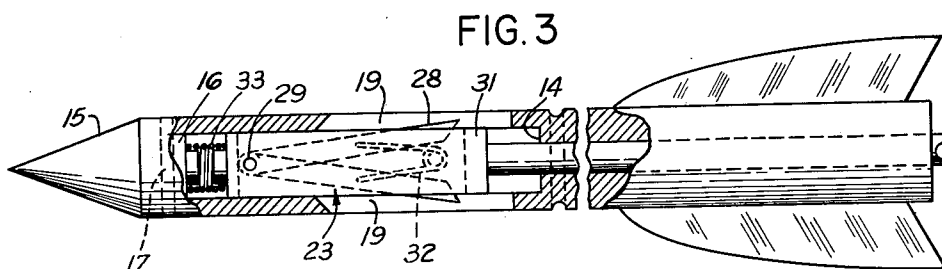
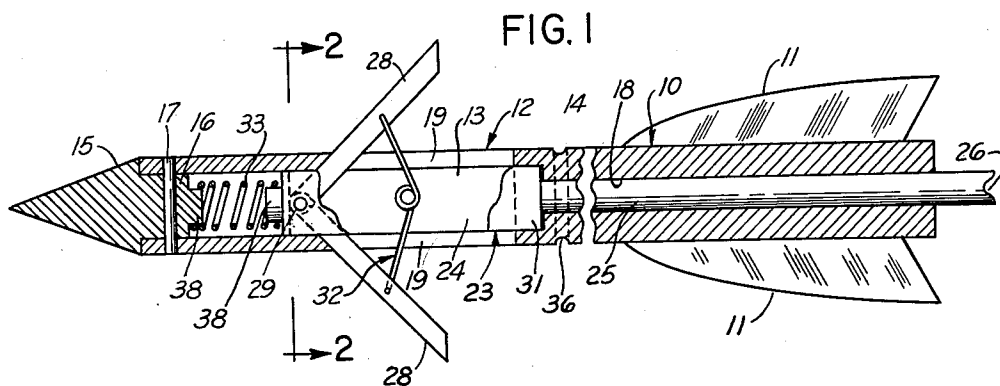
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RETRACTABLE ARROW

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3,036,396

RETRACTABLE ARROW

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The present invention relates generally to arrows and more particularly is concerned with arrows used by sportsmen in hunting fish, game and the like.

The object and general nature of this invention is the provision of an arrow provided with retractable barbs and manually operated means for retracting the barbs when the arrow is embedded in the body of the game, such as a fish or animal, so as to facilitate the withdrawal of the arrow without entailing unnecessary tearing of the flesh. A further feature of this invention is the provision of barb-retracting means extending through the shaft of the arrow to the feather end thereof.

Another object of this invention is the provision of a barbed arrow with means to yieldably hold the barbs in extended position but in which the barbs automatically retract when the object is struck by the arrow. Another feature of this invention is the provision of means facilitating the disassembly of the several parts, as for repair or replacement.

Further, a more specific feature of this invention is the provision of a hunting or fishing arrow in which normally extended parts in the form of barbs are automatically retracted when the arrow pierces the game but which are automatically extended when the arrow is embedded in the object struck, with manually operated means accessible at the feather end of the arrow for retracting the barbs to make it easier to withdraw the arrow.

These and other objects and advantages of my invention will be apparent to those skilled in the art after a consideration of the following detailed description of the preferred structural embodiment of my invention, taken in conjunction with the accompanying drawing in which the preferred form of my invention has been illustrated. In the drawing:

FIG. 1 is a longitudinal sectional view taken through the central portion of an arrow incorporating my invention.

FIG. 2 is a cross section taken along the line 2—2 of FIG. 1 showing in particular the pivoting of the barbs to the barb carrier.

FIG. 3 is a fragmentary sectional view, similar to FIG. 1 showing the barbs in the position they occupy when they are manually retracted.

FIG. 4 is a view similar to FIG. 3 showing the way in which removal of the point member from the shaft facilitates disassembly of the arrow parts.

FIG. 5 is a side view of a modified form of arrow head.

Referring first to FIG. 1, the arrow of this invention comprises an elongated tubular shaft 10, which may be formed of aluminum or the like, having feathers 11 at its rear end. At its front or head end the shaft 10 carries or is formed with a socket or chamber portion 12 having an enlarged interior space 13 that is generally square in cross section, as shown in FIG. 2. This provides a shoulder 14 to which detailed reference will be made below. The forward end of the chamber 12 is closed by a point member 15 having a squared shank 16 fitting into the outermost end of the chamber 12. The walls of the chamber 12 are apertured to receive a pin 17 that extends through an aperture in the point shank 16. The pin 17 is removable by any suitable means. The space 13 at its rear portion opens into the interior portion 18 of the tubular shaft 10. Opposite portions of the walls of the chamber 12 are provided with slots 19 to receive barbs described below.

Disposed within the space 13 of the chamber 12 is a

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barb carrier 23 which comprises a member that is generally square in cross section and closely interfits in and is slidable generally longitudinally of the chamber space 13. The barb carrier 23 is provided with a longitudinal slot 24 that lies in the plane of the two associated chamber wall slots 19, the slots 19 and 24 thus being in registry. A rod section 25 is fixed to or formed integrally with the barb carrier 23 and extends the full length of the tubular shaft 10 and outwardly the rear end thereof, as shown in FIG. 1. The outer end of the rod section 25 is provided with a bowstring-receiving notch 26.

A pair of barbs 28 are disposed in the slots 19 and 24 and are mounted on a pivot pin 29 carried in apertures 30 in the side portions of the barb carrier, adjacent the forward end thereof. When the barb carrier 23 is disposed in its rear position (FIG. 1) with its rear end 31 against the shoulder 14 a spring member 32, which has its ends pivoted in openings formed in the barb members 28, acts to swing the barbs out through the wall apertures or slots 19 and into the position shown in FIG. 1. A coil spring 33 acts between the inner end of the point member shank 16 and the outer end of the barb carrier 23 for urging the latter to and holding it in the position shown in FIG. 1.

It will be noted that the barb-extending spring 32 is arranged in the slot 24 with the barbs 28 and that the walls of the slot 24 hold these parts against displacement.

The rear end of the rod section carrying the rear notched portion 26 extends rearwardly out of the tubular shaft a distance so that when the arrow is placed in the bow and the bowstring engaged in the notch 26, the bowstring does not contact the feathers 11, the length of the rod section being such that this is so, even though the energy of the released string may momentarily compress the spring 33.

After the arrow is shot and strikes its target, the point member pierces the object struck. This decelerates the point member but the inertia of the barb carrier 23 tends to cause the latter to continue its motion. This serves to compress the spring 33 and to move the latter toward the position, relative to the point member 15, shown in FIG. 3 and thus serves to retract the barbs 28. Thus, entry of the arrow into the body of the object is facilitated since at this moment the barbs are retracted. However, as soon as the arrow is stopped, the spring 33 extends the barbs 28 whereby the arrow is firmly embedded. If, for example, the sportsman is shooting fish, he may tie a line to the shaft, and to this end the latter is provided with a groove 36 adjacent the chamber end of the shaft. The arrow cannot readily be withdrawn from the struck quarry so long as the barbs are extended, but according to this invention the barbs may readily be retracted merely by depressing the notched end 26 of the rod section so as to force the barb carrier 23 to the position shown in FIG. 3 whereby the barbs are withdrawn into the slots 19. The arrow may then readily be pulled out of the fish or game. If it should be desired to repair or replace the barbs or any of the other parts, the arrow may be disassembled merely by punching out the pin 17 and removing the point member 15. This allows the barb carrier 23 and spring 33 to be removed from the interior of the chamber 12, the barbs being further retractable to a position within the space 13. For centering and holding the spring 33 in position suitable means, such as bosses 38, may be formed on the outer end of the barb carrier and the inner end of the point member 15.

The ready removability of the point member 15 accommodates changing the point member 15 for another member of different size and/or weight, such as the member 15a shown in FIG. 5 having a larger flange 40. However, the member 15a has a square shank 16a which interchanges with the shank 16.

It is to be understood that my invention is not to be

limited to the particular means shown and described above.

What I desire to secure by Letters Patent is:

1. An arrow comprising a hollow shaft, an arrow head on one end of said shaft, a pair of outwardly extendible and inwardly retractable barbs movably carried by said shaft end, spring means acting between said barbs to urge them to extended position, an actuating member movably mounted within said hollow shaft and connected at one end with said barbs to move them to a retracted position, spring means acting between said head and said barbs for urging the latter to move longitudinally of the shaft and into a position extending outwardly of the shaft, and the other end of said actuating member extending outwardly of the other end of said shaft, both when the barbs are retracted and when the barbs are extended.

2. An arrow comprising a hollow shaft, an arrow head on one end of said shaft and including a chambered portion having slotted walls, a removable point closing the outer end of said chambered portion, a barb-supporting member movable within said chamber and including a rod section extending out through said hollow shaft and beyond the other end thereof, a pair of outwardly extendible and inwardly retractable barbs movably carried by said shaft end, said barbs being pivoted to said barb-supporting member and extending outwardly through the slotted walls of said chamber, spring means acting between said removable point and said barb-supporting member for urging the latter to a position in which said barbs extend outwardly beyond said slotted walls, and the portion of said rod extending outwardly from the other end of said shaft serving as means to move said barb-supporting member against said spring means and thus move said barbs to their retracted position.

3. An arrow comprising a shaft having at the head end a chambered portion provided with slotted walls and closed at its forward end with a point member fixed to said walls, a barb-supporting member movable axially in said chamber toward and away from the inner end of said point member and the opposite end of said chamber, a pair of barbs pivoted to said member and movable in the slots in said walls between extended and retracted positions, a first spring means acting between the barbs for urging them to move outwardly of said slots, and second spring means acting between said point member and said barb-supporting member for shifting said member axially in said chamber and causing said barbs to be moved by said first spring means into an extended position.

4. An arrow as defined in claim 3, further characterized by said shaft being hollow, and a rod section connected at its inner end to said barb-supporting member and at its outer end extending outwardly of the other end of said shaft and carrying bowstring-receiving means.

5. An arrow comprising a shaft, means at one end thereof forming an interior chamber extending axially of the shaft and being generally square in cross section, a point member fixed removably to and closing the outer end of said chamber, two opposite walls of the latter having slots, a barb carrier of generally square cross section slidably interfitting in said chamber, means on said shaft forming a shoulder limiting axial movement of said member in the barb-extending direction, said barb carrier being held against rotation by virtue of the generally cross section of said carrier and said chamber, certain walls of said chamber being slotted and said barb carrier having a slot in registering relation with said chamber slots, a pair of barbs disposed within said barb carrier slot and pivoted to said carrier so as to extend outwardly through the slots in said chamber walls, a spring acting between said point member and said carrier for shifting the latter to a barb-extended position, and means connected with said barb-carrier to shift the latter to retract said barbs.

6. An arrow comprising a shaft including an elongated tubular portion and an enlarged socket at one end there-

of, the walls of said socket being slotted, a barb carrier movable in said socket longitudinally of said shaft, a pair of barbs pivoted to said carrier and extending outwardly through the walls of said socket, spring means acting between said barbs to extend the latter outwardly of the socket, a point member removably fixed to the outer end of said socket, a spring acting between the inner end of said point member and said barb carrier to move the latter to barb-extending position, movement of said carrier in the other direction relative to said shaft serving to withdraw said barbs to positions within said socket, and a rod section extending through the tubular portion of said shaft and connected with said carrier to shift the same against the action of said spring, removal of said point member from said shaft accommodating disassembly of said barb carrier, barbs and spring from said shaft.

7. An arrow comprising a shaft, a forward chamber fixed to said shaft, a point member fixed to the forward portion of said chamber, a barb carrier mounted for axial movement in said chamber toward and away from said point, a pair of barbs retractably and extensibly carried by said chamber and connected with said carrier, whereby axial movement of the latter in said chamber retracts and extends said barbs, spring means in said chamber acting against said point member to shift said carrier so as to extend said barbs, inertial movement of said carrier toward said point when the latter strikes an object, such as game, fish or the like, serving to retract said barbs and thereby facilitate entry of the arrow into said object, and said spring means serving to extend said barbs when movement of said arrow ceases.

8. An arrow comprising a shaft having a forward chamber, a point member fixed to the forward portion of said chamber, a barb normally disposed in extended position and movably carried by said shaft with an inner end extending into said chamber, a member normally held away from said point member and connected with said barb, and spring means acting between said point member and said barb-connected member for urging said barb into extended position upon termination of said deceleration whereby when the point member strikes its object, said member serves to retract said barb as said point member decelerates.

9. An arrow comprising a shaft having a chamber at the forward end, a point member closing the forward end of said chamber, opposite walls of the latter having elongated slots therein and said chamber being non-circular in cross section, a barb carrier slidable longitudinally in said chamber and having a cross section corresponding to the cross section of said chamber, whereby the carrier is held non-rotatably therein, said carrier having a slot lying in the plane of the slots in said chamber walls, barb means pivoted to said carrier and lying in the carrier slot, said barb means extending outwardly through the slots in said chamber walls, and spring means acting against said carrier for moving it to a position in which said barb means extends outwardly.

10. An arrow as defined in claim 9, further characterized by the slot in said carrier being dimensioned to accommodate the complete retraction of said barb means therein, and said point member being removable from the forward end of said shaft to accommodate the removal of said point member from the shaft and the removal of said barb means and said carrier from said chamber.

11. An arrow comprising a shaft having a chamber at the forward end, opposite walls of the chamber having elongated slots therein and said chamber being non-circular in cross section, a barb carrier slidable longitudinally in said chamber and having a cross section corresponding to the cross section of said chamber, means forming a shoulder adjacent an end of said chamber, one portion of said barb carrier being engageable with said shoulder, said carrier having a slot lying in the plane of the slots in the chamber walls, barb means pivoted to said carrier and lying in the carrier slot, said barb means

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extending outwardly through the slots in said chamber walls, said carrier being held against rotation in said chamber by virtue of said non-circular configuration so that the barbs do not bind in the chamber slots, and said shoulder and said barb carrier portion serving to prevent said barbs from engaging the rear ends of said slots.

12. An arrow comprising a shaft having a forward chamber, a point member fixed to the forward portion of said chamber, a wall of said chamber having a slot, a barb carrier member slidable in said chamber, means holding said carrier against rotation in said chamber, barb means pivotally connected with said carrier and extending outwardly through said chamber slot, said carrier serving to retract said barb when said point member decelerates, and spring means acting between said point member and said carrier for urging said barb means into extended position upon the termination of said deceleration.

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13. The invention set forth in claim 11, further characterized by spring means within said chamber acting against said barb carrier to move said one portion thereof against said shoulder so as to hold said barbs in their extended position.

14. The invention set forth in claim 11, further characterized by a point member removably fixed to the forward part of said chamber, the internal section of said chamber being substantially uniform from end to end, whereby when said point member is removed, the barb carrier may be removed from said chamber.

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