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Brekke et al.

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(54) **HANGER FOR FIRE SEPARATION WALL**

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See application file for complete search history.

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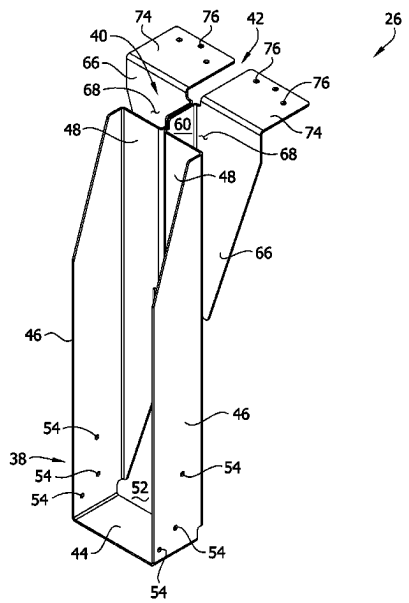
(57) **ABSTRACT**

A hanger for connecting a structural component to a wall that can have sheathing mounted thereon either before or after the hanger is connected to the wall. The hanger includes a channel-shaped portion configured to receive the structural component. An extension portion extends from the channel-shaped portion and is configured to extend through the sheathing to engage the wall at a first location. A connection portion is configured for attachment to the wall at a second location spaced from the first location.

105 Claims, 43 Drawing Sheets



Simpson Strong-Tie Company EX1065
Simpson v. Columbia
PGR2024-00050

Related U.S. Application Data

continuation of application No. 14/555,049, filed on Nov. 26, 2014, now Pat. No. 10,024,049.

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FIG. 1

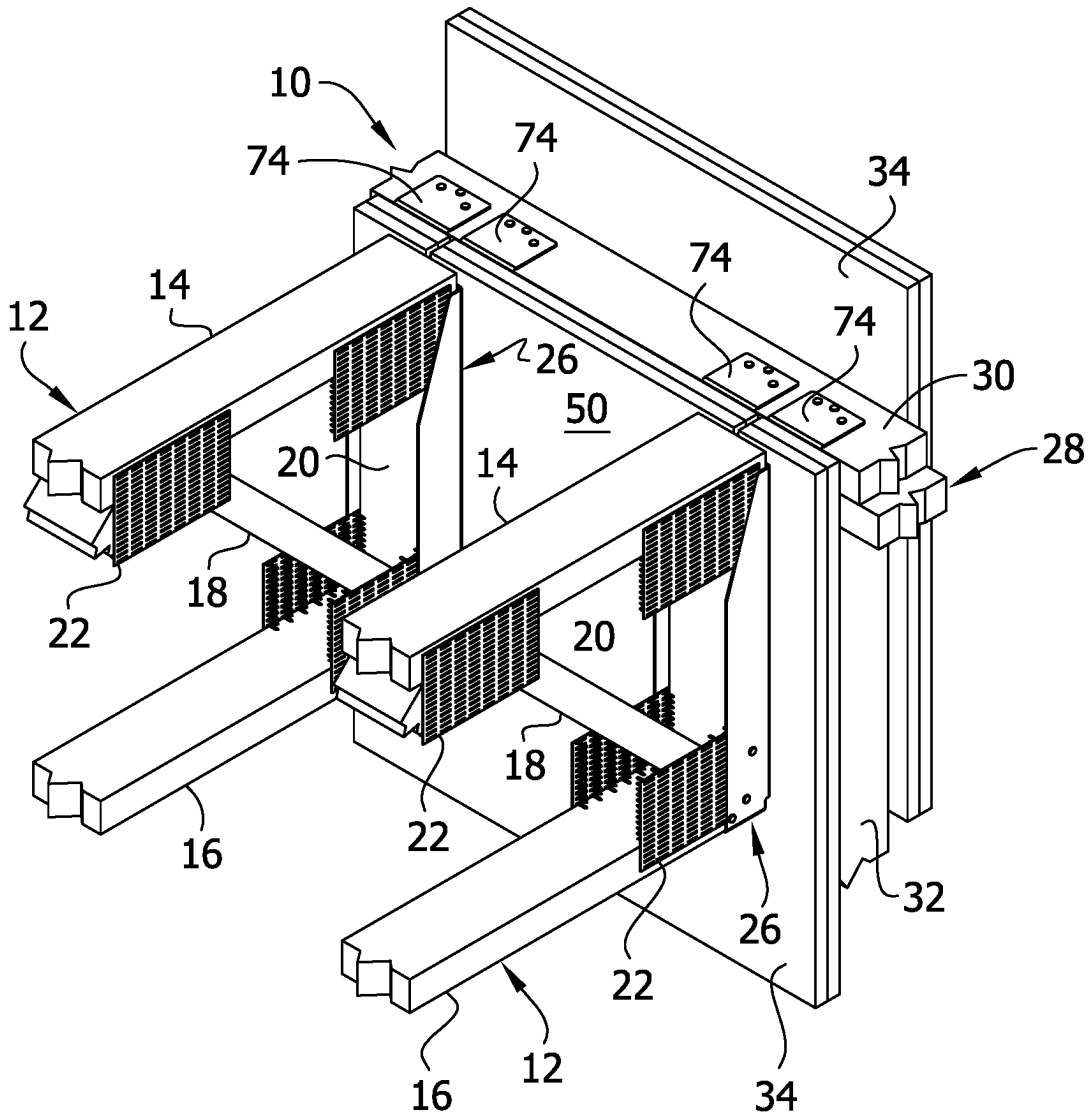
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FIG. 2

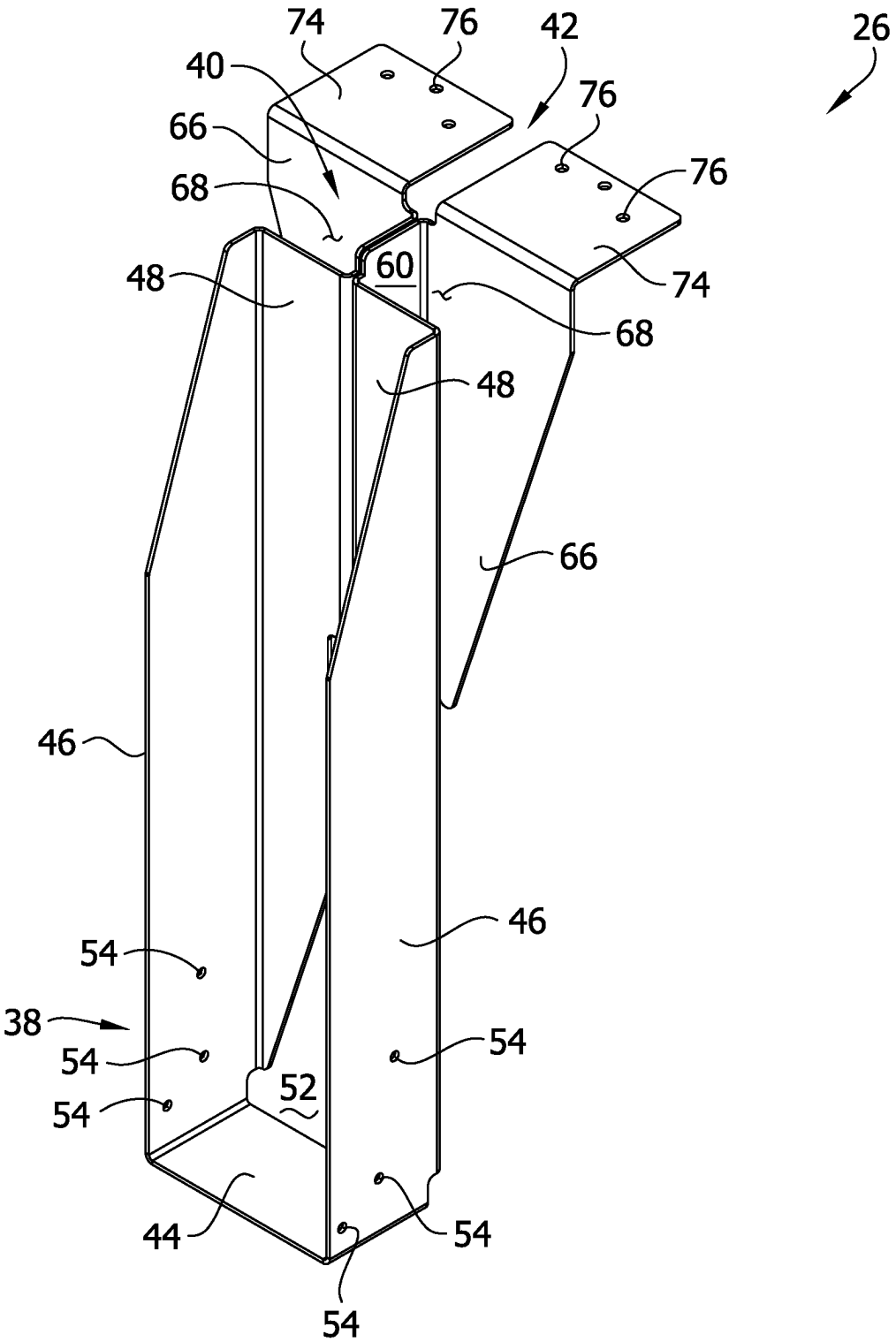
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FIG. 2A

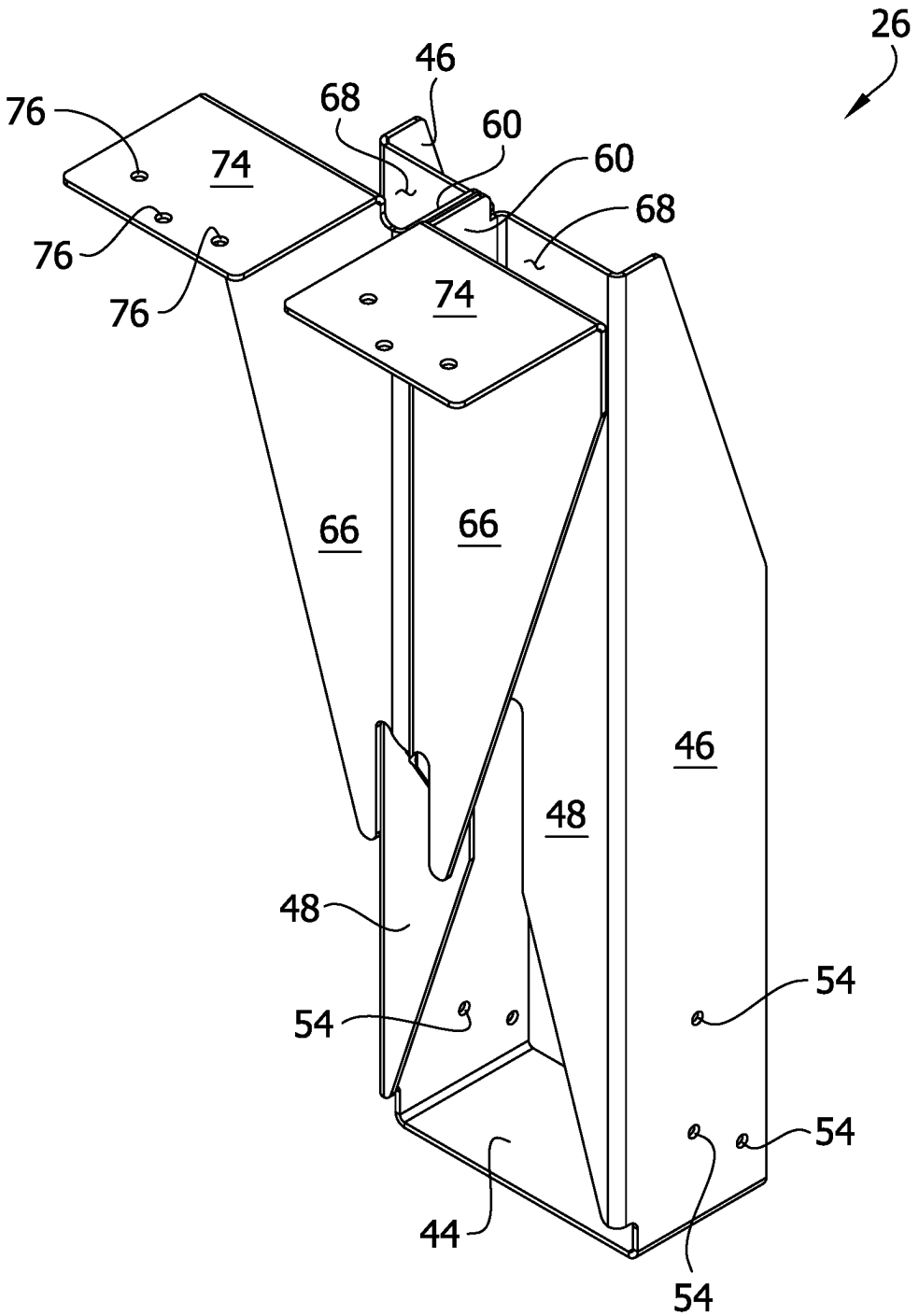


FIG. 3

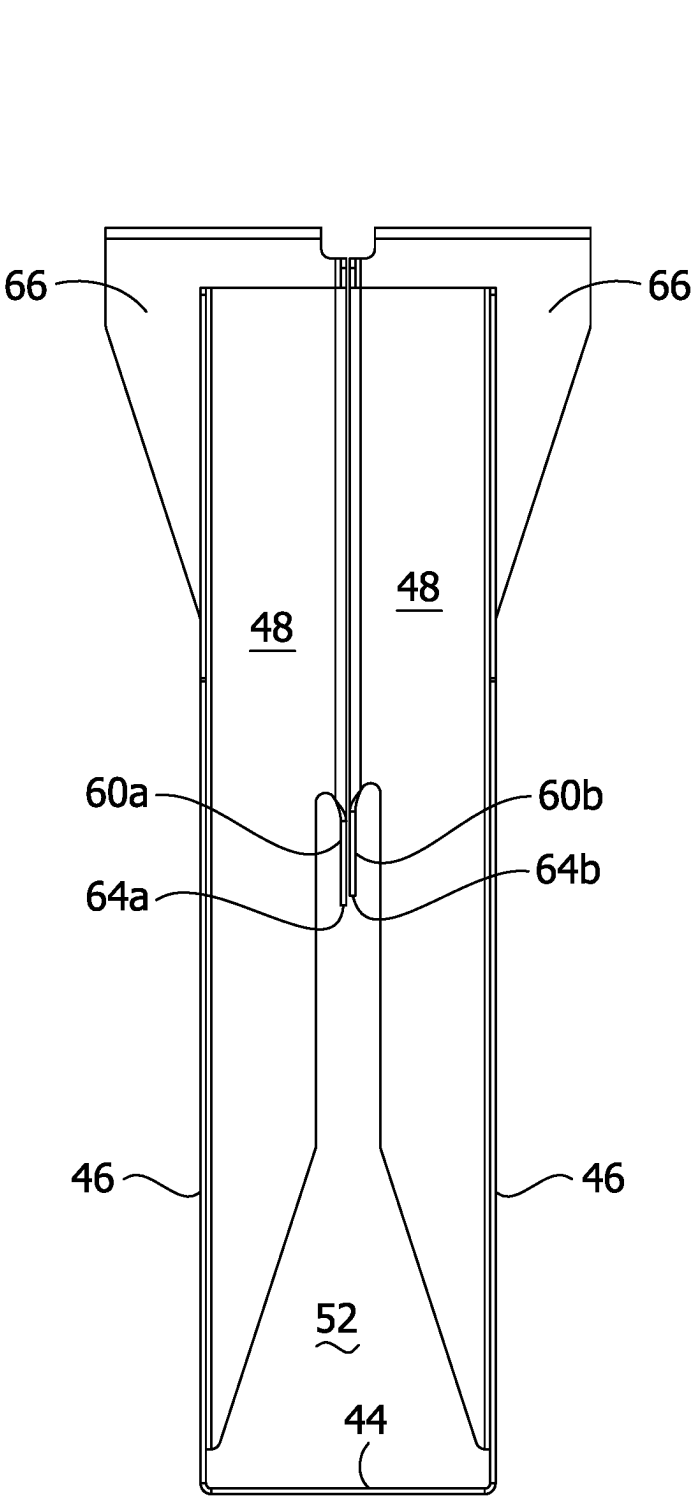
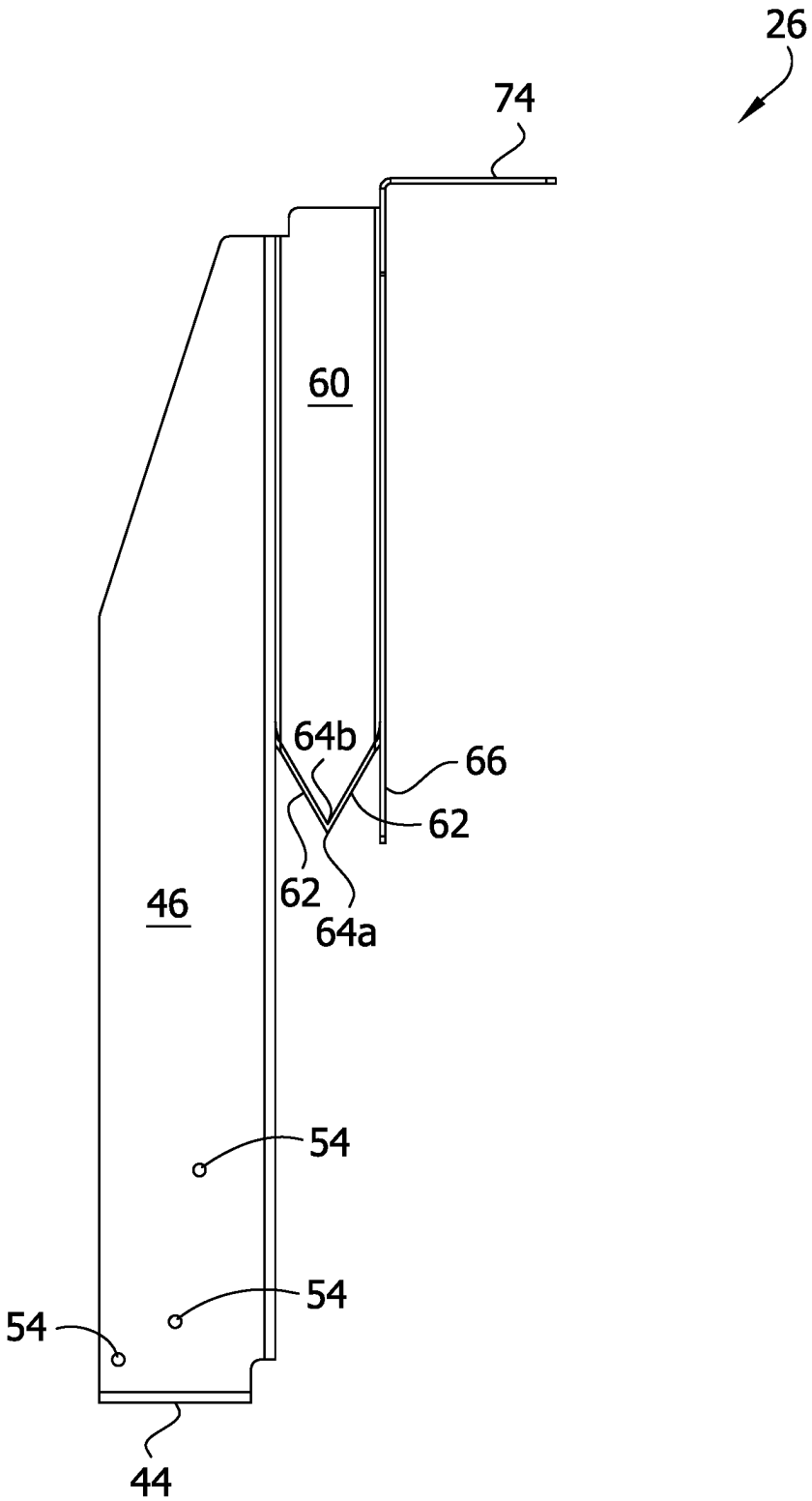


FIG. 4



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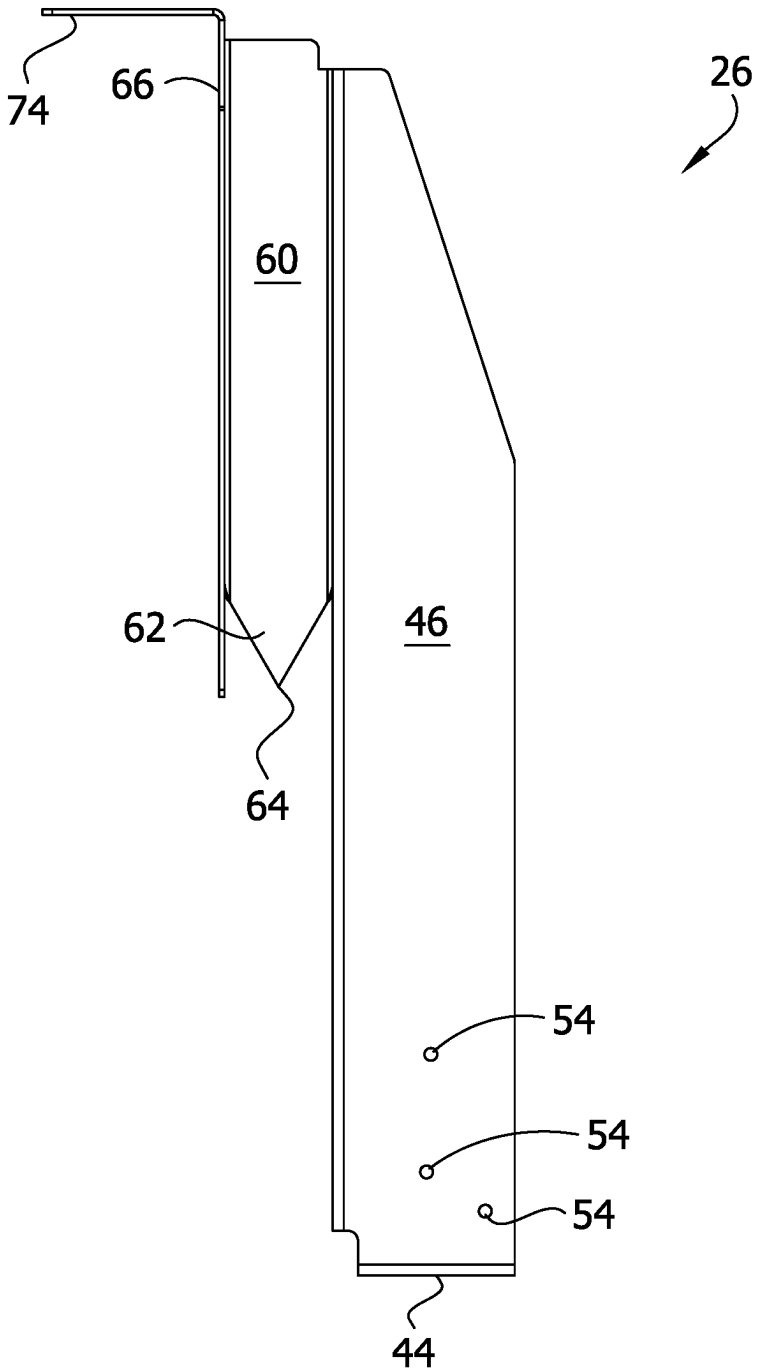

FIG. 6

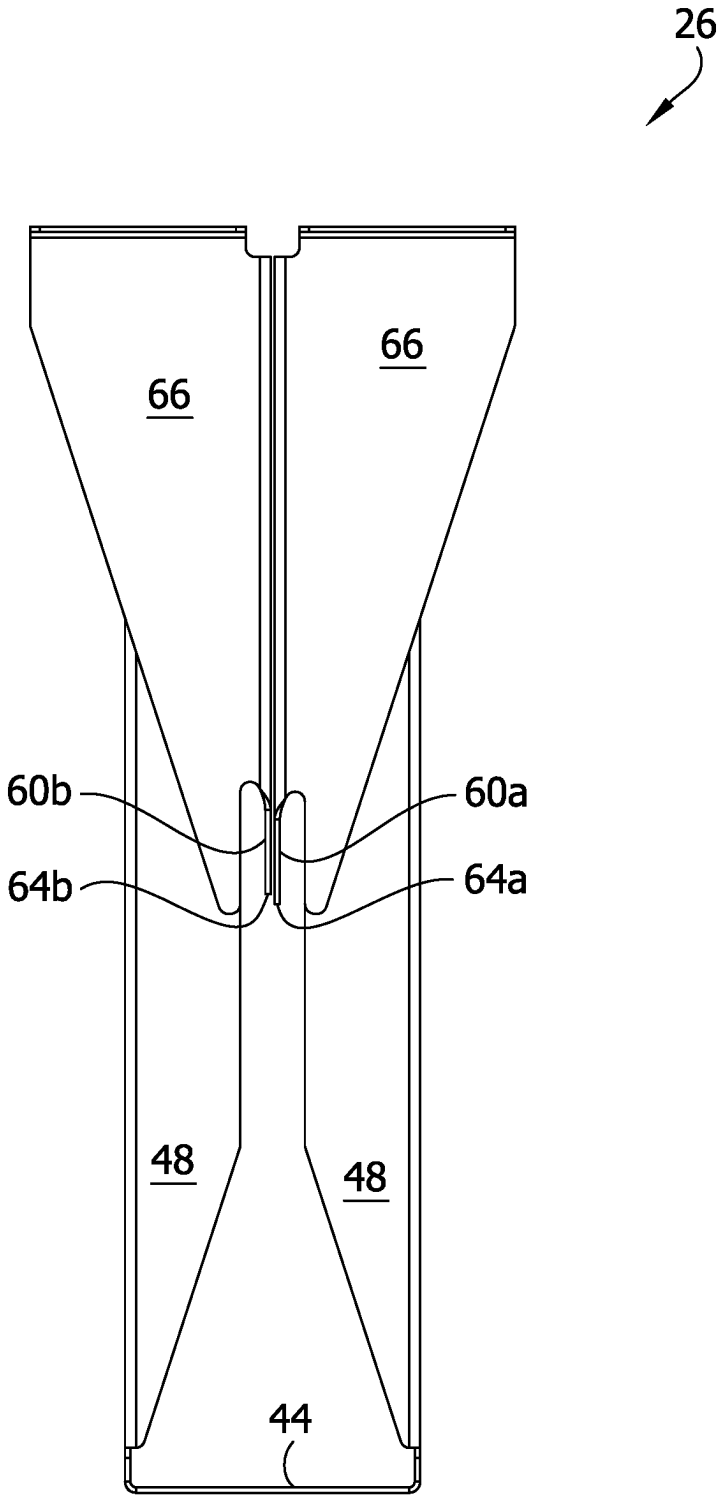

FIG. 7

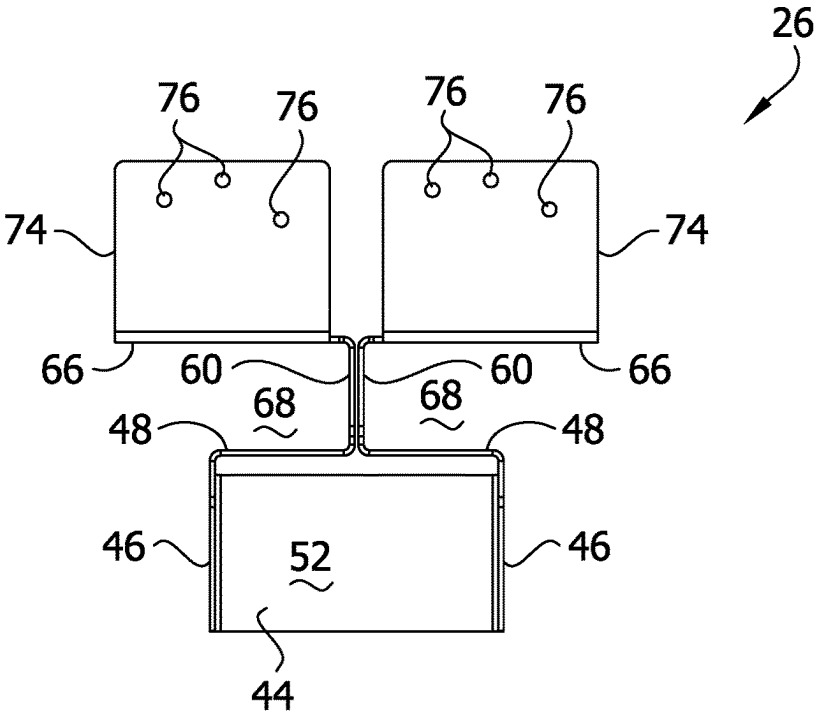
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FIG. 8

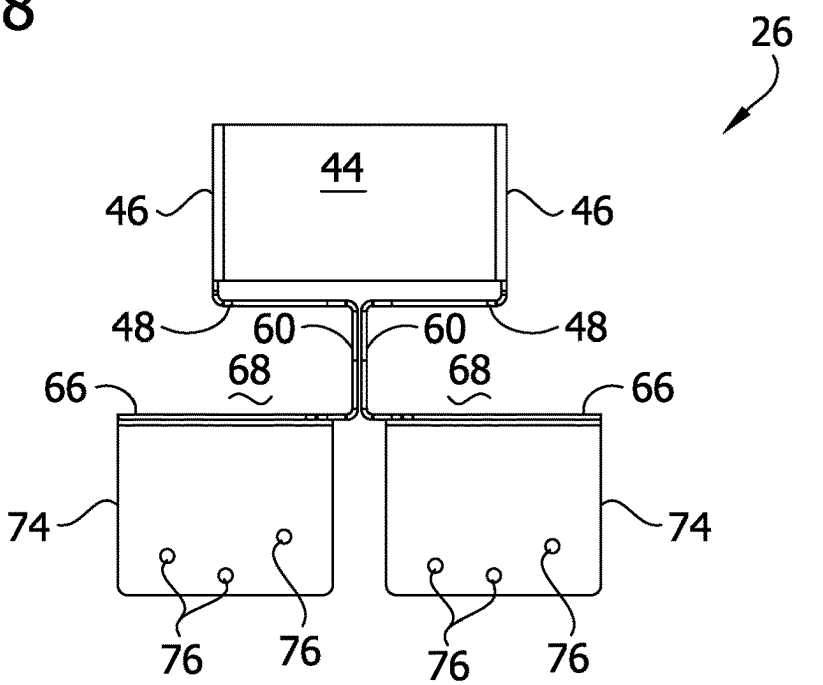
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FIG. 9

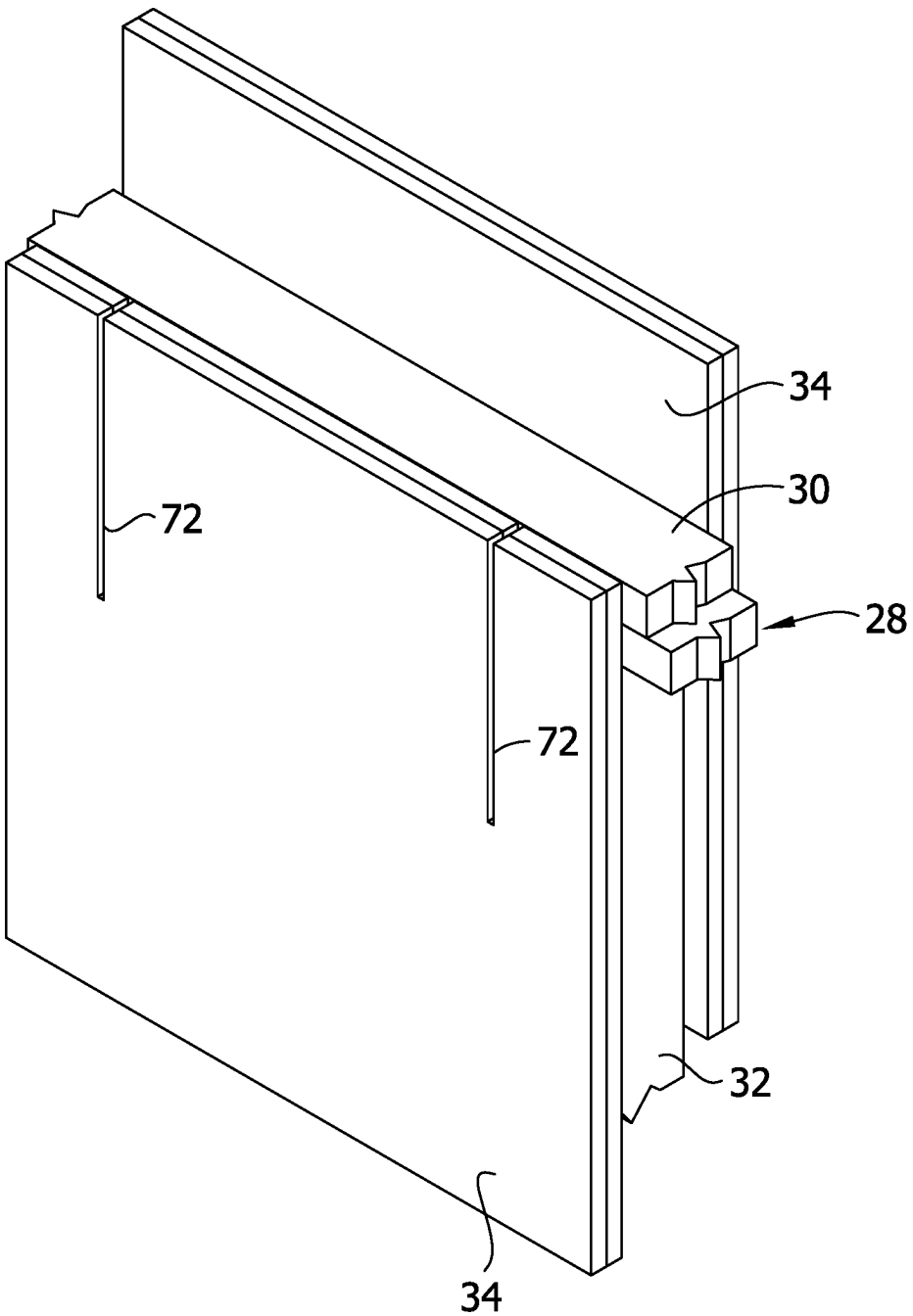

FIG. 10

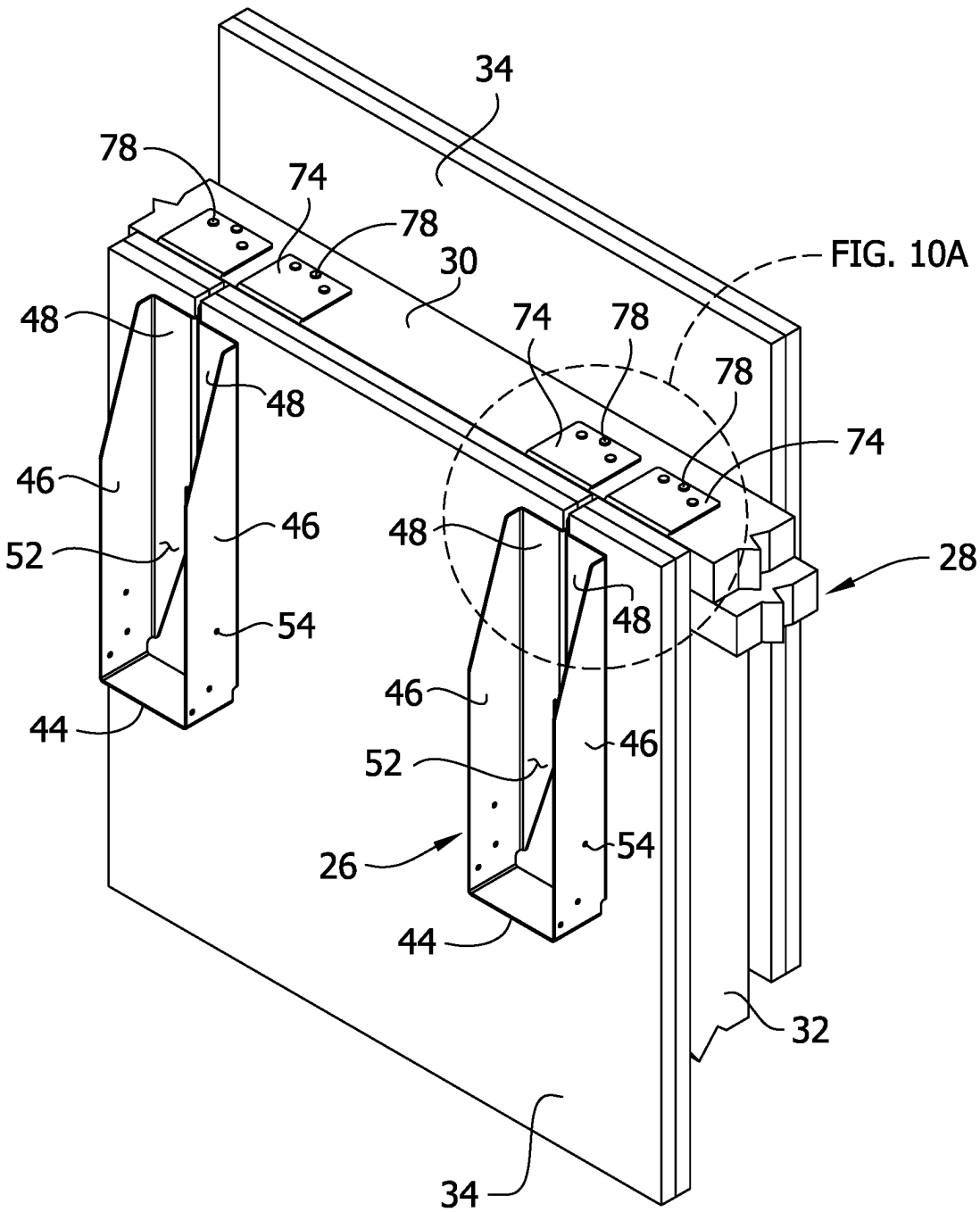
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FIG. 10A
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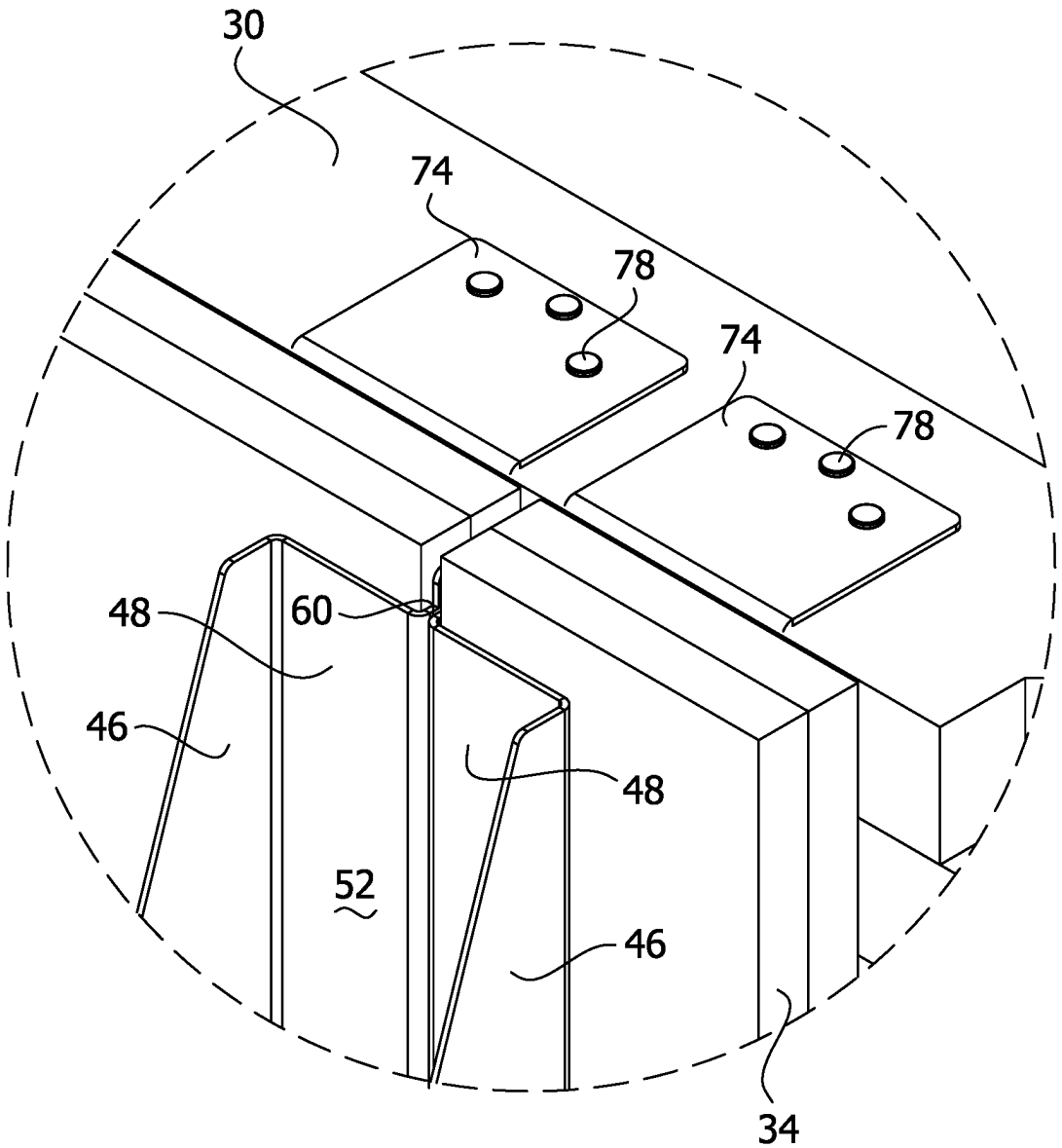
FIG. 10A



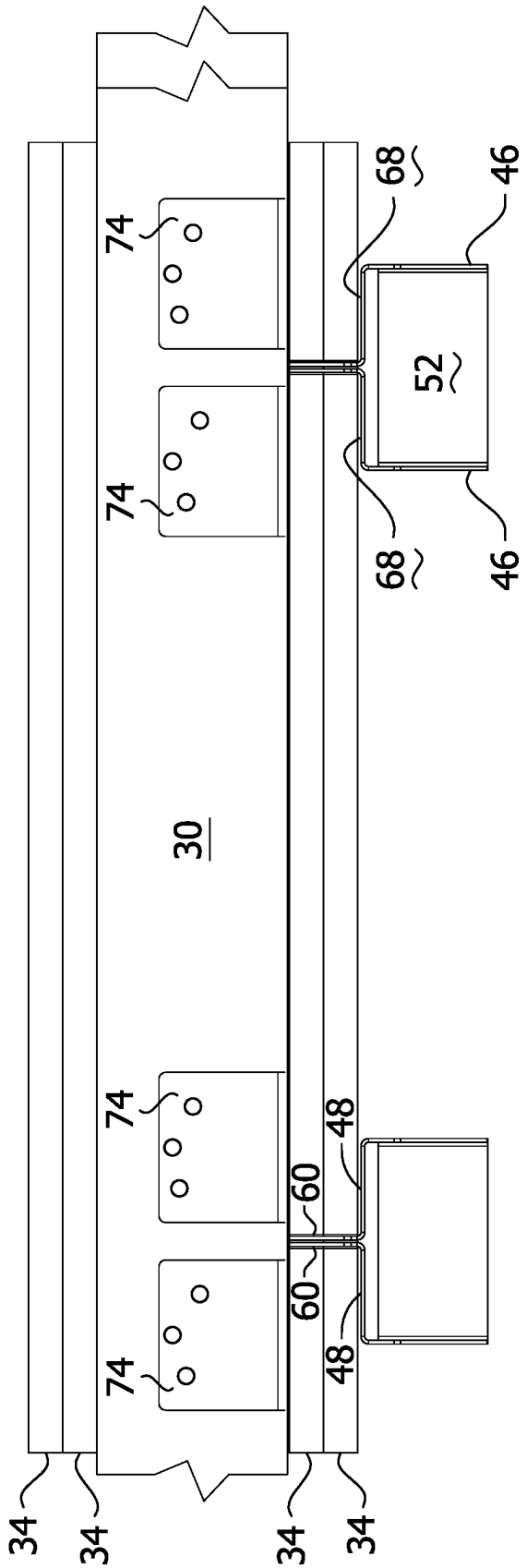


FIG. 11

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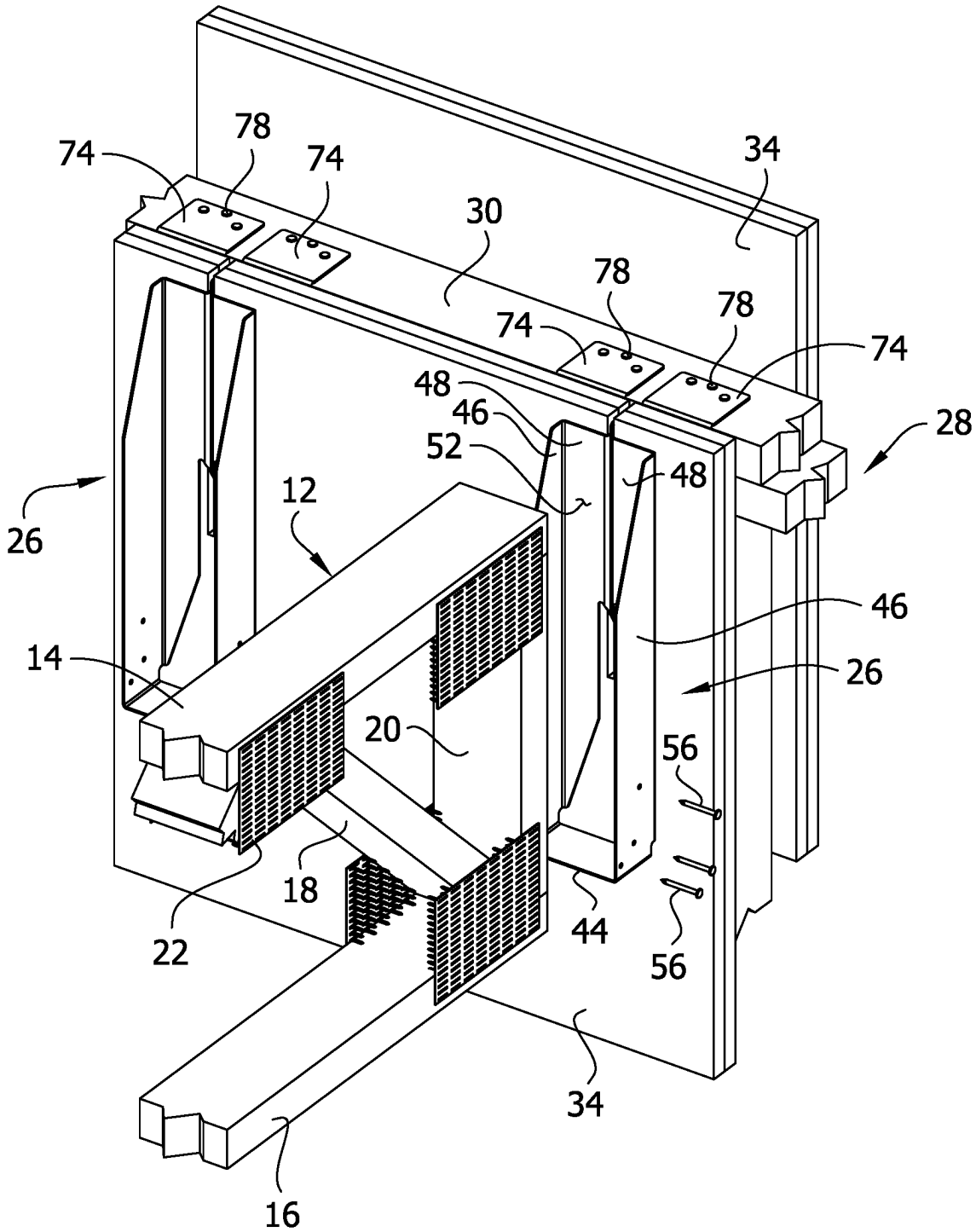
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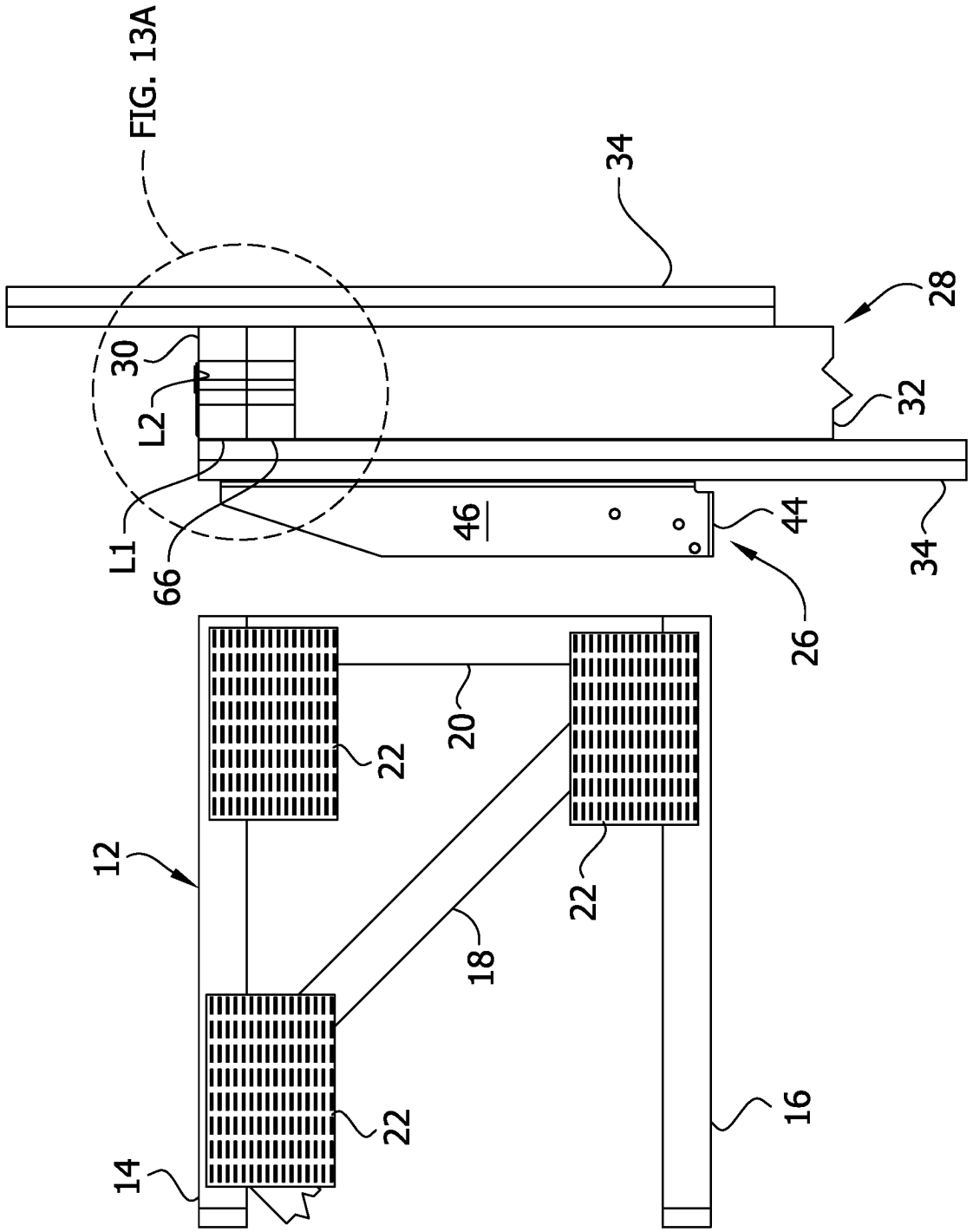


FIG. 13

FIG. 13A

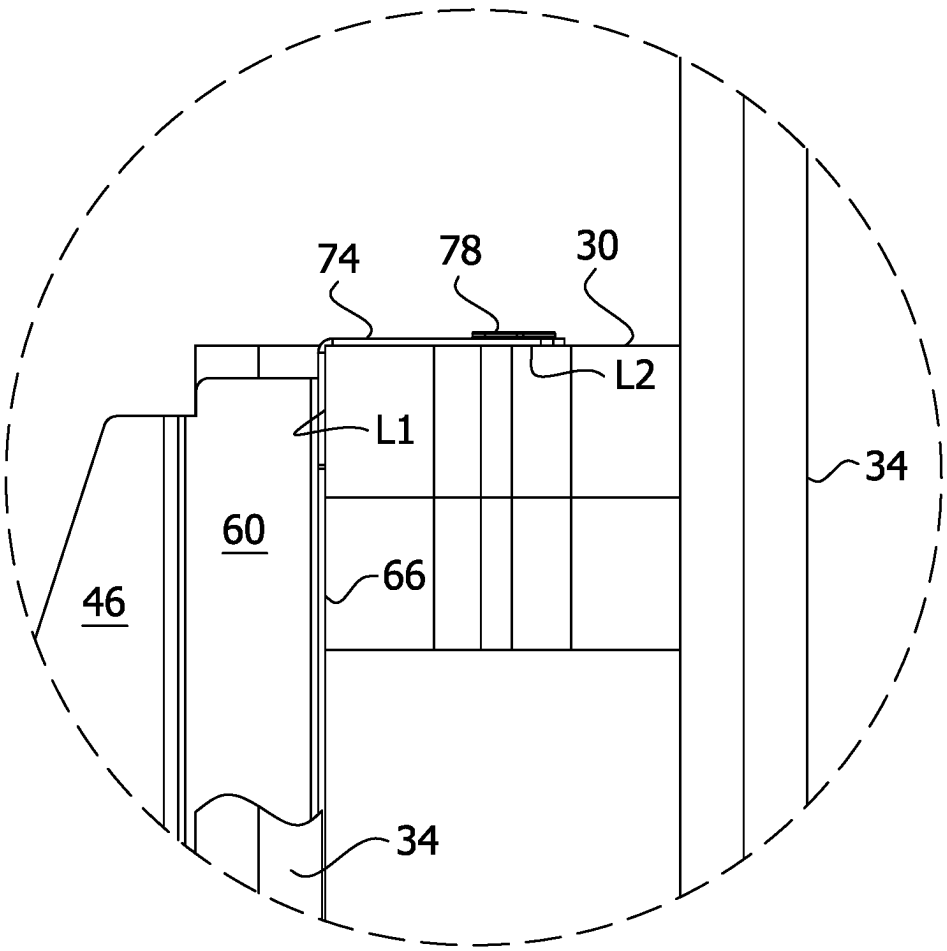


FIG. 14

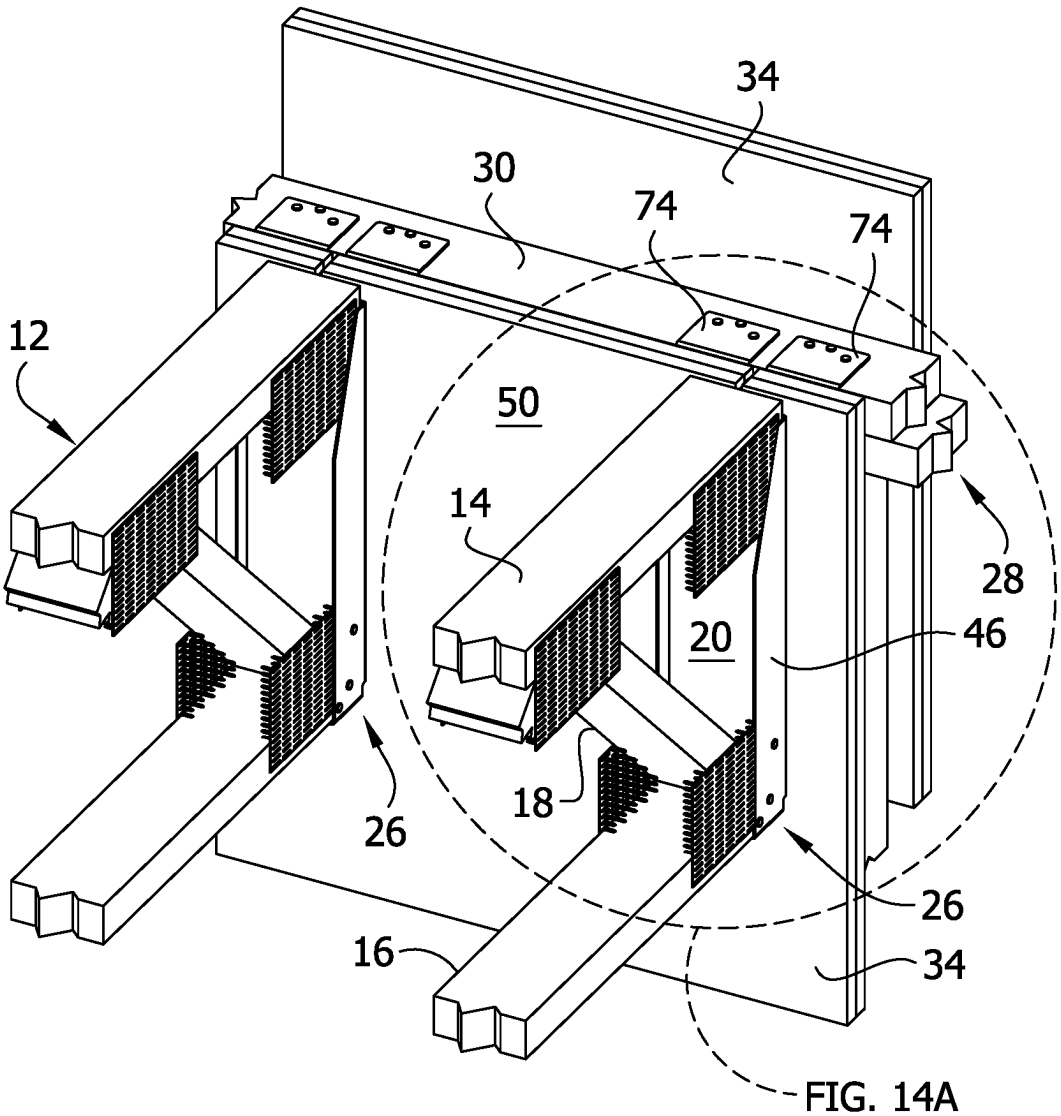


FIG. 14A

FIG. 14A

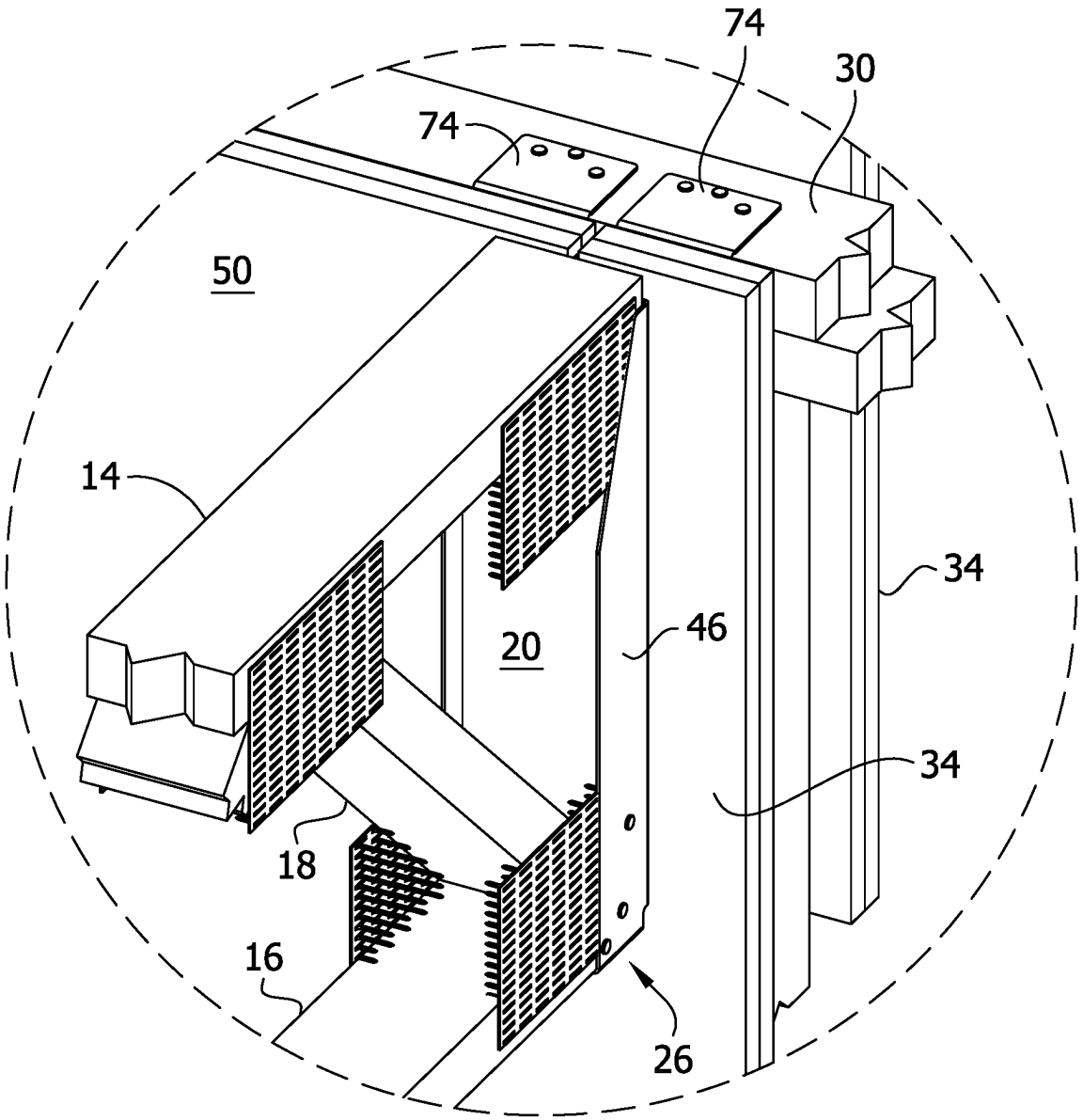


FIG. 15

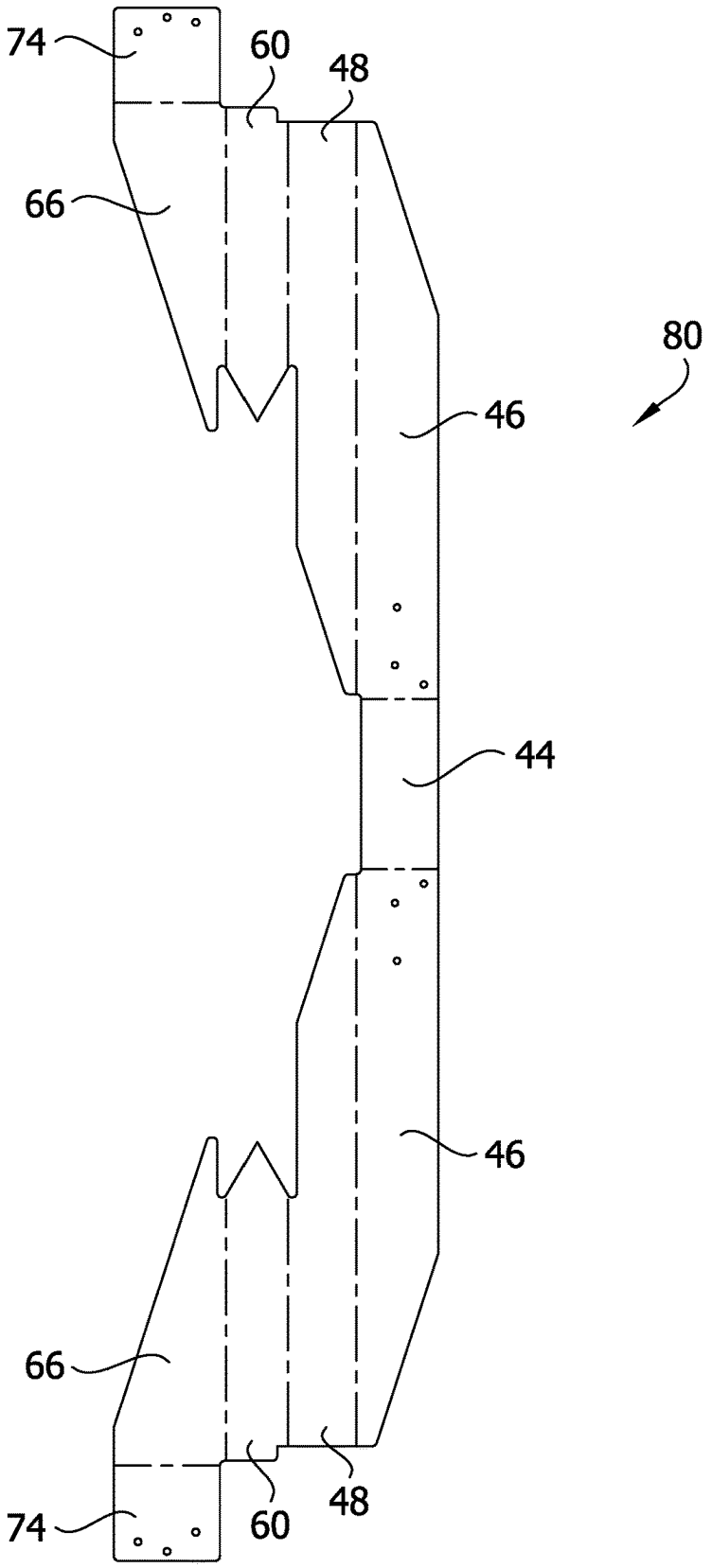
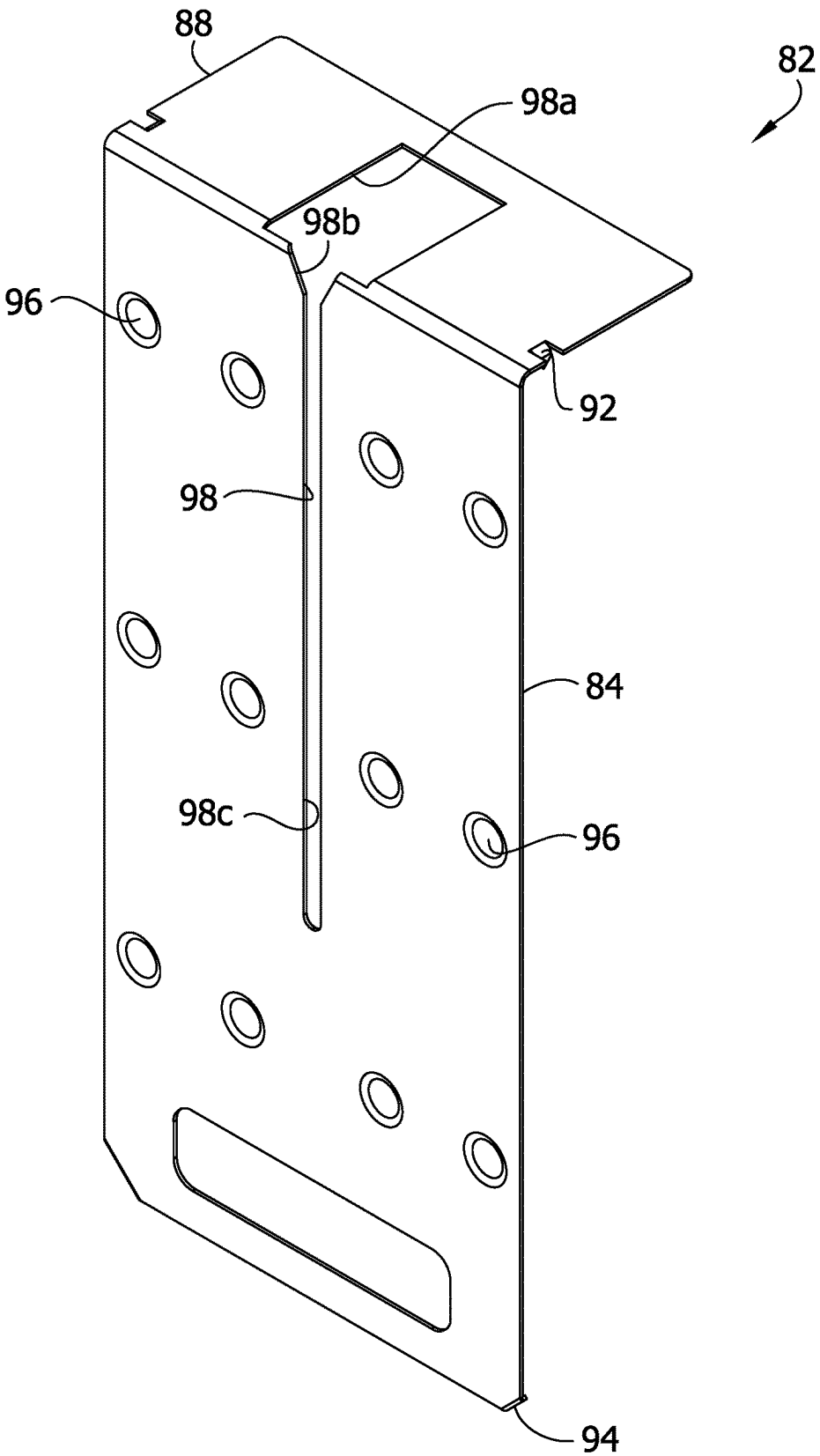


FIG. 16



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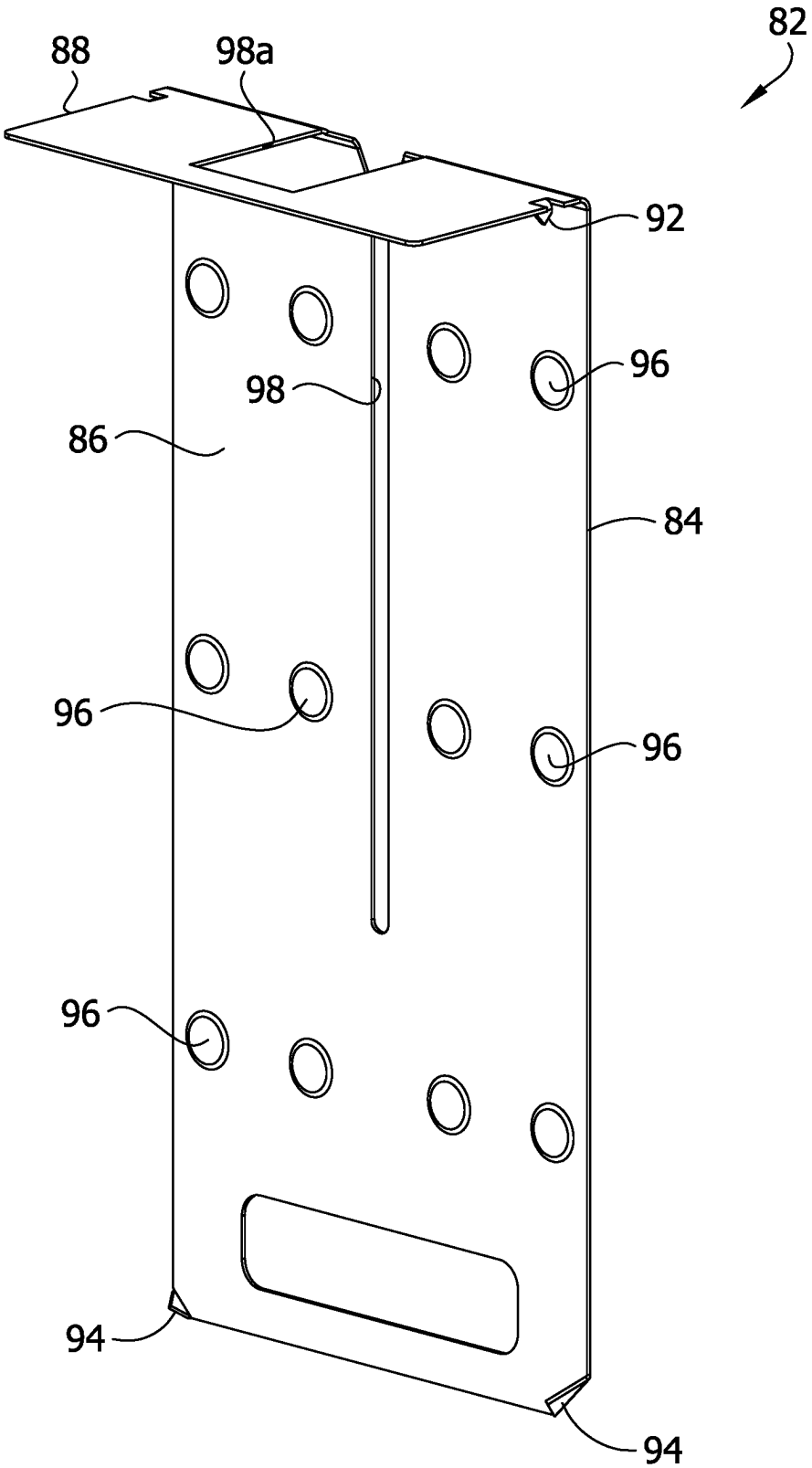

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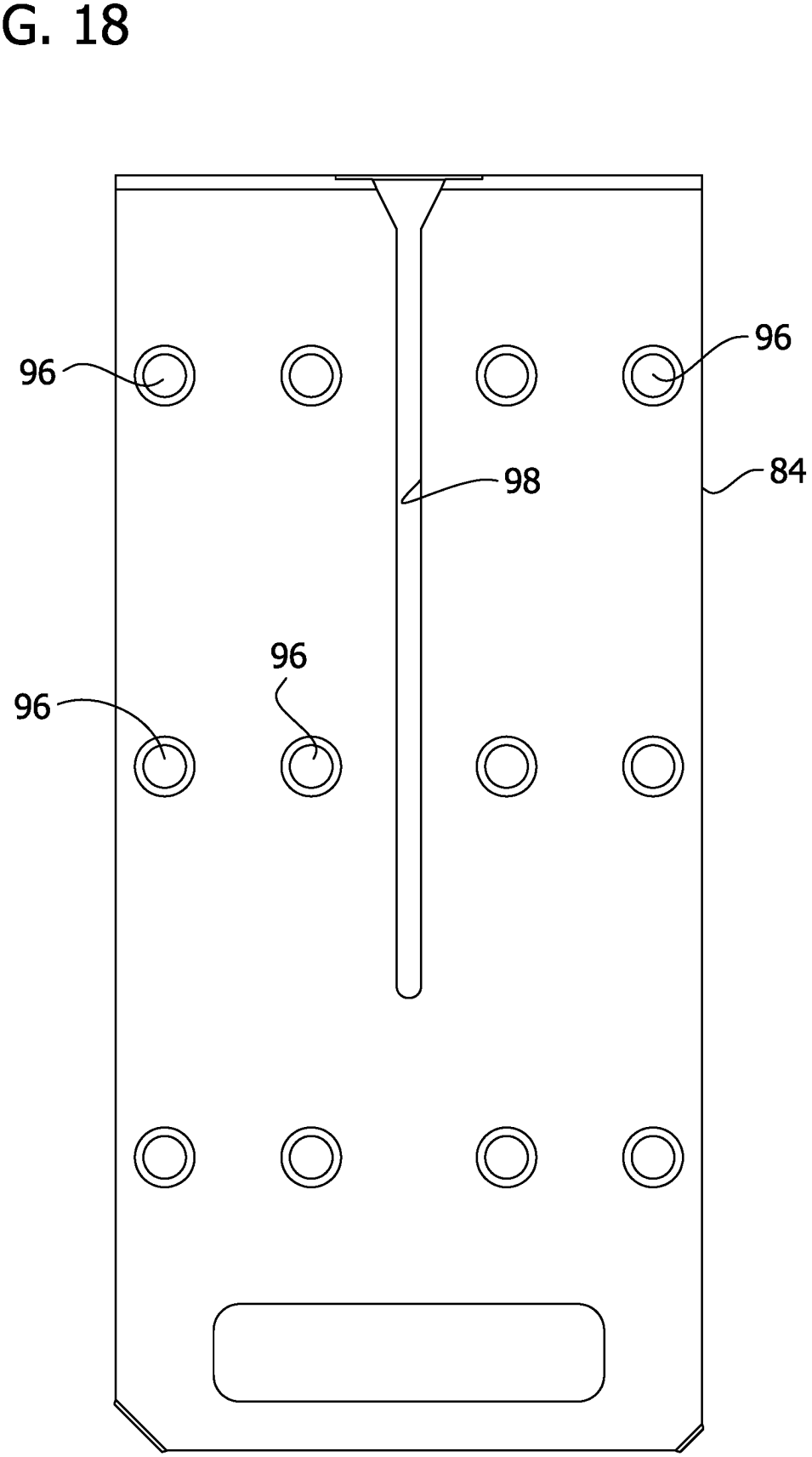
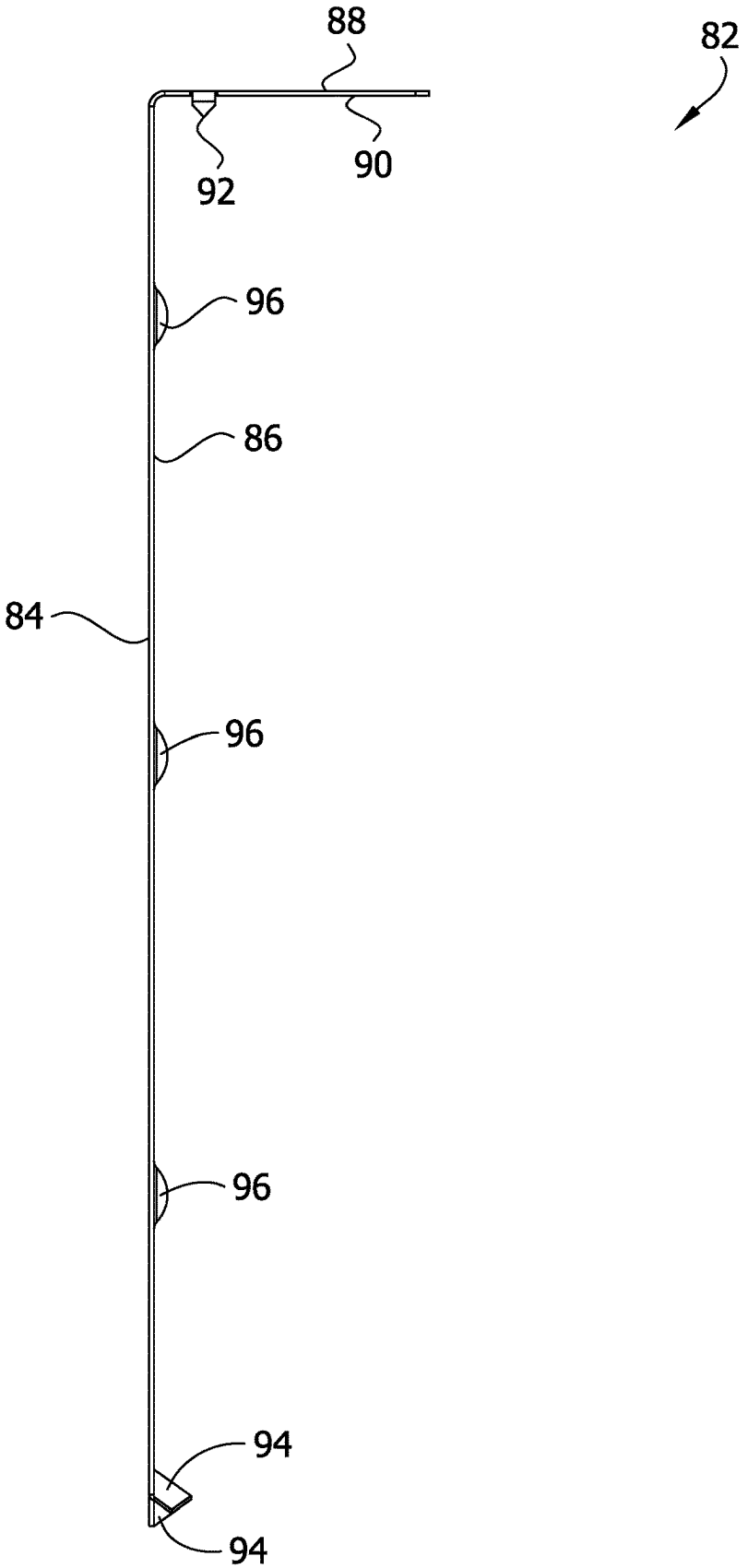


FIG. 19



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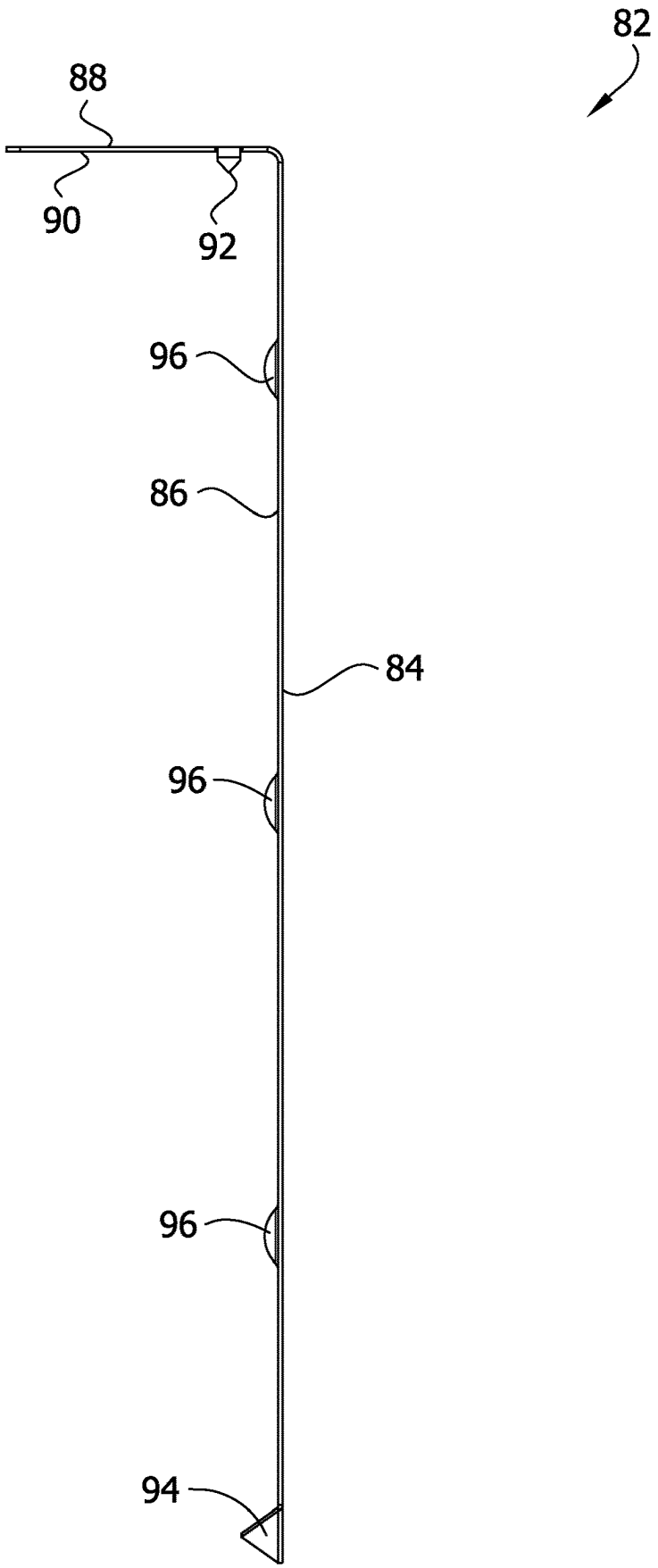
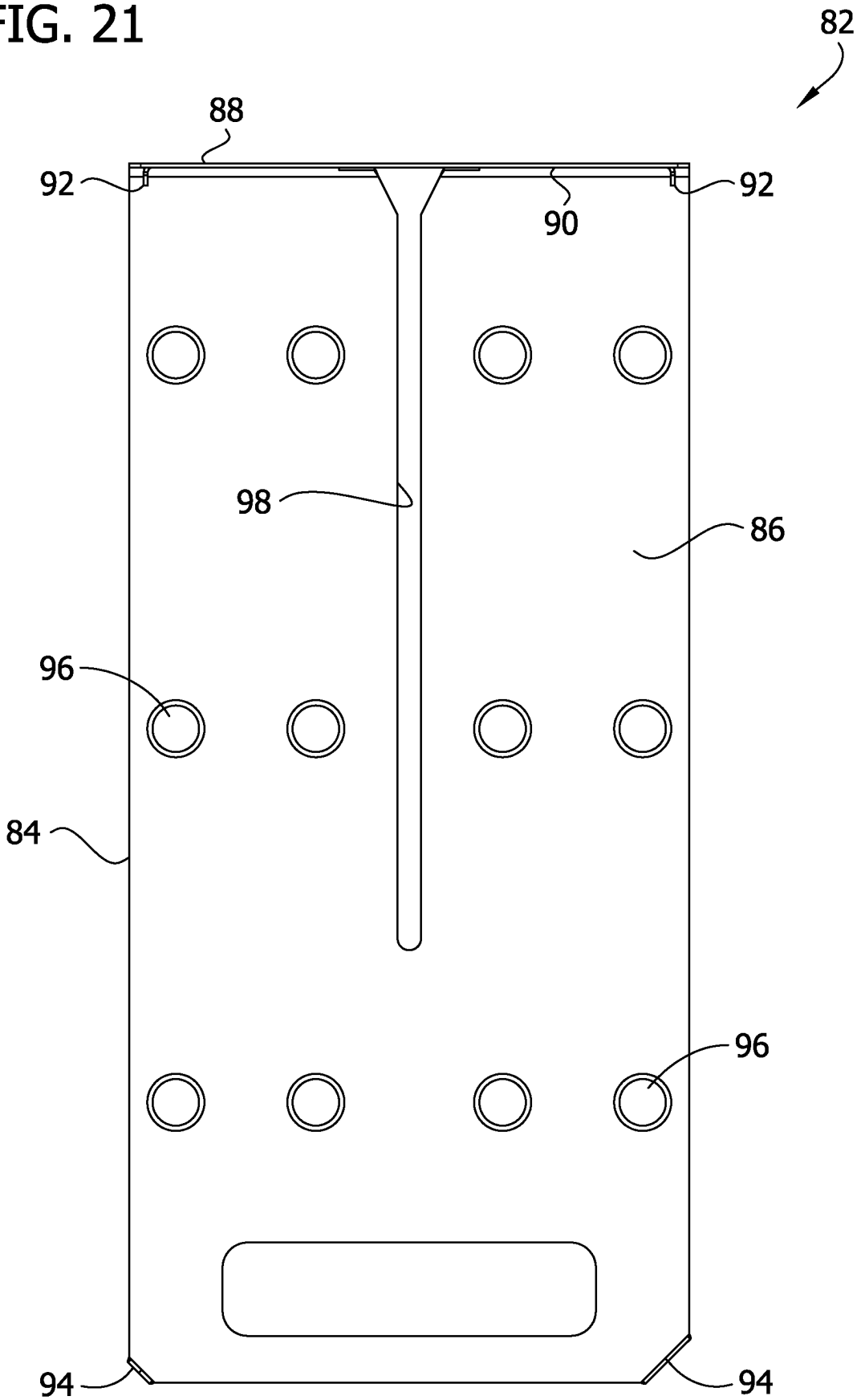
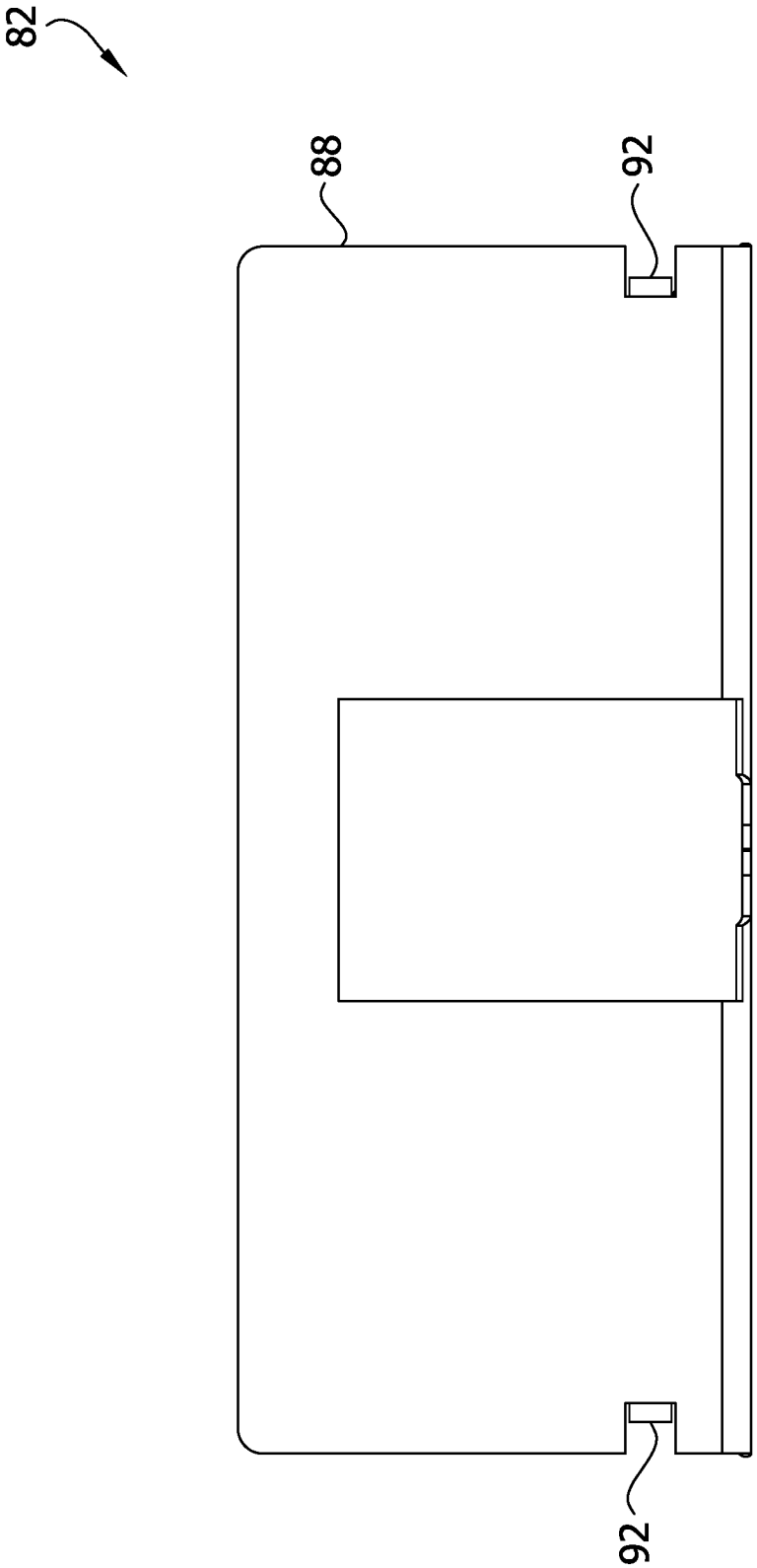


FIG. 21





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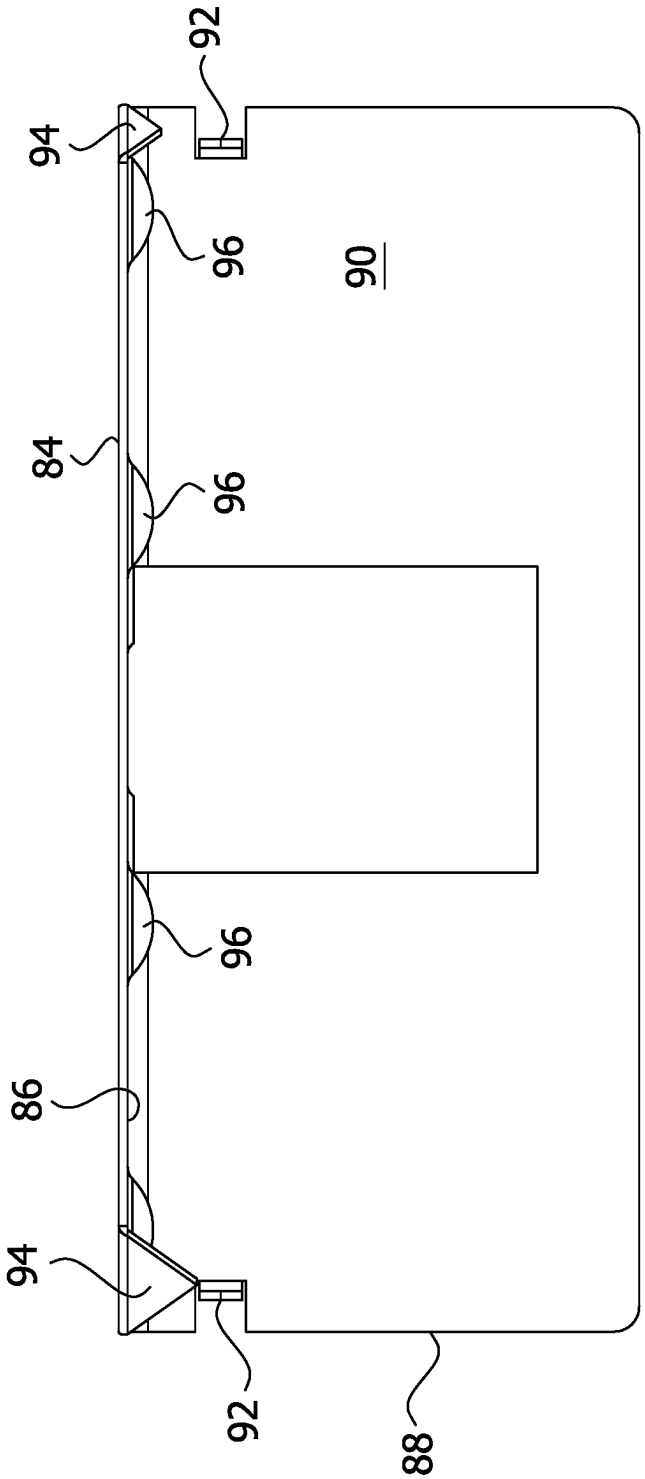

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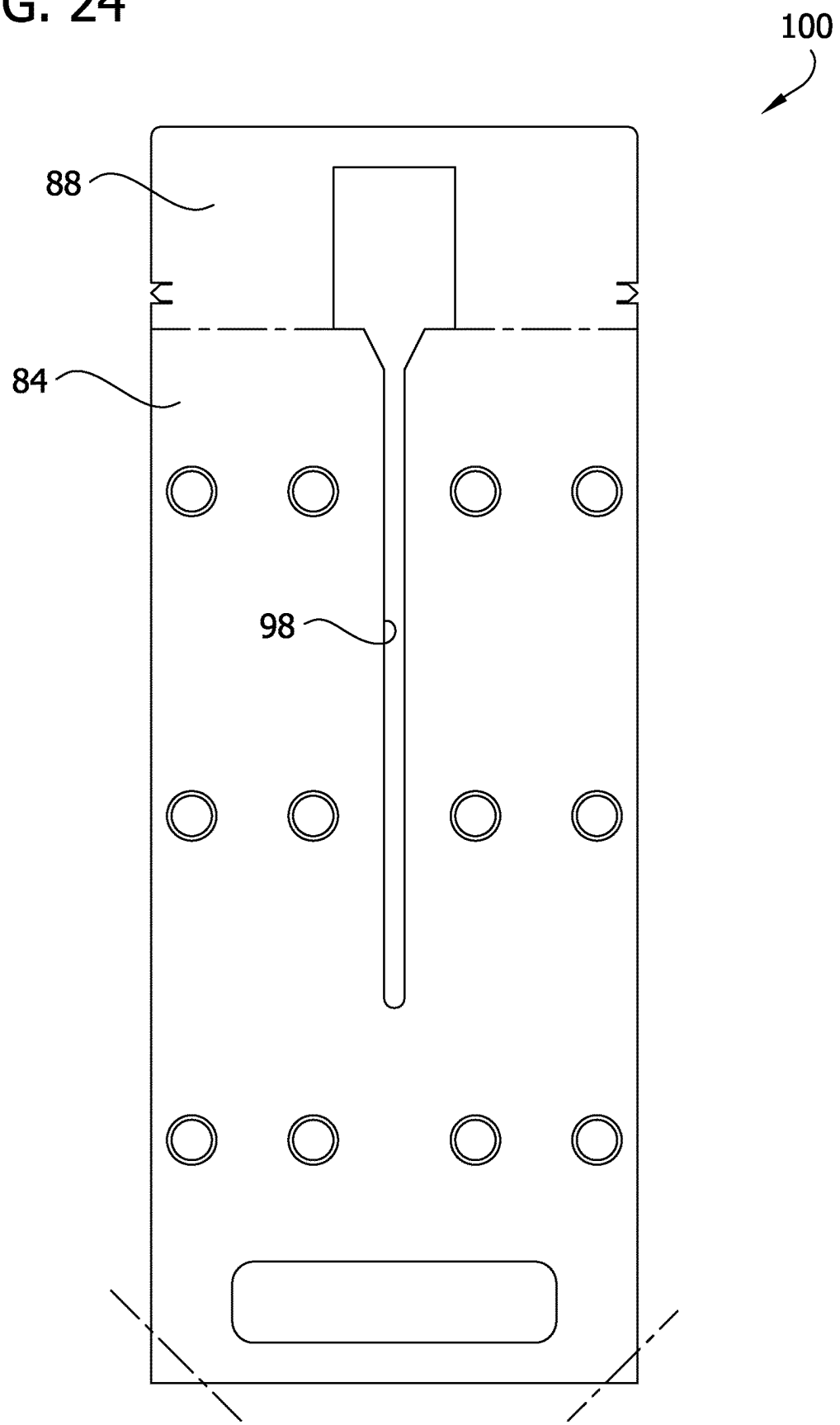

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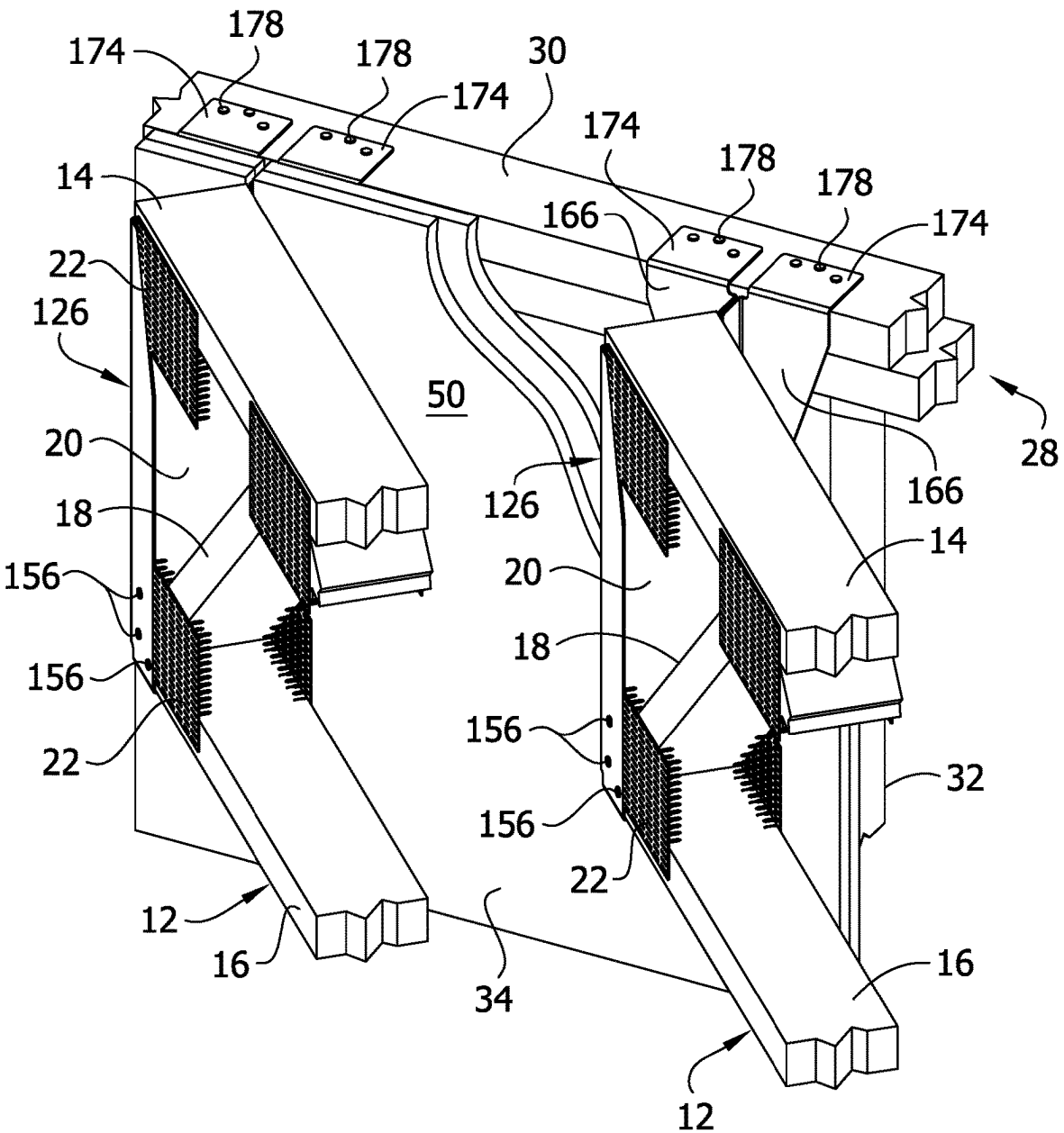
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FIG. 26

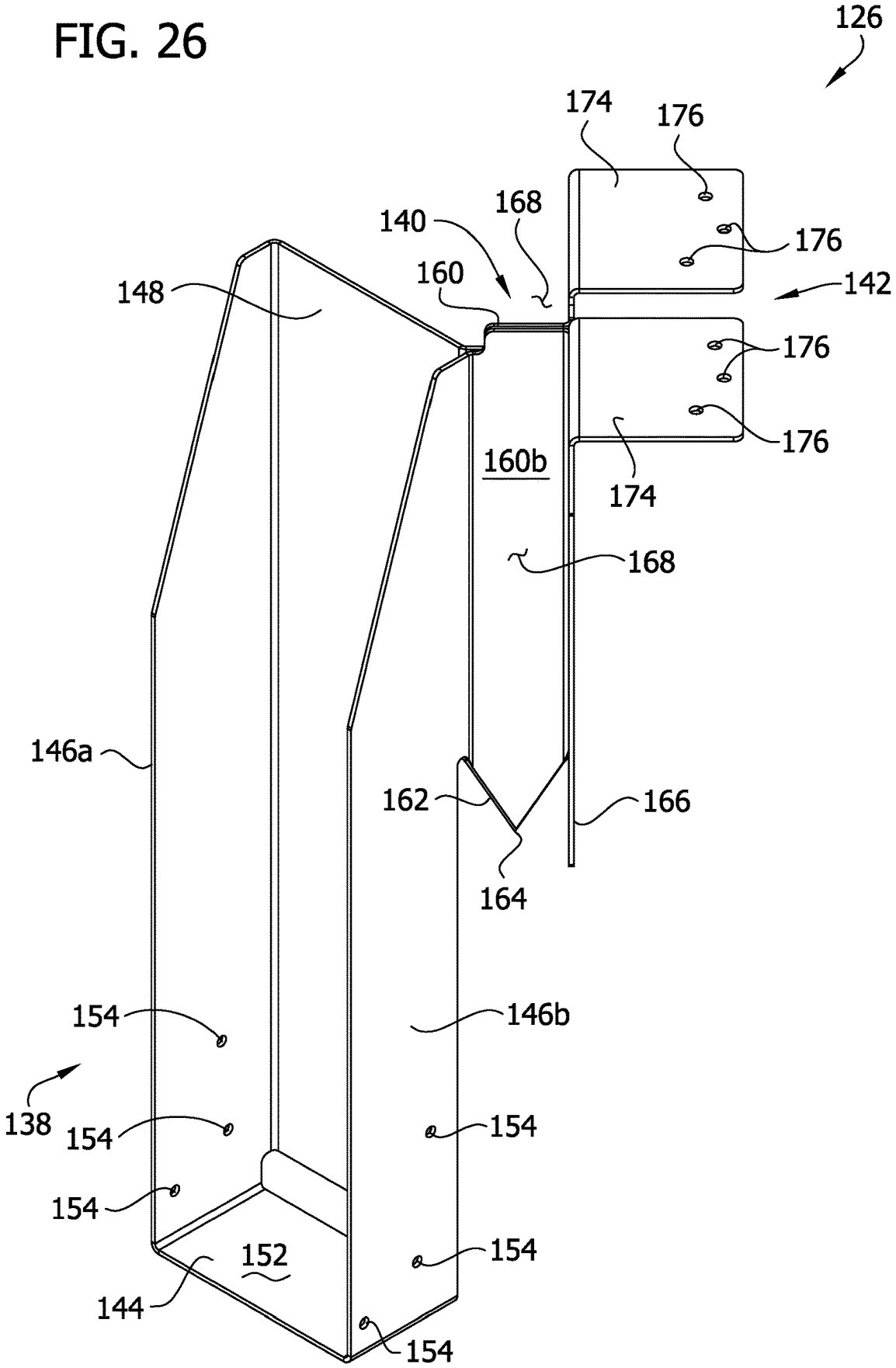
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FIG. 27

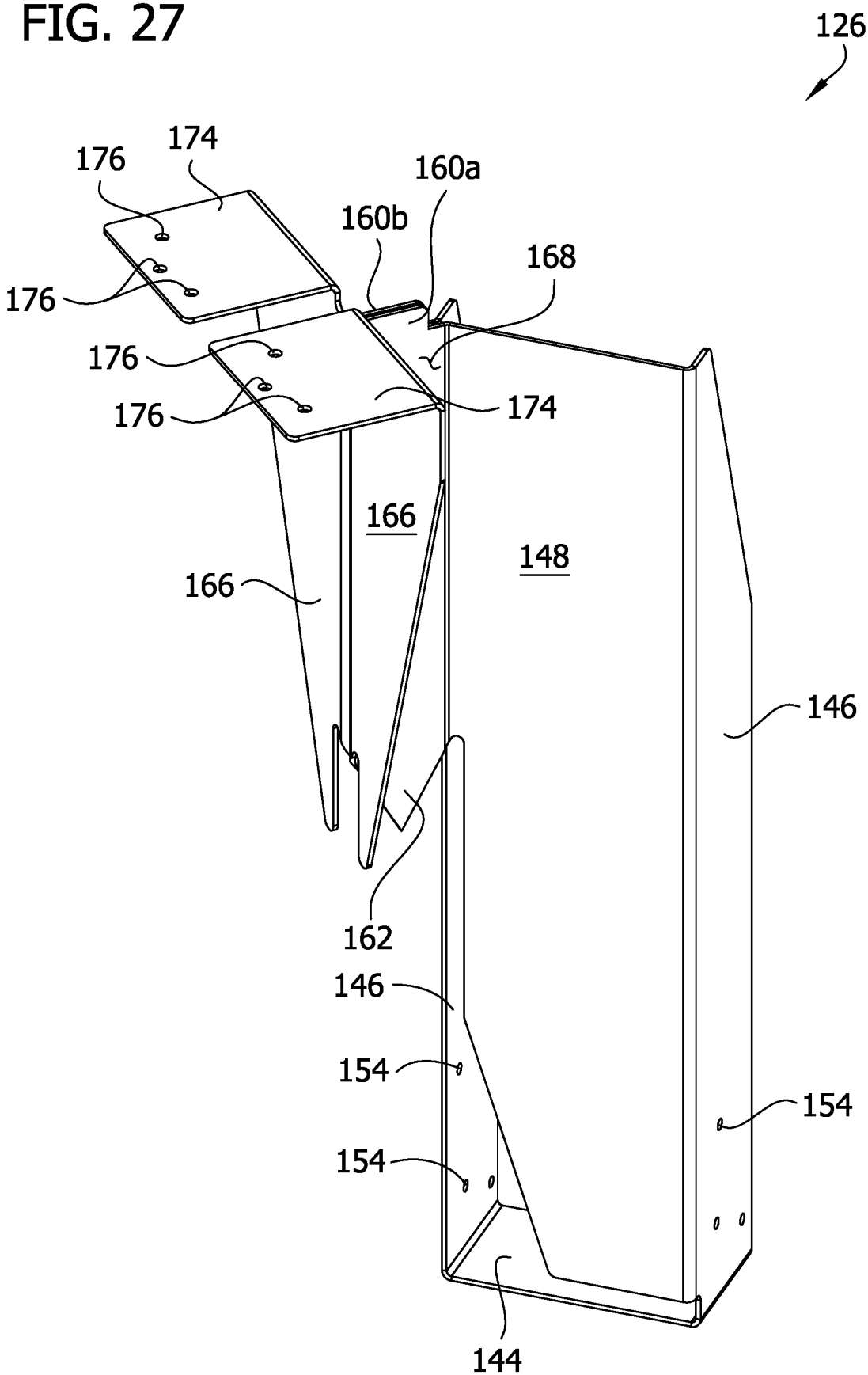
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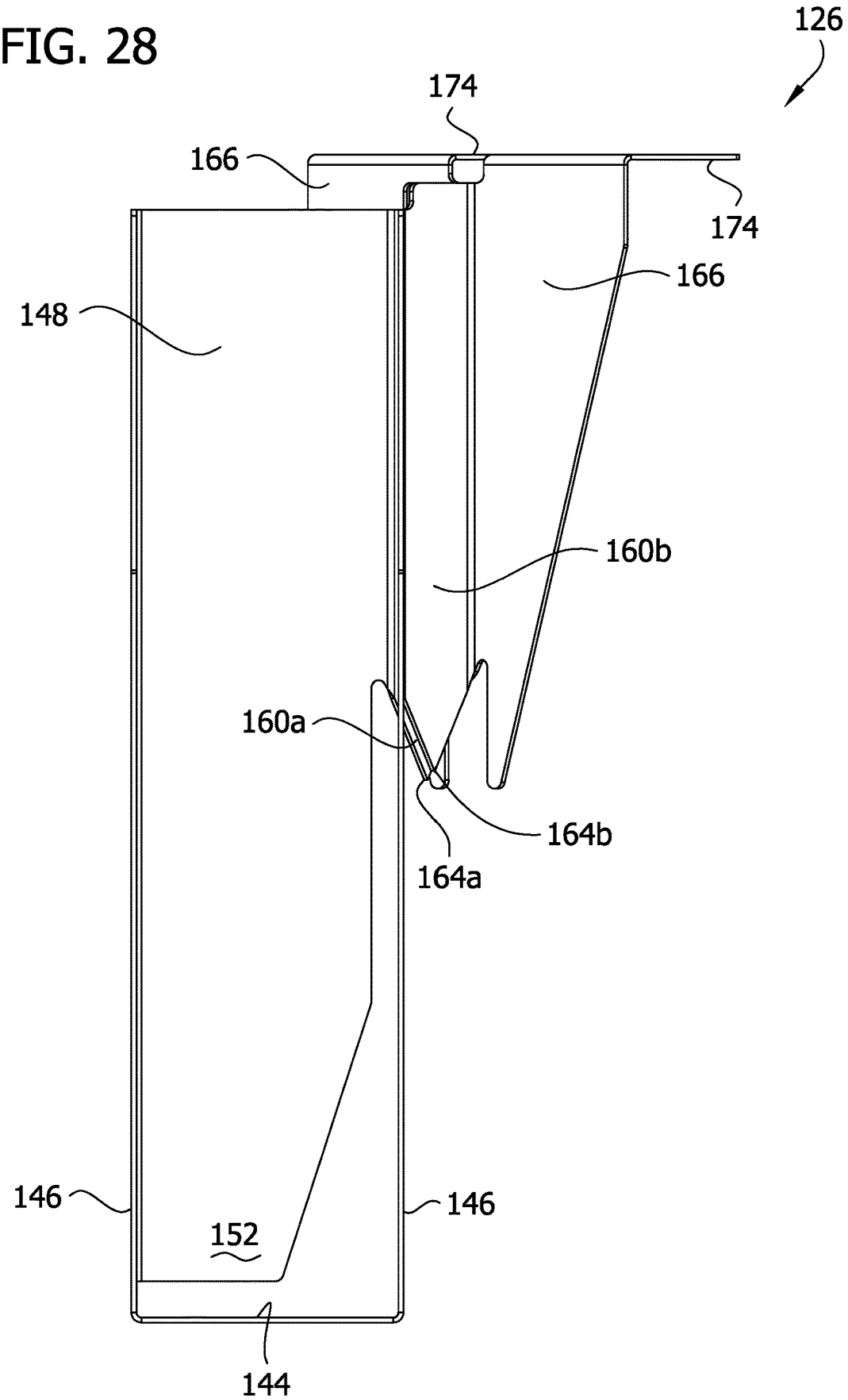
FIG. 28



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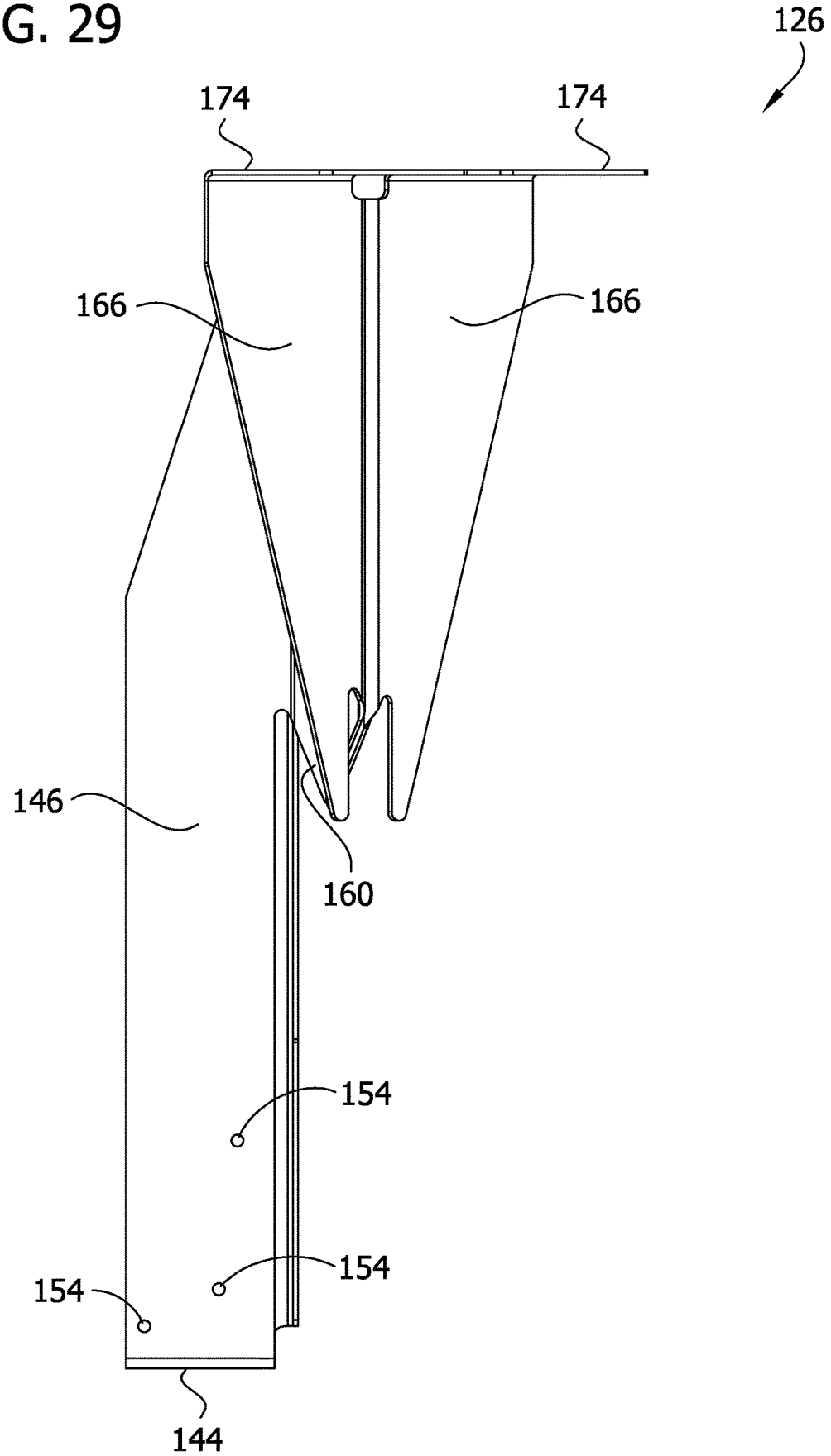


FIG. 30

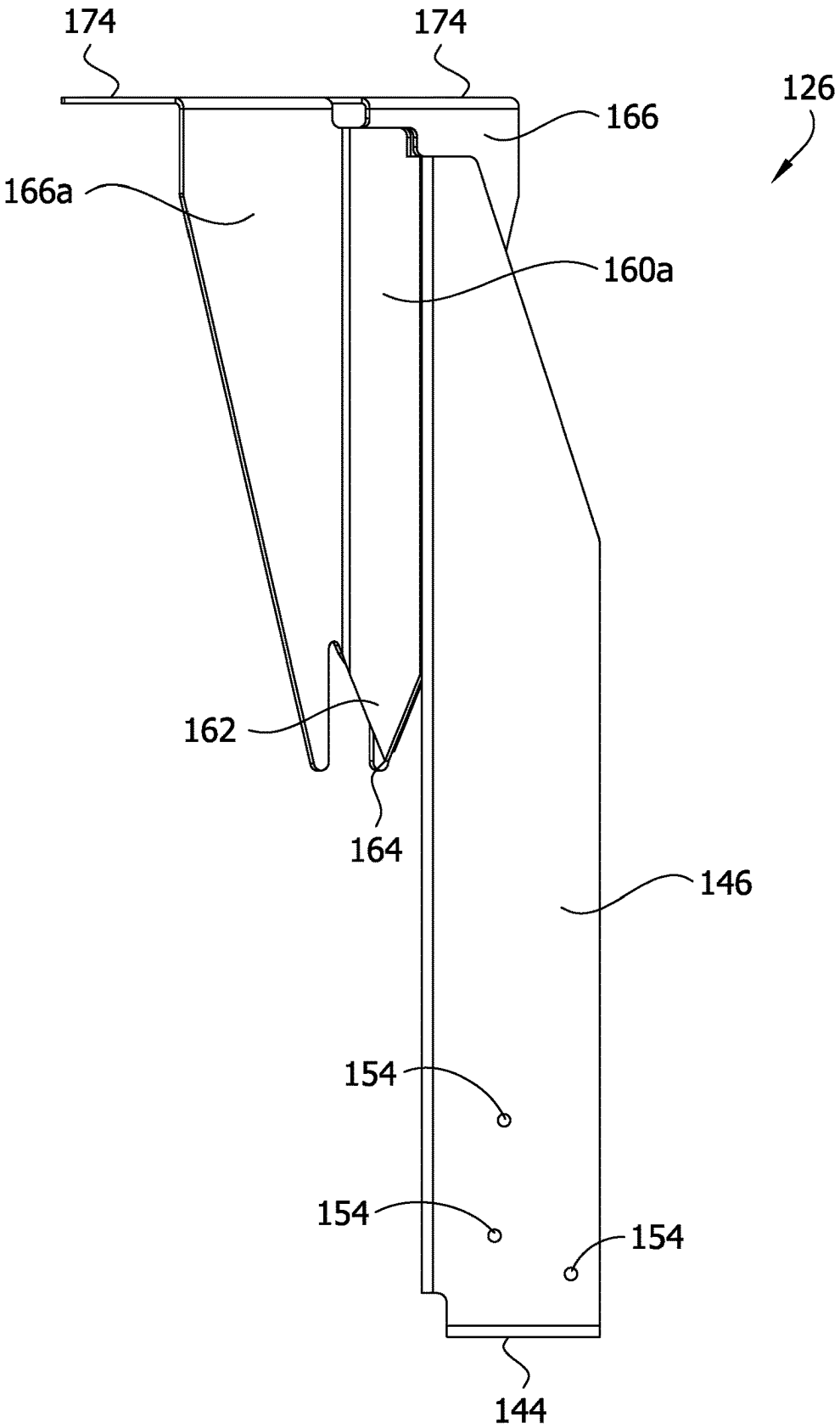
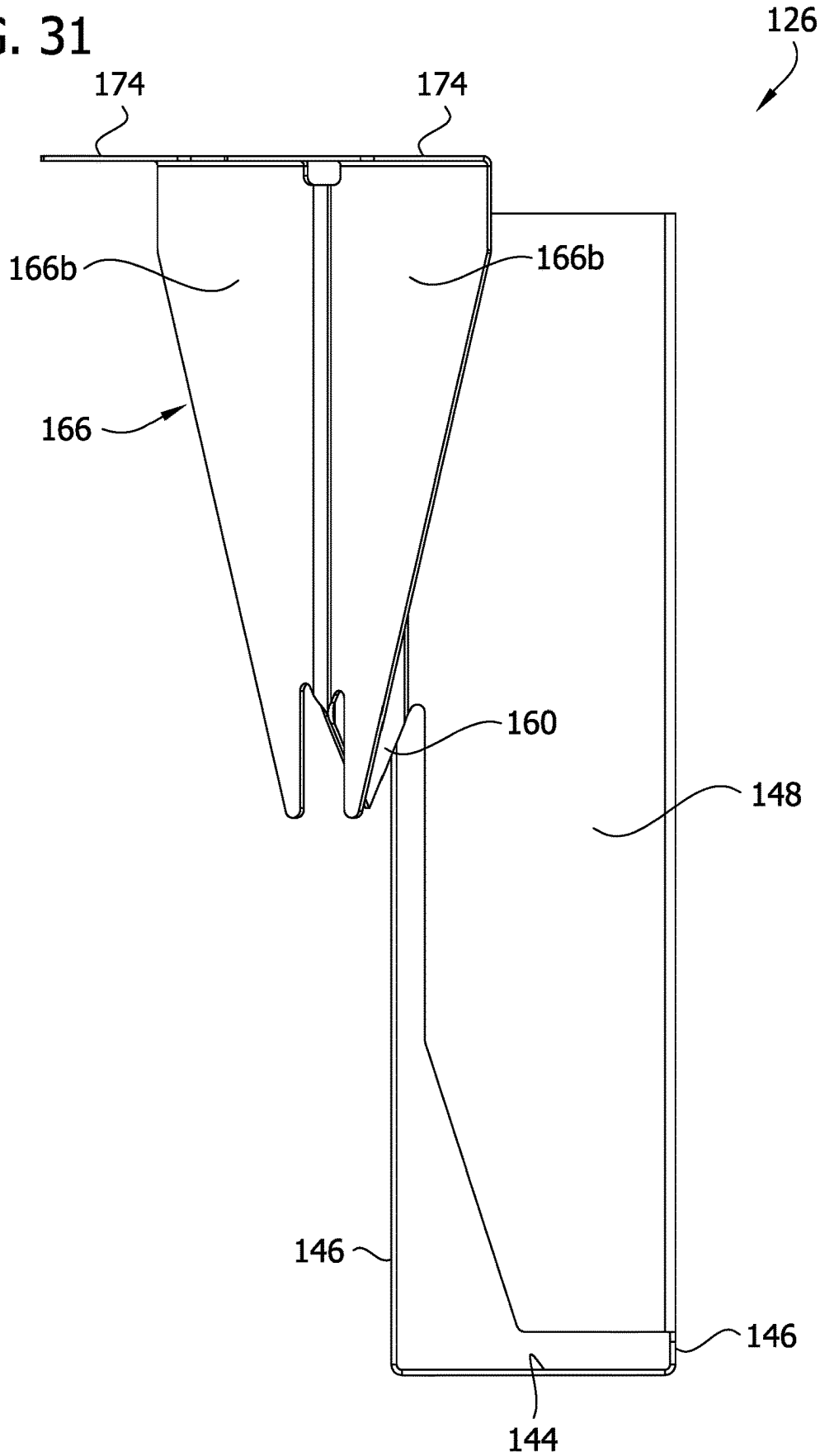


FIG. 31



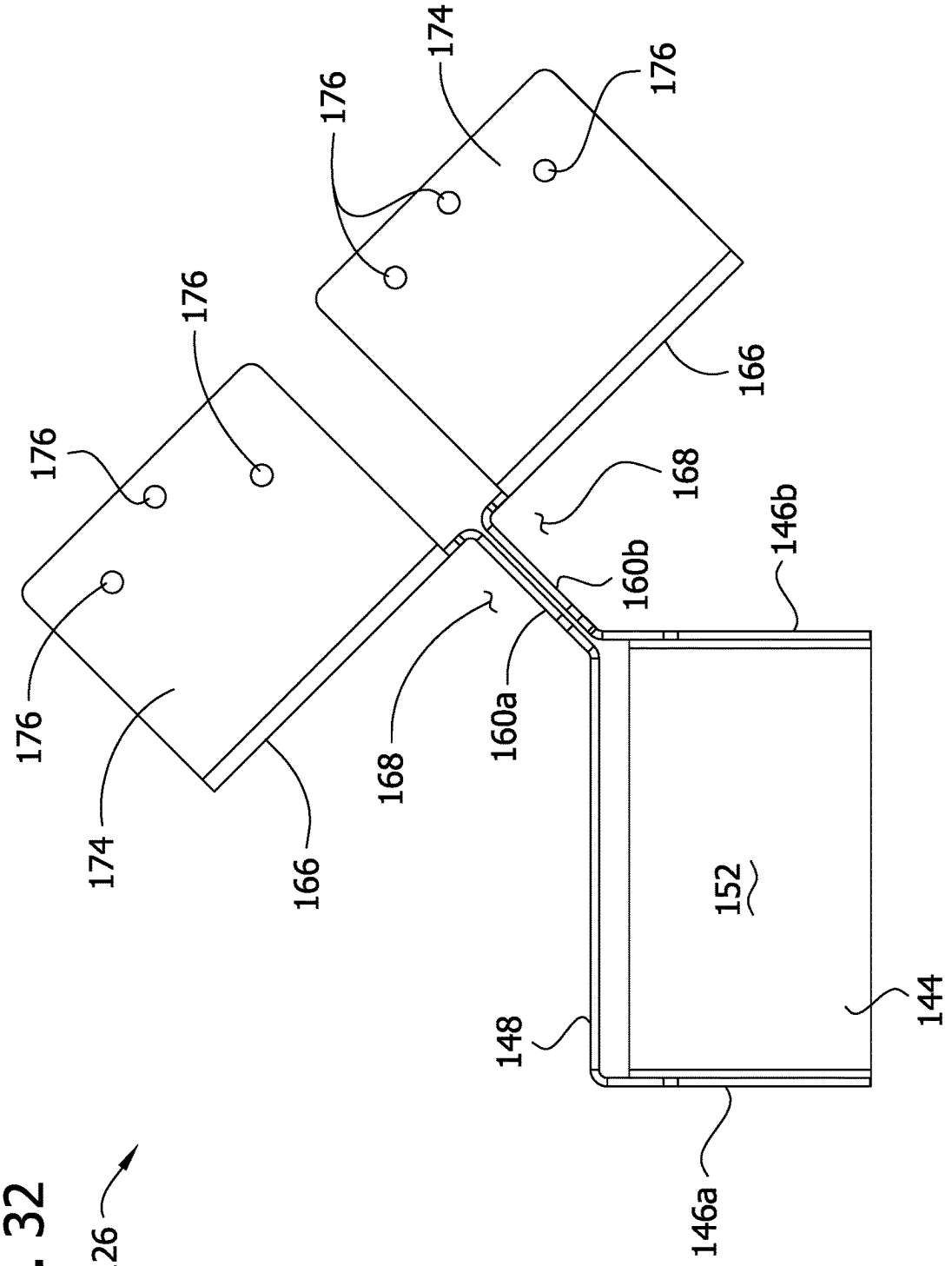


FIG. 32

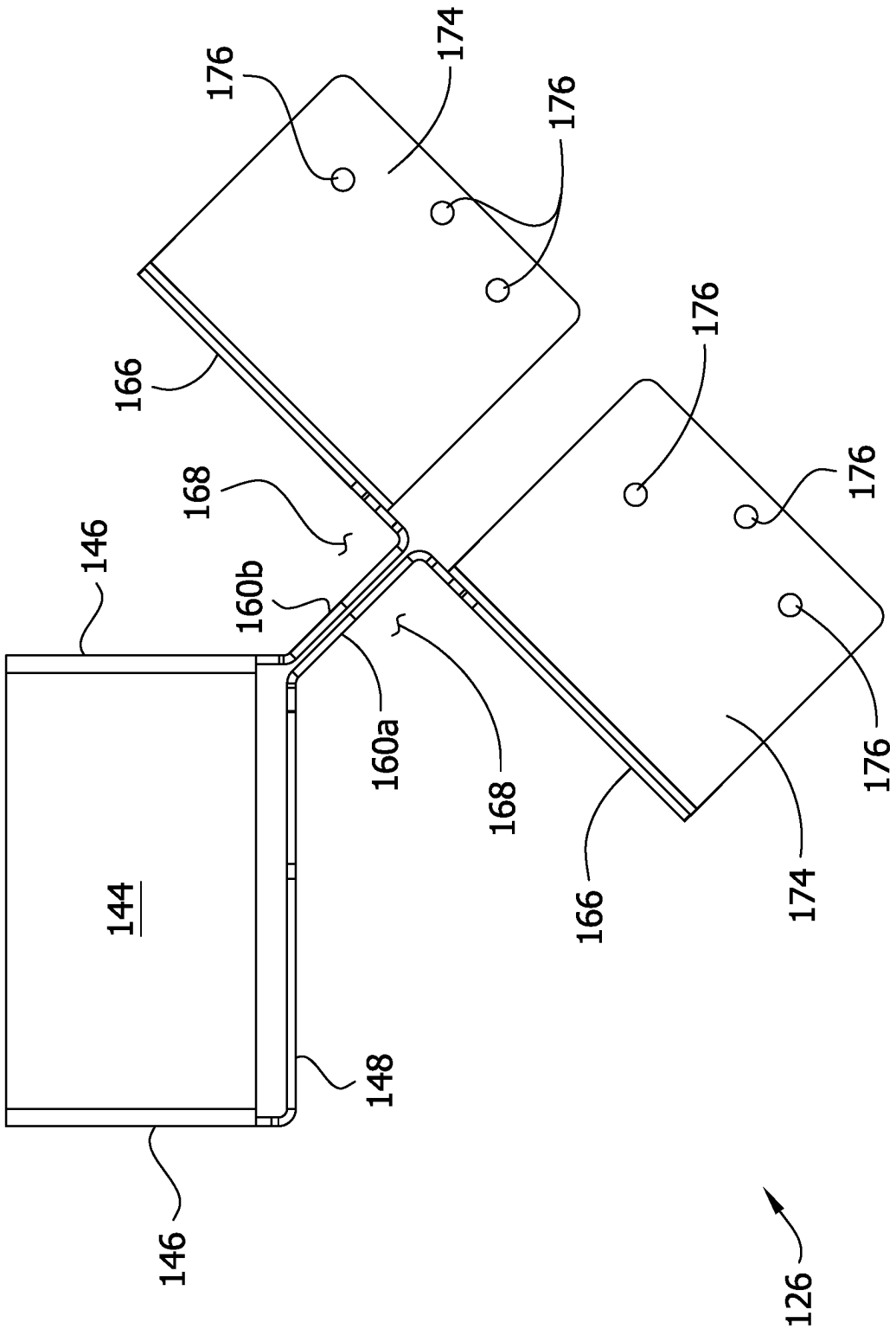

176
174
176
166
168
146
160b
160a
168
144
148
146
176
176
176
166
174
126

FIG. 33

FIG. 34

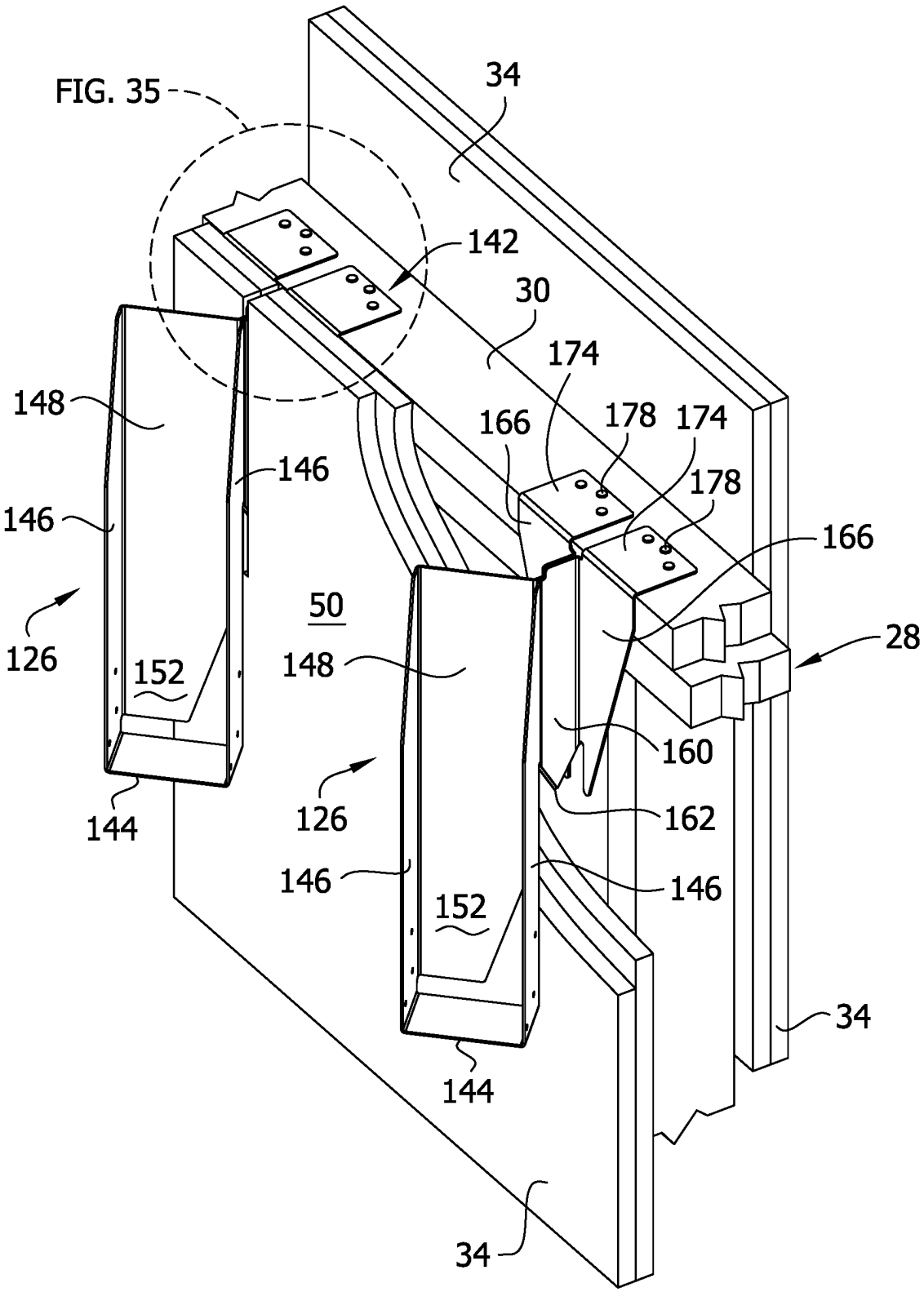
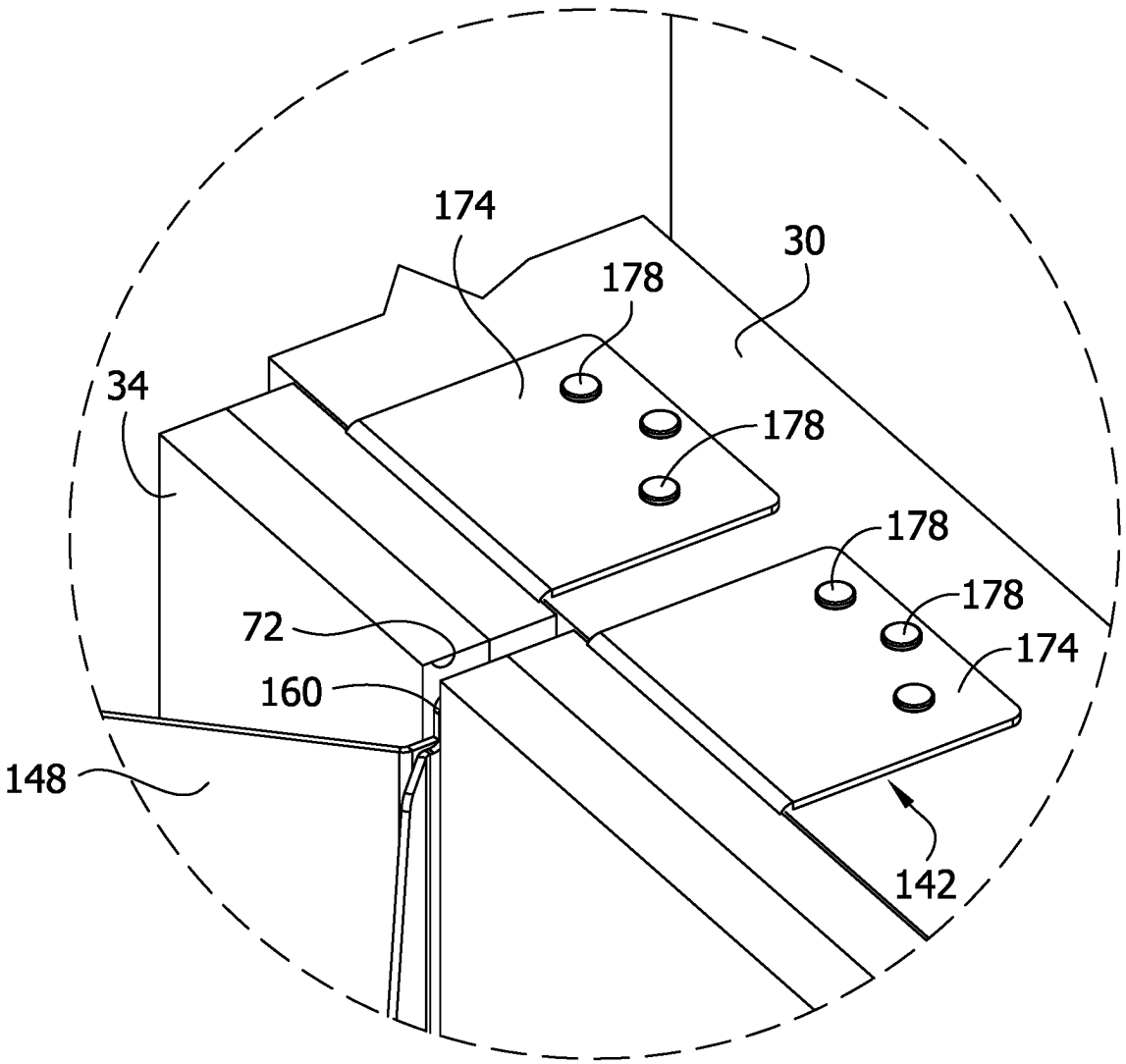


FIG. 35
34
142
30
174
148
166
178
174
146
178
146
166
50
28
126
152
148
160
126
162
144
146
146
152
34
144
34

FIG. 35



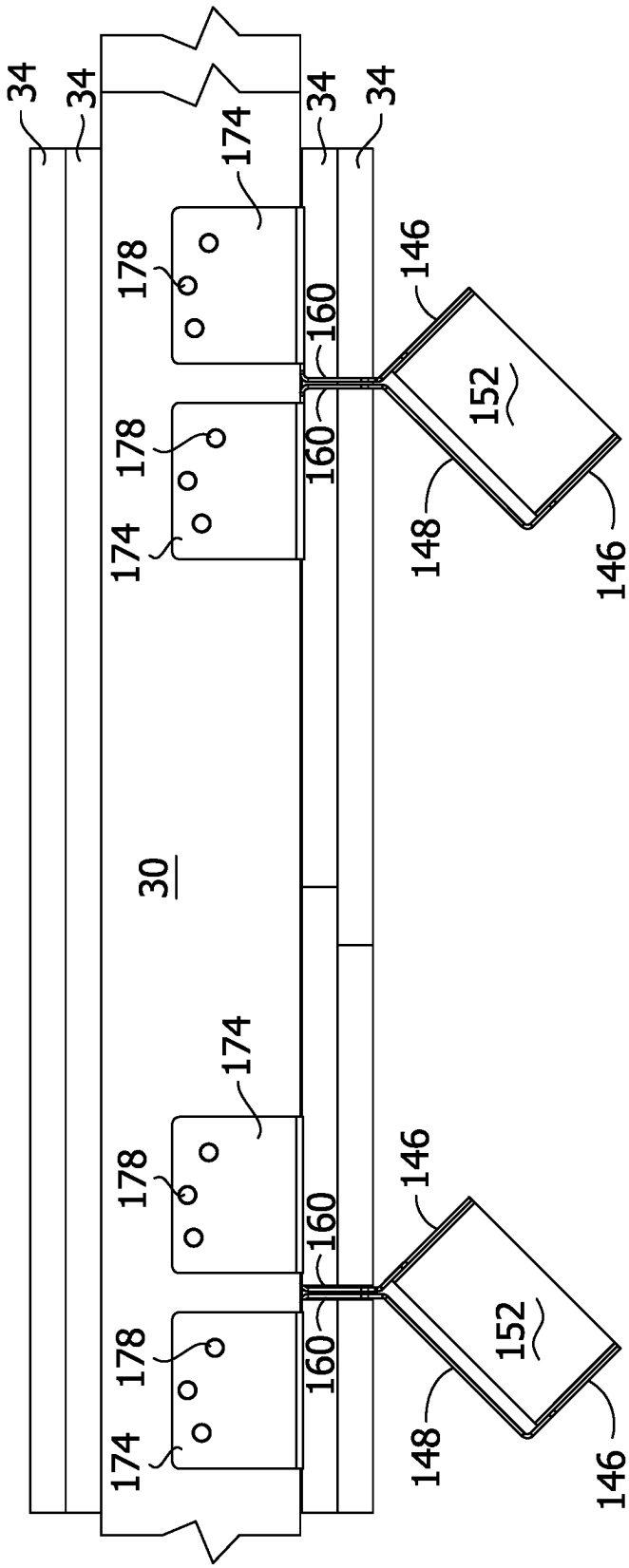

34
34
34
34
174
178
160
146
152
178
160
174
148
146
30
174
178
160
146
152
178
160
174
148
146

FIG. 36

FIG. 37

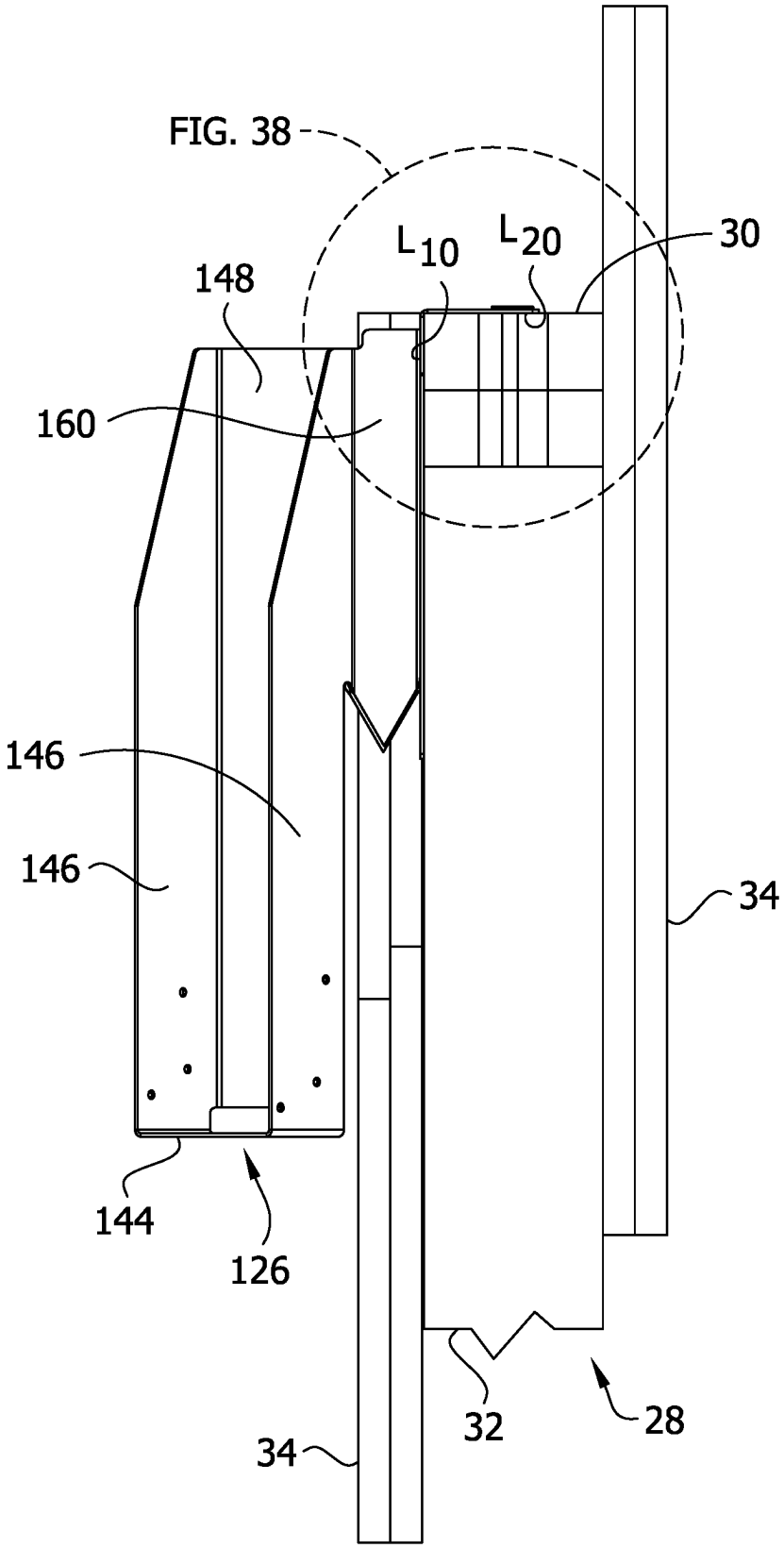
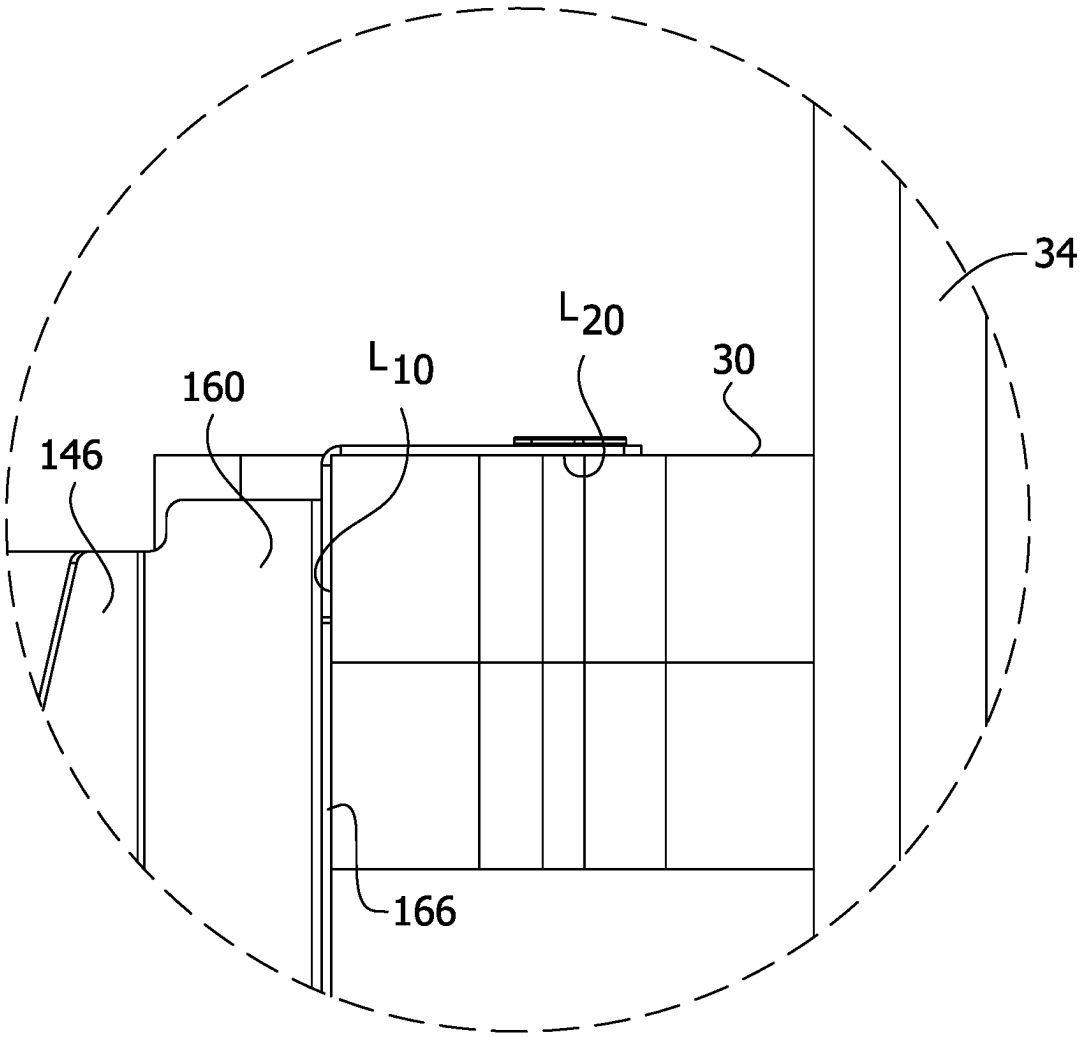


FIG. 38



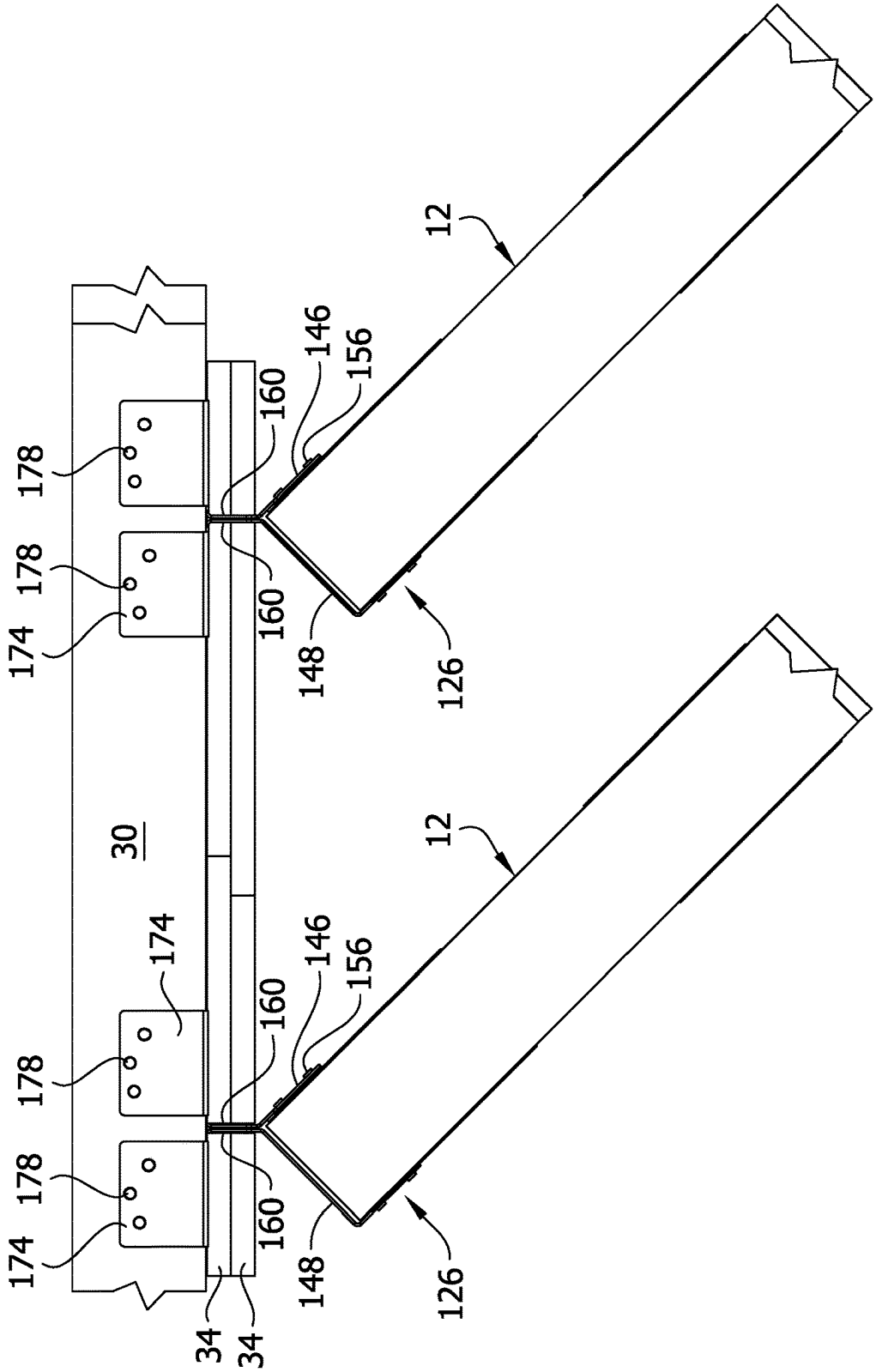
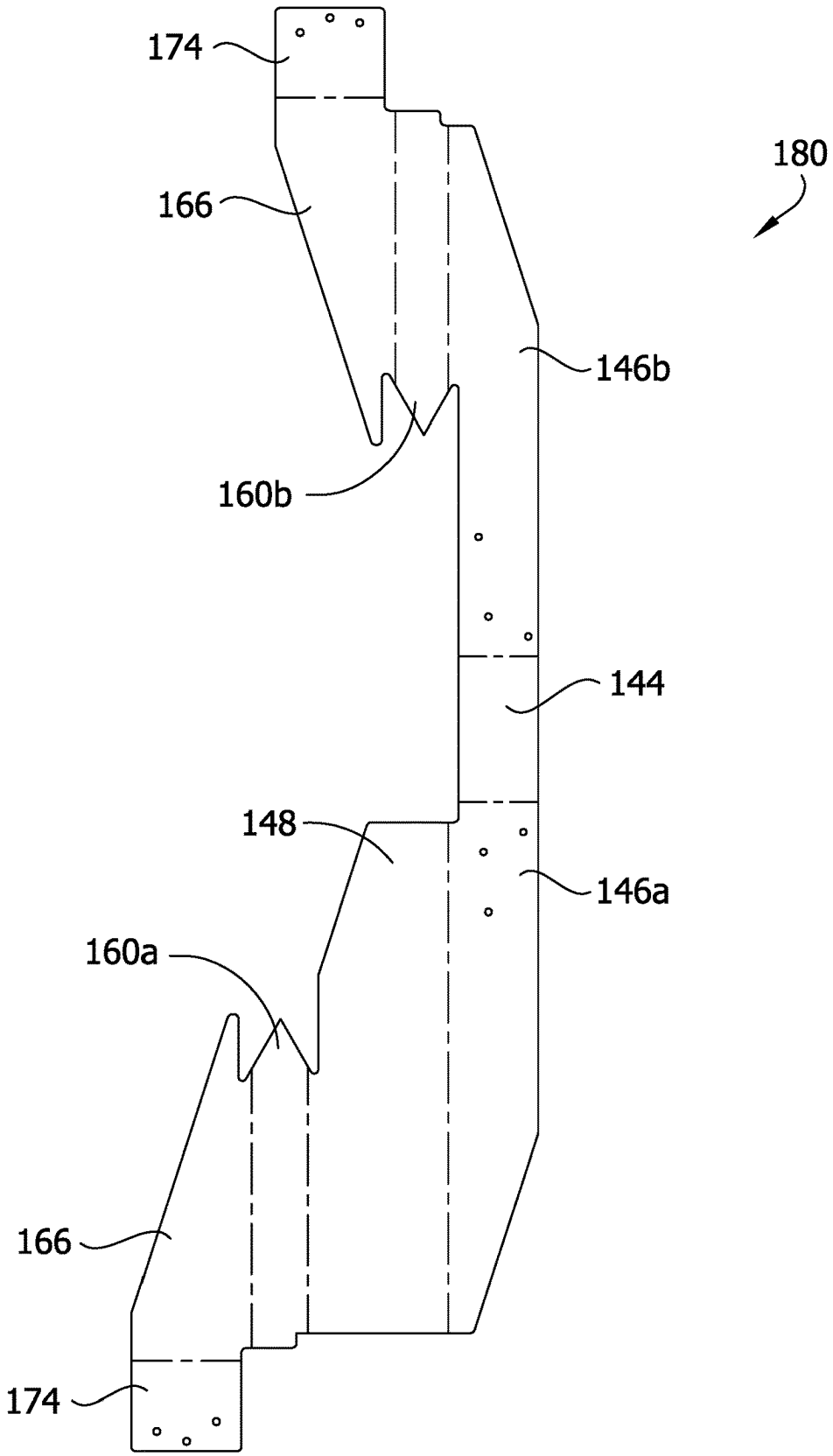

12
146
156
160
178
178
174
160
148
126
30
12
174
146
156
160
178
178
174
160
148
126
34
34

FIG. 39

FIG. 40



HANGER FOR FIRE SEPARATION WALL

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. application Ser. No. 16/433,799, filed Jun. 6, 2019, which is a continuation of U.S. application Ser. No. 16/225,517, filed Dec. 19, 2018, now U.S. Pat. No. 10,316,510, which is a continuation of U.S. application Ser. No. 15/675,409, filed Aug. 11, 2017, now U.S. Pat. No. 10,184,242, which is a continuation of U.S. application Ser. No. 14/555,049, filed Nov. 26, 2014, now U.S. Pat. No. 10,024,049, which claims priority to U.S. Provisional Application No. 61/922,531, filed Dec. 31, 2013, the entirety of which are incorporated herein by reference.

FIELD OF THE INVENTION

The present invention generally relates to connections for structures, and more specifically, a truss hanger for connecting a truss to a wall including fire retardant sheathing.

BACKGROUND

The use of fire separation walls in structures, such as in multifamily housing, is commonplace. Often, fire separation is required to be continuous along the walls between adjoining units to prevent fire from spreading between the adjoining units in a multifamily structure. For some types of construction, the building codes also require exterior walls to be fire rated. Typically, gypsum board is used as a fire retardant sheathing along these walls. Floor trusses or joists are attached to or hung from the walls including the gypsum board, but cannot be hung from the gypsum board itself. The trusses or joists must therefore be attached to the wall framing. A cutout for the entire cross section of the truss leaves a large discontinuity in the fire retardant sheathing. However, building codes require that the fire separation wall maintain a certain fire resistant rating. Thus, the integrity of the fire retardant sheathing should be maintained and interruptions of the sheathing kept to a minimum.

SUMMARY

In one aspect of the present invention, a hanger for connecting a structural component to a wall having sheathing mounted thereon includes a channel-shaped portion configured to receive the structural component. The channel shaped portion includes a bottom wall, side walls extending from opposite edges of the bottom wall and a back wall. The bottom wall, side walls and back wall are sized and arranged to receive an end of the structural component for supporting the end of the structural component. A connection portion includes a top flange extending away from the back wall of the channel-shaped portion in a direction opposite to the bottom wall of the channel-shaped portion. The top flange is configured for attachment to a top surface of a top plate of the wall. The connection portion further includes a back flange extending from an edge of the top flange in a direction toward the bottom wall of the channel-shaped portion. The back flange of the connection portion faces the back wall of the channel-shaped portion and the back flange and back wall define a space sized to receive the sheathing between the back flange and the back wall. An extension portion extends from the channel-shaped portion to the connection portion and interconnects the channel-shaped portion and the connection portion. The extension portion separates the back wall of the channel-shaped portion from the back flange of the connection portion to define the space sized to receive the sheathing.

In another aspect pf the present invention a hanger for connecting a structural component to a wall adapted to have sheathing mounted thereon generally comprises a channel-shaped portion configured to receive the structural component. An extension portion extends from the channel-shaped portion and is configured to extend through the sheathing to engage the wall at a first location. The extension portion includes extension flanges extending from the channel-shaped portion forming a bend between each extension flange and the channel-shaped portion. Each of the extension flanges is configured to extend through the sheathing. A connection portion is fixed in position relative to the channel-shaped portion such that that channel-shaped portion does not rotate relative to the connection portion. The connection portion is configured for attachment to the wall at a second location spaced from the first location. The extension flanges define planar surfaces disposed in opposed face-to-face relation between the connection portion and the channel-shaped portion.

In another aspect of the present invention, a truss hanger for connecting a truss to a wall adapted to have fire resistant sheathing mounted thereon generally comprises a channel-shaped portion configured to receive the truss. The channel-shaped portion includes a base sized and shaped for receiving a truss chord of the truss thereon, side panels extending upward from the base, and a back panel. The back panel extends orthogonally from one of the side panels. An extension portion extends from the channel-shaped portion and is configured to extend through the fire resistant sheathing. The extension portion includes extension flanges. Each of the extension flanges extends away from the base of the channel-shaped portion. A connection portion includes a top flange extending away from the back panel of the channel-shaped portion in a direction opposite to the base of the channel-shaped portion. The top flange is configured for attachment to a top surface of a top plate of the wall. The connection portion further includes a back flange extending from an edge of the top flange in a direction toward the base of the channel-shaped portion.

A hanger for connecting a structural component to a wall having sheathing mounted thereon generally comprises a channel-shaped portion configured to receive the structural component. An extension portion is configured to be disposed at least partially in the sheathing. A connection portion is configured for attachment to the wall.

Other objects and features will be in part apparent and in part pointed out hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a fragmentary perspective of adjacent floor trusses connected to a wall having fire retardant sheathing by truss hangers that extend through the sheathing;

FIG. **2** is a perspective of a truss hanger according to a first embodiment of the present invention;

FIG. **2A** is a rear perspective of the truss hanger;

FIG. **3** is a front elevation thereof;

FIG. **4** is a right side elevation thereof;

FIG. **5** is a left side elevation thereof;

FIG. **6** is a rear elevation thereof;

FIG. **7** is a top plan thereof;

FIG. **8** is a bottom plan thereof;

FIG. **9** is a perspective of a wall having fire retardant sheathing with a slot cut in the sheathing to receive the truss hanger;

FIG. **10** is the perspective of FIG. **9**, but showing two of the truss hangers mounted thereon;

FIG. **10**A is an enlarged fragmentary perspective of FIG. **10**;

FIG. **11** is a top plan of FIG. **10**, illustrating the truss hanger extending through the fire retardant sheathing;

FIG. **12** is a perspective similar to FIG. **10**, but showing a floor truss positioned for mounting in the truss hanger;

FIG. **13** is a side elevation of FIG. **12**;

FIG. **13**A is an enlarged fragmentary perspective of FIG. **13** with a portion of the fire retardant sheathing broken away;

FIG. **14** is the perspective of FIG. **10**, but showing floor trusses mounted in the truss hangers;

FIG. **14**A is an enlarged fragmentary perspective of FIG. **14**;

FIG. **15** is a top view of a stamped metal blank for forming a truss hanger according to the present invention;

FIG. **16** is a perspective of a slot template for use in cutting the slot in the sheathing to receive the truss hanger;

FIG. **17** is a rear perspective of the slot template;

FIG. **18** is a front elevation thereof;

FIG. **19** is a right side elevation thereof;

FIG. **20** is a left side elevation thereof;

FIG. **21** is a rear elevation thereof;

FIG. **22** is a top plan thereof;

FIG. **23** is a bottom plan thereof;

FIG. **24** is a front view of a stamped metal blank for forming the slot template;

FIG. **25** is a fragmentary perspective of adjacent floor trusses connected at an angle to a wall having fire retardant sheathing by truss hangers of a second embodiment that extend through the sheathing;

FIG. **26** is a perspective of one of the truss hangers of FIG. **25**;

FIG. **27** is a rear perspective thereof;

FIG. **28** is a front elevation thereof;

FIG. **29** is a right side elevation thereof;

FIG. **30** is a left side elevation thereof;

FIG. **31** is a rear elevation thereof;

FIG. **32** is a top plan thereof;

FIG. **33** is a bottom plan thereof;

FIG. **34** is a perspective of a wall and the two truss hangers mounted thereon with parts broken away;

FIG. **35** is an enlarged fragmentary perspective of FIG. **34**;

FIG. **36** is a top plan of FIG. **34**, illustrating the truss hangers extending through the fire retardant sheathing;

FIG. **37** is a side elevation of FIG. **34**;

FIG. **38** is an enlarged fragment of FIG. **37**;

FIG. **39** is a top plan similar to FIG. **36**, but showing a floor truss mounted in each truss hanger; and

FIG. **40** is a front view of a stamped metal blank for forming a truss hanger according to the present invention.

Corresponding reference characters indicate corresponding parts throughout the drawings.

DETAILED DESCRIPTION

Referring to FIG. **1**, a first embodiment of a connection system for a fire separation wall is shown generally at **10**. Floor trusses generally indicated at **12** each include truss members (broadly, "wooden structural members") including a top chord **14**, a bottom chord **16**, and web members **18** joining the top and bottom chords. Each floor truss also includes end members **20** at each end joining the top and bottom chords **14**, **16** (only one end of each truss is shown). The truss members can be joined by nail plates **22** or by any other suitable fastening structure. The number and orientations of the web members **18** and chords **14**, **16** may vary from the illustrated embodiment without departing from the scope of the invention, as a truss hanger **26** according to the present invention is readily applicable to other truss configurations (e.g. a roof truss). Moreover, the hanger **26** may be used to connect structural components other than trusses to a wall or other part of a structure. The hanger can be used to support other wood framing members such as solid sawn or structural composite lumber.

As seen in FIG. **1**, a wall **28** includes a top member or plate **30** and support members or studs **32** (only one stud may be seen in FIG. **1**). As illustrated, the top plate **30** is formed by two 2×4's in stacked relation. Fire retardant sheathing **34** is mounted on both sides of the wall **28**, as illustrated. In one embodiment, the fire retardant sheathing is gypsum board, such as two layers of ⅝" gypsum board mounted on each side of the wall **28** as illustrated, although other configurations of fire retardant sheathing are within the scope of the present invention. Other wall configurations, including different wall constructions and materials, are within the scope of the present invention. For example, the truss hangers **26** can be used with any wall assembly or fire-rated wall assembly, such as a 2-hour fire-resistive wall assembly. The floor trusses **12** are mounted on the wall **28** adjacent the fire retardant sheathing **34** by the truss hangers **26**. The truss hangers **26** extend through a narrow slot in the fire retardant sheathing **34** to maintain the integrity and fire retardant characteristics of the fire separation wall.

Referring to FIGS. **2-8**, the truss hanger **26** includes a channel-shaped portion **38**, an extension portion **40**, and a connection portion **42**. The channel-shaped portion **38** is configured to receive the floor truss **12**. The channel-shaped portion **38** includes a seat or base **44** and a pair of side panels **46** extending upward from the base. When installed, the base **44** is generally horizontal, and the side panels **46** extend generally vertical from the base. A back panel **48** extends from each of the side panels **46**. Each back panel **48** is generally perpendicular to both the side panels **46** and the base **44**. When installed, each back panel **48** extends generally parallel to an interior face **50** of the fire retardant sheathing **34**. The base **44**, side panels **46**, and back panels **48** form a channel **52** configured to receive the floor truss **12**.

As seen in FIGS. **1** and **12-14**A, the floor truss **12** is received in the channel **52** to attach the floor truss to the wall **28**. The bottom chord **16** of the floor truss **12** engages and rests upon (i.e., is supported by) the base **44**. The end member **20** of the floor truss **12** is positioned against the back panels **48** between the side panels **46**. The truss hanger **26** includes fastening structure for attaching the floor truss **12** to the truss hanger. Fastening structure can be of any type known in the art for attaching a connector to a wooden structural member, such as nailing teeth (not shown) struck from the material of the hanger. In the illustrated embodiment, the fastening structure comprises a hole to allow for insertion of a fastening member. More specifically, in one embodiment the fastening structure comprises nail holes **54** in the side panels **46** of the truss hanger **26**, and the fastening member comprises a nail **56** (see FIG. **12**). In the illustrated embodiment, nail holes **54** are positioned on each of the side panels **46** so that nails **56** can be inserted into both the bottom chord **16** and the end member **20** of the floor truss **12** to attach the hanger **26** to the floor truss **12**.

Referring again to FIGS. **2-8**, the extension portion **40** includes two extension flanges **60** configured to extend through the fire retardant sheathing **34**. Each flange **60** extends from one of the back panels **48**. The flanges **60** are positioned in opposed, face-to-face relation, and preferably engage each other along a juncture. Each flange **60** extends generally perpendicular from the corresponding back panel **48** and generally parallel to the side panels **46**. At a bottom edge, each flange **60** includes a driving point **62**. Each of the driving points **62** is generally triangular and includes a pointed tip **64**. As seen in FIGS. **3** and **6**, the tips **64** of the driving points **62** are vertically offset from each other. As illustrated, the tip **64***a* of one flange **60***a* extends vertically below the tip **64***b* of the other flange **60***b*. In one embodiment, the tips **64** are vertically offset from each other about ⅛", although other configurations are within the scope of the present invention, such as tips that are aligned or tips that are offset a smaller or larger amount.

A back flange **66** extends from each of the extension flanges **60**. Each back flange **66** extends generally perpendicular from the extension flange **60** and is oriented generally parallel to the back panels **48**. Referring to FIG. **13**A, the back flanges **66** engage the wall **28** at a first location L_1, which in the illustrated embodiment is a vertical face of the top plate **30** of the wall. The back panels **48**, extension flanges **60**, and back flanges **66** form a pair of sheathing channels **68**. Each sheathing channel **68** is configured to receive a portion of the fire retardant sheathing **34** to secure the sheathing between the hanger **26** and the wall **28**. As seen in FIG. **7**, the sheathing channels **68** extend generally perpendicular to the truss-receiving channel **52**.

As seen in FIGS. **10**A and **11**, the extension flanges **60** extend through a slot **72** in the fire retardant sheathing **34**. Preferably, the slot has an area less than or equal to 6 square inches, and the gap between the extension flanges **60** and the edge of the slot **72** is less than or equal to ⅛". The driving points **62** extend down into the sheathing **34** to further secure the sheathing between the hanger **26** and the wall **28**. A portion of the fire retardant sheathing **34** extends into each sheathing channel **68** and is secured between the back panels **48** and the back flanges **66**.

In one embodiment, the slot **72** in the fire retardant sheathing **34** can be made using a slot template **82** (FIGS. **16-24**). The slot template **82** includes a vertical panel **84** having a rear face **86** configured to engage the interior face **50** of the fire retardant sheathing **34** and a horizontal panel **88** having a bottom face **90** configured to engage a top face of the sheathing. The horizontal panel **88** extends generally perpendicular from the vertical panel **84**. The slot template **82** is configured to be quickly fixed in position on the sheathing **34** for use in cutting the slot **72** to receive the truss hanger **26**. Portions of the slot template **82** are configured to be pressed into the sheathing **34** to locate the template on the sheathing and retain the template in position for cutting the slot **72**. In the illustrated embodiment, the horizontal panel includes prongs **92** that are bent downward for insertion into the top face of the sheathing **34**. Bottom corners **94** of the vertical panel **84** are bent rearward for insertion into the interior face **50** of the sheathing **34**. The prongs **92** and the corners **94** are inserted into the sheathing **34** to retain the template **82** in position for cutting the slot **72**. In addition, the vertical panel **84** optionally includes dimples **96** extending toward the rear face **86** of the vertical panel **84**. The dimples **96** ensure the vertical panel **84** remains slightly spaced from the interior face **50** of the sheathing **34** so the template **82** can be easily removed from the sheathing after the slot **72** is cut.

The template **82** includes a guide slot **98** to guide a cutting tool in cutting the slot **72** in the sheathing **34**. The guide slot **98** extends from a top edge of the vertical panel **84** to a location spaced from a bottom edge of the vertical panel. As illustrated, the guide slot **98** includes a wide, rectangular portion **98***a* in the horizontal panel **88** to ease insertion of a cutting tool into the guide slot. A converging portion **98***b* of the slot **98** in the vertical panel **84** transitions from the wide portion **98***a* to a narrow lower portion **98***c* of the slot. This facilitates entry of the cutting tool into the narrow portion **98***c*. The narrow portion **98***c* of the guide slot **98** is dimensioned to facilitate cutting the slot **72** in the sheathing **34** to a size configured to receive the extension flanges **60** of the truss hanger **26**.

As seen in FIG. **24**, the template **82** described above can be formed as one piece from a metal blank **100** that is stamped from a sheet metal roll and bent into shape. In one embodiment, the template **82** is stamped from 16 gauge steel, although other thicknesses (e.g., 12-18 gauge) and other suitable materials are within the scope of the present invention.

In use, the template **82** is placed on the sheathing **34** in a selected location for a slot **72**. The template can be used to cut the slot **72** in the sheathing **34** either before or after the sheathing is mounted on the wall **28**. The prongs **92** and corners **94** are inserted into the sheathing **34** by tapping with a hand or striking with a hammer or other blunt instrument. Once the template **82** is secured in position on the sheathing **34**, a cutting tool (e.g., a drywall cutout tool) is inserted into the guide slot **98** to cut a slot **72** in the sheathing at the location of the guide slot. In one embodiment, a drywall cutout tool with a ⅛" or ¼" spiral bit is used to cut the slot **72**, although other cutting tools are within the scope of the present invention. After the slot **72** is cut in the sheathing **34**, the template **82** is removed from the sheathing. The sheathing **34** is then configured to receive the truss hanger **26**.

Referring again to FIGS. **2-8**, the connection portion of the hanger includes a pair of connector tabs **74** extending from the back flanges **66**. Each connector tab **74** extends generally perpendicular from one of the back flanges **66**. The connector tabs **74** are generally horizontal when the hanger **26** is installed. The connector tabs **74** are configured to engage an upper surface of the top plate **30** of the wall **28** at a second location L_2 spaced from the first location L_1. The connector tabs **74** can be used to attach the truss hanger **26** to the wall, thereby hanging the floor trusses **12** from the wall. As seen in FIG. **1**, the connector tabs **74** extend over a portion of the top plate **30** of the wall **28**. Each connector tab **74** includes fastening structure, such as nail holes **76**, for insertion of a fastening member, such as nails **78** (see FIGS. **10** and **10**A), to attach the hanger **26** to the wall **28**. In the illustrated embodiment, each connector tab **74** includes three nail holes **76**. Other configurations are within the scope of the present invention, such as a different number of nail holes, or alternate fastening structure such as nailing teeth or other appropriate structure for fastening the hanger to the wall.

The base **44** and back flanges **66** of the truss hanger **26** cooperate to stabilize the truss hanger **26** and protect the fire retardant sheathing **34** under the loads transferred from the truss **12** to the wall **28** by way of the hanger. The channel **52** that receives an end portion of the truss **12** is spaced to the interior of the wall **28** and more particularly to the interior of the second location L_2 where the connector tabs **74** are attached to an upper surface of the top plate **30**. The vertically downward load of the truss **12** applied to the base **44** of the truss hanger **26** urges the truss hanger **26** to pivot

so that the base would move toward the wall **28**, which could damage the fire retardant sheathing **34** and pry out the nails **78** connecting the connector tabs **74** to the upper surface of the top plate **30**. However, this motion is resisted by the engagement of the back flanges **66** with the interior vertical face of the top plate **30** at the first location L_1. Thus, there is a force couple between the base **44** of the hanger **26** carrying the vertical load of the truss **12** and the back panels **48** of the hanger (via engagement of the back flanges **66** with the top plate **30**) engaging the end face of the truss. Accordingly, the truss hanger **26** and truss **12** are stable with minimal disruption of the fire retardant sheathing **34**, even though the truss is held at a distance from the wall **28** by the truss hanger.

As seen in FIG. **15**, a truss hanger **26** as described above can be formed as one piece from a metal blank **80** that is stamped from a sheet metal roll and bent into shape. In one embodiment, the truss hanger **26** is stamped from 12-14 gauge steel, although other suitable materials are within the scope of the present invention. The configuration of the truss hanger **26** of the present invention allows a lighter gauge metal to be used.

In use, the truss hanger **26** is positioned in the slot **72** of the fire retardant sheathing **34** mounted on the wall **28**. As seen in FIGS. **9-14**A, one method of using the truss hanger **26** includes cutting the slot **72** in the fire retardant sheathing **34** (either before or after the sheathing is mounted on the wall). In one embodiment, the slot **72** can be cut using the slot template **82** (either before or after the sheathing **34** is mounted to the wall **28**). The slot can be any suitable length, and in one embodiment is about 10 inches long. The truss hanger **26** is then positioned against the fire retardant sheathing **34** so that the extension flanges **60** extend through the slot **72**. In one embodiment, the hanger **26** is slid downward into place so that the extension flanges **60** extend through the slot **72**, the back flanges **66** are positioned adjacent the wall **28**, and the fire retardant sheathing **34** is positioned in the sheathing channels **68** between the back flanges and the back panels **48**. The hanger connector tabs **74** are fastened to the top plate **30** of the wall **28** by any suitable means, such as by inserting nail **78** through the nail holes **76**. Then, a truss member, e.g. truss bottom chord **16**, is positioned in the truss channel **52** of the hanger **26** (see FIG. **1**), thereby securing the floor truss **12** to the wall **28**. The truss hanger **26** is then fastened to the truss **12** by any suitable means, such as by inserting nails **56** through the nail holes **54** in each side panel **46** of the hanger. The hanger **26** is thus secured to both the truss **12** and the wall **28**, with the fire retardant sheathing **34** secured between the hanger and the wall.

In another embodiment, the truss hangers **26** can be installed without pre-forming the slot **72** in the fire retardant sheathing **34**. More particularly, each hanger **26** can be driven into the sheathing **34**. The driving point **62** of the hanger **26** is positioned against a top edge of the fire retardant sheathing. The hanger **26** is then driven downward into the sheathing **34**, led by the pointed tip **64**. The hanger **26** continues to be driven into the gypsum boards until the connector tabs **74** engage the upper surface of the top plate **30**. In this way, the hanger **26** forms the slot in the sheathing **34**.

In still another embodiment, the truss hangers **26** can be installed on the wall **28** before the sheathing **34** is mounted on the wall. This simplifies construction by allowing the building to be completely framed and roofed before requiring the sheathing **34** to be installed. Trade workers (e.g., mechanical, electrical) therefore have complete access to the wall cavity to install components without interference from the sheathing **34**. The truss hanger **26** is positioned against the wall **28** such that the back flanges **66** engage the wall and the connector tabs **74** engage the top plate **30**. The connector tabs **74** are fastened to the top plate **30** of the wall by any suitable means, such as by inserting nails **78** through nail holes **76**. Then, a truss **12** is positioned in the truss channel **52** of the hanger **26**. The truss hanger is fastened to the truss **12** by any suitable means, such as by inserting nails **56** through the nail holes **54** in each side panel **46** of the hanger **26**. The floor truss **12** is thereby secured to the hanger **26** and the wall **28**, and access to the wall cavity remains unhindered by sheathing. Subsequently, the sheathing **34** can be mounted on the wall **28** by moving the sheathing upward into place so that the extension flanges **60** of the hanger **26** extend through the slot **72** of the sheathing and the sheathing is positioned in the sheathing channels **68** between the back flanges **66** and the back panels **48**.

Referring to FIGS. **25-40**, a second embodiment of a truss hanger **126** for use in mounting the floor truss **12** to the wall **28** is illustrated. The truss hanger **126** is similar to the truss hanger **26** described above, with differences as pointed out herein. Where the truss hanger **26** is configured for mounting the floor truss **12** generally orthogonal to the wall **28**, the truss hanger **126** is configured for mounting the floor truss **12** in a skewed position relative to the wall.

Referring to FIGS. **26-33**, the truss hanger **126** includes a channel-shaped portion **138**, an extension portion **140**, and a connection portion **142**. The channel-shaped portion **138** is configured to receive the floor truss **12**. The channel-shaped portion **138** is configured to support the floor truss **12** at a non-orthogonal angle relative to the wall **28**. In this skewed embodiment, the channel-shaped portion **138** is offset from the extension portion **140**. The channel-shaped portion **138** includes a seat or base **144** and a pair of side panels **146** extending upward from the base. When installed, the base **144** is generally horizontal, and the side panels **146** extend generally vertical from the base. A back panel **148** extends from one of the side panels **146***a* toward the opposing side panel **146***b*. The back panel **148** is generally perpendicular to both the side panels **146** and the base **144**. When installed, the back panel **148** extends at a non-orthogonal angle (e.g., about 45°) to the interior face **50** of the fire retardant sheathing **34**. The base **144**, side panels **146**, and back panel **148** form a channel **152** configured to receive the floor truss **12**. Other configurations are within the scope of the present invention. For example, the truss hanger **126** can be configured to support the floor truss **12** at a range of different angles with respect to the wall **28**.

As seen in FIGS. **25** and **39**, the floor truss **12** is received in the channel **152** to attach the floor truss to the wall **28** at a skewed angle. The bottom chord **16** of the floor truss **12** engages and rests upon (i.e., is supported by) the base **144**. The end member **20** of the floor truss **12** is positioned against the back panel **148** between the side panels **146**. The truss hanger **126** includes fastening structure for attaching the floor truss **12** to the truss hanger. Fastening structure can be of any type known in the art for attaching a connector to a wooden structural member, such as nailing teeth (not shown) struck from the material of the hanger. In the illustrated embodiment, the fastening structure comprises a hole to allow for insertion of a fastening member. More specifically, in one embodiment the fastening structure comprises nail holes **154** in the side panels **146** of the truss hanger **126** (see, FIG. **26**), and the fastening member comprises a nail **156** (see, FIG. **25**). In the illustrated embodiment, nail holes **154** are positioned on each of the side panels **146** so that nails

156 can be inserted into both the bottom chord 16 and the end member 20 of the floor truss 12 to attach the hanger 126 to the floor truss.

Referring again to FIGS. 26-33, the extension portion 140 includes two extension flanges 160 configured to extend through the fire retardant sheathing 34. One of the flanges 160*a* extends from the back panel 148. The other flange 160*b* extends from the side panel 146*b*. The flanges 160 are positioned in opposed, face-to-face relation, and preferably engage each other along a juncture. At a bottom edge, each flange 160 includes a driving point 162. Each of the driving points 162 is generally triangular and includes a pointed tip 164. As seen in FIG. 28, the tips 164 of the driving points 162 are vertically offset from each other. As illustrated, the tip 164*a* of one flange 160*a* extends vertically below the tip 164*b* of the other flange 160*b*. In one embodiment, the tips 164 are vertically offset from each other about ⅛", although other configurations are within the scope of the present invention, such as tips that are aligned or tips that are offset a smaller or larger amount.

A back flange 166 extends from the extension flange 160 generally perpendicular from the extension flange. Referring to FIG. 38, the back flange 166 engages the wall 28 at a first location L_{10}, which in the illustrated embodiment is a vertical face of the top plate 30 of the wall behind the fire retardant sheathing 34. The back flange 166 comprises a back flange portion 166*a* bent from the extension flange 160*a* and a back flange portion 166*b* bent from the extension flange 160*b*. The back panel 148, side panel 146*b*, extension flanges 160, and back flange 166 form a pair of sheathing channels 168 (see, FIG. 32). Each sheathing channel 168 is configured to receive a portion of the fire retardant sheathing 34.

As seen in FIGS. 34-36, the extension flanges 160 extend through the slot 72 in the fire retardant sheathing 34. Preferably, the slot has an area less than or equal to 6 square inches, and the gap between the extension flanges 60 and the edge of the slot 72 is less than or equal to ⅛". The driving points 162 extend down into the sheathing 34 to engage the sheathing and further secure the sheathing between the hanger 126 and the wall 28. A portion of the fire retardant sheathing 34 extends into each sheathing channel 168 and is secured against the back flange 166.

Referring again to FIGS. 26-33, the connection portion 142 of the hanger 126 includes a pair of connector tabs 174 extending from the back flange portions 166*a*, 166*b*. Each connector tab 174 extends generally perpendicular from a respective one of the back flanges 166*a*, 166*b*. The connector tabs 174 are generally horizontal when the hanger 126 is installed. The connector tabs 174 are configured to overlie and engage an upper surface of the top plate 30 of the wall 28 at a second location L_{20} spaced from the first location L_{10} (see, FIGS. 37 and 38). The connector tabs 174 can be used to attach the truss hanger 126 to the wall 28, thereby hanging the floor trusses 12 from the wall. As seen in FIG. 25, the connector tabs 174 extend over a portion of the top plate 30 of the wall 28. Each connector tab 174 includes fastening structure, such as nail holes 176, for insertion of a fastening member, such as nails 178 (see FIGS. 34 and 35), to attach the hanger 126 to the wall 28. In the illustrated embodiment, each connector tab 174 includes three nail holes 176. Other configurations are within the scope of the present invention, such as a different number of nail holes, or alternate fastening structure such as nailing teeth or other appropriate structure for fastening the hanger to the wall.

The base 144 and back flanges 166 cooperate to stabilize the truss hanger 126 and protect the fire retardant sheathing 34 from exposure to the loads transferred from the truss 12 to the wall 28 by way of the truss hanger 126. The channel 152 that receives an end portion of the truss 12 is spaced to the interior of the wall 28 and more particularly to the interior of the second location L_{20} where the connector tabs 174 are attached to an upper surface of the top plate 30 (see FIG. 38). The vertically downward load of the truss 126 applied to the base 144 of the truss hanger 126 urges the truss hanger to pivot so that the base would move toward the wall 28, which could damage the fire retardant sheathing 34 and pry out the nails 178 connecting the connector tabs 174 to the upper surface of the top plate 30. However, this motion is resisted by the engagement of the back flanges 166 with the interior vertical face of the top plate 30 at the first location L_{10}. Thus, there is a force couple between the base 144 and back panel 148 of the hanger 126 (via engagement of the back flanges 166 with the top plate 30) engaging the end fact of the truss. Accordingly, the truss hanger 126 and truss 12 are stable with minimal disruption of the fire retardant sheathing 34, even though the truss is held at a distance from the wall 28.

As seen in FIG. 40, a truss hanger 126 as described above can be formed as one piece from a metal blank 180 that is stamped from a sheet metal roll and bent into shape. Parts of the blank 180 are labelled with reference numerals corresponding to the various parts of the formed truss hanger 126. In one embodiment, the truss hanger 126 is stamped from 12-14 gauge steel, although other suitable materials are within the scope of the present invention. The configuration of the truss hanger 126 of the present invention allows a lighter gauge metal to be used.

The truss hanger 126 is used as described above with reference to the truss hanger 26. In use, the truss hanger 126 is positioned in the slot 72 of the fire retardant sheathing 34 mounted to the wall 28. One method of using the truss hanger 126 includes cutting the slot 72 in the fire retardant sheathing 34 (either before or after the sheathing is mounted on the wall). In one embodiment, the slot 72 can be cut using the slot template 82 (either before or after the sheathing 34 is mounted to the wall 28). The slot 72 can be any suitable length, and in one embodiment is about 10 inches long. The truss hanger 126 is then positioned against the fire retardant sheathing 34 so that the extension flanges 160 extend through the slot 72. In one embodiment, the hanger 126 is slid downward into place so that the extension flanges 160 extend through the slot 72, the driving point 162 engages the fire retardant sheathing 34, the back flange 166 is positioned adjacent the wall 28, and the fire retardant sheathing is positioned in the sheathing channels 168 of the hanger. The hanger connector tabs 174 are fastened to the top plate 30 of the wall 28 by driving nails 178 through the nail holes 176 into the top plate 30. Then, a truss member, e.g. truss bottom chord 16 is positioned in the truss channel 152 of the hanger 126. Nails 156 are driven through holes 154 in the side panels 146 to secure the floor truss 12 to the wall 28. The hanger 126 is thus secured to both the truss 12 and the wall 28, with the fire retardant sheathing 34 between the hanger and the wall.

In another embodiment, the truss hangers 126 can be installed without pre-forming the slot 72 in the fire retardant sheathing 34. More particularly, each hanger 126 can be driven into the sheathing 34. The pointed tip 164 of the driving point 162 of the hanger 126 is positioned against a top edge of the fire retardant sheathing 34. The hanger 126 is then driven downward into the sheathing 34, led by the pointed tip 164. The hanger 126 continues to be driven into the gypsum boards until the connector tabs 174 engage the

upper surface of the top plate **30**. In this way, the hanger **126** forms the slot in the sheathing **34**.

In another embodiment, the truss hangers **126** can be installed on the wall **28** before the sheathing **34** is mounted on the wall. This simplifies construction by allowing the building to be completely framed and roofed before requiring the sheathing **34** to be installed. Trade workers (e.g., mechanical, electrical) therefore have complete access to the wall cavity to install components without interference from the sheathing **34**. The truss hanger **126** is positioned against the wall **28** such that the back flange **166** engages the wall and the connector tabs **174** engage the top plate **30**. The connector tabs **174** are fastened to the top plate **30** of the wall by any suitable means, such as by inserting nails **178** through nail holes **176**. Then, a truss **12** is positioned in the truss channel **152** of the hanger **126**. The truss hanger **126** is fastened to the truss **12** by any suitable means, such as by inserting nails **156** through the nail holes **154** in each side panel **146** of the hanger. The floor truss **12** is thereby secured to the hanger **126** and the wall **28**, and access to the wall cavity remains unhindered by sheathing. Subsequently, the sheathing **34** can be mounted on the wall **28** by moving the sheathing upward into place so that the extension flanges **160** of the hanger **126** extend through the slot **72** of the sheathing and the sheathing is positioned in the sheathing channels **168** of the hanger.

The truss hanger **26**, **126** permits a floor truss **12** to be secured to a wall **28** through fire retardant sheathing **34** with minimal interruption to the sheathing. Installation of the truss hanger minimally disrupts the continuity of the sheathing and therefore does not reduce the fire resistive rating of a fire rated assembly. The extension flanges **60**, **160** extend through the fire retardant sheathing **34** so that the sheathing is interrupted only by the slot **72** required to receive the flanges. The back flanges **66**, **166** engage the wall **28** behind the sheathing **34** to stabilize the hanger **26**, **126** and protect the sheathing. The truss hanger **26**, **126** can be mounted on a wall already having sheathing mounted thereon, or can be mounted on a wall before the sheathing (i.e., the sheathing does not have to be mounted on the wall before the truss hanger), thereby simplifying construction. The truss hanger **26**, **126** can be formed from a metal blank **80**, **180**, which reduces the number of parts required to hang the floor truss **12** and simplifies the manufacturing process.

In an independent test performed by an outside firm, the truss hanger was installed as part of a wall assembly including 2×6 wood studs, 24" on center, with two layers of ⅝" Type X gypsum attached to each side. The gypsum board included a slot to accommodate the hanger. The hanger was fixed to the top plate of the wall with six 10d common nails in the connector tabs. The cavities in the wall were filled with mineral wool insulation. The testing was performed per ASTM E814 which subjected the specimen to the time/temperature curve prescribed in ASTM E119 for a period of two hours, followed by a hose stream test. As a result of this testing, the outside firm reported that when installed on one side of a maximum 2 hour fire-rated wall assembly, the penetration of the truss hanger through the gypsum board will not reduce the fire resistive rating of the 2 hour fire resistive assembly.

Having described the invention in detail, it will be apparent that modifications and variations are possible without departing from the scope of the invention defined in the appended claims.

When introducing elements of the present invention or the preferred embodiments(s) thereof, the articles "a", "an", "the" and "said" are intended to mean that there are one or more of the elements. The terms "comprising", "including" and "having" are intended to be inclusive and mean that there may be additional elements other than the listed elements.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above products without departing from the scope of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A fire wall hanger for connecting a structural component to a frame wall adapted to have two layers of ⅝-inch-thick drywall mounted thereon to form a fire separation wall, the fire wall hanger comprising:

a channel-shaped portion configured to receive the structural component;

a connection portion including a top flange arranged to engage a top surface of a top plate of the frame wall and a back flange extending from an edge of the top flange, the back flange arranged to engage a vertical face of the top plate of the frame wall, the back flange having a front surface lying in a back flange plane; and

an extension portion including a first extension flange extending from the back flange of the connection portion to the channel-shaped portion, the extension portion spacing the channel-shaped portion from the back flange plane by a distance sized large enough to permit the two layers of ⅝-inch-thick drywall of the fire separation wall to be received between the channel-shaped portion and the back flange plane;

wherein the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another.

2. The fire wall hanger of claim **1**, further comprising a stop arranged to engage and space an end of the structural component from the back flange plane by a distance sized large enough to permit the two layers of ⅝-inch-thick drywall to be received between the end of the structural component and the back flange plane.

3. The fire wall hanger of claim **2**, wherein the stop comprises first and second back panels extending toward each other.

4. The fire wall hanger of claim **3**, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the first back panel being directly attached to the first extension flange, and the second back panel being directly attached to the second extension flange.

5. The fire wall hanger of claim **4**, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the channel-shaped portion including first and second side panels extending upward from the base, the first back panel being directly attached to the first side panel, and the second back panel being directly attached to the second side panel.

6. The fire wall hanger of claim **2**, wherein the stop is part of the channel-shaped portion.

7. The fire wall hanger of claim **6**, wherein the channel-shaped portion bounds a channel sized and shaped to receive the structural component, the stop comprising a first back panel bounding the channel.

8. The fire wall hanger of claim **7**, wherein the stop comprises a second back panel bounding the channel.

9. The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the first extension flange lies in a first extension flange plane, the first extension flange plane being generally perpendicular to the base plane.

10. The fire wall hanger of claim 9, wherein the first extension flange is generally planar.

11. The fire wall hanger of claim 10, wherein the first extension flange is arranged to extend edgewise through the two layers of 5/8-inch-thick drywall.

12. The fire wall hanger of claim 9, wherein the first extension flange includes an upper free edge.

13. The fire wall hanger of claim 9, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the second extension flange lying in a second extension flange plane, the second extension flange plane being generally perpendicular to the base plane and parallel to the first extension flange plane.

14. The fire wall hanger of claim 13, wherein the channel-shaped portion includes first and second side panels extending upward from the base, the first and second side panels each having a rear edge, the rear edges of the first and second side panels lying in a rear edge plane, the rear edge plane being perpendicular to the first and second extension flange planes.

15. The fire wall hanger of claim 13, wherein the channel-shaped portion includes first and second side panels extending upward from the base, the first and second side panels each having a rear edge, the rear edges of the first and second side panels lying in a rear edge plane, the rear edge plane being oriented at a skewed angle to the first and second extension flange planes.

16. The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the first extension flange is directly attached to the channel-shaped portion by a first connection, the first connection having an upper end and a lower end, the first connection extending from the upper end to the lower end in a first direction, the first direction being perpendicular to the base plane.

17. The fire wall hanger of claim 16, wherein the first extension flange is directly attached to the connection portion by a second connection, the second connection having an upper end and a lower end, the second connection extending from the upper end of the second connection to the lower end of the second connection in a second direction, the second direction being parallel to the first direction and perpendicular to the base plane.

18. The fire wall hanger of claim 17, wherein the first extension flange is directly attached to the back flange of the connection portion by the second connection.

19. The fire wall hanger of claim 17, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the second extension flange being directly attached to the channel-shaped portion by a third connection, the third connection having an upper end and a lower end, the third connection extending from the upper end of the third connection to the lower end of the third connection in a third direction, and the second extension flange being directly attached to the connection portion by a fourth connection, the fourth connection having an upper end and a lower end, the fourth connection extending from the upper end of the fourth connection to the lower end of the fourth connection in a fourth direction, the third and fourth directions being parallel to the first and second directions and being perpendicular to the base plane.

20. The fire wall hanger of claim 16, wherein the channel-shaped portion includes a side panel having an upper edge, the lower end of the first connection being disposed at an elevation located in an inclusive range between the base plane and the upper edge of the side panel.

21. The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the first extension flange includes an edge, the first extension flange extending edgewise from the channel-shaped portion toward the back flange in an extension direction, the extension direction being parallel to the base plane.

22. The fire wall hanger of claim 1, wherein the first extension flange and the channel-shaped portion are formed as one-piece of sheet metal.

23. The fire wall hanger of claim 1, wherein the first extension flange and the connection portion are formed as one-piece of sheet metal.

24. The fire wall hanger of claim 1, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal.

25. The fire wall hanger of claim 1, wherein the channel-shaped portion is made of sheet metal, the first extension flange being an extension of the sheet metal forming the channel-shaped portion.

26. The fire wall hanger of claim 1, wherein the first extension flange and the channel-shaped portion are formed as one-piece.

27. The fire wall hanger of claim 1, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece.

28. The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, the channel-shaped portion including a first side panel extending upward from the base, and wherein the first side panel is spaced apart from the front surface of the back flange along a first axis that is normal to the front surface of the back flange, the first axis intersecting the first side panel and the front surface of the back flange.

29. The fire wall hanger of claim 1, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the first and second extension flanges being parallel to one another.

30. The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and a first side panel extending upward from the base, and wherein a front edge of the first extension flange abuts a rear edge of the first side panel.

31. The fire wall hanger of claim 30, wherein the first extension flange is directly attached to the first side panel by way of a bend such that the front edge of the first extension flange abuts the rear edge of the first side panel.

32. The fire wall hanger of claim 1, wherein the top flange includes a rear edge located rearwardly of the edge of the top flange from which the back flange extends, the rear edge located rearwardly of the back flange.

33. The fire wall hanger of claim 1, further comprising a drywall space sized and shaped to receive the two layers of 5/8-inch-thick drywall therein, the channel-shaped portion and the back flange plane bounding the drywall space.

34. The fire wall hanger of claim 33, wherein the first extension flange bounds the drywall space.

35. The fire wall hanger of claim 34, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the second extension flange bounding the drywall space.

36. The fire wall hanger of claim 1, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, and wherein the first and second extension flanges and the first and second side panels are all parallel to each other.

37. The fire wall hanger of claim 1, wherein the channel-shaped portion is arranged with respect to the connection portion to mount the structural component at a non-orthogonal angle relative to the frame wall.

38. The fire wall hanger of claim 1, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the first and second extension flanges engaging each other along a juncture, the juncture arranged to be positioned within the two layers of 5/8-inch-thick drywall.

39. The fire wall hanger of claim 1, wherein the back flange is a first back flange and the top flange is a first top flange, and wherein the connection portion includes a second top flange arranged to engage the top surface of the top plate of the frame wall and a second back flange extending from an edge of the second top flange, the second back flange arranged to engage the vertical face of the top plate of the frame wall, the second back flange having a front surface lying in the back flange plane.

40. The fire wall hanger of claim 39, wherein the first top flange includes a first rear edge located rearwardly of the edge of the first top flange from which the first back flange extends, and wherein the second top flange includes a second rear edge located rearwardly of the edge of the second top flange from which the second back flange extends, the first rear edge being located rearwardly of the first back flange and the second rear edge being located rearwardly of the second back flange.

41. The fire wall hanger of claim 40, wherein the extension portion includes a second extension flange extending from the second back flange to the channel-shaped portion.

42. The fire wall hanger of claim 41, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, and wherein the first and second extension flanges and the first and second side panels are all parallel to each other.

43. The fire wall hanger of claim 42, wherein a front edge of the first extension flange abuts a rear edge of the first side panel.

44. The fire wall hanger of claim 43, wherein the first extension flange and the first back flange are directly attached to each other by a first bend, the first back flange and the first top flange are directly attached to each other by a second bend, the second extension flange and the second back flange are directly attached to each other by a third bend, and the second back flange and the second top flange are directly attached to each other by a fourth bend.

45. The fire wall hanger of claim 44, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal.

46. The fire wall hanger of claim 1, wherein the channel-shaped portion and the connection portion are spaced apart from one another.

47. The fire wall hanger of claim 1, wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, and wherein the first and second extension flanges each include an inner face and an outer face, the inner faces of the first and second extension flanges facing one another, the inner face of the first extension flange facing in a first direction toward the inner face of the second extension flange and the outer face of the first extension flange facing in a second direction that is opposite the first direction, the back flange having a side edge disposed outward, in the second direction, of the outer face of the first extension flange.

48. The fire wall hanger of claim 47, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, each of the first and second side panels having an inner face and an outer face, the inner faces of the first and second side panels facing one another, wherein the outer face of the first side panel is disposed outward, in the second direction, of the inner face of the first extension flange and the outer face of the second side panel is disposed outward, in the first direction, of the inner face of the second extension flange.

49. The fire wall hanger of claim 47, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the outer faces of the first and second extension flanges each have a height extending in a direction that is perpendicular to the base plane and a length extending in a direction that is parallel to the base plane and perpendicular to the first direction, the height of the outer face of the first extension flange being greater than the length of the outer face of the first extension flange, and the height of the outer face of the second extension flange being greater than the length of the outer face of the second extension flange.

50. The fire wall hanger of claim 1, further comprising a stop arranged to engage an end of the structural component to space the end of the structural component from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall to be received between the end of the structural component and the back flange plane;

wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane;

wherein the first extension flange is directly attached to the channel-shaped portion by a first connection, the first connection having an upper end and a lower end, the first connection extending from the upper end to the

lower end in a first direction, the first direction being perpendicular to the base plane;

wherein the first extension flange is directly attached to the connection portion by a second connection, the second connection having an upper end and a lower end, the second connection extending from the upper end of the second connection to the lower end of the second connection in a second direction, the second direction being parallel to the first direction and perpendicular to the base plane;

wherein the first extension flange and the channel-shaped portion are formed as one-piece of sheet metal;

wherein the top flange includes a rear edge located rearwardly of the edge of the top flange from which the back flange extends, the rear edge located rearwardly of the back flange; and

wherein the channel-shaped portion and the connection portion are spaced apart from one another.

51. The fire wall hanger of claim **50**, wherein the stop comprises first and second back panels extending toward each other;

wherein the extension portion includes a second extension flange extending from the connection portion to the channel-shaped portion, the second extension flange being directly attached to the channel-shaped portion by a third connection, the third connection having an upper end and a lower end, the third connection extending from the upper end of the third connection to the lower end of the third connection in a third direction, and the second extension flange being directly attached to the connection portion by a fourth connection, the fourth connection having an upper end and a lower end, the fourth connection extending from the upper end of the fourth connection to the lower end of the fourth connection in a fourth direction, the third and fourth directions being parallel to the first and second directions and being perpendicular to the base plane;

wherein the channel-shaped portion includes a first side panel extending upward from the base, and wherein a front edge of the first extension flange abuts a rear edge of the first side panel; and

wherein the fire wall hanger further comprises a drywall space sized and shaped to receive the two layers of ⅝-inch-thick drywall therein, the channel-shaped portion, the first and second extension flanges and the back flange plane bounding the drywall space.

52. The fire wall hanger of claim **51**, wherein the first back panel is directly attached to the first extension flange and the second back panel is directly attached to the second extension flange;

wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal;

wherein the channel-shaped portion includes a second side panel extending upward from the base, and wherein the first and second extension flanges and the first and second side panels are all parallel to each other;

wherein the back flange is a first back flange and the top flange is a first top flange, and wherein the connection portion includes a second top flange arranged to engage the top surface of the top plate of the frame wall and a second back flange extending from an edge of the second top flange, the second back flange arranged to engage the vertical face of the top plate of the frame wall, the second back flange having a front surface lying in the back flange plane; and

wherein the second extension flange extends from the second back flange to the channel-shaped portion, and wherein the first and second extension flanges each include an inner face and an outer face, the inner faces of the first and second extension flanges facing one another, the inner face of the first extension flange facing in a first direction toward the inner face of the second extension flange and the outer face of the first extension flange facing in a second direction that is opposite the first direction, the first back flange having a side edge disposed outward, in the second direction, of the outer face of the first extension flange, and the second back flange having a side edge disposed outward, in the first direction, of the outer face of the second extension flange.

53. A fire wall hanger for connecting a structural component to a frame wall adapted to have two layers of ⅝-inch-thick drywall mounted thereon to form a fire separation wall, the fire wall hanger comprising:

a channel-shaped portion configured to receive the structural component;

an extension portion extending from the channel-shaped portion and configured to extend through the two layers of ⅝-inch-thick drywall; and

a connection portion including a top flange arranged to engage a top surface of a top plate of the frame wall and a back flange extending from an edge of the top flange, the back flange arranged to engage a vertical face of the top plate of the frame wall, the back flange having a front surface lying in a back flange plane, the extension portion spacing the channel-shaped portion from the back flange plane by a distance sized large enough to permit the two layers of ⅝-inch-thick drywall of the fire separation wall to be received between the channel-shaped portion and the back flange plane;

wherein the channel-shaped portion, the extension portion and the connection portion are rigidly fixed with respect to one another.

54. The fire wall hanger of claim **53**, further comprising a stop arranged to engage an space an end of the structural component from the back flange plane by a distance sized large enough to permit the two layers of ⅝-inch-thick drywall to be received between the end of the structural component and the back flange plane.

55. The fire wall hanger of claim **54**, wherein the stop comprises first and second back panels extending toward each other.

56. The fire wall hanger of claim **55**, wherein the extension portion includes first and second extension flanges extending from the channel-shaped portion to the connection portion, the first back panel being directly attached to the first extension flange, and the second back panel being directly attached to the second extension flange.

57. The fire wall hanger of claim **56**, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the channel-shaped portion including first and second side panels extending upward from the base, the first back panel being directly attached to the first side panel, and the second back panel being directly attached to the second side panel.

58. The fire wall hanger of claim **54**, wherein the stop is part of the channel-shaped portion.

59. The fire wall hanger of claim **58**, wherein the channel-shaped portion bounds a channel sized and shaped to receive the structural component, the stop comprising a first back panel bounding the channel.

60. The fire wall hanger of claim 59, wherein the stop comprises a second back panel bounding the channel.

61. The fire wall hanger of claim 53, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the extension portion includes a first extension flange extending from the channel-shaped portion to the connection portion, the first extension flange being generally perpendicular to the base plane.

62. The fire wall hanger of claim 61, wherein the extension portion includes a second extension flange extending from the channel-shaped portion to the connection portion, the second extension flange being generally perpendicular to the base plane and parallel to the first extension flange.

63. The fire wall hanger of claim 62, wherein the first and second extension flanges are each generally planar.

64. The fire wall hanger of claim 63, wherein the first and second extension flanges each include an edge, the first and second extension flanges each being arranged to extend edgewise through the two layers of ⅝-inch-thick drywall.

65. The fire wall hanger of claim 64, wherein the first and second extension flanges each include an upper free edge.

66. The fire wall hanger of claim 62, wherein the channel-shaped portion includes first and second side panels extending upward from the base, the first and second side panels each having a rear edge, the rear edges of the first and second side panels lying in a rear edge plane, the rear edge plane being perpendicular to the first and second extension flanges.

67. The fire wall hanger of claim 62, wherein the channel-shaped portion includes first and second side panels extending upward from the base, the first and second side panels each having a rear edge, the rear edges of the first and second side panels lying in a rear edge plane, the rear edge plane being oriented at a skewed angle to the first and second extension flanges.

68. The fire wall hanger of claim 53, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the extension portion includes a first extension flange directly attached to the channel-shaped portion by a first connection, the first connection having an upper end and a lower end, the first connection extending from the upper end to the lower end in a first direction, the first direction being perpendicular to the base plane.

69. The fire wall hanger of claim 68, wherein the first extension flange is directly attached to the connection portion by a second connection, the second connection having an upper end and a lower end, the second connection extending from the upper end of the second connection to the lower end of the second connection in a second direction, the second direction being parallel to the first direction and perpendicular to the base plane.

70. The fire wall hanger of claim 69, wherein the first extension flange is directly attached to the back flange of the connection portion by the second connection.

71. The fire wall hanger of claim 69, wherein the extension portion includes a second extension flange directly attached to the channel-shaped portion by a third connection, the third connection having an upper end and a lower end, the third connection extending from the upper end of the third connection to the lower end of the third connection in a third direction, and the second extension flange being directly attached to the connection portion by a fourth connection, the fourth connection having an upper end and a lower end, the fourth connection extending from the upper end of the fourth connection to the lower end of the fourth connection in a fourth direction, the third and fourth directions being parallel to the first and second directions and being perpendicular to the base plane.

72. The fire wall hanger of claim 71, wherein the channel-shaped portion includes a side panel having an upper edge, the lower end of the first connection being disposed at an elevation located between the base plane and the upper edge of the side panel and the lower end of the third connection being disposed at an elevation located between the base plane and the upper edge of the side panel.

73. The fire wall hanger of claim 53, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the extension portion includes a first extension flange and a second extension flange, each of the first and second extension flanges having an edge, the first and second extension flanges each extending edgewise from the channel-shaped portion toward the back flange plane in an extension direction, the extension directions being parallel to the base plane.

74. The fire wall hanger of claim 53, wherein the extension portion and the channel-shaped portion are formed as one-piece of sheet metal.

75. The fire wall hanger of claim 53, wherein the extension portion and the connection portion are formed as one-piece of sheet metal.

76. The fire wall hanger of claim 53, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal.

77. The fire wall hanger of claim 53, wherein the channel-shaped portion is made of sheet metal, the extension portion being an extension of the sheet metal forming the channel-shaped portion.

78. The fire wall hanger of claim 53, wherein the extension portion and the channel-shaped portion are formed as one-piece.

79. The fire wall hanger of claim 53, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece.

80. The fire wall hanger of claim 53, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, the channel-shaped portion including a first side panel extending upward from the base, and wherein the first side panel is spaced apart from the front surface of the back flange along a first axis that is normal to the front surface of the back flange, the first axis intersecting the first side panel and the front surface of the back flange.

81. The fire wall hanger of claim 55, wherein the extension portion includes first and second extension flanges extending from the channel-shaped portion to the connection portion, the first and second extension flanges being parallel to one another.

82. The fire wall hanger of claim 55, wherein the extension portion includes a first extension flange extending from the channel-shaped portion toward the connection portion, and wherein the channel-shaped portion includes a base

configured to receive an end portion of the structural component thereon to support the structural component and a first side panel extending upward from the base, and wherein a front edge of the first extension flange abuts a rear edge of the first side panel.

83. The fire wall hanger of claim **82**, wherein the first extension flange is directly attached to the first side panel by way of a bend such that the front edge of the first extension flange abuts the rear edge of the first side panel.

84. The fire wall hanger of claim **53**, wherein the top flange includes a rear edge located rearwardly of the edge of the top flange, the rear edge located rearwardly of the back flange.

85. The fire wall hanger of claim **53**, further comprising a drywall space sized and shaped to receive the two layers of ⅝-inch-thick drywall therein, the channel-shaped portion and the back flange plane bounding the drywall space.

86. The fire wall hanger of claim **85**, wherein the extension portion includes first and second extension flanges bounding the drywall space.

87. The fire wall hanger of claim **86**, wherein the first and second extension flanges each include a lower edge bounding the drywall space.

88. The fire wall hanger of claim **87**, wherein the back flange bounds the drywall space.

89. The fire wall hanger of claim **53**, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, wherein the extension portion includes first and second extension flanges extending from the channel-shaped portion to the connection portion, and wherein the first and second extension flanges and the first and second side panels are all parallel to each other.

90. The fire wall hanger of claim **53**, wherein the channel-shaped portion is arranged with respect to the connection portion to mount the structural component at a non-orthogonal angle relative to the frame wall.

91. The fire wall hanger of claim **53**, wherein the extension portion includes first and second extension flanges extending from the channel-shaped portion to the connection portion, the first and second extension flanges engaging each other along a juncture, the juncture arranged to be positioned within the two layers of ⅝-inch-thick drywall.

92. The fire wall hanger of claim **53**, wherein the back flange is a first back flange and the top flange is a first top flange, and wherein the connection portion includes a second top flange arranged to engage the top surface of the top plate of the frame wall and a second back flange extending from an edge of the second top flange, the second back flange arranged to engage the vertical face of the top plate of the frame wall, the second back flange having a front surface lying in the back flange plane.

93. The fire wall hanger of claim **92**, wherein the first top flange includes a first rear edge located rearwardly of the edge of the first top flange from which the first back flange extends, and wherein the second top flange includes a second rear edge located rearwardly of the edge of the second top flange from which the second back flange extends, the first rear edge being located rearwardly of the first back flange and the second rear edge being located rearwardly of the second back flange.

94. The fire wall hanger of claim **92**, wherein the extension portion includes first and second extension flanges, the first extension flange extending from the channel-shaped portion to the first back flange, and the second extension flange extending from the channel-shaped portion to the second back flange.

95. The fire wall hanger of claim **94**, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, and wherein the first and second extension flanges and the first and second side panels are all parallel to each other.

96. The fire wall hanger of claim **95**, wherein a front edge of the first extension flange abuts a rear edge of the first side panel.

97. The fire wall hanger of claim **96**, wherein the first extension flange and the first back flange are directly attached to each other by a first bend, the first back flange and the first top flange are directly attached to each other by a second bend, the second extension flange and the second back flange are directly attached to each other by a third bend, and the second back flange and the second top flange are directly attached to each other by a fourth bend.

98. The fire wall hanger of claim **97**, wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal.

99. The fire wall hanger of claim **55**, wherein the channel-shaped portion and the connection portion are spaced apart from one another.

100. The fire wall hanger of claim **53**, wherein the extension portion includes first and second extension flanges extending from the channel-shaped portion to the connection portion, and wherein the first and second extension flanges each include an inner face and an outer face, the inner faces of the first and second extension flanges facing one another, the inner face of the first extension flange facing in a first direction toward the inner face of the second extension flange and the outer face of the first extension flange facing in a second direction that is opposite the first direction, the back flange having a side edge disposed outward, in the second direction, of the outer face of the first extension flange.

101. The fire wall hanger of claim **100**, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component and first and second side panels extending upward from the base, each of the first and second side panels having an inner face and an outer face, the inner faces of the first and second side panels facing one another, wherein the outer face of the first side panel is disposed outward, in the second direction, of the inner face of the first extension flange and the outer face of the second side panel is disposed outward, in the first direction, of the inner face of the second extension flange.

102. The fire wall hanger of claim **100**, wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane, and wherein the outer faces of the first and second extension flanges each have a height extending in a direction that is perpendicular to the base plane and a length extending in a direction that is parallel to the base plane and perpendicular to the first direction, the height of the outer face of the first extension flange being greater than the length of the outer face of the first extension flange, and the height of the outer face of the second extension flange being greater than the length of the outer face of the second extension flange.

103. The fire wall hanger of claim **53**, further comprising a stop arranged to engage an end of the structural component to space the end of the structural component from the back flange plane by a distance sized large enough to permit the two layers of 5/8-inch-thick drywall to be received between the end of the structural component and the back flange plane;

wherein the channel-shaped portion includes a base configured to receive an end portion of the structural component thereon to support the structural component, the base having an upper surface arranged to engage the structural component, the upper surface lying in a base plane;

wherein the extension portion includes a first extension flange directly attached to the channel-shaped portion by a first connection, the first connection having an upper end and a lower end, the first connection extending from the upper end to the lower end in a first direction, the first direction being perpendicular to the base plane;

wherein the first extension flange is directly attached to the connection portion by a second connection, the second connection having an upper end and a lower end, the second connection extending from the upper end of the second connection to the lower end of the second connection in a second direction, the second direction being parallel to the first direction and perpendicular to the base plane;

wherein the first extension flange and the channel-shaped portion are formed as one-piece of sheet metal;

wherein the top flange includes a rear edge located rearwardly of the edge of the top flange from which the back flange extends, the rear edge located rearwardly of the back flange; and

wherein the channel-shaped portion and the connection portion are spaced apart from one another.

104. The fire wall hanger of claim **103**, wherein the stop comprises first and second back panels extending toward each other;

wherein the extension portion includes a second extension flange directly attached to the channel-shaped portion by a third connection, the third connection having an upper end and a lower end, the third connection extending from the upper end of the third connection to the lower end of the third connection in a third direction, and the second extension flange being directly attached to the connection portion by a fourth connection, the fourth connection having an upper end and a lower end, the fourth connection extending from the upper end of the fourth connection to the lower end of the fourth connection in a fourth direction, the third and fourth directions being parallel to the first and second directions and being perpendicular to the base plane;

wherein the channel-shaped portion includes a first side panel extending upward from the base, and wherein a front edge of the first extension flange abuts a rear edge of the first side panel; and

wherein the fire wall hanger further comprises a drywall space sized and shaped to receive the two layers of 5/8-inch-thick drywall therein, the channel-shaped portion, the first and second extension flanges and the back flange plane bounding the drywall space.

105. The fire wall hanger of claim **104**, wherein the first back panel is directly attached to the first extension flange and the second back panel is directly attached to the second extension flange;

wherein the channel-shaped portion, the connection portion, and the extension portion are formed as one-piece of sheet metal;

wherein the channel-shaped portion includes a second side panel extending upward from the base, and wherein the first and second extension flanges and the first and second side panels are all parallel to each other;

wherein the back flange is a first back flange and the top flange is a first top flange, and wherein the connection portion includes a second top flange arranged to engage the top surface of the top plate of the frame wall and a second back flange extending from an edge of the second top flange, the second back flange arranged to engage the vertical face of the top plate of the frame wall, the second back flange having a front surface lying in the back flange plane; and

wherein the second extension flange extends from the second back flange to the channel-shaped portion and the first extension flange extends from the first back flange to the channel-shaped portion, and wherein the first and second extension flanges each include an inner face and an outer face, the inner faces of the first and second extension flanges facing one another, the inner face of the first extension flange facing in a first direction toward the inner face of the second extension flange and the outer face of the first extension flange facing in a second direction that is opposite the first direction, the first back flange having a side edge disposed outward, in the second direction, of the outer face of the first extension flange, and the second back flange having a side edge disposed outward, in the first direction, of the outer face of the second extension flange.

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 11,649,626 B2
APPLICATION NO. : 17/235349
DATED : May 16, 2023
INVENTOR(S) : Steven Brekke and Mark R. Rolf

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Claims

In Column 15, Claim 42, Lines 59-60:
Add --are parallel to each other-- after the phrase 'wherein the first and second extension flanges';

In Column 15, Claim 42, Line 61:
Delete "all";

In Column 17, Claim 52, Line 56:
Add --are parallel to each other-- after the phrase 'wherein the first and second extension flanges';

In Column 17, Claim 52, Line 57:
Delete "all";

In Column 21, Claim 84, Lines 11-12:
Add --from which the back flange extends-- after the phrase 'the edge of the top flange';

In Column 22, Claim 95, Lines 8-9:
Add --are parallel to each other-- after the phrase 'wherein the first and second extension flanges';

In Column 22, Claim 95, Line 10:
Delete "all";

In Column 24, Claim 105, Line 21:
Add --are parallel to each other-- after the phrase 'wherein the first and second extension flanges'; and

In Column 24, Claim 105, Line 22:
Delete "all".

Signed and Sealed this
Thirteenth Day of June, 2023

Katherine Kelly Vidal

Katherine Kelly Vidal
Director of the United States Patent and Trademark Office

(12) **POST-GRANT REVIEW CERTIFICATE** (299th)
United States Patent
Brekke et al.

(10) **Number: US 11,649,626 J1**
(45) **Certificate Issued: Jul. 16, 2025**

(54) **HANGER FOR FIRE SEPARATION WALL**

(71) Applicants: **Steven Brekke**; **Mark R. Rolf**

(72) Inventors: **Steven Brekke**; **Mark R. Rolf**

(73) Assignee: **COLUMBIA INSURANCE COMPANY**

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The results of PGR2023-00047, PGR2023-00048, and PGR2023-00049 are reflected in this post-grant review certificate under 35 U.S.C. 328(b).

POST-GRANT REVIEW CERTIFICATE
U.S. Patent 11,649,626 J1
Trial No. PGR2023-00047
Certificate Issued Jul. 16, 2025

AS A RESULT OF THE POST-GRANT REVIEW PROCEEDING, IT HAS BEEN DETERMINED THAT:

Claims **38** and **91** are found patentable.

Claims **1-37**, **39-90** and **92-105** are cancelled.

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