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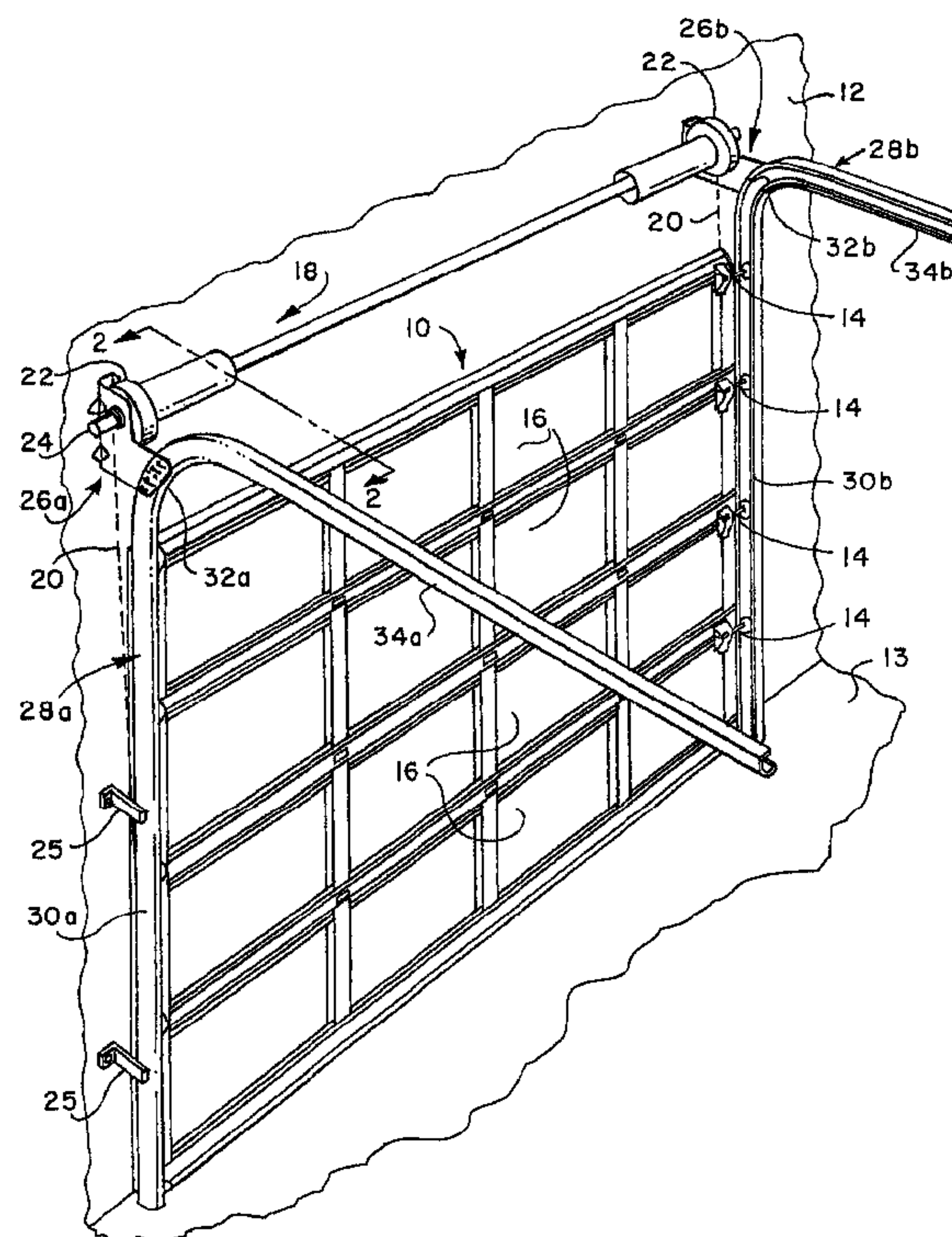
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(54) Title: GUIDE TRACK ASSEMBLIES AND MOUNTING BRACKETS FOR UPWARD ACTING DOORS



(57) Abrégé/Abstract:

Guide track assemblies for upward acting doors include substantially linear vertical and horizontal track sections and curvilinear transition sections formed as separate sections or as portions of each of the vertical and horizontal linear sections. The track assemblies are supported, respectively, by mounting brackets which also support a counterbalance mechanism for the door. The curvilinear transition track sections may be formed integral with the vertical and horizontal track sections and may have a constant or elliptical radius of curvature, the latter to provide clearance for the guide track assemblies in low headroom installations. The mounting brackets are formed of stamped metal plates which are folded to provide a first flange for attaching the mounting bracket to a structural wall, a support part including a flag portion for connection to the guide track sections and a second flange for connection to a door counterbalance mechanism.



ABSTRACT OF THE DISCLOSURE

Guide track assemblies for upward acting doors include substantially linear vertical and horizontal track sections and curvilinear transition sections formed as separate sections or as portions of each of the vertical and horizontal linear sections. The track assemblies are supported, respectively, by mounting brackets which also support a counterbalance mechanism for the door. The curvilinear transition track sections may be formed integral with the vertical and horizontal track sections and may have a constant or elliptical radius of curvature, the latter to provide clearance for the guide track assemblies in low headroom installations. The mounting brackets are formed of stamped metal plates which are folded to provide a first flange for attaching the mounting bracket to a structural wall, a support part including a flag portion for connection to the guide track sections and a second flange for connection to a door counterbalance mechanism.

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TITLE: GUIDE TRACK ASSEMBLIES AND MOUNTING BRACKETS FOR
UPWARD ACTING DOORS

FIELD OF THE INVENTION

[0001] The present invention pertains to circular radius
and elliptical radius configurations of guide track
assemblies for upward acting doors and including combined
5 mounting brackets for the guide track assemblies and door
counterbalance mechanisms.

BACKGROUND

[0002] In the art of upward acting single and multi panel
garage doors, and the like, there has been a continuing need
10 to develop door guide track assemblies which are easy to
install and which can accommodate door installations where
low headroom or low ceiling height conditions are
encountered. In particular, there has also been a
continuing need to develop simplified guide track mounting
15 brackets which reduce the manufacturing cost and
installation time associated with the production and
installation of upward acting doors. The present invention
meets the above mentioned needs and desiderata and overcomes
the disadvantages of prior art guide track assemblies and
20 support structure therefor.

SUMMARY OF THE INVENTION

[0003] The present invention provides improved guide track assemblies and mounting brackets therefor for use with upward acting garage doors and the like.

5 **[0004]** In accordance with one aspect of the present invention, improved guide track assemblies are provided which include two or three piece track assemblies which make up the entire lengths of the track assemblies including the vertical track section, a transition section and a
10 substantially horizontal track section. In one embodiment of the improved track assemblies, the transition section is substantially of circular radius of curvature and each track section includes a curved section of approximately equal circumferential extent.

15 **[0005]** In another embodiment in accordance with the invention, a multi-piece track assembly is provided which includes a substantially vertical section, a variable radius of curvature transition section and a substantially horizontal section. The track assembly is adapted for low
20 headroom or low ceiling height installations. In a preferred embodiment of the low headroom track assembly, the radius of curvature is elliptical and the two piece track assembly includes a first vertically extending track section having a minor portion of a curved transition section and
25 the second track section comprises the horizontal section and a major portion of the curved transition section. The elliptical track section is preferably provided with major and minor axes having a length ratio of about 1.5:1 to 2:1.

[0006] In accordance with a further aspect of the present
30 invention, the track assemblies include improved mounting brackets which are also adapted to support counterbalance mechanisms for associated upward acting doors. The mounting

brackets preferably comprise formed metal or plastic integral brackets which include elongated slots formed therein to provide for adjusting the positions of the track assemblies with respect to associated support structure including the wall surrounding the door opening. The one piece integral mounting brackets each accommodate selective positioning of the track assemblies with respect to the wall to which the mounting bracket is attached and also eliminate the requirement for a separate, generally horizontally extending bracket part for supporting a track assembly. Moreover, the mounting brackets are advantageously configured to be fabricated of stamped and folded metal plate, for example. Still further, integral mounting tabs or flanges are formed on the mounting brackets to facilitate attachment of the brackets to support structure including the wall surrounding the door opening.

[0007a] In accordance with another aspect of the present invention then, there is provided a guide track assembly for guiding movement of an upward acting door between open and closed positions, the guide track assembly including: a first substantially linear track section adapted to be mounted extending substantially horizontally; a second substantially linear track section adapted to be mounted extending substantially vertically adjacent a wall; a header bracket for mounting on the wall; a curvilinear track section extending between the first and second linear track sections, the curvilinear track section being engaged with and releasably connected directly at its opposite ends in supportive relationship to the linear track sections, respectively, and the curvilinear track section being connected directly to the header bracket at a point between opposite ends of the curvilinear track section; and plural jamb brackets adapted to be connected to the wall and to the second track section by cooperating retainers and

elongated slots formed on the jamb brackets and the second track section in such a way as to provide for supporting the second track section with respect to the wall and for adjusting the position of the track assembly with respect to the wall.

[0007b] In accordance with yet another aspect of the present invention, there is provided opposed guide track assemblies for supporting an upward acting door for movement between door open and closed positions, the guide track assemblies each including: a first substantially linear track section adapted to extend substantially horizontally; a second substantially linear track section adapted to extend substantially vertically adjacent a wall; a header bracket adapted to be secured to the wall; a curvilinear track section extending between the first and second linear track sections and operable to be engaged with and releasably connected directly to the linear track sections in supportive relationship, respectively, and the curvilinear track section is operable to be connected directly to the header bracket; and plural jamb brackets adapted to be secured to the wall and to the second track section by a retainer disposed on the jamb brackets, respectively, the retainer being adapted to be disposed in elongated slots formed in the second track section for securing the track assembly with respect to the wall and for adjusting the position of the track assembly with respect to the wall.

[0007c] In accordance with still another aspect of the present invention, there is provided a guide track assembly for guiding movement of an upward acting door between open and closed positions, the guide track assembly including: a first substantially linear track section adapted to be mounted extending substantially horizontally; a second

substantially linear track section adapted to be mounted extending substantially vertically adjacent a wall; the first and second track sections being interchangeable; a header bracket for mounting on the wall; a curvilinear track section extending between the first and second linear track sections, the curvilinear track section including opposite end portions for receiving respective ends of the first and second linear track sections, respectively, whereby the curvilinear track section is adapted to be engaged with and releasably connected directly to the linear track sections in supportive relationship, respectively; and the curvilinear track section is adapted to be releasably connected to the header bracket; and plural jamb brackets adapted to be connected to the wall and to one of the linear track sections for supporting the one linear track section with respect to the wall.

[0007d] In accordance with a further aspect of the present invention, there is provided a guide track assembly for guiding movement of an upward acting door between open and closed positions, the guide track assembly including: a first substantially linear track section adapted to be mounted extending substantially horizontally; a second substantially linear track section adapted to be mounted extending substantially vertically adjacent a wall; a header bracket for mounting on the wall; a curvilinear track section extending between the first and second linear track sections and releasably connected directly to the linear track sections, respectively, the curvilinear track section being engaged with and releasably connected directly to the header bracket at a point between opposite ends of the curvilinear track section, the curvilinear track section includes plural spaced apart elongated slots formed therein; plural jamb brackets adapted to be connected to the wall and to the second track section,

respectively; and the header bracket includes a first part for mounting the header bracket on the wall and a second part projecting substantially normal to the first part and including a retainer mounted thereon and disposed in one of the slots for supporting the curvilinear track section adjustably on and with respect to the header bracket.

[0007e] The respective mounting brackets may be provided with connector or retainer elements which are easily and adjustably connected to the respective track sections. In particular, the mounting brackets may be provided with one or more rivet head shaped retainer members mounted thereon and operable to be engaged with a track section at cooperating keyhole-shaped slots. Mounting brackets are also provided with portions which engage the track section to provide a snug fit between the brackets and the track section so that the brackets do not slip out of position during installation procedures.

[0008] Those skilled in the art will further appreciate the above mentioned advantages and superior features of the invention together with other important aspects thereof upon reading the detail description which follows in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

- [0009] FIGURE 1 is a perspective view of one preferred embodiment of an improved guide track assembly and mounting brackets therefor in accordance with the present invention;
- 5 [0010] FIGURE 2 is a view taken substantially from the line 2-2 of FIGURE 1;
- [0011] FIGURE 3 is a developed plan view of a mounting bracket in accordance with the present invention for use with the door guide track assemblies of FIGURES 1 and 2;
- 10 [0012] FIGURE 4 is a front elevation of the mounting bracket of FIGURE 3 in the final folded configuration;
- [0013] FIGURE 5 is a side elevation of the mounting bracket shown in FIGURES 3 and 4;
- [0014] FIGURE 6 is a perspective view of another
15 preferred embodiment of guide track assemblies and mounting brackets therefor in accordance with the present invention;
- [0015] FIGURE 7 is a view taken generally from the line 7-7 of FIGURE 6;
- [0016] FIGURE 8 is a front elevation of the mounting
20 bracket for the guide track assembly of FIGURES 6 and 7;
- [0017] FIGURE 9 is a side elevation of the mounting bracket embodiment of FIGURES 6 through 8;
- [0018] FIGURE 10 is an end elevation of the bracket shown in FIGURE 9;
- 25 [0019] FIGURE 11 is a perspective view of a sectional upward acting door including another embodiment of the guide track assemblies of the present invention;
- [0020] FIGURE 12 is a perspective view of the left-hand guide track assembly for the door shown in FIGURE 11;
- 30 [0021] FIGURE 13 is a longitudinal side elevation of one of the straight track sections for the guide track assemblies shown in FIGURES 11 and 12;

[0022] FIGURE 14 is a section view taken along the line 14-14 of FIGURE 13;

[0023] FIGURE 15 is a side elevation of one of the mounting brackets for the track assemblies of the present invention;

[0024] FIGURE 16 is a perspective view of the bracket shown in FIGURE 15;

[0025] FIGURE 17 is a section view taken along the line 17-17 of FIGURE 15;

10 [0026] FIGURE 18 is a perspective view of the track assembly shown in FIGURE 12 but taken from another viewpoint;

[0027] FIGURE 19 is a side elevation of the curved or transition track section of the track assembly shown in 15 FIGURES 12 and 18;

[0028] FIGURE 20 is a perspective view of a header bracket which is also shown in FIGURES 12 and 18; and

[0029] FIGURE 21 is a detail section view taken along the line 21-21 of FIGURE 20.

20 DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0030] In the description which follows, like parts are marked throughout the specification and drawing with the same reference numerals, respectively. The drawing figures may not be to scale and certain features may be shown in 25 general or somewhat schematic form in the interest of clarity and conciseness.

[0031] Referring to FIGURE 1, there is illustrated a sectional upward acting door, generally designated by the numeral 10, which is mounted adjacent a wall 12 for closing 30 a conventional rectangular opening, not shown, in said wall. The door 10 is provided with spaced apart sets of roller

type guide members 14, which may be of conventional construction, and are shown mounted on one side edge of sectional door panels 16, respectively. Corresponding guide members 14 are mounted on the opposite side edge of each of the panels 16 in a conventional manner.

[0032] Referring further to FIGURE 1, the door 10 is also provided with a counterbalance mechanism, generally designated by the numeral 18. The counterbalance mechanism 18 is adapted to suspend spaced apart cables or similar flexible members 20 which depend along opposite sides of the door 10 and are connected to the lowermost panel 16 in a conventional manner for counterbalancing at least part of the weight of the door.

[0033] The counterbalance mechanism 18 is provided with spaced apart cable drums 22 supported by a shaft 24 which is adapted to be mounted in spaced apart support brackets 26a and 26b, which support brackets also are adapted to support opposed guide member track assemblies 28a and 28b in a unique manner. The support brackets 26a and 26b are substantially identical and are configured as mirror images of each other thereby comprising so called left hand and right hand brackets. In like manner, the track assemblies 28a and 28b are also substantially identical and comprise mirror images of each other. Track assembly 28a includes a substantially vertically extending section 30a and supported relative to wall 12 by mounting brackets 25, FIGURE 1. Track section 30a is also adapted to include a portion of a curved transition section 32a. Track assembly 28a also includes a substantially horizontal extending track section 34a which further includes a portion of the transition section 32a. Transition section 32a has a substantially circular or constant radius of curvature. Track section 34a is

preferably supported at a distal end by a conventional support bracket, not shown. In like manner, track assembly 28b includes a vertically extending track section 30b, a transition section 32b having a substantially circular radius of curvature and a generally horizontal track section 34b. The transition sections 32a and 32b are formed as integral parts of the track sections 30a and 34a and 30b and 34b, respectively. Track sections 30a and 34a are joined to each other at support bracket 26a. In like manner, track sections 30b and 34b are joined to each other at the cooperating support bracket 26b and are otherwise supported in a manner similar to track assembly 28a.

[0034] Referring now to FIGURE 2, the track assembly 28a and bracket 26a are shown by way of example. Support bracket 26a includes a mounting flange 38 adapted to mount the bracket 26a on wall 12 by conventional fasteners, not shown. Bracket 26a includes an integrally formed support plate part 40 which extends normal to the flange 38 and includes an outer distal "flag" portion 42 provided with a plurality of generally elongated slots formed therein, see FIGURE 3 also, and designated by numerals 43a, 43b, 43c, 43d and 43e, which slots are generally parallel to each other and are staggered so as to extend along a radius of curvature corresponding substantially to the radius of curvature of the track transition section 32a. As shown in FIGURE 2, track sections 30a and 34a are provided with spaced apart fastener receiving openings 44 and 46, respectively, which are alignable with selected ones of the slots 43a, 43b, 43c, 43d and 43e, respectively, as shown. Conventional mechanical fasteners, not shown, may thus be used to join the track sections 30a and 34a to the bracket 26a at the respective fastener receiving openings described

on each of the track sections and on the bracket flag portion 42. The slots in bracket 26a are provided such that vertical and horizontal adjustment of the positions of the track sections 30a and 34a may be obtained while at least
5 two fastener receiving openings in each track section are each aligned with a slot in the bracket.

[0035] As shown in FIGURE 2, the track sections 30a and 34a each include an equal portion of the transition section 32a formed thereon and designated by the numerals 33 and 35,
10 respectively. Accordingly, the circumferential extent of the curved, generally circular radiused portions of track sections 30a and 34a are each approximately 45°, angle "y" in FIGURE 2, with respect to the axis "g" of the radius of curvature. In this way an additional mounting bracket, such
15 as one of brackets 25 for track section 30a, FIGURE 1, or a similar horizontally extending bracket, may be eliminated and the track sections 30a and 34a may also be more easily stacked and packaged for shipment to an installation site. As shown in FIGURE 2, the track sections 30a and 34a are
20 adapted to be positioned directly adjacent to each other and suitably connected to the support bracket 26a. The track sections 30b and 34b are of identical construction but of the opposite hand and, as previously mentioned, the bracket 26b is substantially a mirror image of the bracket 26a.

25 **[0036]** Another advantage of the track assemblies 28a and 28b is that by providing the curved transition section 33 of track section 30a, for example, the uppermost guide member 14, see FIGURE 2, resides in the vertical track section 30a in the closed position of the door 10. The uppermost guide
30 member 14 on the opposite side of the uppermost door panel 16 would also reside in the upper curved portion of track section 30b. In this way the track sections 30a and 30b may

be erected and the door 10 assembled and supported in its closed position before erection of the track sections 34a and 34b would be required. Moreover, the door panel 16 may be moved into position during erection by inserting the
5 guide members 14 into the upper end of the transition section 33 of track section 30a and the corresponding transition section of track section 30b after these track sections have been erected and supported by the wall 12. Again, this arrangement facilitates assembly of the door.

10 **[0037]** Referring further to FIGURE 3, the bracket 26a is shown in a planar developed view in which the flange 38 is coplanar with the support part 40 including its distal flag portion 42. The bracket 26a is shown in FIGURE 3 before the bracket is folded along a first fold region 47 defined by
15 three closely spaced dashed lines and before a second flange is formed extending normal to the flange 38 and in the same direction as the support part 40 by folding the bracket 26a along a second fold region 49 defined by a second set of closely spaced dashed lines, as shown. A second flange 50
20 formed by folding the metal plate which comprises the bracket 26a along the fold region 49 has a relieved surface 51 and openings 53 formed therein for receiving portions of the counterbalance mechanism as further described in the above identified patent application to Mondragon, et al.

25 **[0038]** As further shown in FIGURE 3, the flange 38 is provided with fastener receiving holes 38a and the support part 40 is provided with a cylindrical bore 54 for receiving a bearing assembly for supporting the counterbalance mechanism support shaft 24, neither shown in FIGURE 3.
30 Lastly, the bracket 26a, when formed, is provided with two spaced apart bracket mounting tabs 56 and 58 which are formed by a coining or stamping operation by removing metal

to form generally rectangular or, as shown, somewhat V shaped slits 56a and 58a, respectively. The base portions of the tabs 56 and 58 extend along the fold region 47 so that when the flange 38 is folded with respect to the support part 40 of bracket 26a, the tabs 56 and 58 remain substantially coplanar with the flange 38, as shown in FIGURES 4 and 5. Mounting tabs 56 and 58 include suitable fastener receiving slots 56a and 58a, respectively. As shown in FIGURES 3 and 4, the flange 38 includes a longitudinally extending portion 38b of approximately less than half the full width of the flange 38 to provide additional rigidity to the bracket support part 40, including the distal flag portion 42. The rigidity of the support part 40, 42 is further enhanced by an elongated rib 55, as shown in FIGURE 5. Still further, the bearing bore 54 is also provided with a circumferential flange 54a, FIGURES 4 and 5, as part of the metal displacing operation which forms the bracket 26a.

[0039] Those skilled in the art will recognize that the brackets 26a and 26b may be formed from the same, so called blank part illustrated in FIGURE 3 depending on which direction the folds are accomplished at the fold regions 47 and 49. The rigidity of the support brackets 26a and 26b may be further enhanced along the fold region 47 by forming respective gussets 59, FIGURES 4 and 5, by a suitable stamping or coining operation.

[0040] A major advantage of the brackets 26a and 26b is that these brackets provide the dual function of supporting a counterbalance mechanism for the door 10 as well as the respective track assemblies 28a and 28b for the door. Thanks to the provision of the elongated slots 43a through 43e, the position of track assembly 28a (as well as track assembly 28b) may be easily adjusted with respect to the

wall 12 and floor 13, FIGURE 1. Accordingly, the brackets 26a and 26b reduce the number of parts associated with the support structure for the door 10, are easily fabricated as substantially mirror images of each other and simplify door
5 installation procedures.

[0041] Referring now to FIGURES 6 and 7, another embodiment of guide track assemblies for the door 10 is illustrated including an alternate embodiment of respective counterbalance mechanism and track assembly support
10 brackets. In the embodiment shown in FIGURES 6 and 7, the door 10 is supported for movement between open and closed positions by respective spaced apart track assemblies 70a and 70b. Track assembly 70a includes a substantially vertically extending track section 72a, a curvilinear
15 transition track section 74a and a generally horizontal extending track section 76a. In like manner, the track assembly 70b includes a generally vertical extending linear track section 72b comprising a mirror image of track section 72a, a curvilinear transition section 74b and a
20 substantially horizontal extending track section 76b, being mirror images of track sections 74a and 76a, respectively. The curvilinear transition sections 74a and 74b are formed, in part, by the respective vertical and horizontal track sections of each track assembly. Moreover, the curvilinear
25 transition sections 74a and 74b preferably have a substantially elliptical curvature throughout the transition section length wherein the major axis of the elliptical curvature extends generally horizontally and the minor axis of the elliptical curvature extends generally vertically.
30 In this way, an improved arrangement of a track assembly is provided for low ceiling height or other low "headroom" applications of the door 10.

[0042] Referring primarily to FIGURE 7, a portion of the track assembly 70a is shown by way of example. The transition section 74a is made up of a major portion of the transition section formed integral with the track section 76a and generally designated by numeral 77 while a major portion of the curvilinear section 74a is formed as part of the track section 72a. The curvilinear shape of the transition section 74a, including the portions 77 and 79 preferably has a major semiaxis m which is about twice the length of the minor semiaxis n . Preferred dimensions for the major and minor semiaxes are 20.0 inches and 10.0 inches, respectively. Distance p from the inside edge 72a' of track section 72a is approximately one-fourth of dimension m and angle x , which dictates the extent of the curvilinear track sections 77 and 79, is approximately 40° with respect to the center point c which is located on the major axis of the elliptical radius of curvature at dimension p from the vertical extent of track section 72a. As shown in FIGURE 7, the configuration of the track assembly 70a as well as the track assembly 70b is advantageous with respect to applications of the door 10 in low ceiling height structures, as indicated by the ceiling 13 in FIGURE 7. Other applications requiring low headroom or height of the guide track assemblies also benefit from the configuration of the track assemblies 70a and 70b. Moreover, track sections 72a and 72b are also operable to support the uppermost guide rollers 14 in the curvilinear transition sections of these track sections in the door closed position of the uppermost door panel 16.

[0043] Referring again to FIGURE 6 also, alternate embodiments of combination counterbalance mechanism and track assembly mounting or support brackets are illustrated

and generally designated by the numerals 80a and 80b, respectively. The brackets 80a and 80b are mirror images of each other and are formed from metal plate in substantially the same manner that the brackets 26a and 26b are formed.

5 Referring primarily to FIGURE 7, the bracket 80a is illustrated and is characterized by a generally planar flange part 82 adapted to be secured to the wall 12 by conventional mechanical fasteners, not shown. Flange part 82 is integral with and extends normal to an elongated

10 support part 84 including a first upper portion 84a having a bearing bore 86 formed therein for receiving a support bearing, not shown, for the counterbalance mechanism shaft 24.

[0044] Support part 84 also includes a depending portion

15 84b and a distal, generally horizontally extending track or flag support portion 84c. Bracket flag portion 84c is provided with a plurality of spaced apart, staggered and parallel fastener receiving slots 88a, 88b, 88c and 88d. The slots 88a, 88b, 88c and 88d are adapted to be aligned

20 with cooperating fastener receiving bores 90 and 92 formed in the respective track sections 76a and 72a as illustrated in FIGURE 7, for receiving mechanical fasteners, not shown, to secure the track sections 72a and 76a to the bracket 80a and in generally abutting relationship to each other. The

25 track assembly 70b is similarly configured for connection to the mounting bracket 80b.

[0045] Referring now primarily to FIGURES 8 through 10, the support bracket 80a is further illustrated as including a second flange part 92 similar to the flange part 50 of

30 bracket 26a for connection to a spring winder support part of the counterbalance mechanism 18 previously described. The configuration of flange part 92 is substantially like

that of flange part 50 and extends generally parallel to the support part 84 and spaced therefrom. Support or mounting bracket 80a also includes a circumferential flange 86a defining the bearing bore 86 and a plurality of spaced apart mounting tabs 98 which are formed by displacing material forming part of the support part 84 during the forming of the bracket 80a in the same manner that the mounting tabs 56 are formed for the bracket 26a. Elongated fastener receiving slots 98a and formed in the tabs 98 and fastener receiving bores 82a are formed in the flange 82. The flange 82 includes an elongated portion 82b of reduced width, FIGURE 8, to strengthen and increase the rigidity of support part 84 of the bracket 80a.

[0046] The brackets 80a and 80b are formed in substantially the same manner as the brackets 26a and 26b and differ substantially only in their proportions and, for example, the number of mounting tabs 98 which are also coplanar with the flange 82. Accordingly, the brackets 80a and 80b enjoy the same advantages for supporting both the counterbalance mechanism and the door guide track assemblies in a manner substantially like that provided for by the brackets 26a and 26b. Moreover, the configuration of the elliptical curved transition sections 74a and 74b is such that the lengths of the distal flag portions of the brackets 80a and 80b are minimized and the rigidity of the brackets and track assemblies connected thereto is improved.

[0047] For residential garage door applications, primarily, the brackets 26a, 26b, 80a and 80b may be formed of rolled steel having a thickness of about .099 inches and the respective sections of the track assemblies 28a, 28b, 70a and 70b may also be formed of roll formed steel having a nominal thickness of about .049 inches to .099 inches.

Fabrication of the track assemblies and support brackets described herein may be carried out using conventional roll forming, stamping or similar metal forming techniques known to those skilled in the art.

5 **[0048]** Referring to FIGURE 11, there is illustrated a sectional upward acting door 120 comprising plural hingedly interconnected panels 122 adapted to form a closure over an opening 124 in a vertical wall 126. The door 120 is guided for movement between the closed position shown and an open
10 position by opposed guide track assemblies 128a and 128b which are substantially identical but of the opposite hand or otherwise identified as left-hand and right-hand assemblies. For the further discussion herein, a detailed description of the guide track assembly 128a will be
15 provided. Those skilled in the art will appreciate that the guide track assembly 128b is substantially identical to the assembly 128a but is a mirror image thereof. Moreover, common parts are used to provide the guide track assemblies 128a and 128b. For example, the guide track assembly 128a
20 is characterized by a vertically extending track section 130 and a second horizontally extending track section which is identical to the vertically extending track section and is also designated by the numeral 130. A curvilinear transition section 132a is interposed the vertical section
25 130 and the horizontal section 130 and is connected to a header bracket 134a. Header bracket 134a is cooperable with an opposed header bracket 134b to support a counterbalance mechanism 136.

30 **[0049]** Guide track assembly 128b is substantially like guide track assembly 128a and is characterized by a vertically extending track section 130, a horizontally extending track section 130 and a curved transition section

132b interposed the straight track sections and connected thereto in a manner to be described in further detail herein. Transition track section 132b is supported by header bracket 134b in the same manner that transition
5 section 132a is supported by header bracket 134a.

[0050] Each of the door panels 122 is preferably guided for movement between open and closed positions of the door 120 by suitable roller guide members 135 within the guide track sections 130, 132a and 132b of the respective track
10 assemblies 128a and 128b. Moreover, the vertically extending track sections 130 of the respective track assemblies 128a and 128b are supported at the wall 126 by spaced-apart jamb brackets 138, two shown for supporting the track assembly 128a in FIGURES 11 and 12. The horizontally
15 extending track sections 130 are preferably supported by brackets, not shown, depending from a ceiling or other structure, not shown, in a conventional manner.

[0051] Referring now to FIGURES 12, 13 and 14, each of the straight track sections 130 comprises an elongated
20 rolled or otherwise formed metal member including, as shown in FIGURES 13 and 14, a flange 140, a web 142 extending at right angles to the flange and a channel-shaped portion 144 having angled side walls 144a and 144b for receiving a guide roller member 135. As shown in FIGURE 13, the web 142 is
25 provided with plural spaced-apart somewhat keyhole-shaped slots 146 and 148. Each of the slots 146 includes an enlarged generally circular opening 147 contiguous with a narrow elongated slot part 149. The slot parts 149 extend at an acute angle X with respect to the longitudinal extent
30 of the track section 130, as shown in FIGURE 13. The slots 148 have the same geometry as the slots 146 but extend at an acute angle X in opposite directions, as indicated in

FIGURE 13. Accordingly, a pair of slots 146 is disposed adjacent one end 130a of a track section 130 and a pair of slots 148 is disposed adjacent an opposite end 130b of a track section 130, as shown in FIGURE 13. Respective slots 146 and 148 are disposed spaced substantially apart from each other between the aforementioned pairs of slots 146 and 148 and a single slot 148 is disposed intermediate the single opposed slots 146 and 148 just described and as shown in FIGURE 13. Spaced-apart door latchbar receiving openings 150 may be provided in the web 142 also, as shown in FIGURE 13. Moreover, the pattern of the slots 146 and 148 and the openings 50 are such as to allow the track sections 130 to be used in both left-hand and right-hand applications and in both horizontal and vertical applications as will be appreciated by those skilled in the art. Still further, each of the track sections 130 is provided with a fastener receiving hole 151, FIGURE 13, preferably located adjacent each of the respective ends 130a and 130b.

[0052] By providing opposed pairs of slots 146 and 148 adjacent opposite ends of the track section 130 and by providing intermediate spaced-apart slots 146 and 148, as shown in FIGURE 3, a track section 130 may be connected to a wall, such as the wall 126, at a selected position in accordance with a structural member available for securing the track section to the wall via a bracket 138. By positioning respective pairs of angled slots 146 and 148 adjacent opposite ends of a track section 130, the track section may be used in both left-hand and right-hand track assemblies, as well as in both vertical and horizontal positions, as shown by way of example in FIGURES 1 and 2.

[0053] Still further, by positioning fastener receiving openings or holes 151 at opposite ends of a track section

130, the track section may be secured to a curvilinear track section 132a or 132b, as required, to form a track assembly. For example, as shown in FIGURE 2, a horizontal track section 130 is secured to the curvilinear track section 132a by an arrangement which includes a fastener assembly 153 comprising a conventional panhead or flathead machine screw and nut assembly, for example, for positively securing the straight or linear track section 130 to the curvilinear track section 132a. In like manner, the track section 130 extending vertically along the wall 126 may also be secured to the opposite end of the curvilinear track section 132a by a second fastener assembly 153.

[0054] Referring now to FIGURES 15, 16 and 17, the jamb bracket 138 preferably comprises a formed metal member, including a first flange 156 and a second flange 158 integrally joined to the first flange, see FIGURE 16, and extending at right angles thereto. Coined or otherwise formed reinforcing gussets 159 are provided between the flanges 156 and 158. The flange 158 includes an elongated fastener receiving slot 160 formed therein and flange 156 includes a somewhat rivet-shaped retainer member 162 mounted thereon and interposed elongated parallel extending raised bosses 163. As shown in FIGURE 17, bosses 163 project from the surface 156a of the flange 156 in the same direction as the retainer member 162, including an enlarged diameter head portion 162a. Retainer member 162 also includes a reduced diameter shank portion 162b, a part of which projects through a suitable opening in the flange 156 and may be deformed in a known manner to secure the retainer member 162 firmly to the bracket 138. The distance between the flange 162a and the bosses 163 is determined to be essentially the same as or slightly less than the thickness of the web 42 of

each track section 130. When a bracket 138 is connected to a track section 130, the retainer head 162a is inserted into a slot 146 or 148 through the large diameter opening portion, such as portion 147, and the bracket is then moved to a position such that the retainer 162 is disposed in the slot portion 149, for example, and the bracket is firmly but slidably engaged with the web 42 on opposite sides thereof by the bosses 163 and the retainer head 162a. In this way, the brackets 138 may be prepositioned on and supported by track section 130 and remain in their designated positions during a track mounting or installation procedure. However, the brackets 138 may also be conveniently moved within the slots 146 and/or 148 and with respect to a track section 130, as needed, to adjust the final position of a track assembly, such as the track assembly 128a, with respect to wall 126.

[0055] Referring now to FIGURES 18 and 19, the curvilinear track section 132a is preferably provided with the same cross-sectional geometry as the track sections 130 and includes a web 170 interposed a flange 172 and a channel-shaped portion 174. Opposite ends 173 and 175 of the curvilinear section 132a are swedged or otherwise enlarged slightly with respect to major track portion 177 to receive opposite ends 130a and 130b, respectively, of the respective horizontal and vertical track sections 130 in telescoping relationship, as shown in FIGURE 18. As shown in FIGURE 19, elongated fastener receiving slots 173a and 175a are provided in a web 170a at the respective enlarged cross section end portions 173 and 175 for receiving fastener assemblies 153, for example, as shown in FIGURE 18, to positively secure track sections 130 to the track section 132a, if desired.

[0056] Referring further to FIGURES 18 and 19, the curvilinear track section 132a is also provided with plural, spaced-apart keyhole-shaped slots 178 having substantially the same geometry as the slots 146 and 148 and adapted to receive retainer members 162 supported on the header bracket 134a, as shown in FIGURE 18. The track section 132a is further provided with plural spaced-apart fastener receiving holes 180, two shown in FIGURE 18, one of said fastener receiving holes being interposed the slots 178, as shown in FIGURE 19. In the view of FIGURE 18, the fastener receiving hole 180 interposed the slots 178 is covered by a fastener assembly 153.

[0057] Referring to FIGURE 19, the proportions of the curvature of the track section 132a are such that center point 181 of the elliptical radius of curvature defines the intersection of major and minor axes having a length ratio of about 1.5:1 to 2:1. However, the elliptical radius of curvature may not extend entirely between the enlarged cross sections provided at each end 173 and 175. For example, a second center 183 may define a circular radius of curvature beginning at the juncture of the swedged end 175 with the major portion 177 of the track section 132 and which extends from the swedged end 175 through an angle Z of about forty degrees to sixty degrees, for example. The remaining curvilinear extent of the track section 132a follows the elliptical radius of curvature previously discussed. The circular radius of curvature may, preferably, be about twenty percent to twenty-five percent of the major axis for the elliptical curvature part of track section 132a.

[0058] Referring further to FIGURES 18, 20 and 21, the header bracket 134a is illustrated in some detail as being characterized by a generally L-shaped planar flange part or

plate section 184 integrally joined to a web 186 which is also integrally joined to a counterbalance mechanism mounting flange 188 extending parallel to the flange part or section 184. Spaced-apart mounting tabs 190, FIGURE 20, are
5 formed by a punching operation on the planar section 184 and by bending the planar section or bending the tabs to be coplanar with the web 186. A suitable bearing assembly 191 is shown mounted on the section 184 for supporting a counterbalance mechanism drive shaft, not shown.

10 **[0059]** Header bracket 134a further includes two spaced-apart retainer members 162 having the same configuration as the retainer members 162 mounted on the jamb brackets 138, respectively, and adapted to fit within the slots 178 of the curvilinear track section 132a, as shown in FIGURE 18, for
15 supporting the curvilinear track section with respect to the header bracket 134a. Spaced-apart, elongated, parallel fastener receiving slots 193 are disposed on opposite sides of one of the retainers 162, as shown in FIGURE 20 for receiving one or more fastener assemblies 153. In the
20 arrangement shown in FIGURE 18, a fastener assembly 153 extends through an opening 180 in track section 132a and through the slot 193 which is interposed the two retainer members 162. Elongated, parallel reinforcing ribs 195a, 195b and 195c may be formed in the bracket section 184, as shown.

25 **[0060]** Accordingly, the curvilinear track sections 132a and 132b may be conveniently mounted on the header brackets 134a and 134b by engaging the retainer members 162 of the header brackets with the track sections within the slots 178 and adjusting the position of each curvilinear track section
30 with respect to the web 186 of each bracket, as needed, before tightening a fastener assembly 153 in the lower slot 193. Although the fastener assembly 153 may not be required

10 **[0061]** The brackets 134a and 134b may be mounted on the wall 126 prior to assembly of the track assemblies 128a and 128b to the wall and to the respective header brackets. Alternatively, the track sections 132a and 132b may be mounted on their respective header brackets 134a and 134b by
15 moving the retainer members 162 into the slots 178 so that the header brackets are at least loosely connected to the track sections 132a and 132b while the precise positioning of the track assemblies 128a and 128b is carried out. The brackets 134a and 134b may then be firmly secured to the
20 wall 126 with conventional fasteners projecting through fastener receiving openings 186a, FIGURE 20, and through suitable openings in the tabs 190 of the respective header brackets. Moreover, for applications involving relatively heavy doors the horizontal track sections of track
25 assemblies 128a and 128b may be reinforced by providing elongated angle cross section braces, not shown, extending from and secured to the header brackets 134a and 134b and secured to the horizontal track sections 130, respectively.

[0062] Thanks to the elongated slots 178 and the cooperating retainer members 162 on the header brackets 134a and 134b, as well as the angled slots 146 and 148 on the track sections 130, which cooperate with the jamb brackets

138, the track assemblies 128a and 128b may be quickly and accurately installed at the point of installation of a sectional door, such as the door 122.

[0063] Materials used in fabricating the track assemblies 128a and 128b may be conventional engineering materials used for upward acting door guide track assemblies including, for example, .085 inch thick steel plate for the bracket members and .068 inch thick steel plate for the track members, respectively. Other materials may be considered for fabricating each of the component parts of the track assemblies 128a and 128b.

[0064] Although preferred embodiments of upward acting door track assemblies and support brackets have been described in detail herein, those skilled in the art will also recognize that various substitutions and modifications may be made without departing from the scope and spirit of the appended claims.

WHAT IS CLAIMED IS:

1. A guide track assembly for guiding movement of an upward acting door between open and closed positions, said guide track assembly including:

a first substantially linear track section adapted to be mounted extending substantially horizontally;

a second substantially linear track section adapted to be mounted extending substantially vertically adjacent a wall;

a header bracket for mounting on said wall;

a curvilinear track section extending between said first and second linear track sections, said curvilinear track section being engaged with and releasably connected directly at its opposite ends in supportive relationship to said linear track sections, respectively, and said curvilinear track section being connected directly to said header bracket at a point between opposite ends of said curvilinear track section; and

plural jamb brackets adapted to be connected to said wall and to said second track section by cooperating retainers and elongated slots formed on said jamb brackets and said second track section in such a way as to provide for supporting said second track section with respect to said wall and for adjusting the position of said track assembly with respect to said wall.

2. The guide track assembly set forth in Claim 1 wherein:

said slots are formed spaced apart in said second track section extending at an acute angle with respect to the longitudinal extent of said second track section.

3. The track assembly set forth in Claim 2 wherein:

said second track section includes a first slot at one end of said second track section, a second slot at an

opposite end of said second track section and at least one slot intermediate said first and second slots.

4. The track assembly set forth in Claim 3 wherein:

5 said first and second slots extend at said acute angles in different directions with respect to each other.

5. The track assembly set forth in Claim 4 including:

10 spaced-apart fastener receiving openings formed in said second track section adjacent opposite ends thereof, respectively.

6. The track assembly set forth in Claim 1 wherein:

15 said first track section and said second track section are identical.

7. The track assembly set forth in Claim 1 wherein:

20 said curvilinear track section is formed to have a substantially elliptical radius of curvature.

8. The track assembly set forth in Claim 1 wherein:

25 said curvilinear track section includes opposed enlarged end portions for receiving ends of said first and second track sections, respectively, therewithin for supporting said first and second track sections with respect to said curvilinear track section.

9. The track assembly set forth in Claim 1 wherein:

30 said jamb brackets include opposed flanges, a retainer member disposed on one of said flanges and engageable with said second track section at an elongated slot formed in said second track section and a fastener receiving opening formed on the other of said flanges.

35

10. The track assembly set forth in Claim 9 including:

a projection on said one flange for cooperating with said retainer member to snugly retain said jamb bracket connected to said second track section when said retainer member is disposed in said slot.

11. The track assembly set forth in Claim 1 wherein:

said header bracket includes a web for mounting said header bracket on said wall adjacent said guide track assembly, an integral flange part extending substantially normal to said web and at least one retainer member mounted on said flange part of said header bracket for connecting said curvilinear track section to said header bracket.

12. The track assembly set forth in Claim 11 including:

at least one slot formed in said flange part of said header bracket for receiving a fastener assembly for securing said curvilinear track section to said header bracket.

13. Opposed guide track assemblies for supporting an upward acting door for movement between door open and closed positions, said guide track assemblies each including:

a first substantially linear track section adapted to extend substantially horizontally;

a second substantially linear track section adapted to extend substantially vertically adjacent a wall;

a header bracket adapted to be secured to said wall;

a curvilinear track section extending between said first and second linear track sections and operable to be engaged with and releasably connected directly to said linear track sections in supportive relationship, respectively, and said curvilinear track section is operable to be connected directly to said header bracket;

and

plural jamb brackets adapted to be secured to said wall and to said second track section by a retainer disposed on said jamb brackets, respectively, said retainer being adapted to be disposed in elongated slots formed in said second track section for securing said track assembly with respect to said wall and for adjusting the position of said track assembly with respect to said wall.

14. The invention set forth in Claim 13 wherein:

said linear track sections are interchangeable.

15. The invention set forth in Claim 13 wherein:

each of said curvilinear track sections includes at least one elongated slot formed therein and each of said header brackets includes a retainer mounted thereon and disposed in said one slot for supporting said curvilinear track section adjustably on and with respect to said header bracket.

16. The invention set forth in Claim 15 wherein:

each of said header brackets includes at least one elongated slot formed adjacent said retainer for receiving a fastener assembly for securing said curvilinear track section firmly to said header bracket.

17. The invention set forth in Claim 15 wherein:

said slots are formed extending at an acute angle with respect to the longitudinal extent of said second track section.

18. The invention set forth in Claim 13 wherein:

said linear track sections are connected to said curvilinear track section at respective ones of enlarged

end portions of said curvilinear track sections which receive said first and second linear track sections telescopically therein, respectively.

- 5 19. A guide track assembly for guiding movement of an upward acting door between open and closed positions, said guide track assembly including:

 a first substantially linear track section adapted to be mounted extending substantially horizontally;

- 10 a second substantially linear track section adapted to be mounted extending substantially vertically adjacent a wall;

 said first and second track sections being interchangeable;

- 15 a header bracket for mounting on said wall;

- a curvilinear track section extending between said first and second linear track sections, said curvilinear track section including opposite end portions for receiving respective ends of said first and second linear track sections, respectively, whereby said curvilinear track section is adapted to be engaged with and releasably connected directly to said linear track sections in supportive relationship, respectively, and said curvilinear track section is adapted to be releasably connected to said header bracket; and
- 20
- 25

 plural jamb brackets adapted to be connected to said wall and to one of said linear track sections for supporting said one linear track section with respect to said wall.

30

20. A guide track assembly for guiding movement of an upward acting door between open and closed positions, said guide track assembly including:

- a first substantially linear track section adapted to be mounted extending substantially horizontally;
- 35

a second substantially linear track section adapted to be mounted extending substantially vertically adjacent a wall;

a header bracket for mounting on said wall;

5 a curvilinear track section extending between said first and second linear track sections and releasably connected directly to said linear track sections, respectively, said curvilinear track section being engaged with and releasably connected directly to said header bracket at a point between opposite ends of said curvilinear track section, said curvilinear track section includes plural spaced apart elongated slots formed therein;

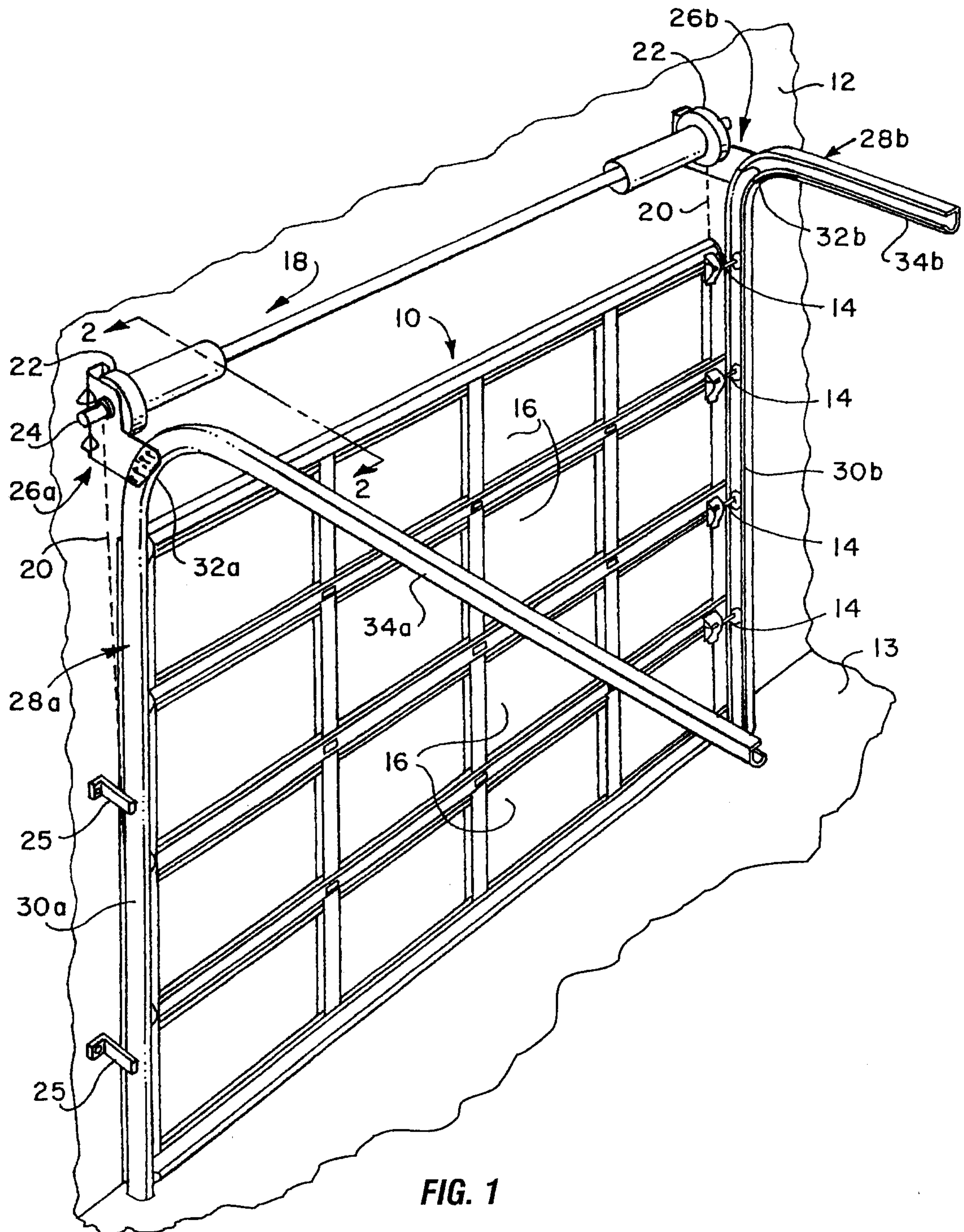
10 plural jamb brackets adapted to be connected to said wall and to said second track section, respectively; and

said header bracket includes a first part for mounting said header bracket on said wall and a second part projecting substantially normal to said first part and including a retainer mounted thereon and disposed in one of said slots for supporting said curvilinear track section adjustably on and with respect to said header bracket.

21. The track assembly set forth in Claim 20 wherein:

25 said header bracket includes at least one elongated slot formed adjacent said retainer for receiving a fastener assembly for securing said curvilinear track section firmly to said header bracket.

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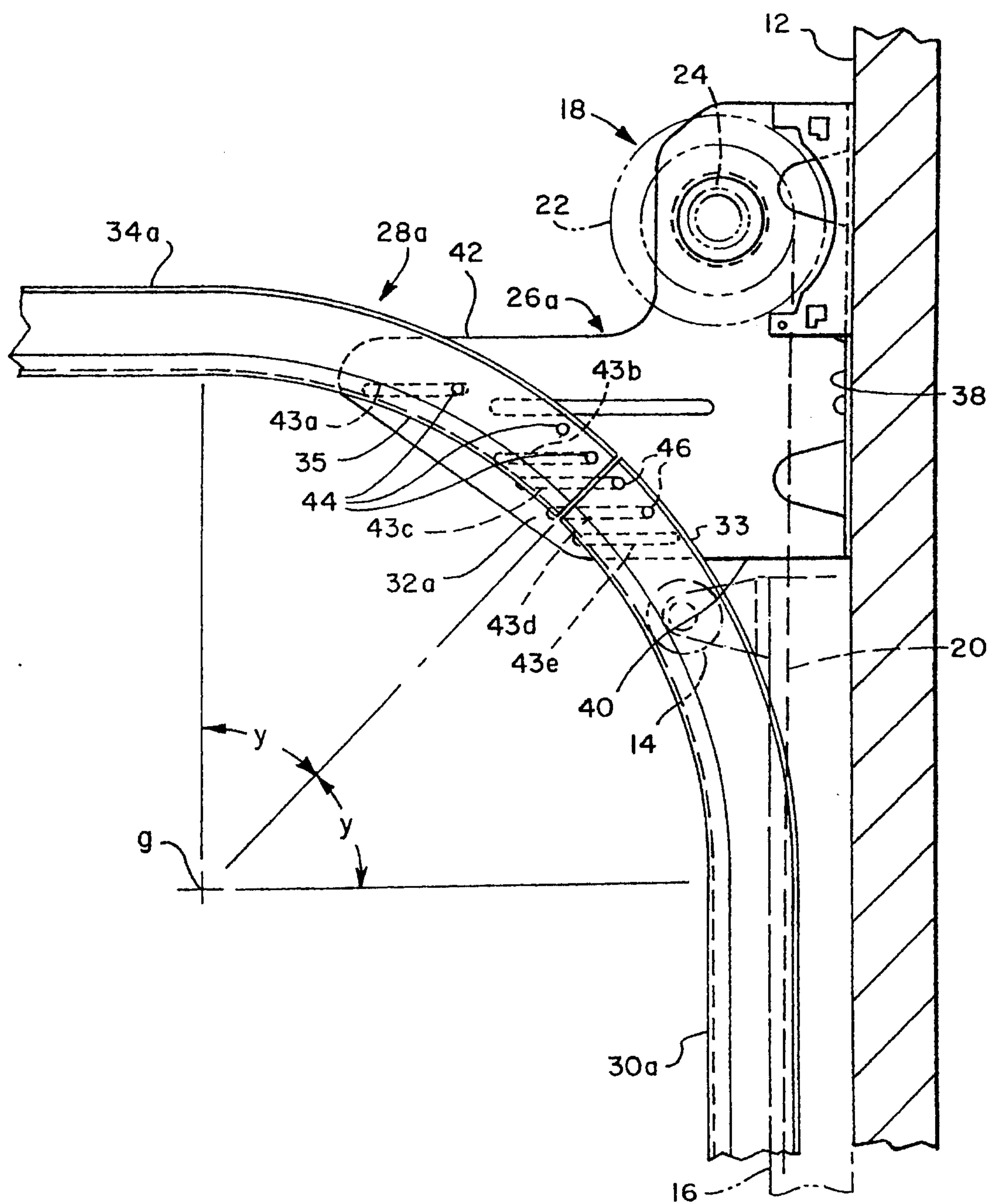


FIG. 2

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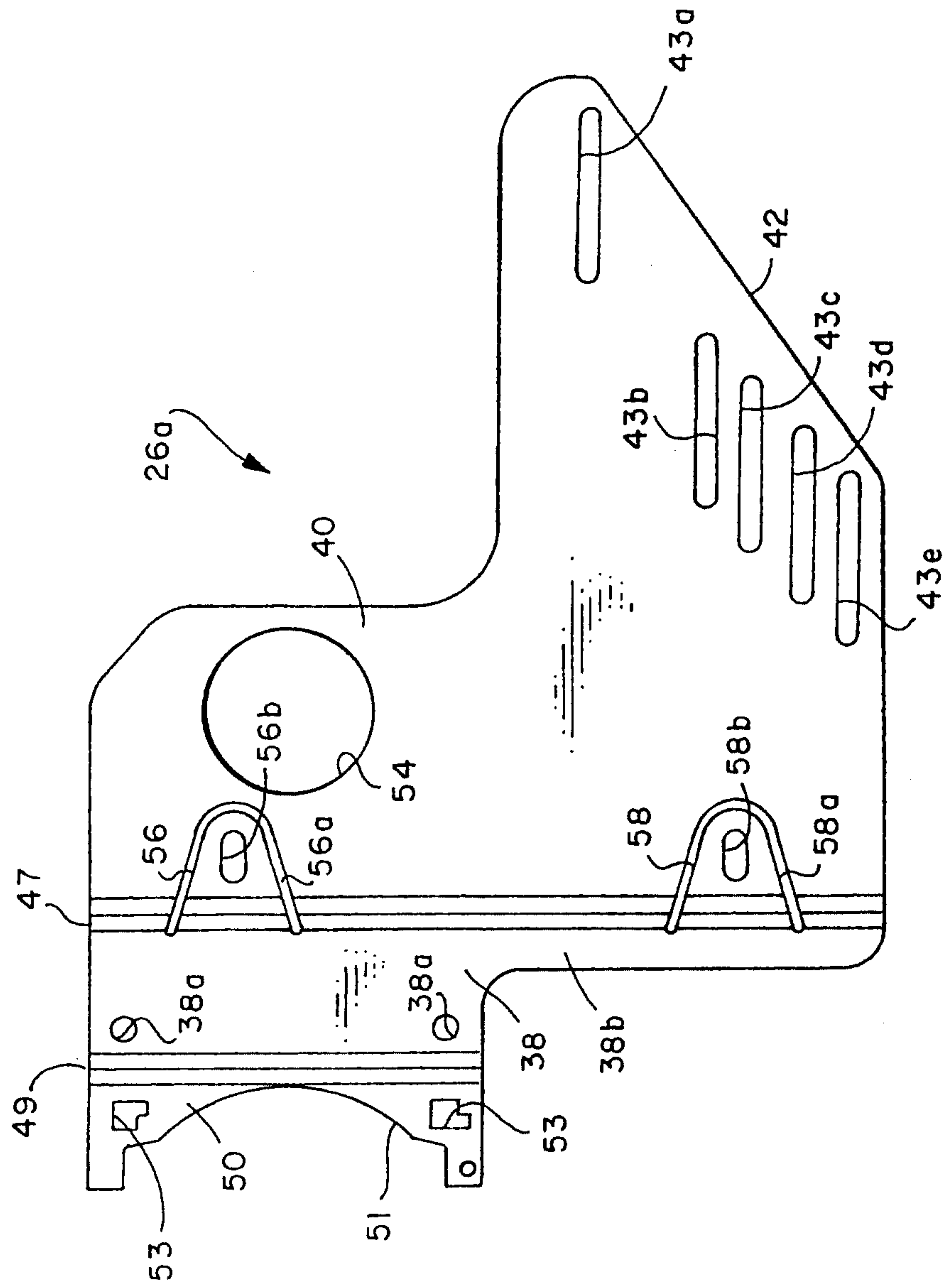


FIG. 3

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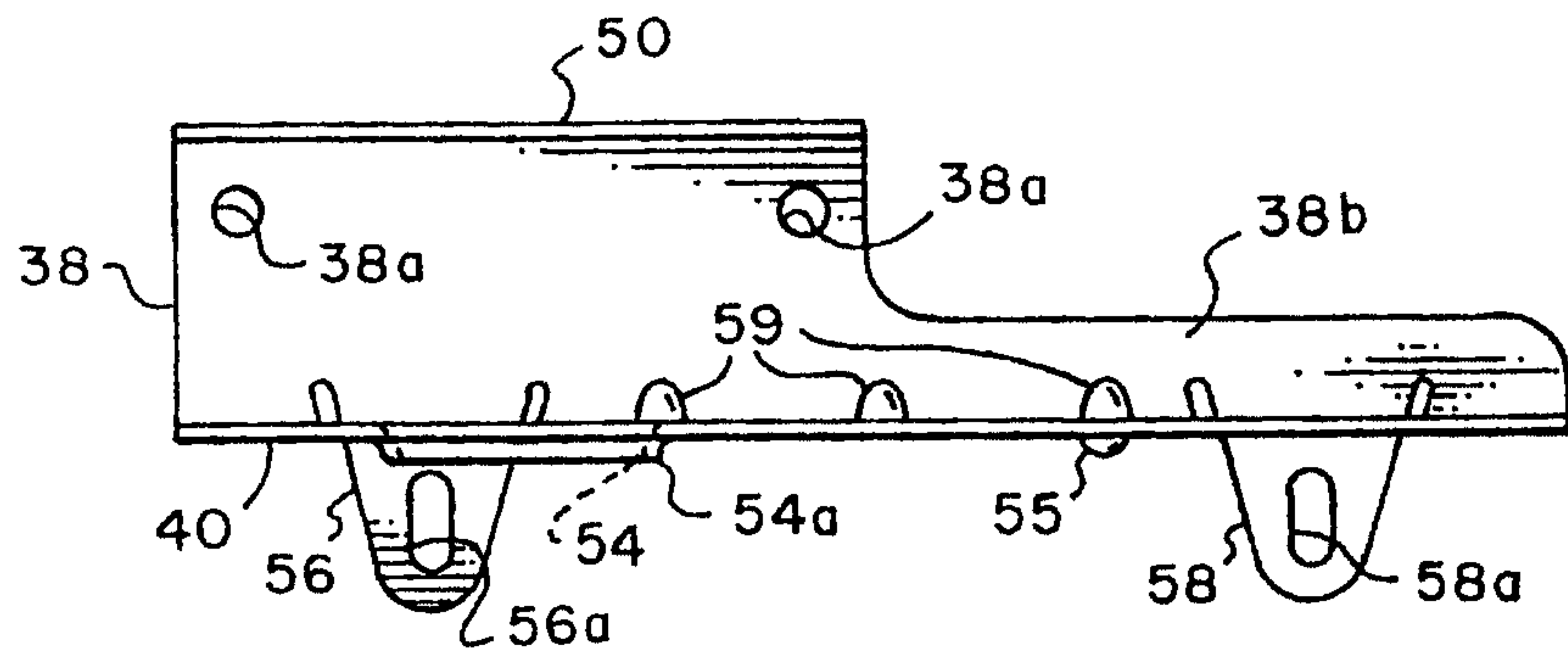


FIG. 4

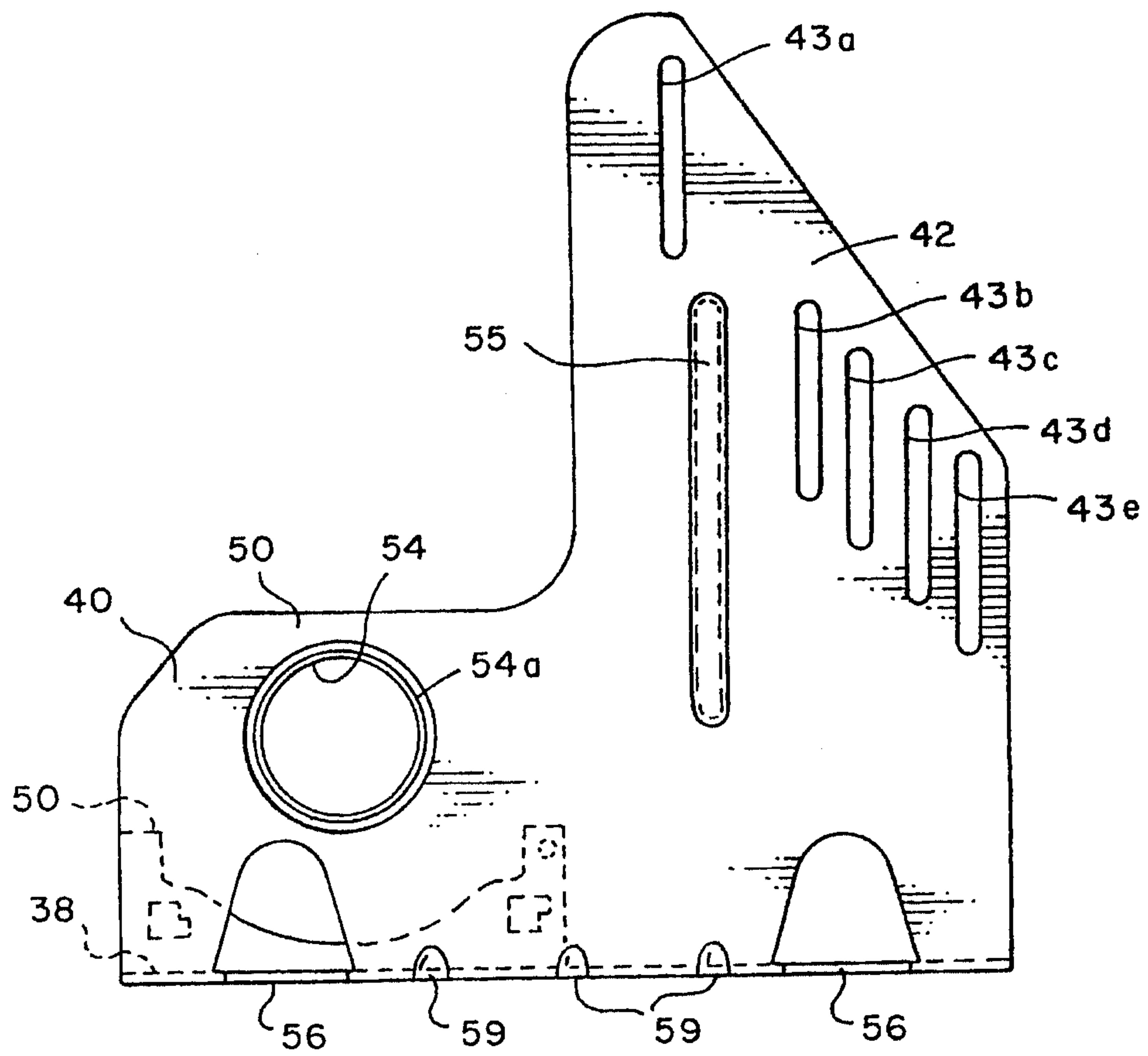
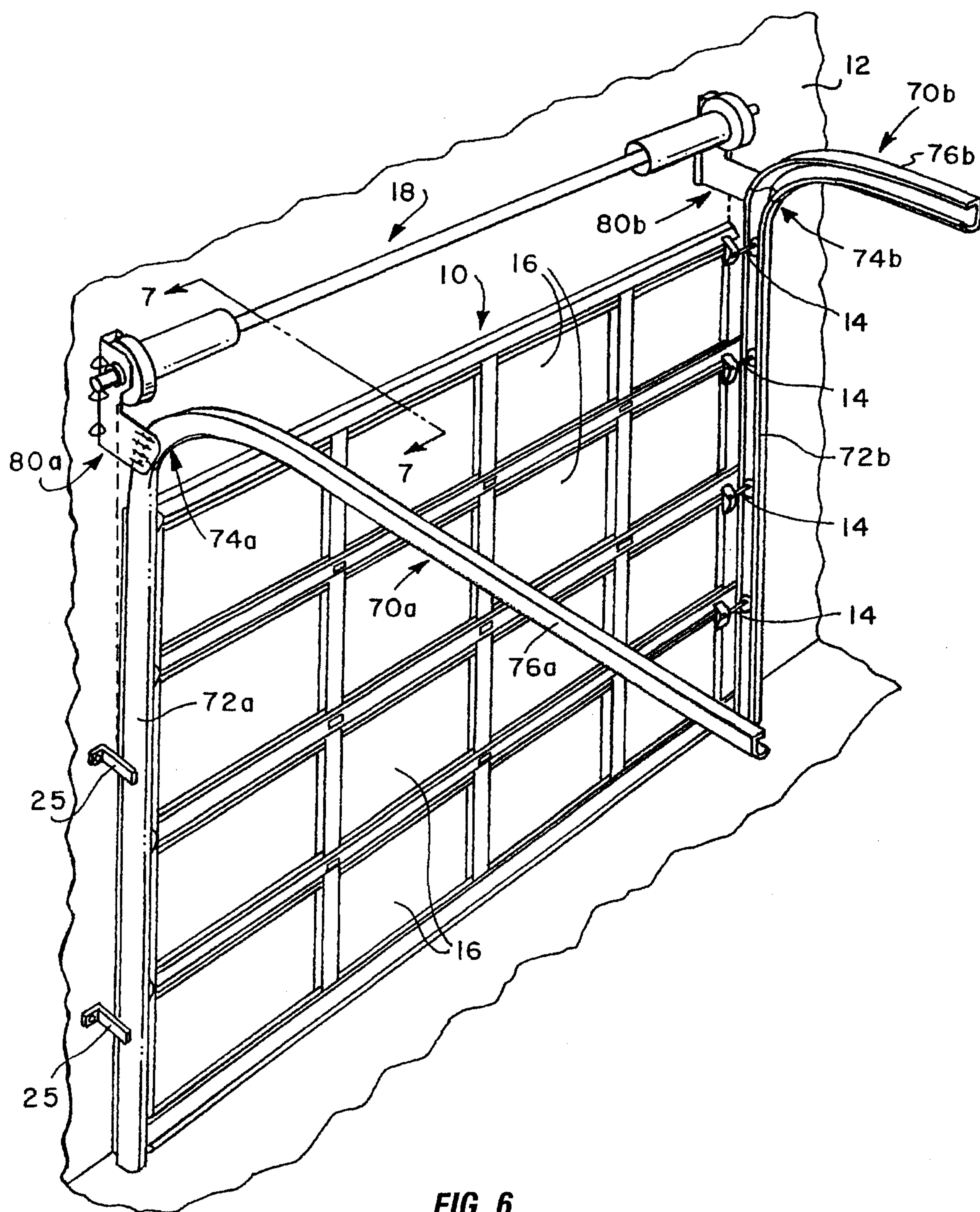


FIG. 5

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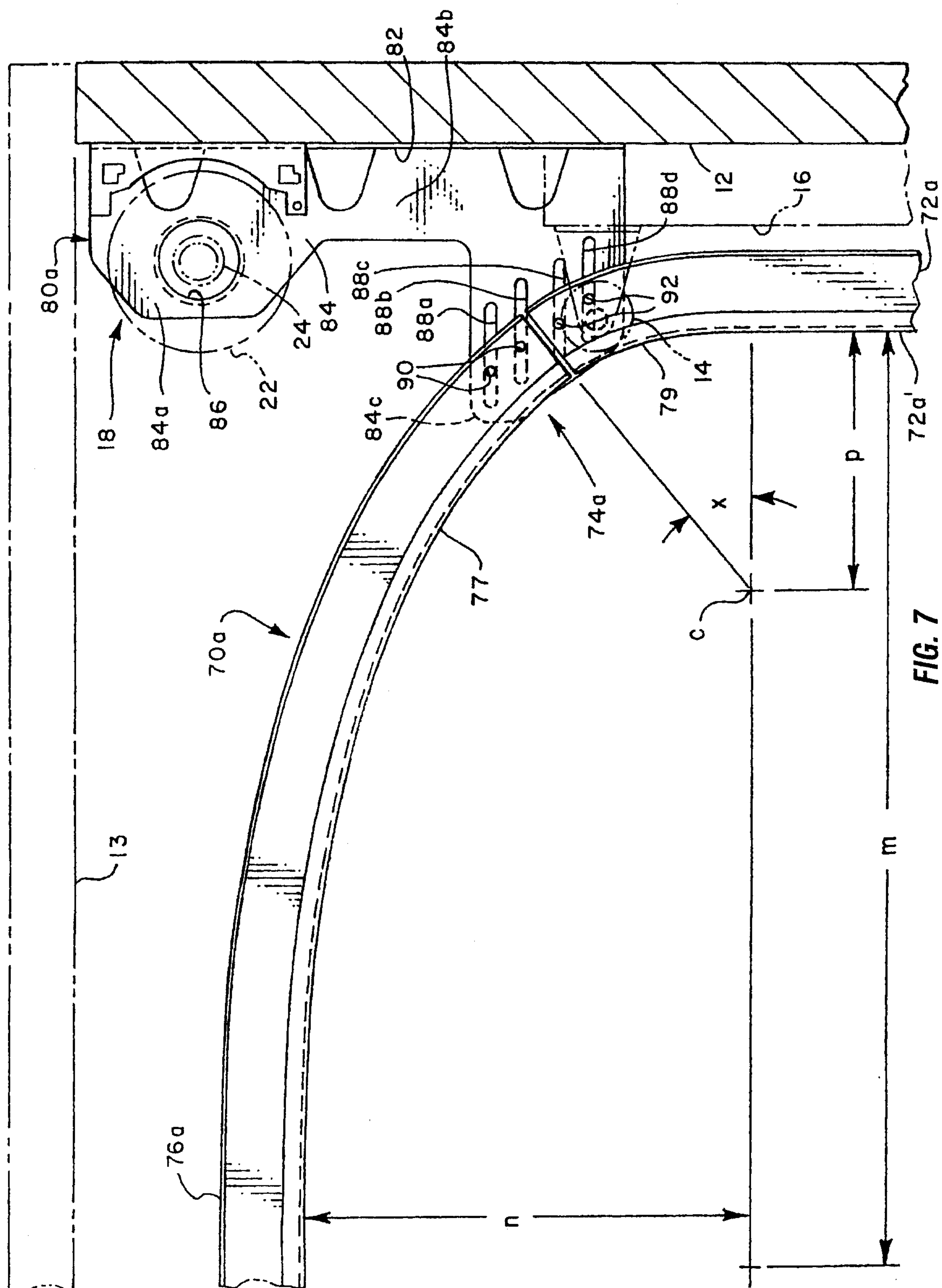


FIG. 7

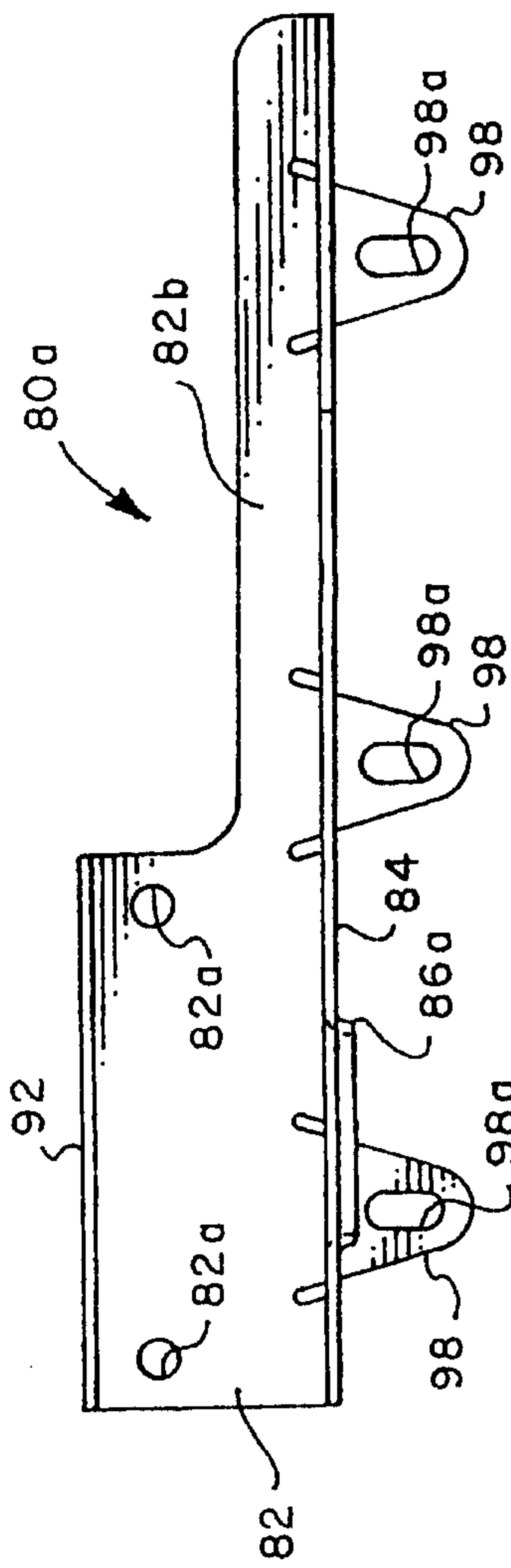


FIG. 8

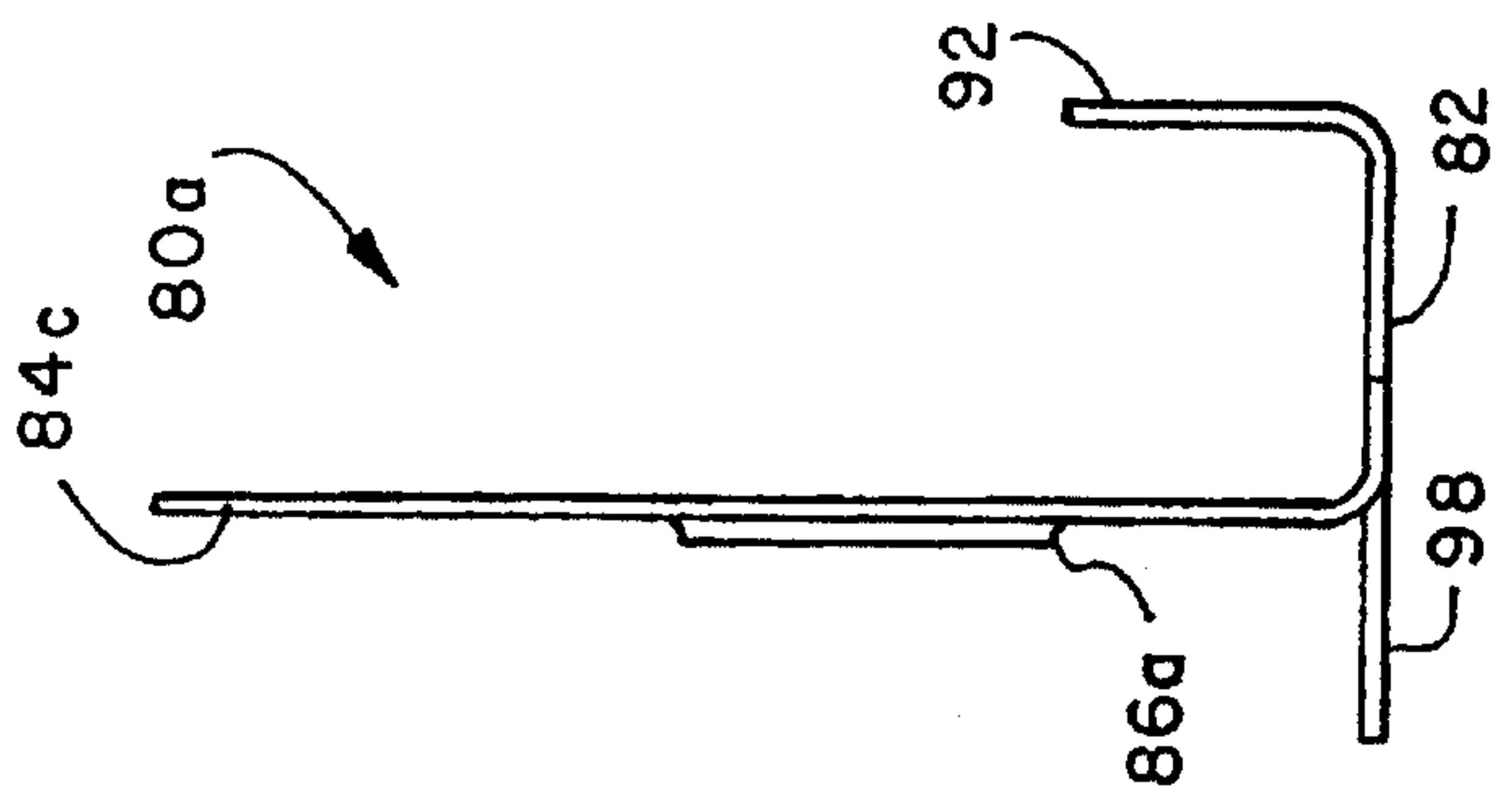


FIG. 10

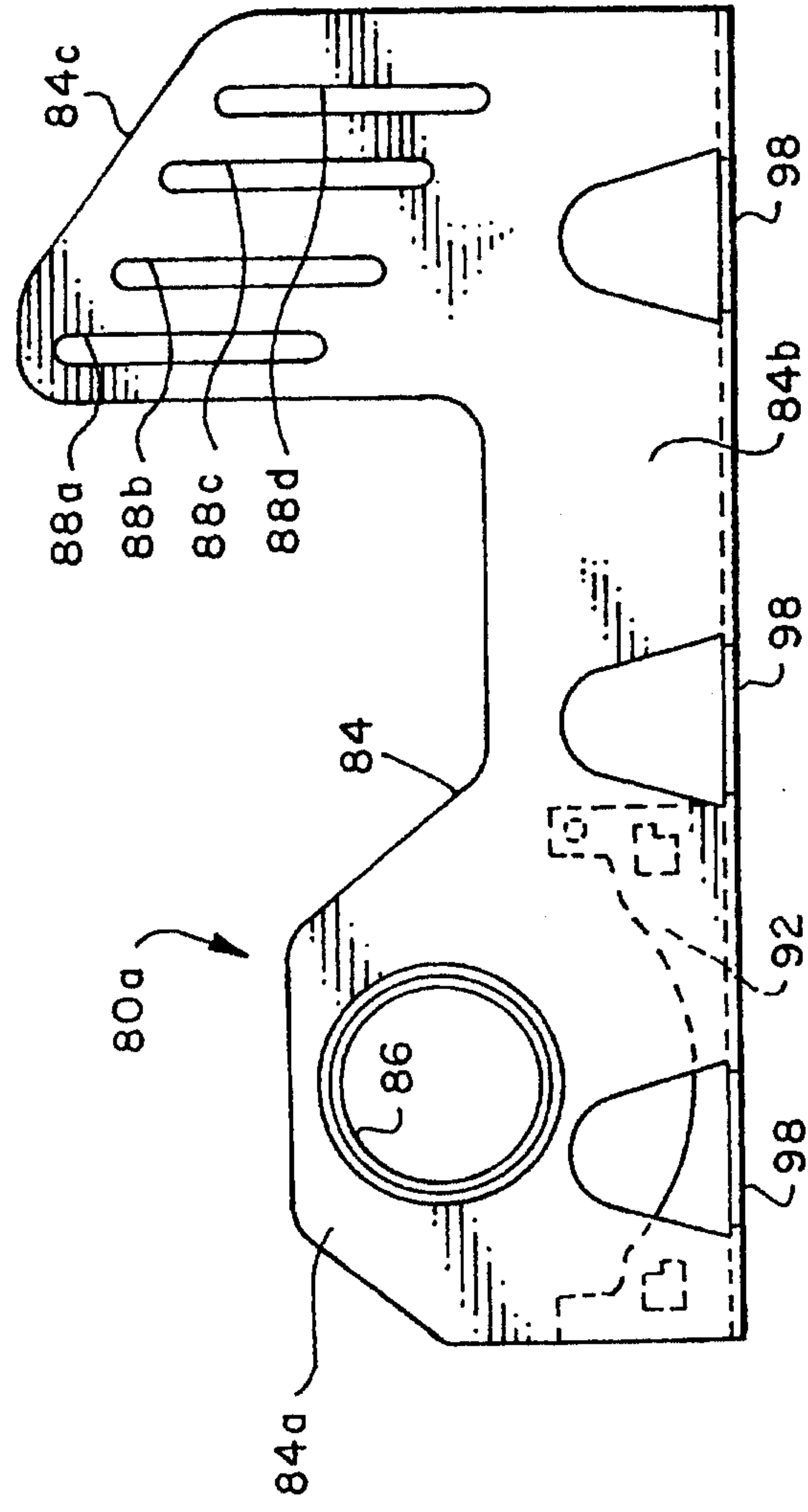


FIG. 9

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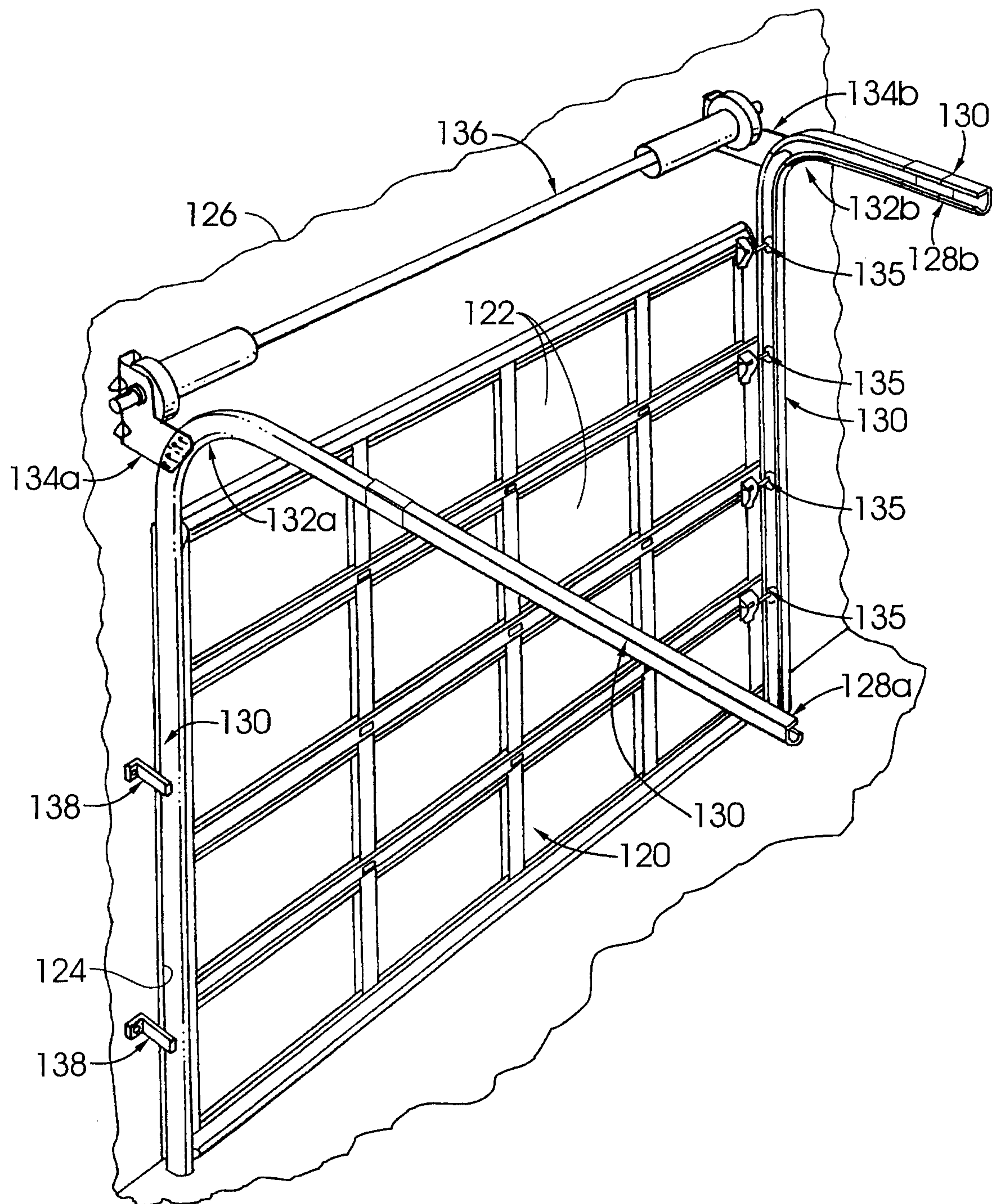


FIG. 11

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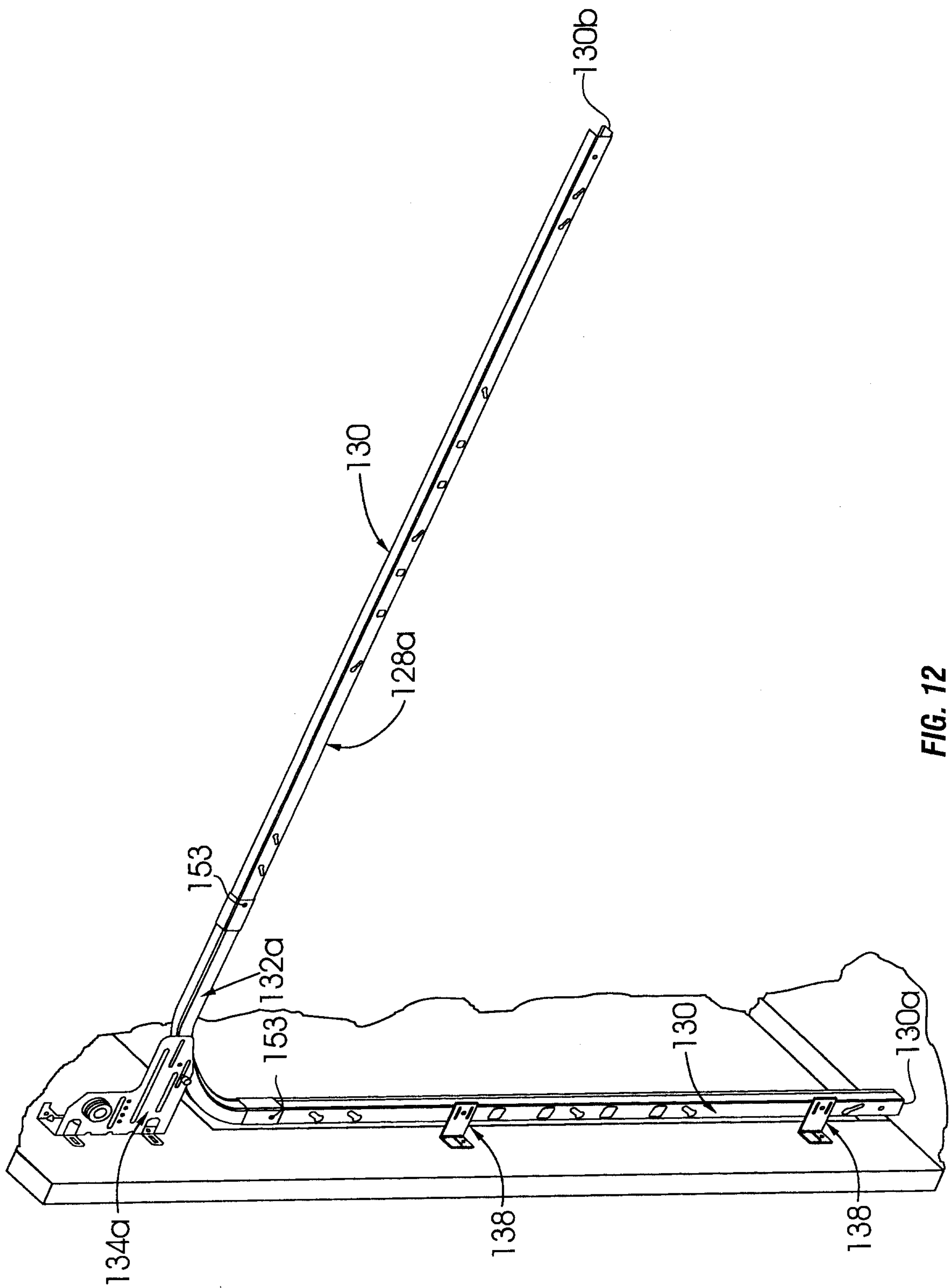
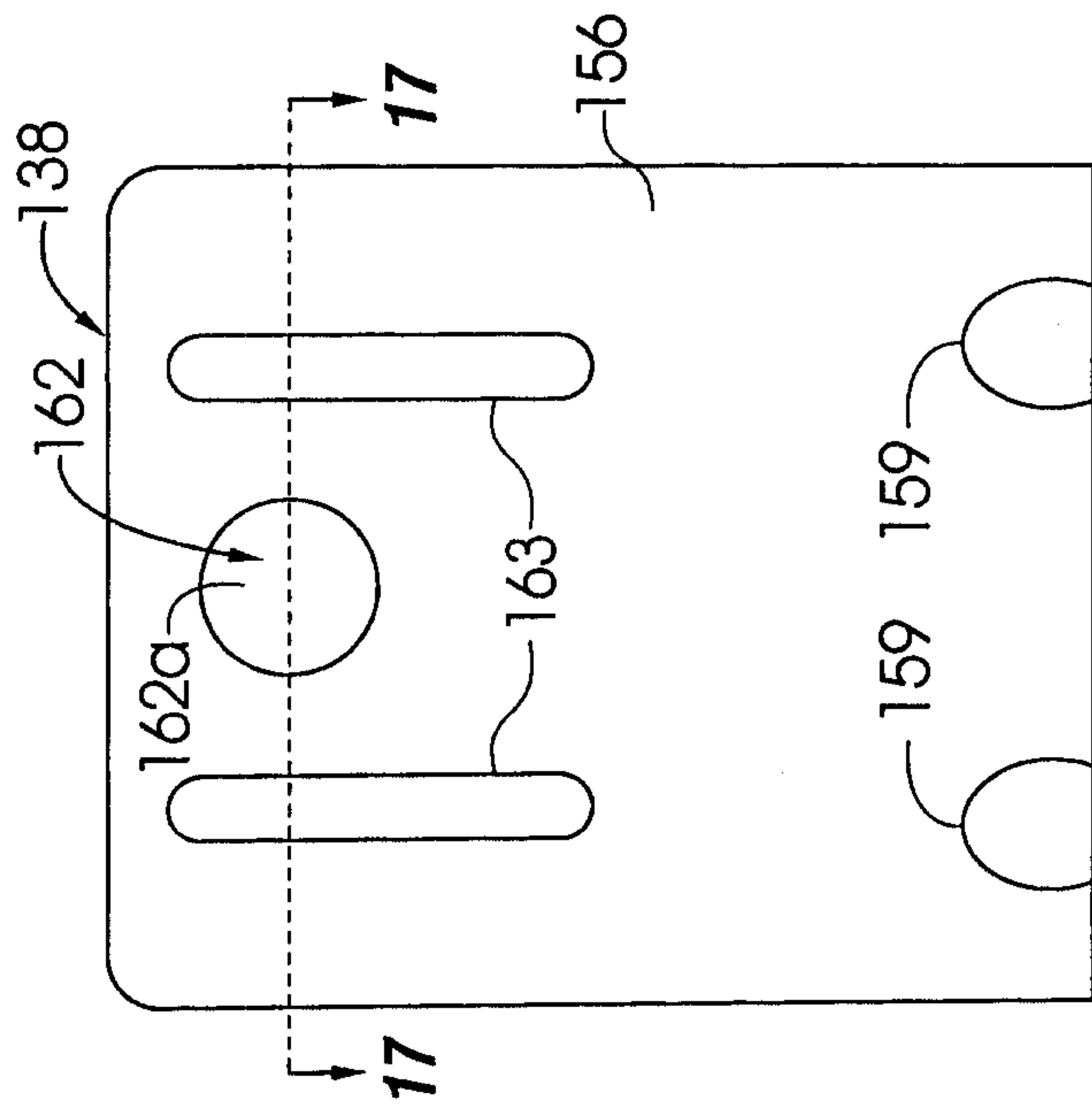
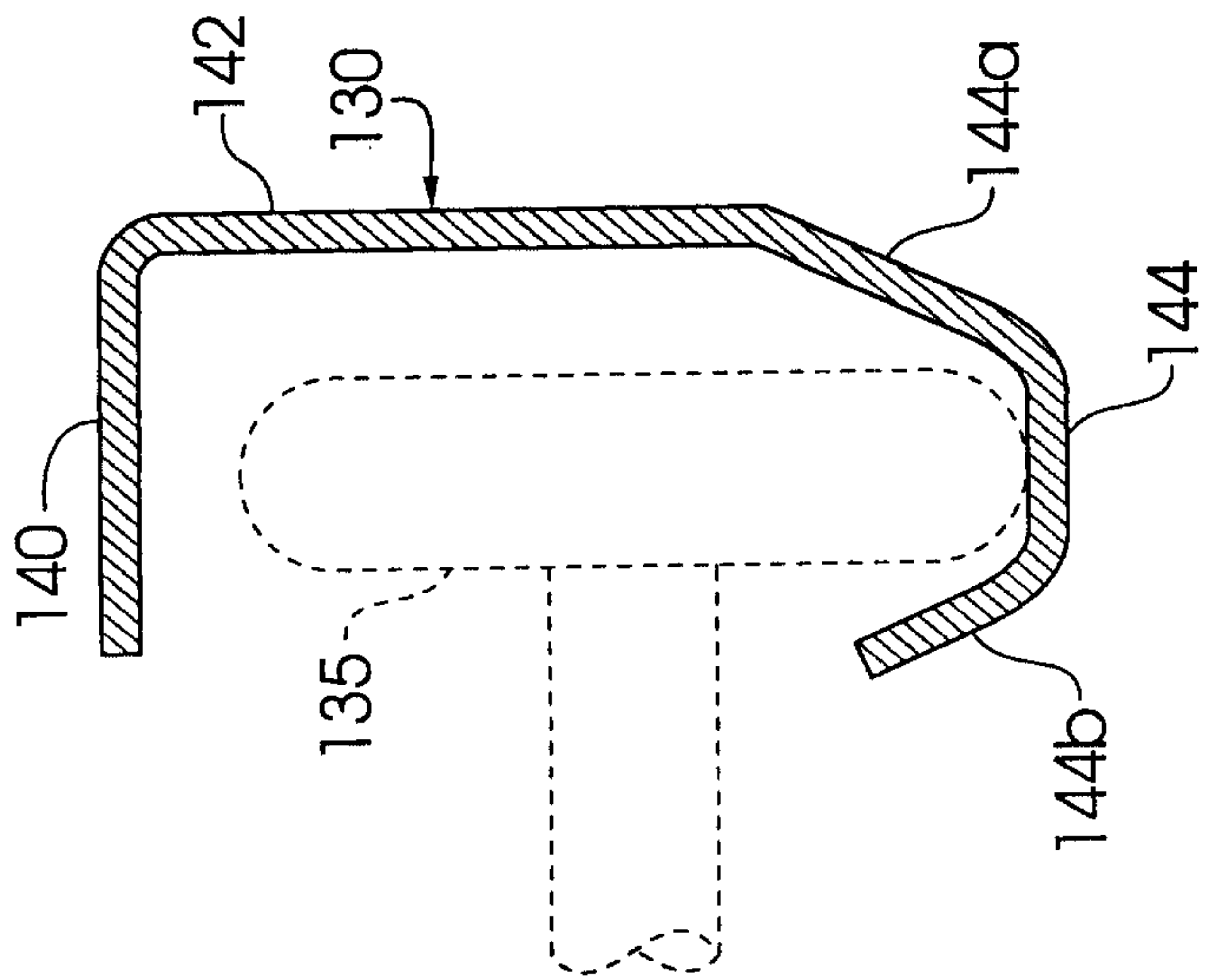
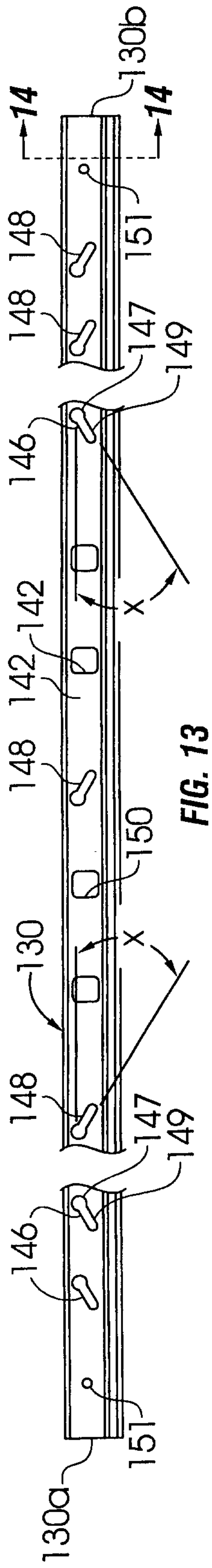
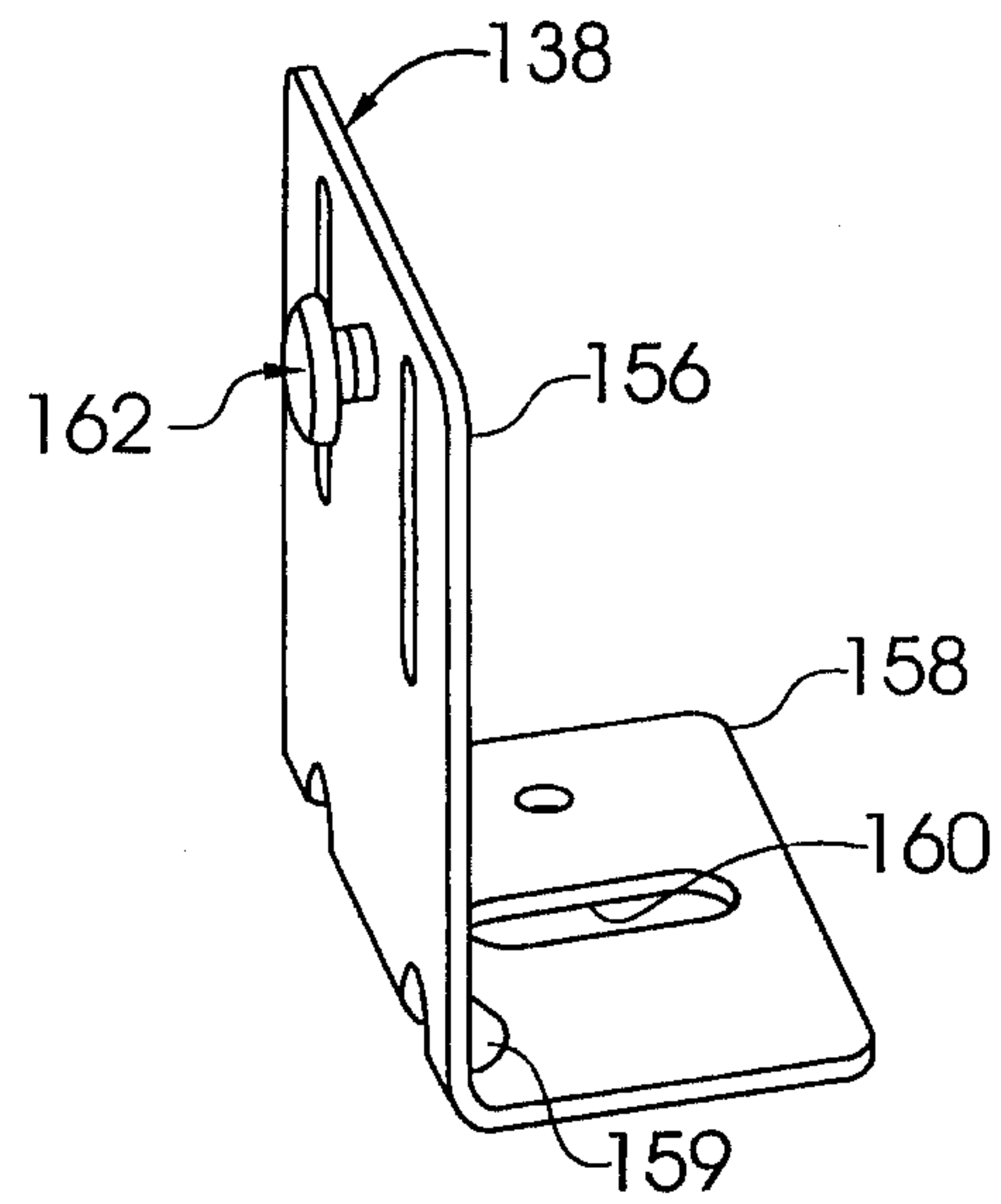
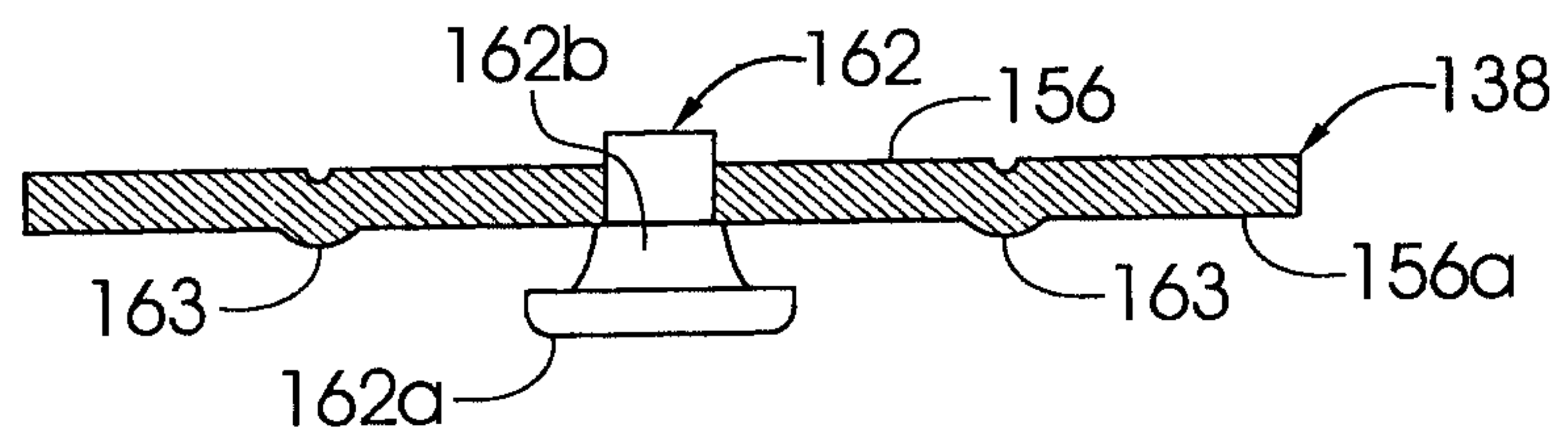


FIG. 12



11/13**FIG. 16****FIG. 17**

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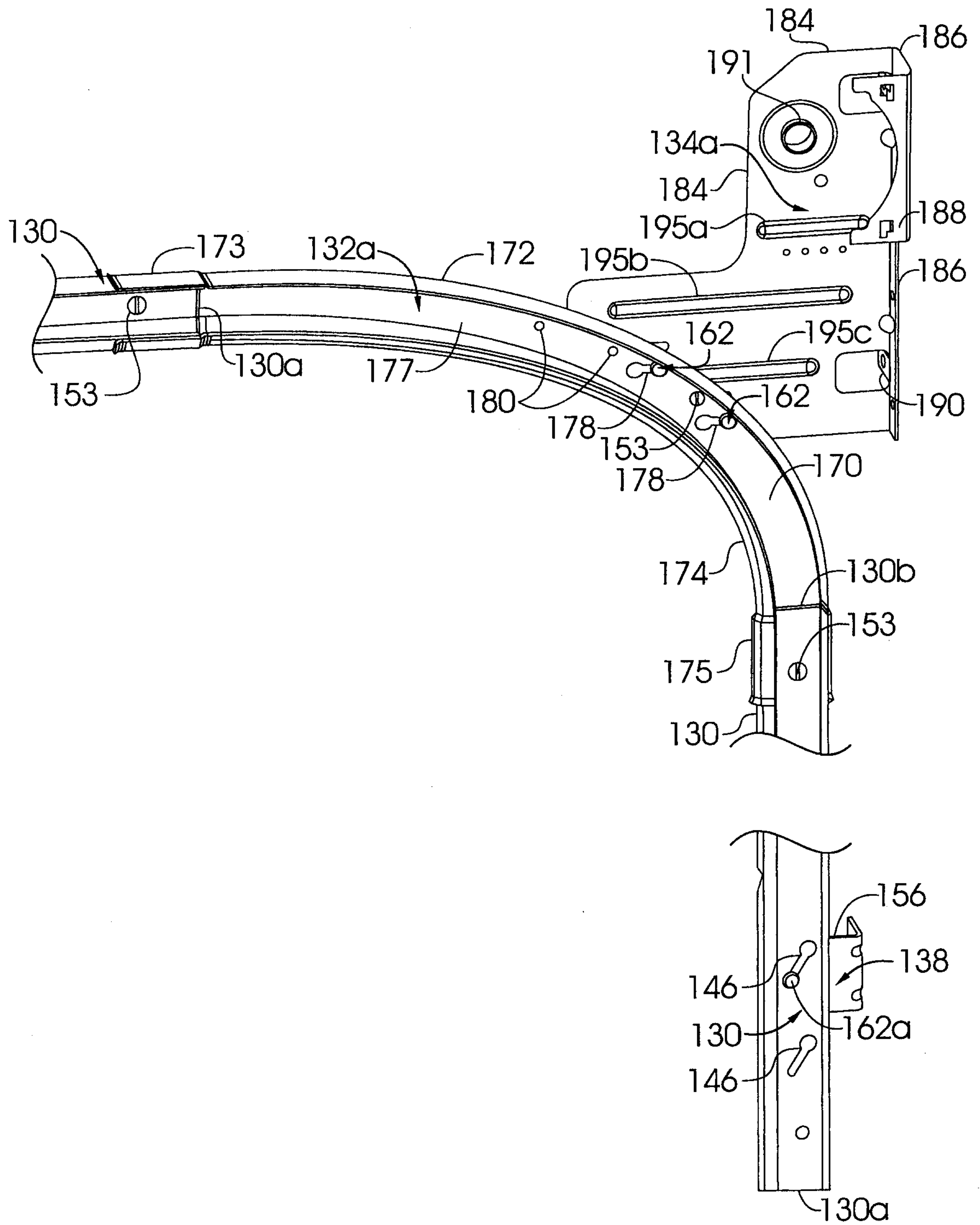


FIG. 18

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