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CA 2590741 A1 2007/12/15

(21) 2 590 741

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(22) Date de dépôt/Filing Date: 2007/06/06

(41) Mise à la disp. pub./Open to Public Insp.: 2007/12/15

(30) Priorité/Priority: 2006/06/15 (ITTO2006A000434)

(51) Cl.Int./Int.Cl. *E05F 11/10* (2006.01),
E06B 3/32 (2006.01)

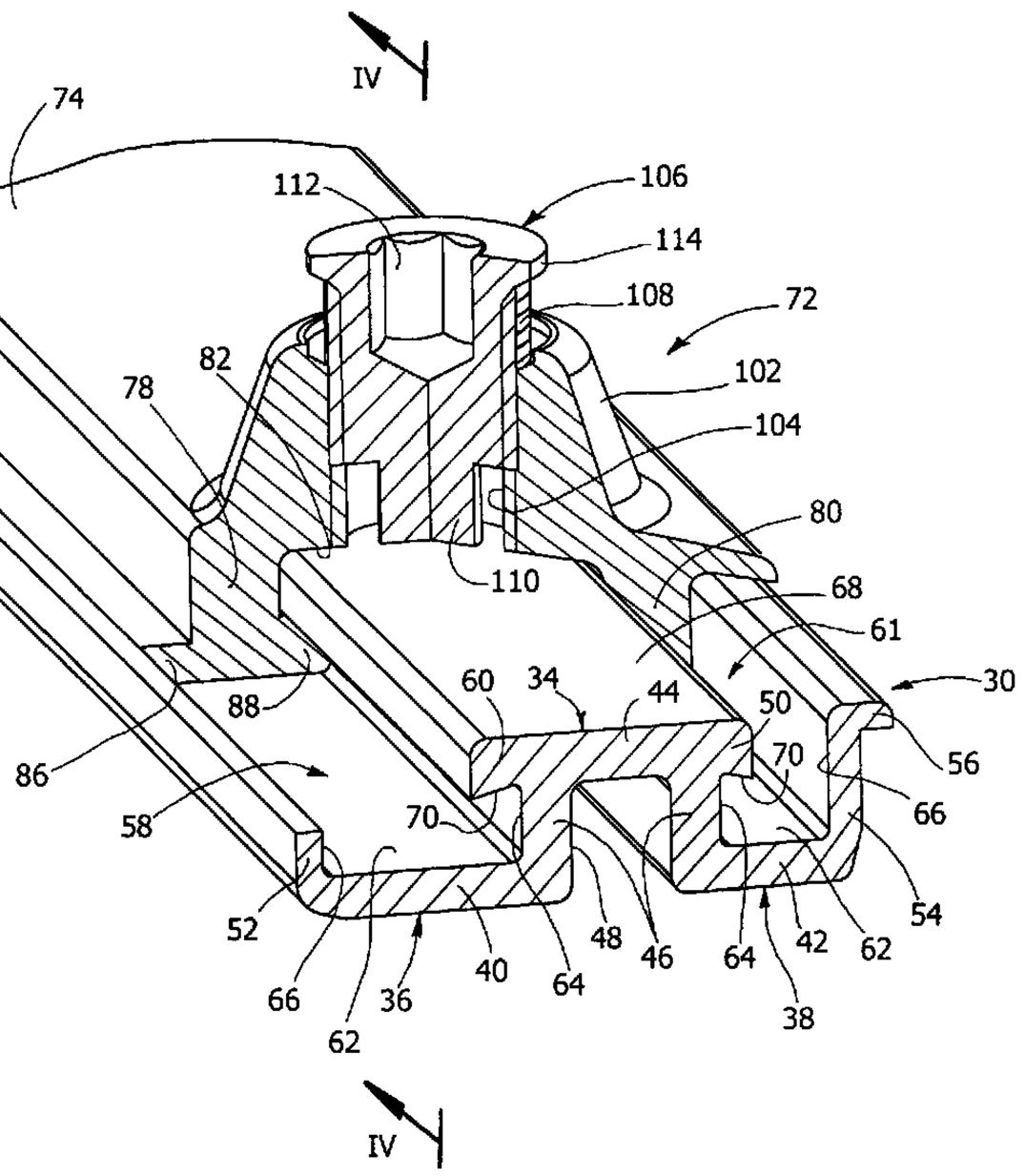
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(74) Agent: MACRAE & CO.

(54) Titre : UNE METHODE DE MONTAGE POUR UN ASSEMBLAGE D'ENTRAINEMENT POUR ENCADREMENTS DE PORTE ET DE FENETRE

(54) Title: A METHOD FOR MOUNTING A DRIVE ASSEMBLY FOR DOOR AND WINDOW FRAMES



(57) Abrégé/Abstract:
Method for mounting a drive assembly (22) on a door or window frame (10), comprising the steps of: mounting at least one actuating member (24, 25, 26, 27, 28) and at least one transmission rod (30, 32) in at least one slot (18, 20) of the frame (10) and mutually fastening said actuating member (24, 25, 26, 27, 28) and said transmission rod (30, 32) by means of a screw (106) that engages a through hole (118) formed in the transmission rod (30, 32). Said through hole (118) is formed in the transmission rod (30, 32) after mounting said actuating member (24, 25, 26, 27, 28) and said transmission rod (30, 32) in said slot (18, 20).

ABSTRACT

Method for mounting a drive assembly (22) on a door or window frame (10), comprising the steps of: mounting at least one actuating member (24, 25, 26, 27, 28) and at least one transmission rod (30, 32) in at least one slot (18, 20) of the frame (10) and mutually fastening said actuating member (24, 25, 26, 27, 28) and said transmission rod (30, 32) by means of a screw (106) that engages a through hole (118) formed in the transmission rod (30, 32). Said through hole (118) is formed in the transmission rod (30, 32) after mounting said actuating member (24, 25, 26, 27, 28) and said transmission rod (30, 32) in said slot (18, 20).

"A method for mounting a drive assembly for door and window frames"

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The present invention relates to accessories for door and window frames and it pertains to a method for mounting a drive assembly for door and window frames.

The method according to the invention can be applied for mounting tilt-and-turn door and window frames or tilt-only or turn-only door and window frames. In the case of tilt-and-turn door and window frames, the drive assembly enables selectively to activate a closed position, a turn opening position and a tilt opening position, under the command of a three-position cremone bolt handle. In the case of turn-only or tilt-only door and window frames, the drive assembly enables to select a closed position and an open position of the door or window frame under the command of a two-position handle.

In the remainder of the description and in the claims, the term "drive assembly" shall mean the set of devices and components that enable to transmit the opening/closing motion from the handle to the various closure elements. The drive assembly for door and window frames comprises at least one actuating member and at least one transmission rod fastened to the drive member.

Door and window frames have variable widths and heights, whilst actuating members are standard components with defined dimensions.

To adapt the actuating members to frames with different dimensions, transmission rods are used which connect various actuating members to each other.

According to the prior art, the lengths of the transmission rods are determined when mounting the drive assembly on the door or window frame. This operation generally requires cutting the transmission rod to measure and drilling holes on the transmission rod for fastening the transmission rod to the actuating members.

Cutting the rods to measure and forming fastening holes on the transmission rods is highly time-consuming. Previously, solutions have been proposed having the purpose of avoiding cutting the transmission rods to measure and forming fastening holes on said rods. Some solutions provide for the use of telescopic rods formed by two mutually sliding parts, able to be fastened in a selected position by means of pressure screws.

However, currently available solutions are not completely satisfactory, as they have several drawbacks

The object of the present invention is to provide an improved method for mounting a drive assembly for door and window frames, which enables to overcome the drawbacks of prior art solutions.

According to the present invention, said object is achieved by a method having the characteristics set out in claim 1.

The present invention shall now be described in detail with reference to the accompanying drawings provided purely by way of non limiting example, in which:

- figure 1 is an exploded perspective view of a drive assembly for door and window frames associated to the frame of a door or window,

- figure 2 is a perspective view of the part designated by the arrow II in figure 1,

- figure 3 is a section according to the line III-III of figure 2,

- figures 4 through 8 are perspective views showing the sequence of the fastening operation between an actuating member and a transmission rod,

- figures 4a and 5a are sections according to the lines IV-IV and V-V of figures 4 and 5,

- figures 4b and 5b are enlarged details of the parts indicated by the arrows IV and V in figures 4a and 5a,

- figures 6a, 7a and 8a are sections according to the lines VIa - VIa, VIIa-VIIa and VIIIa-VIIIa of Figures 6, 7 and 8,

- figures 6b, 7b and 8b are sections according to the lines

VIb-VIb, VIIb-VIIb, VIIIb-VIII of Figures 6, 7 and 8, and

- figures 9 through 27 are perspective views showing the mounting sequence of the various components of the drive assembly on the door or window frame.

With reference to figure 1, the number 10 designates the frame of a tilt-and-turn opening window. The frame 10 comprises two vertical uprights 12 joined together by a lower cross member 14 and by an upper cross member 16. The uprights 12 and the cross members 14, 16 are provided on their outer longitudinal side with slots 18, 20 able to receive the components of a drive assembly that enables to select, by means of a handle, a closed position, a turn opening position and a tilt opening position.

In figure 1, the drive assembly is globally designated by the reference 22 and it comprises a plurality of actuating members 24, 25, 26, 27, 28 and a plurality of transmission rods 30, 32. The actuating members shown in figure 1 are, respectively, a vertical fulcrum 24, a cremone bolt 25, an angled transmission element 26, a cursor 27 and a scissors arm 28. The frame 10 is also provided with a control handle 31 and with a support block 33. The general structure and the operation of the actuating members 24, 25, 26, 27, 28 are known in themselves and they are outside the scope of the present invention.

With reference to Figures 4 and 4a, each transmission rod 30, 32 is constituted by an extruded, drawn or profiled element having constant cross section along its own longitudinal axis.

Each transmission rod 30, 32 comprises a central portion 34 and two lateral portions 36, 38 situated at opposite parts relative to the central portion 34. The two lateral portions 36, 38 have respective mutually co-planar bases 40, 42. The central portion 34 has a base 44 that is parallel and distanced from the bases 40, 42 of the lateral portions 36, 38. The base 44 of the central portion 34 is connected to the respective bases 40, 42 of the lateral portions 36, 38 by means of two longitudinal ribs 46. The base 44 of the central portion 34 and the ribs 46 form a

"U" shaped longitudinal groove 48 that extends along the central portion 34 and that separates the two lateral portions 36, 38. The central portion 34 has two lateral extensions 50 and 60 that extend exteriorly beyond the ribs 46. The two bases 40, 42 of the lateral portions 36, 38 have at their outer ends respective longitudinal ribs 52, 54. The height of the rib 52 of the lateral portion 36 is about half the height of the ribs 46. The rib 54 of the lateral portion 38 ends at the same height as the base 44 of the central portion 34 and it has a laterally projecting edge 56.

The two lateral portions 36, 38 form respective channel-shaped guides 58, 61. Each of the two guides 58, 61 has an upper surface 62 and two lateral surfaces 64, 66. The central portion 34 has an upper surface 68 that is parallel to the upper surfaces 62 of the guides 58, 61. The lateral extensions 50, 60 of the central portion 34 have lower surfaces 70 inclined at an acute angle relative to the lateral surfaces 64 of the ribs 46. The thickness of the bases 40, 42 of the lateral portions 36, 38 of the ribs 46 and of the base 44 of the central portion 34 is substantially constant. The rods 30, 32 are preferably made of metallic material (e.g., aluminium alloy) or plastic material (e.g., polyamide).

With reference to figure 1, each actuating member 24, 25, 26, 27, 28 has a coupling portion 72 for coupling with a transmission rod 30, 32. With reference to figures 2 and 3, the coupling portion 72 of each actuating member 24, 25, 26, 27, 28 comprises a body 74 having a base 76 wherefrom project two parallel longitudinal ribs 78, 80. The ends of the longitudinal ribs 78, 80 are shaped in such a way as to establish a sliding coupling in longitudinal direction with the guides 58, 61 of the transmission rod 30, 32.

With reference again to figures 2 and 3, the base 76 of the coupling portion 72 has a flat lower surface 82 wherefrom extend the ribs 78, 80. The lower ends of the ribs 78, 80 have respective coplanar flat surfaces 84, parallel to the flat

surface 82. When cross sectioned, the longitudinal rib 78 has at its end an outer lateral extension 86 and an inner lateral extension 88. The two lateral extensions 86, 88 have respective lateral parallel walls 90, 92, orthogonal relative to the surfaces 82, 84. The inner lateral extension 88 has an upper surface 94 inclined at an acute angle relative to the lateral wall 92. The longitudinal rib 80 has, in cross section, an inner lateral extension 96 with a lateral wall 98 parallel to the wall 92 and an upper surface 100 inclined at an acute angle relative to the lateral wall 98.

The coupling portion 72 of each actuating member 24, 25, 26, 27, 28 has a protuberance 102 projecting from the outer surface of the base 76. The protuberance 102 has a threaded through hole 104 with an axis orthogonal relative to the inner surface 82 of the base 76. A screw 106 is engaged in the threaded hole 104. The screw 106 has a threaded body 108 and a tip 110 that projects from the threaded body 108. The tip 110 has a cylindrical lateral wall with a smaller diameter than the diameter of the threaded body 108. The tip ends with a flat wall orthogonal to the longitudinal axis of the screw.

The screw 106 has a hexagonal slot 112 and an arresting edge 114 at one end of the threaded body 108. The length of the threaded body 108 is substantially equal to the length of the threaded hole 104, so that when the screw 106 is completely screwed into the hole 104 the tip 110 projects from the lower surface 82 of the base 76.

With reference to Figures 4, 4a and 4b, the coupling portion 72 of each actuating member 24, 25, 26, 27, 28 couples in telescopic fashion with a corresponding portion of a transmission rod 30, 32. At the moment of the telescopic coupling between a transmission member 24, 25, 26, 27, 28 and a transmission rod 30, 32, the screw 106 is only partially screwed into the hole 104 and the frontal end of the tip is recessed in the hole 104 relative to the lower surface 82 of the coupling portion 72. The coupling portion 72 and the transmission rod 30,

32 are therefore free to slide with respect to one another in longitudinal direction. To allow telescopic sliding between the two components, the respective coupling cross-sections are so dimensioned as to leave a constant play along the entire cross-section, e.g. in the order of 0.1 mm, as shown in particular in figures 4a and 4b.

The actuating members 24, 25, 26, 27, 28 and the transmission rods 30, 32 are mounted in the respective slots 18, 20 of the frame 10 according to the procedure described below with reference to figures 9 through 27.

With reference to figure 9, the scissors arm 28 is inserted frontally in the direction of the arrow. Figure 10 shows the scissors arm 28 inserted in the slot 20. After insertion in the slot 20, the scissors arm 28 is positioned and fastened to the frame 10 by means of two dowels (not shown in figure 10).

With reference to figure 11, the rod 32 is then coupled telescopically to the cursor 27 with a sliding motion in the direction of the arrow. After the telescopic coupling, the rod 32 and the cursor 27 are inserted frontally into the slot 20 in the direction indicated by the arrow in figure 12.

With reference to figure 13, after insertion into the slot 20 the rod 32 and the cursor 27 are made to slide in the direction of the arrow. The rod 32 is coupled telescopically with the coupling portion 72 of the scissors arm 28. Figure 14 shows the configuration in which the rod is coupled with the coupling portion 72 of the scissors arm 28.

Figures 15 and 16 show the mounting on the frame 10 of the angled transmission element 26. The transmission element 26 is first inserted into the slot 18 in the direction indicated by the horizontal arrow. After insertion into the slot 18, the element 26 is made to slide in the direction of the vertical arrow until obtaining the engagement of the transmission element with the cursor 27. After the positioning, the angled transmission element 26 is fastened to the frame 10 by means of a dowel 120.

At this point, the components are mounted on the vertical upright 12 of the frame. With reference to figure 17, the cremone bolt coupling 25 is inserted on the transmission rod 30 in the direction indicated by the arrow. As shown in figure 18, the cremone bolt 25 is positioned in proximity to a cut 122 provided on an edge of the frame 10.

With reference to figure 19, the vertical fulcrum 24 is then mounted on the lower end of the rod 30. The rod 30 is coupled telescopically with the vertical fulcrum 24 and it is made to slide all the way (figure 20). Hence, the set formed by the rod 30, by the vertical fulcrum 24 and by the cremone bolt 25 is inserted frontally into the slot 18 in the direction indicated by the arrow in figure 20.

With reference to figure 21, after insertion into the slot 18, the rod 30 and the vertical fulcrum 24 are made to slide in the direction of the arrow. The rod 30 is coupled telescopically with the coupling portion 72 of the angled transmission element 26. Figure 22 shows the rod 30 coupled with the angled transmission element 26.

The frontal insertion of the actuating members 24, 25, 26, 27, 28 and of the transmission rods 30, 32 into the slots 18, 20 is preferably effected as described in European patent application no. 06425586 by the same applicant.

Figure 23 shows the mounting of the support block 33, which is inserted into the slot of the lower cross member 14 in the directions indicated by the two arrows. The subsequent step is to make the vertical fulcrum 24 slide along the direction of the arrow in figure 24 until the vertical fulcrum 24 abuts against a reference 124 of the support block 33.

Lastly, the cremone bolt handle 31 is mounted. As shown in figure 25, the handle 31 has a control element 126 that is inserted through the cut 122 of the frame 10 and engages the cremone bolt coupling 25. With reference to figure 26, the handle 31 is then fastened to the frame 10 by means of two screws 128.

With reference to figure 27, after positioning the various components of the drive assembly as described previously, the transmission rods 30, 32 are definitively fastened to the actuating members 24, 25, 26, 27, 28. The fastening of the rods is performed by completely screwing the screws 106 of the coupling portions 72, in such a way as to obtain the formation of a through hole in the rods 30, 32 in the manner described below.

With reference to figures 5, 5a and 5b, in the initial position the tip 110 of the screw 106 is slightly distanced from the upper surface 68 of the transmission rod 30, 32 and there is a play between the inclined surfaces 94, 100 of the coupling portion 72 and the corresponding surfaces 70 of the transmission rod 30, 32. In this configuration, the rods 30, 32 are free to slide telescopically relative to the actuating members 24, 25, 26, 27, 28.

Beginning from the position shown in Figures 5, 5a and 5b, starting to tighten the screw 106 the tip 110 comes in contact with the upper surface 68 of the transmission rod 30, 32. This contact allows to eliminate the play of the telescopic coupling, bringing the inclined surfaces 94, 100 of the coupling portion 72 in contact with the corresponding surfaces 70 of the transmission rod 30, 32.

With reference to Figures 6, 6a and 6b, continuing to tighten the screw 106 the tip 110 starts to penetrate into the base 44 of the transmission rod 30, 32 shearing the material constituting the base 42. Said shearing forms a disc-shaped scrap 116 that projects in the channel 48 situated below the tip 110. The diameter of the tip 110 is slightly greater than the width of the groove 48, so that the scrap remains wedged in the groove 48. The tip 110 is situated with its own axis aligned to the median vertical axis of the groove 48. The shearing performed by the tip 110 of the screw 106 affects only the thickness of the base 44 between the two lateral walls of the longitudinal groove 48.

With reference to figures 7, 7a and 7b, the screw 106 is screwed until the head 114 of the screw 106 abuts against the respective seat formed at the upper end of the protuberance 102. The length of the tip 110 is determined in such a way that the screw 106 performs a complete shearing of the base 44, hence forming a through hole 118 in the base 44. The scrap 116 detaches from the base 44 and is held by interference between the walls of the groove 48.

With reference to figures 8, 8a and 8b, after the complete shearing of the wall of the base 44, the contact pressure between the inclined surfaces 94, 100 and 70 is eliminated. This allows to restore the initial play, eliminating the stresses and elastic deformations of the transmission rod 30, 32.

After the shearing of the scrap 116, the connection between the coupling portion 72 and the transmission rod 30, 32 no longer takes place by friction but rather by pivot-hole coupling between the tip 110 of the screw 106 and the hole 118 created by the shearing of the base 44. This provides a more secure fastening than in a friction coupling and eliminates deformations of the transmission rod that could produce interference with the walls of the groove 18 of the frame 10 creating difficulties in the sliding of the rods or the actuating members and difficulties in operating the control assembly.

The fact of forming the holes in the rods 30, 32 after mounting the rods and actuating members into the slots avoids the steps of measuring, cutting and drilling the rods. The present invention provides a better mounting precision and avoids problems due to errors or inaccuracies that can occur during the operations of measuring, cutting and drilling the rods.

CLAIMS

1. Method for mounting a drive assembly (22) on a door or window frame (10), comprising the steps of: mounting at least one actuating member (24, 25, 26, 27, 28) and at least one transmission rod (30, 32) in at least one slot (18, 20) of the frame (10) and mutually fastening said actuating member (24, 25, 26, 27, 28) and said transmission rod (30, 32) by means of a screw (106) that engages a through hole (118) formed in the transmission rod (30, 32),

characterised in that said through hole (118) is formed in the transmission rod (30, 32) after mounting said actuating member (24, 25, 26, 27, 28) and said transmission rod (30, 32) in said slot (18, 20).

2. Method as claimed in claim 1, characterised in that said through hole (118) is formed after setting the relative position between said actuating member (24, 25, 26, 27, 28) and said transmission rod (30, 32) in the direction of the respective slot (18, 20).

3. Method as claimed in claim 1 or claim 2, characterised in that said actuating member (24, 25, 26, 27, 28) and said transmission rod (30, 32) are mutually coupled in telescopic fashion in the direction of the respective slot (18, 20).

4. Method as claimed in any of claims 1 through 3, characterised in that said transmission rod (30, 32) is provided with longitudinal channel guides (58, 61) that are slidably engaged by longitudinal ribs (78, 80) of said actuating member (24, 25, 26, 27, 28).

5. Method as claimed in any of claims 1 through 4, characterised in that said hole (118) is formed by a tip (110) of said screw (106) as a result of a screwing of the screw (106) in a threaded hole (104) provided in a coupling portion of said transmission member (24, 25, 26, 27, 28).

6. Method as claimed in claim 5, characterised in that said tip (110) produces a scrap (116) that is retained between two lateral walls of a longitudinal channel (48) of said

transmission rod (30, 32).

7. Method as claimed in claim 5, characterised in that the tip (110) of said screw (106) penetrates into a wall (44) of said transmission rod (30, 32) for a depth that is equal to or greater than the thickness of said wall (44).

8. Method as claimed in claim 6, characterised in that the diameter of said tip (110) is equal to or greater than the width of said longitudinal groove (48).

9. Method as claimed in claim 5, characterised in that the screw (106) is screwed until reaching a contact between an arresting edge (114) of the screw (106) with a corresponding seat of said coupling portion (72).

10. Method as claimed in claim 5, characterised in that the threaded hole (104) of said coupling portion (72) is formed in a protuberance (102) projecting from an outer surface of said coupling portion (72).

FIG. 1

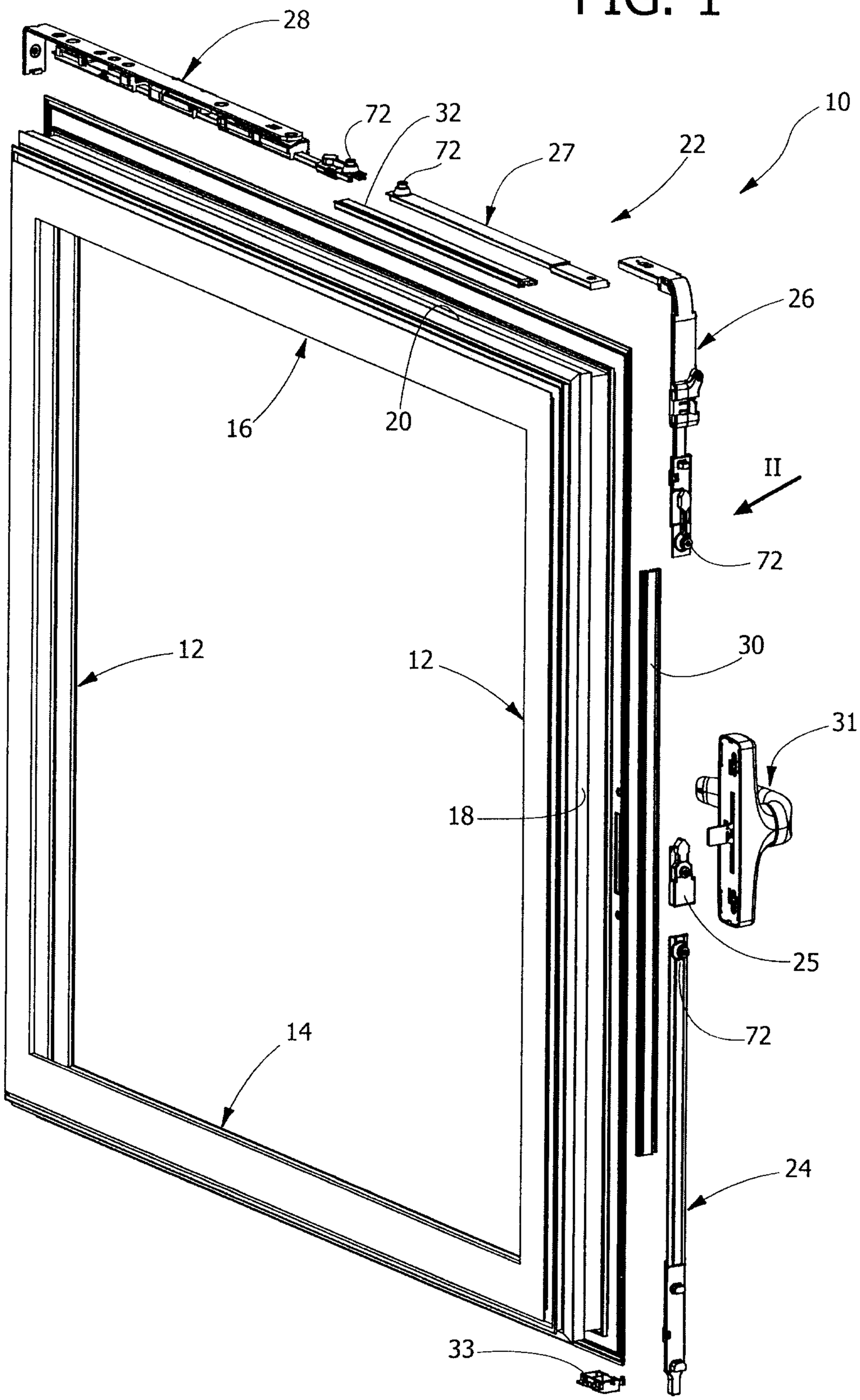


FIG. 2

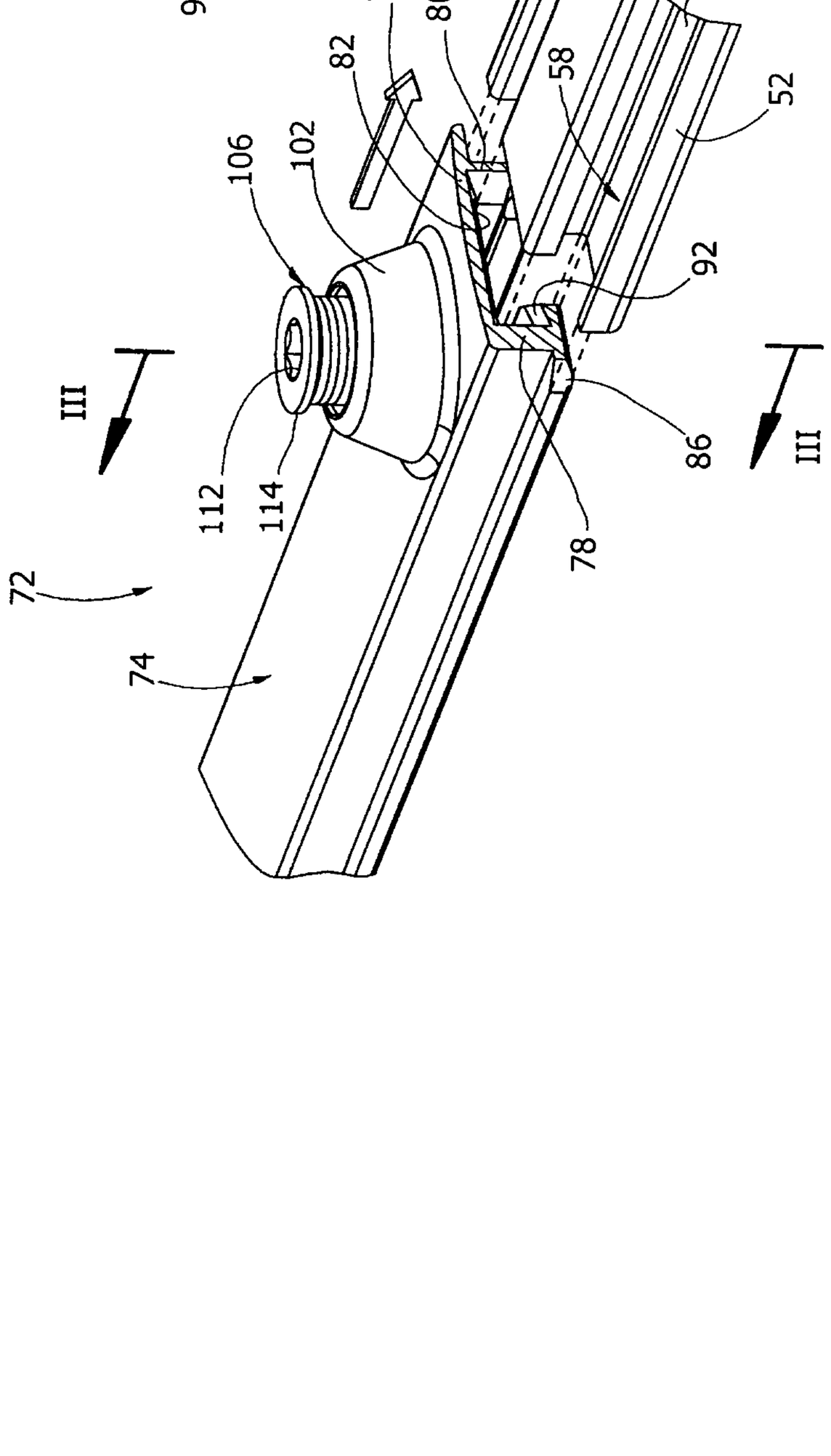

72
74
III
III
112
114
106
102
82
58
52
92
86
78
30
34
61
68
62
76
80
84
98
96
100
88
94
104
90

FIG. 3

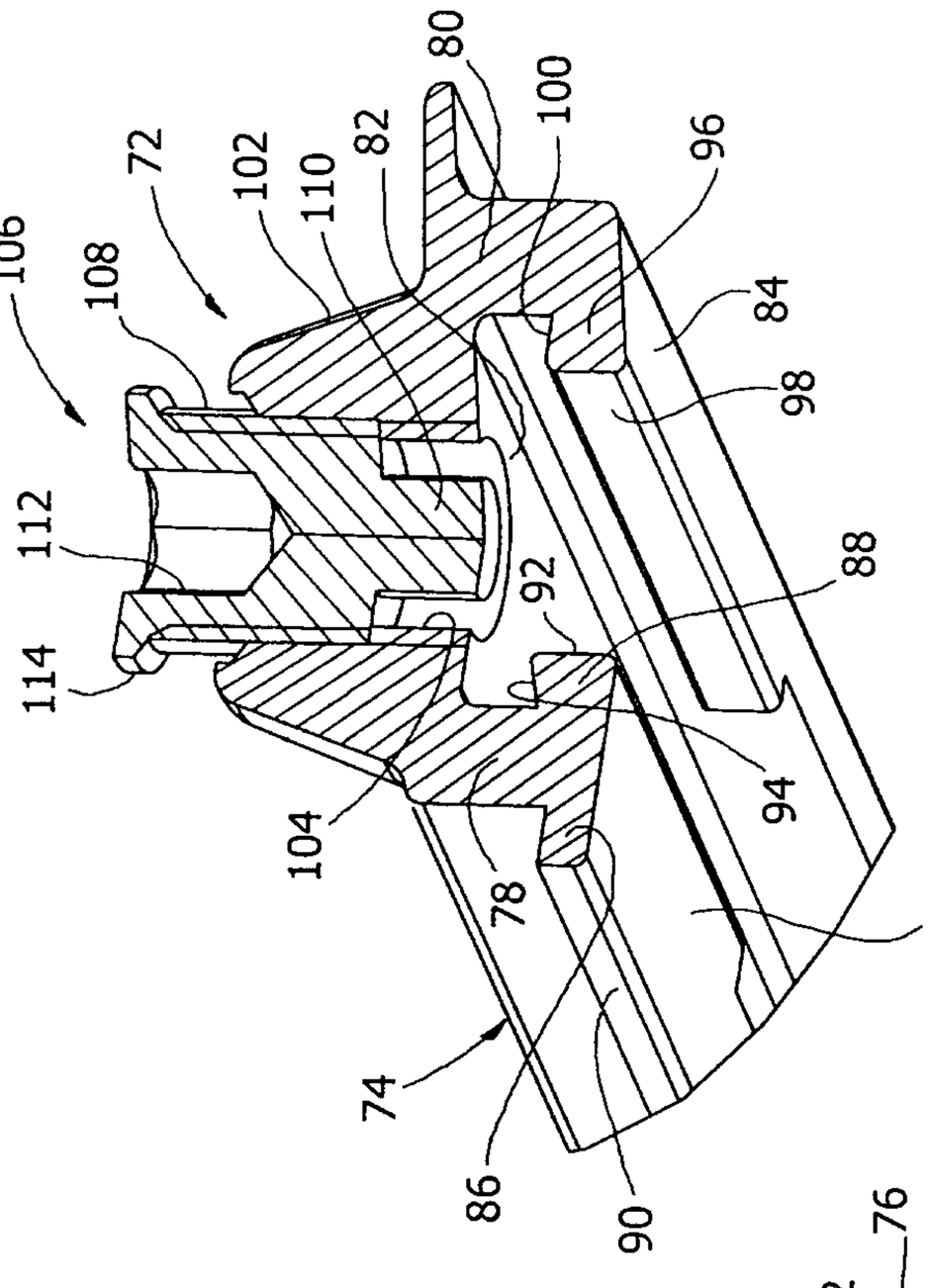

106
108
72
102
110
82
80
100
96
84
98
112
114
92
88
104
94
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90
84

FIG. 4

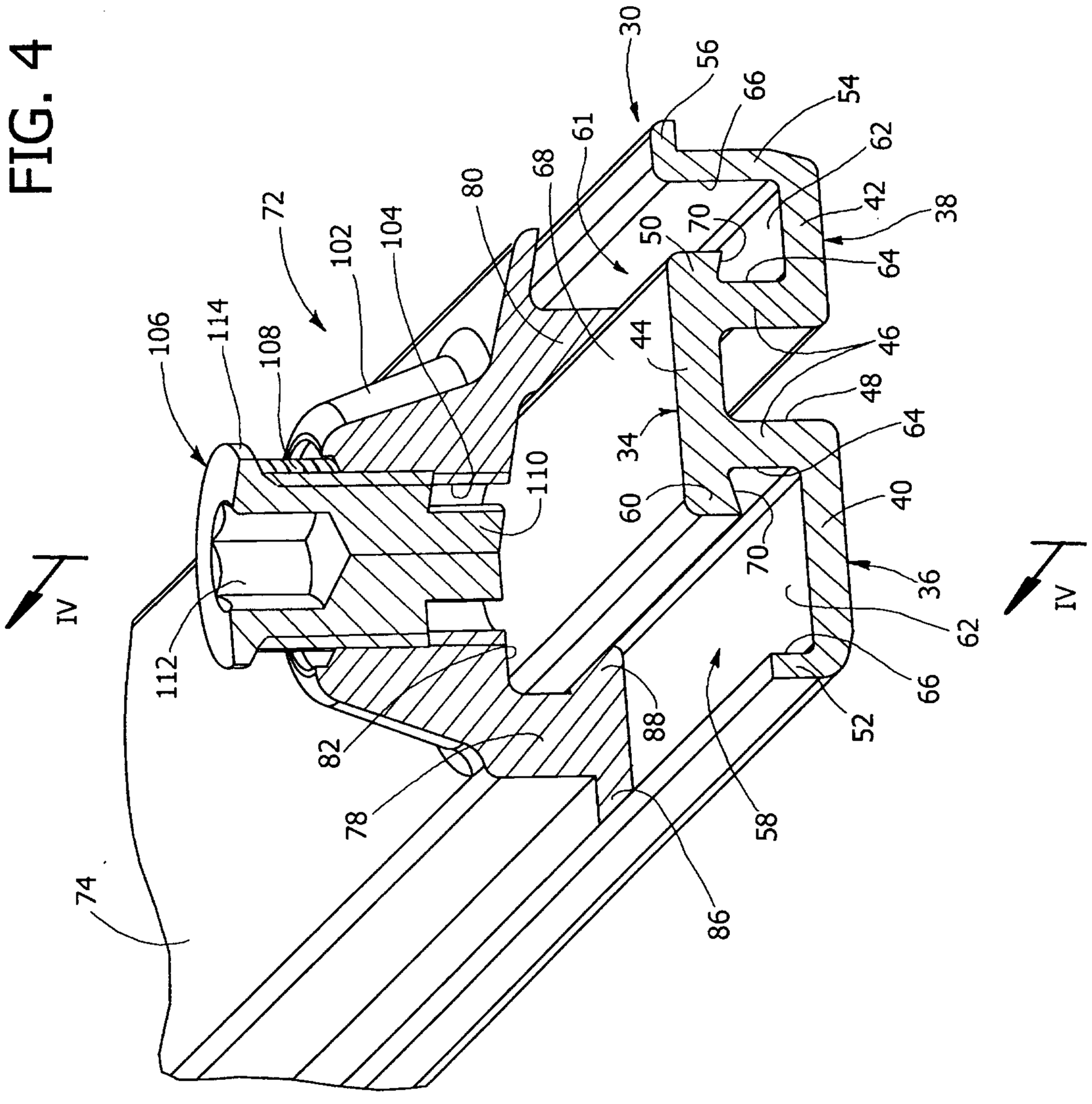

30
56
66
54
62
42
38
64
61
68
80
72
102
104
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70
106
114
108
44
46
48
34
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110
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40
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112
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58
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74
IV
IV

FIG. 4b

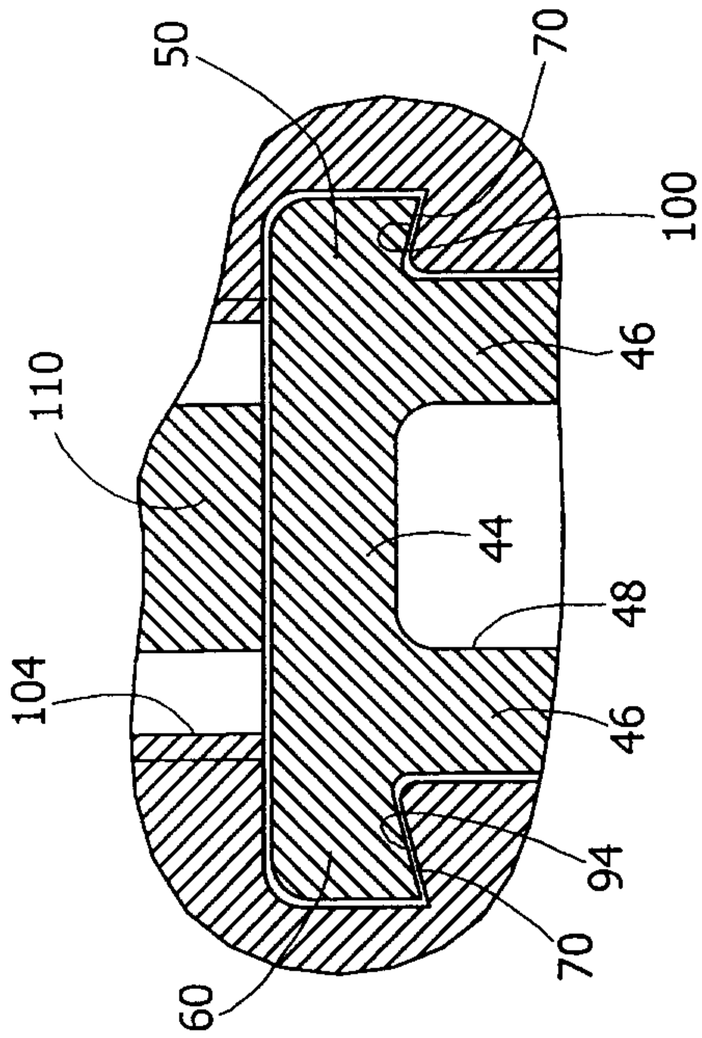

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70
100
46
110
44
48
104
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94
70
60

FIG. 4a

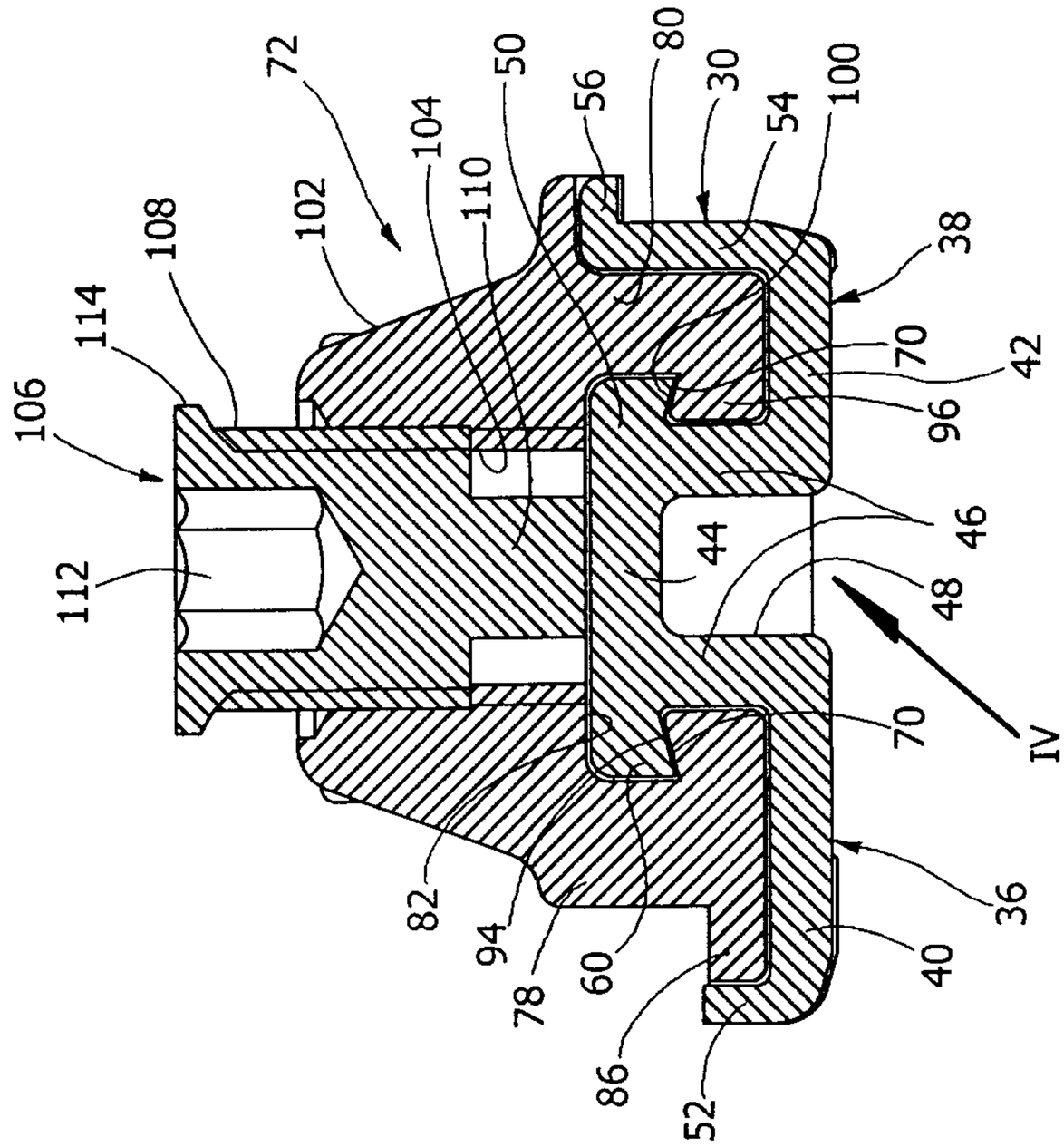

72
104
50
56
30
54
100
102
110
108
38
114
70
42
106
96
112
44
46
48
IV
70
82
94
78
60
36
40
86
52

FIG. 5

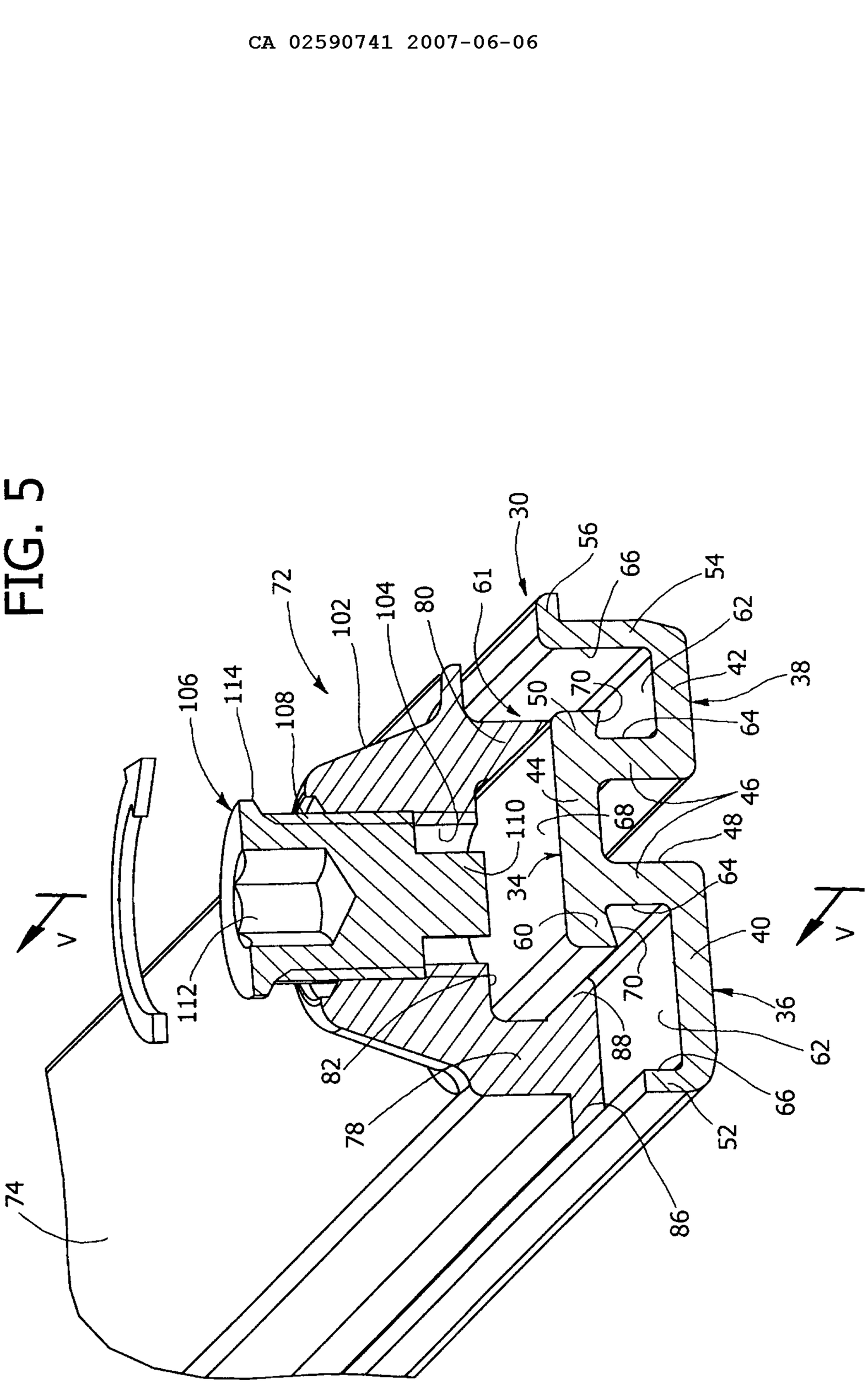

V
V
74
78
82
112
106
114
108
102
104
80
61
72
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38
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70
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68
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34
60
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FIG. 5b

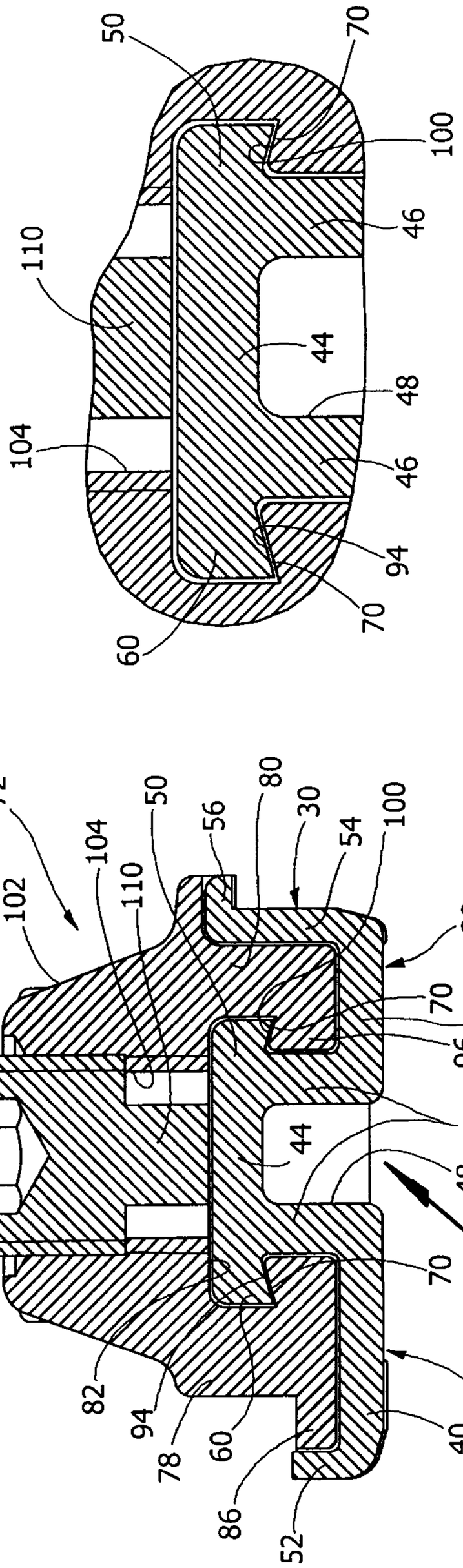

50
70
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44
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104
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30
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114
106
112
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96
46
44
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V
82
94
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60
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86
52

FIG. 5a

FIG. 6

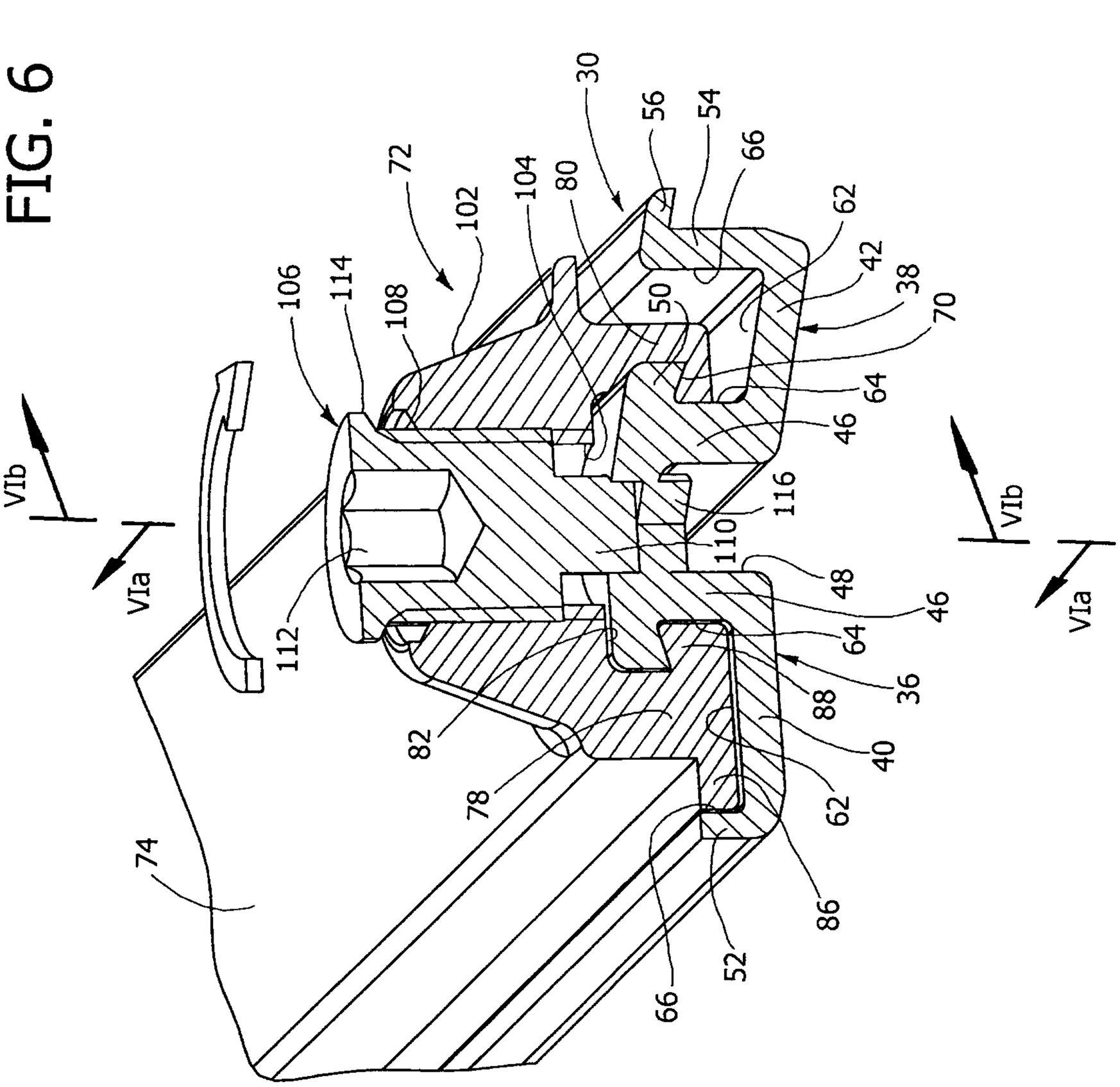

VIb
VIa
30
56
54
66
62
72
102
104
80
106
114
108
42
38
50
70
64
46
116
110
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112
82
78
74
88
36
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62
86
52
66

FIG. 6b

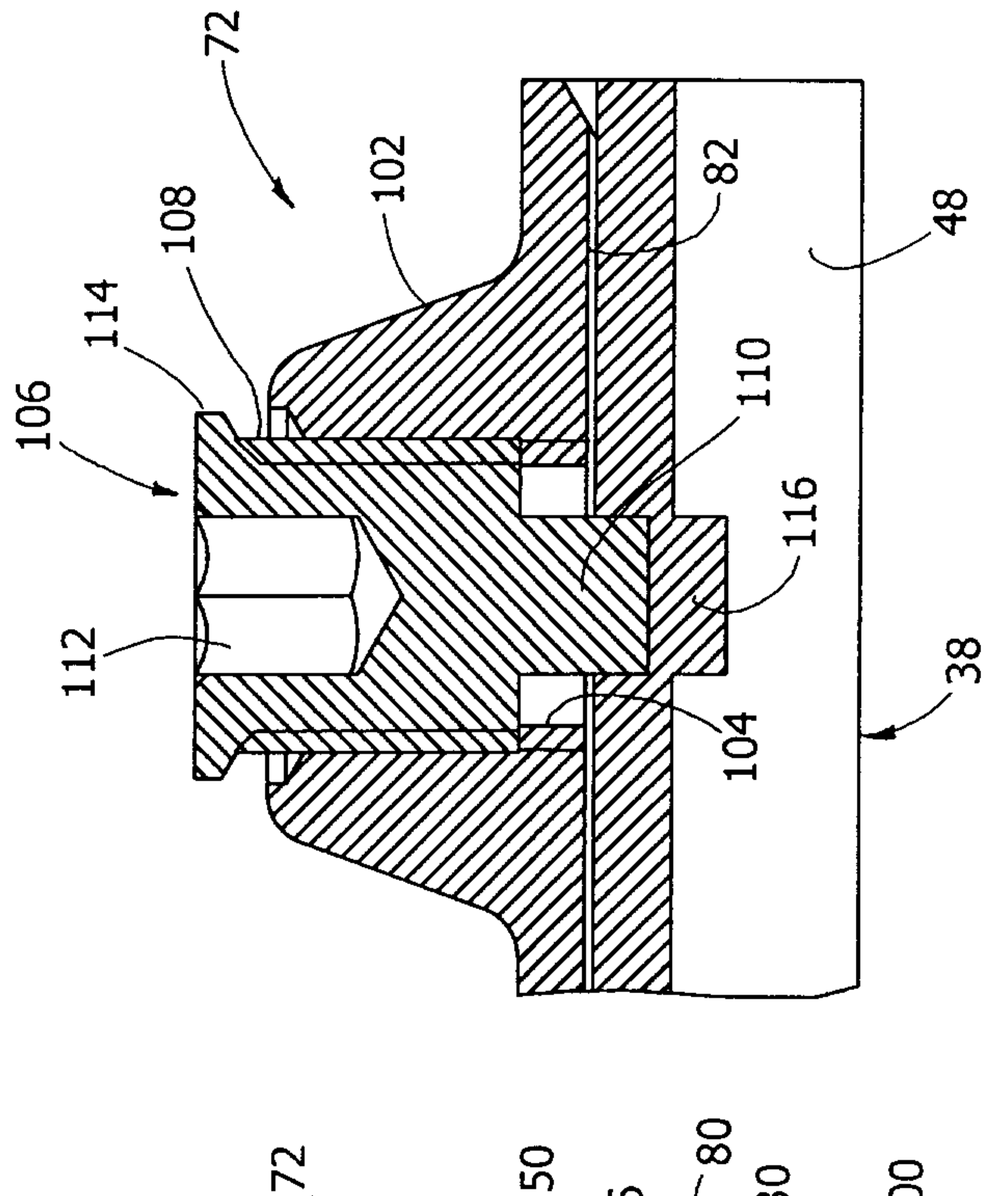

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102
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FIG. 6a

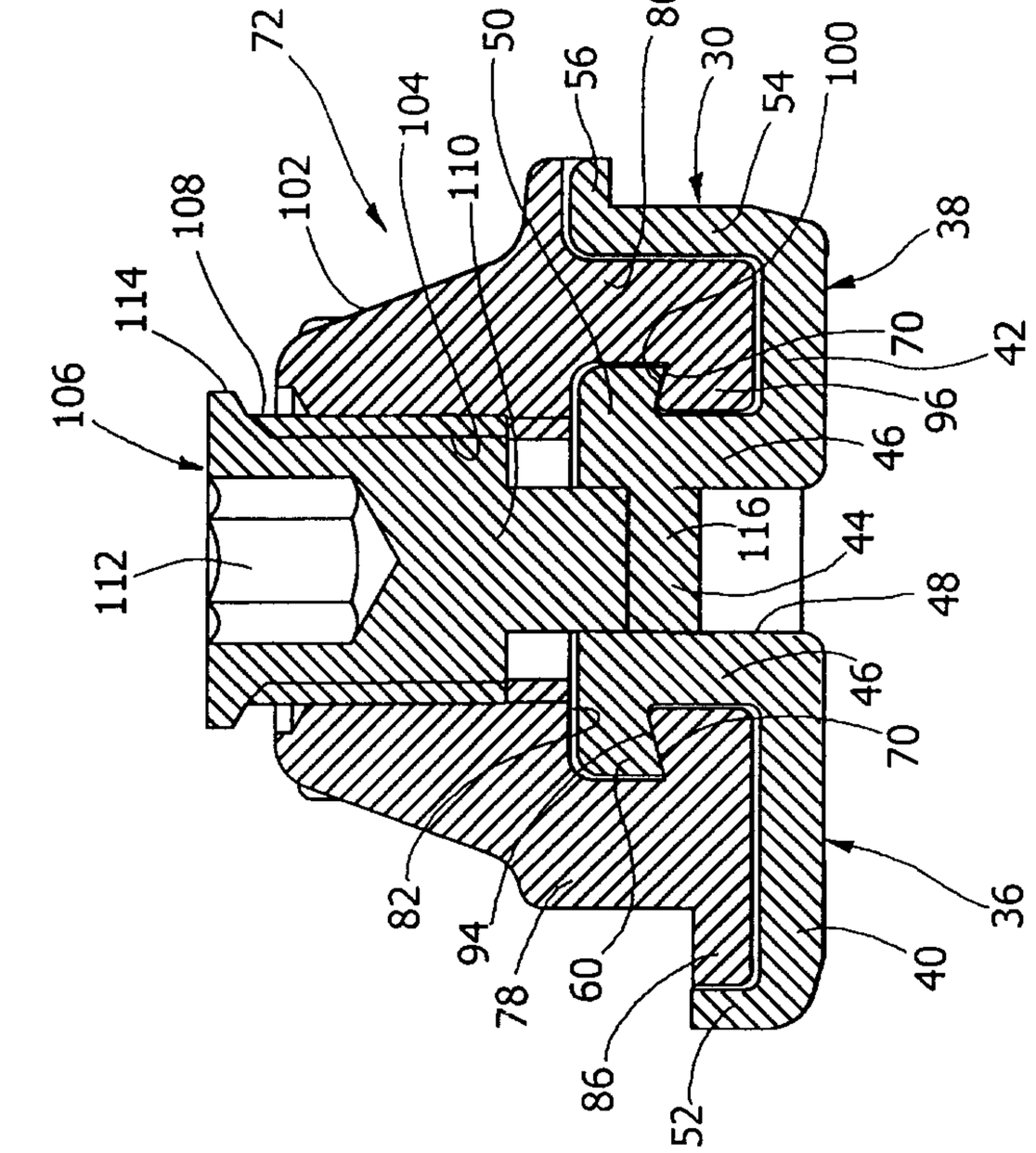

72
104
50
56
8
30
54
100
102
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108
114
38
106
70
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116
44
48
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70
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94
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52

FIG. 7

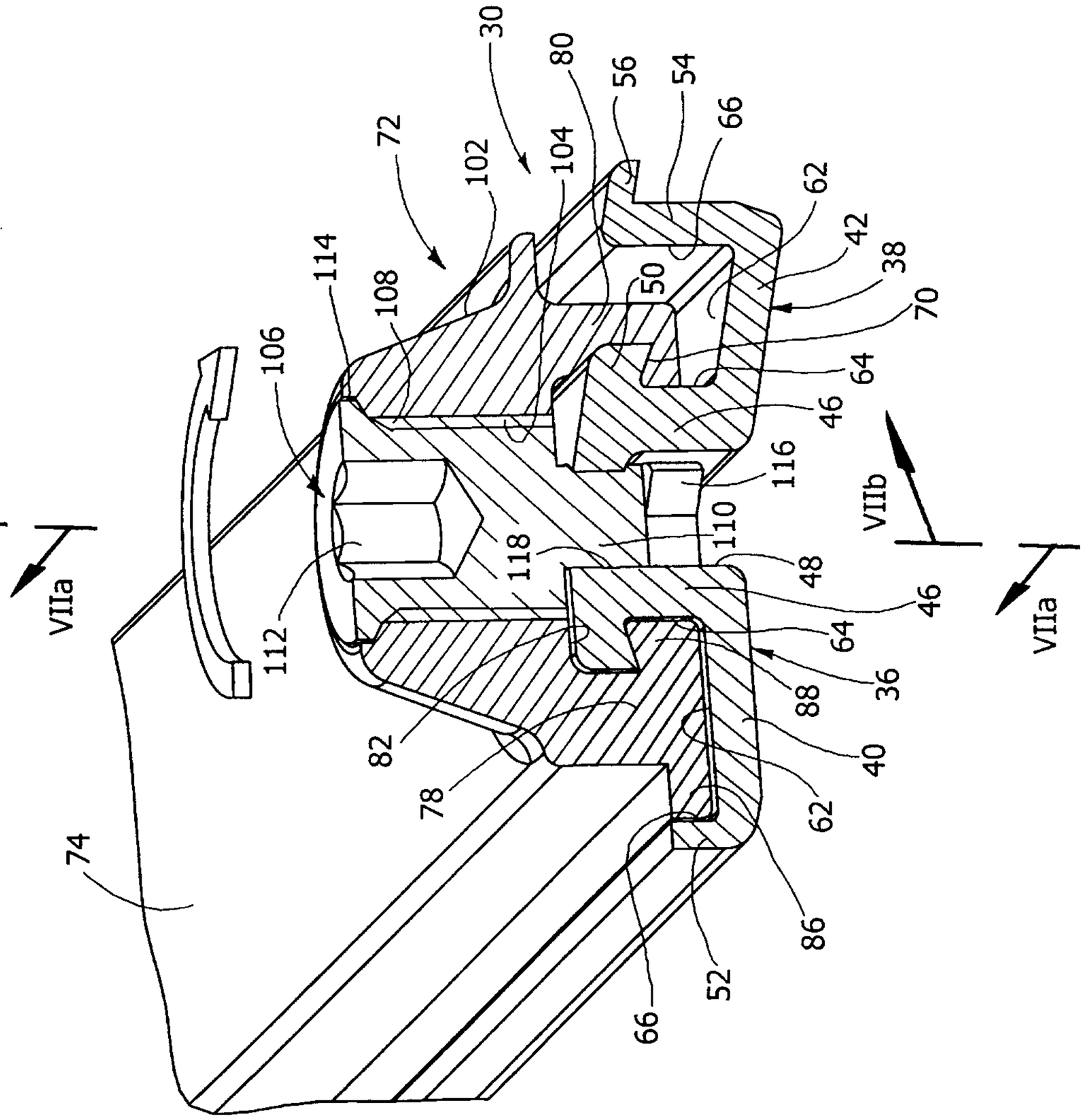

VIIb
VIIa
VIIb
VIIa
30
80
56
54
66
72
102
104
62
42
38
114
108
50
70
106
64
46
116
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118
48
112
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74
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62
86
52
66

FIG. 7b

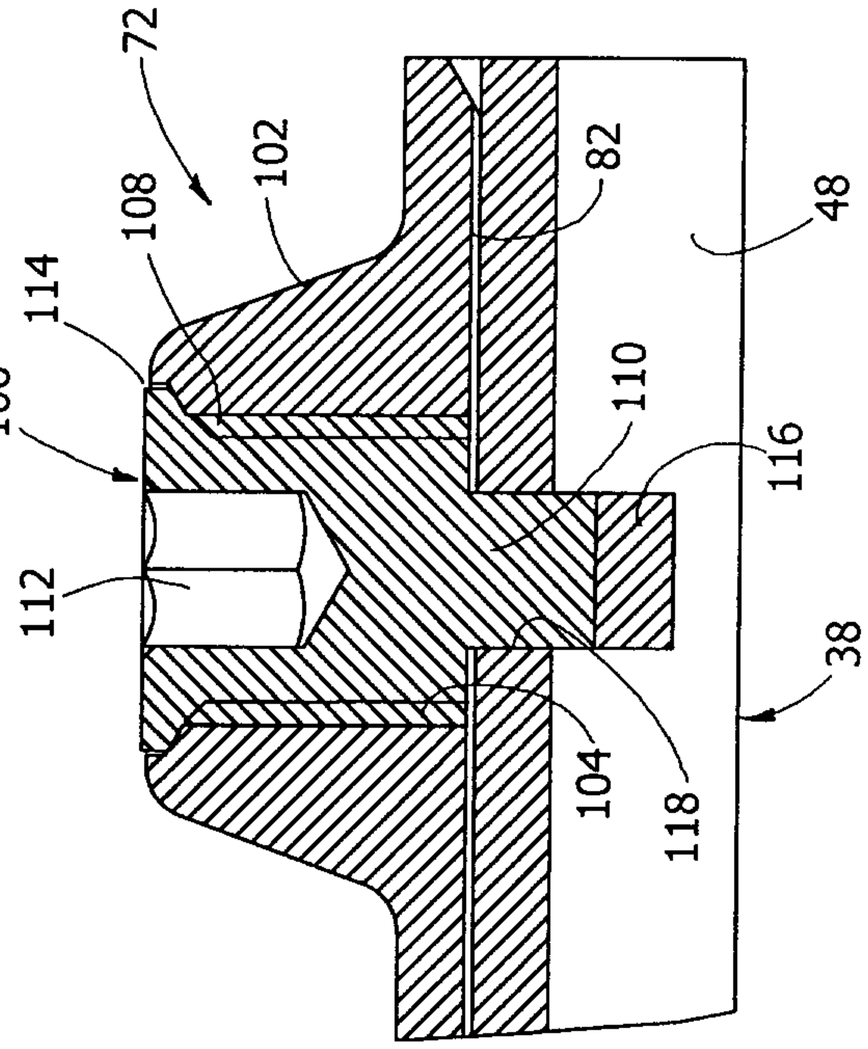

72
102
108
114
106
112
82
48
110
116
104
118
38

FIG. 7a

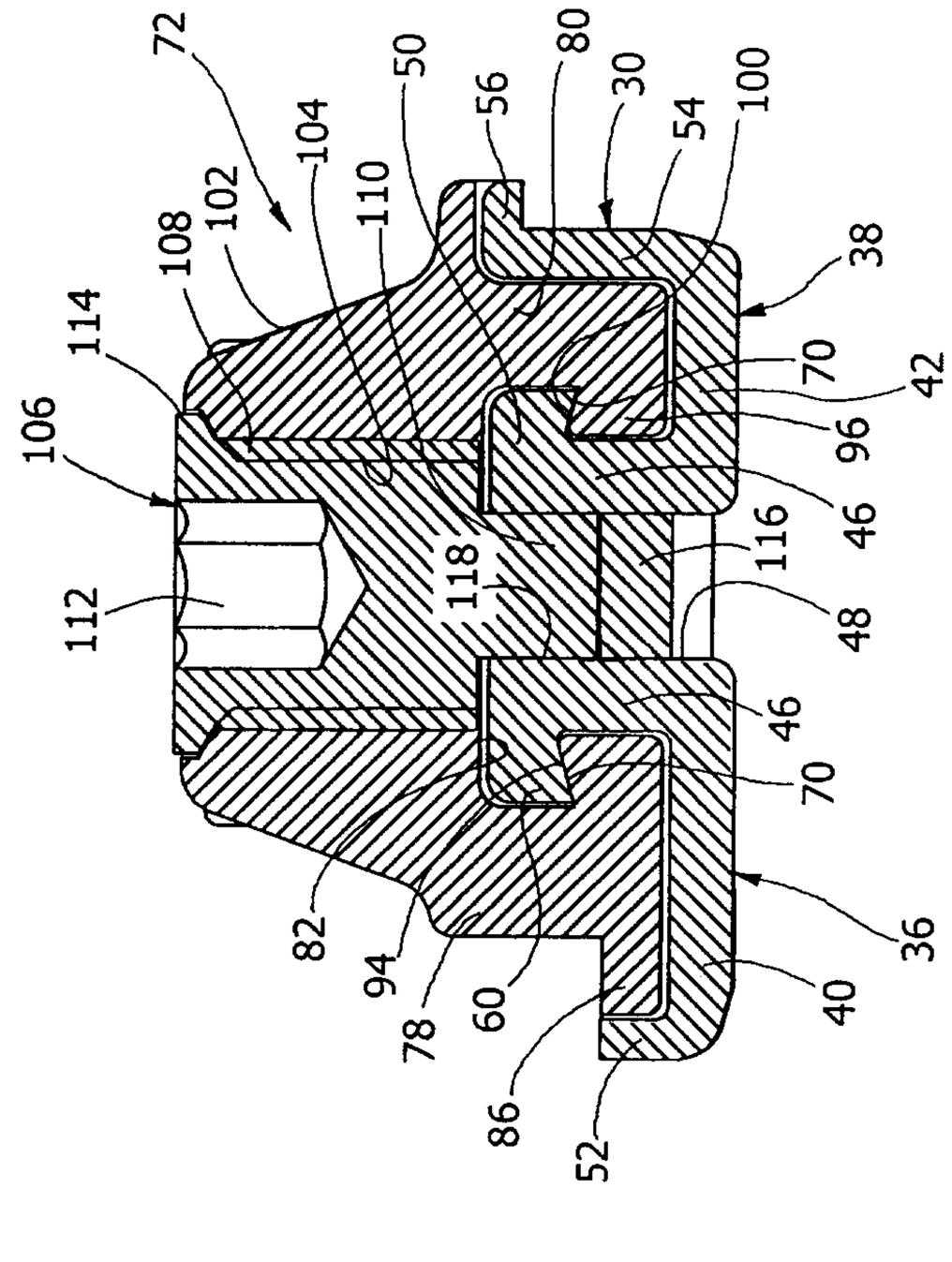

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FIG. 8

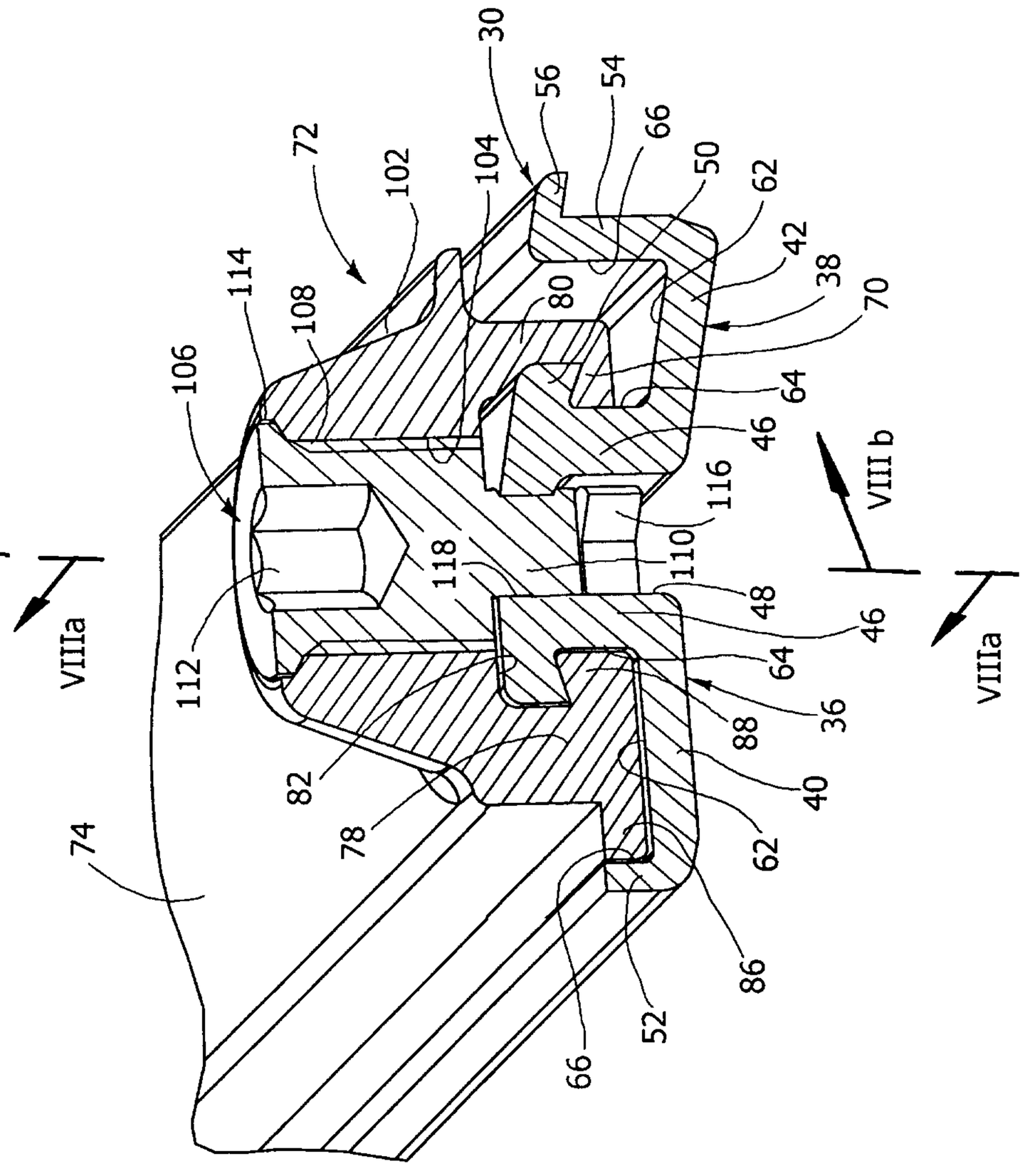

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FIG. 8b

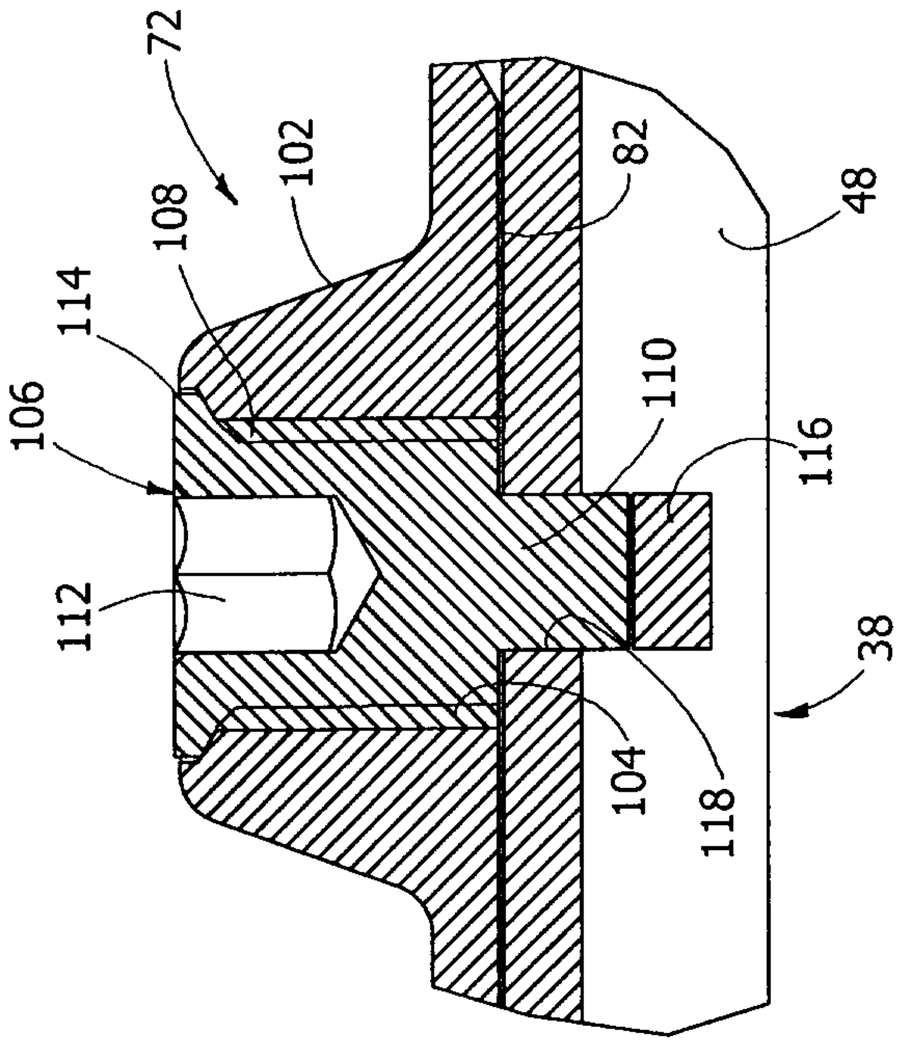

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FIG. 8a

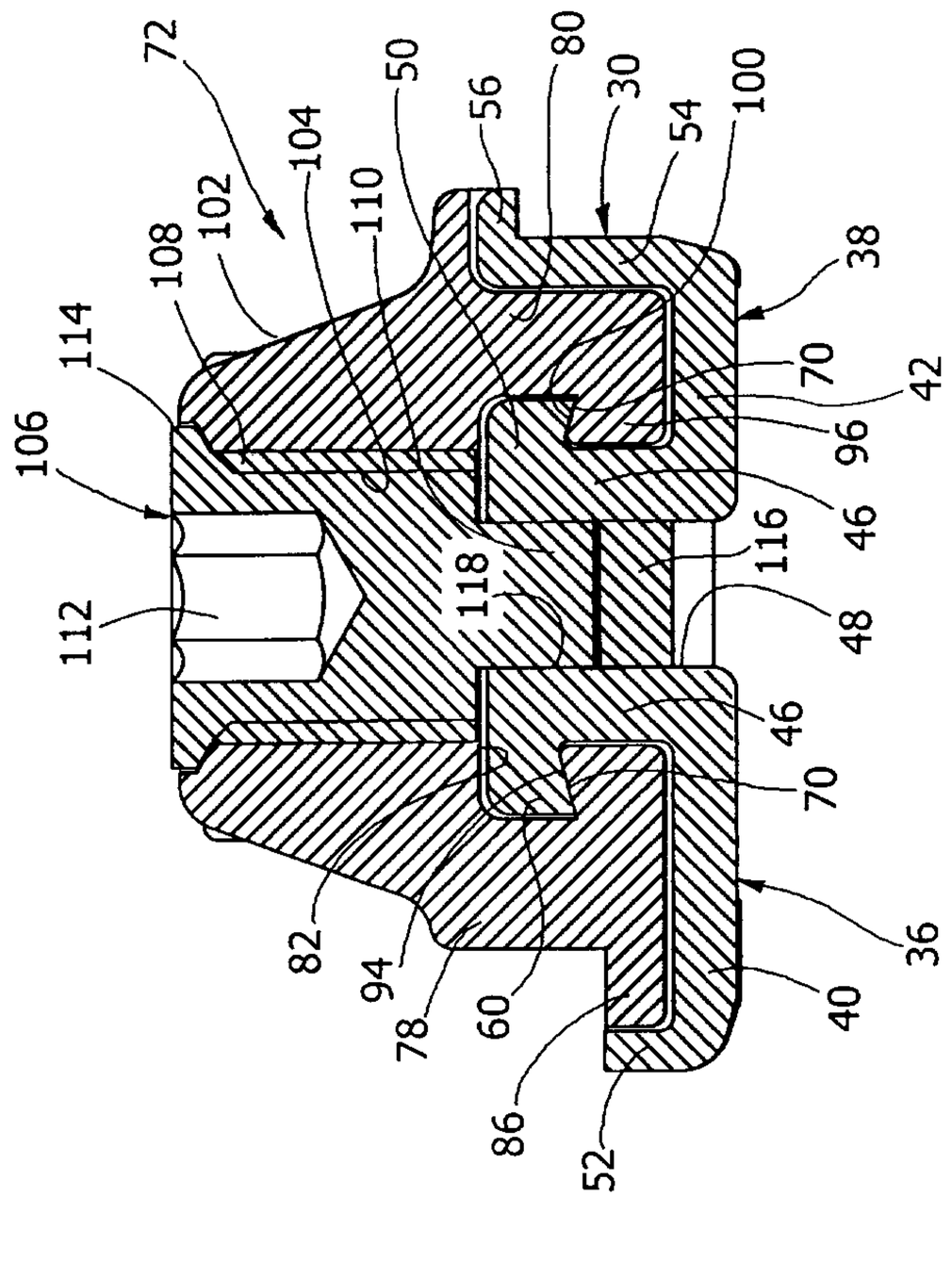

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FIG. 9

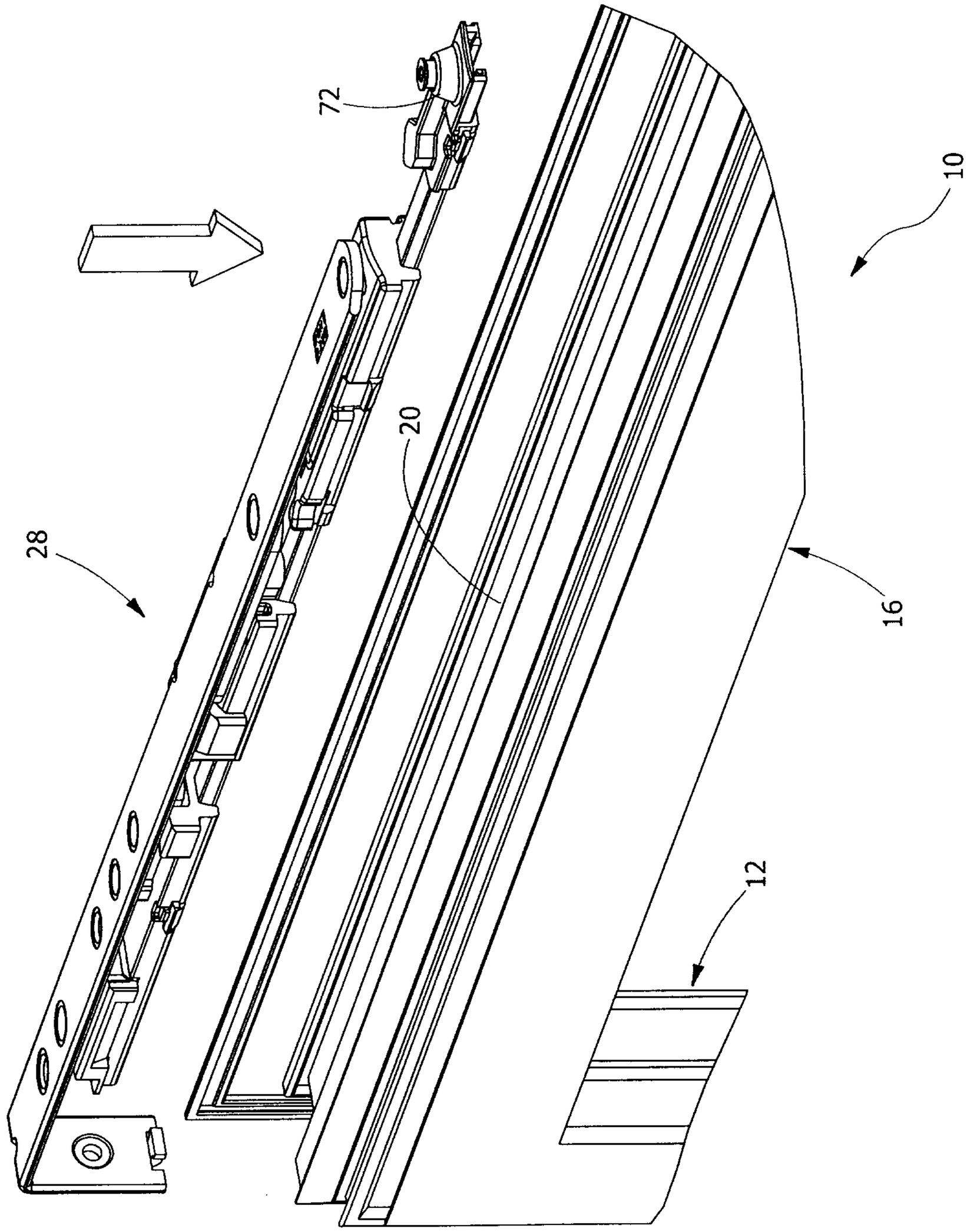


FIG. 10

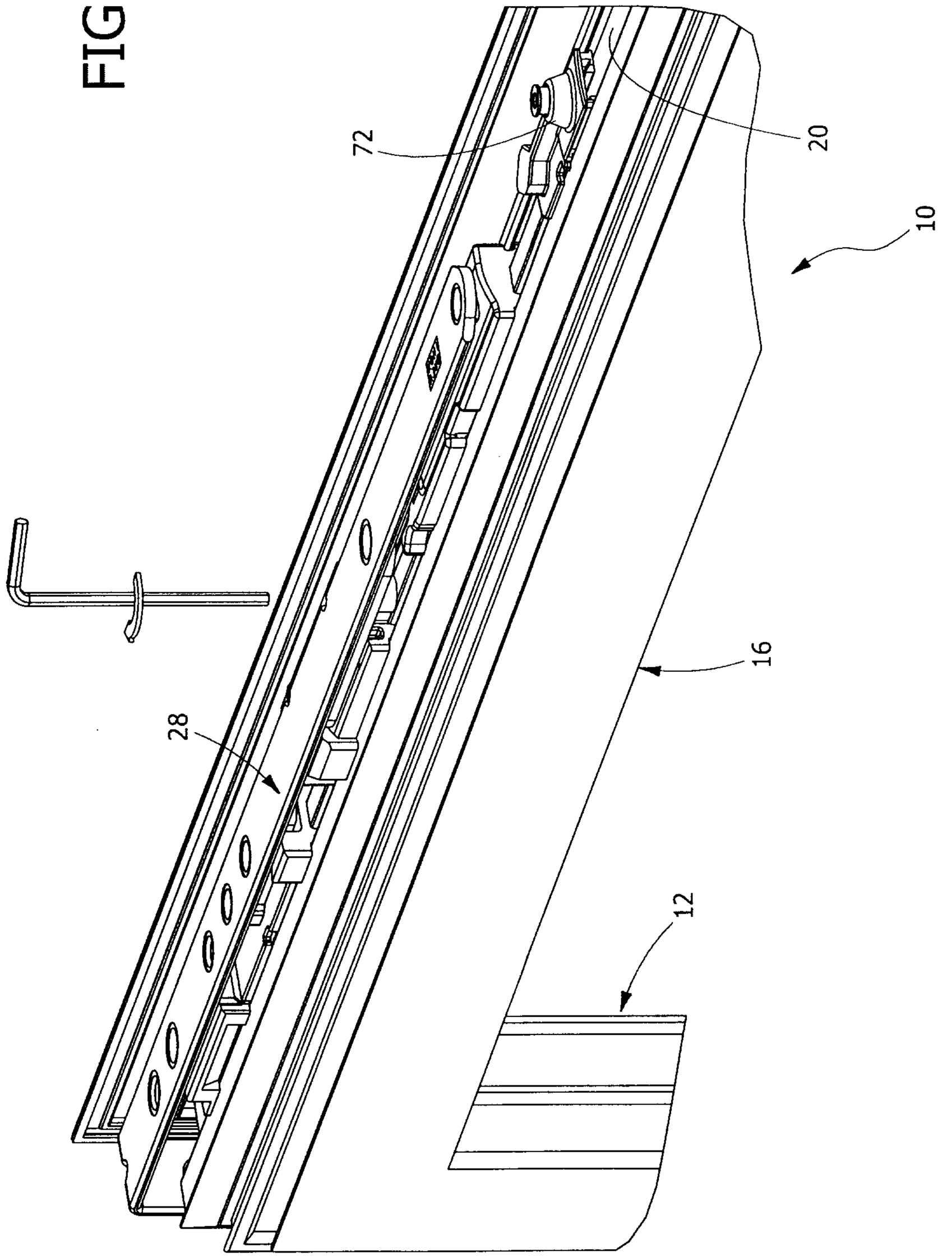


FIG. 11

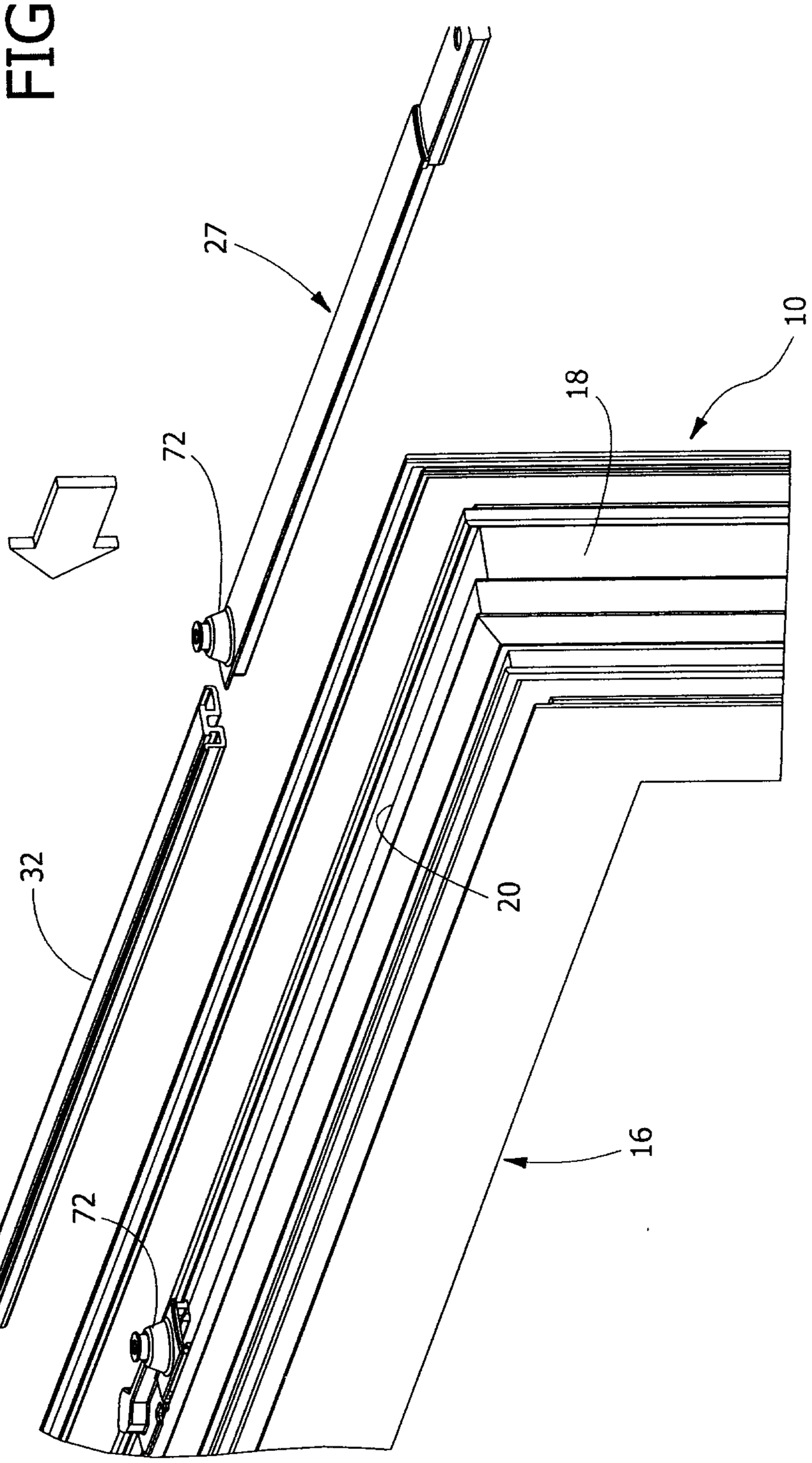


FIG. 12

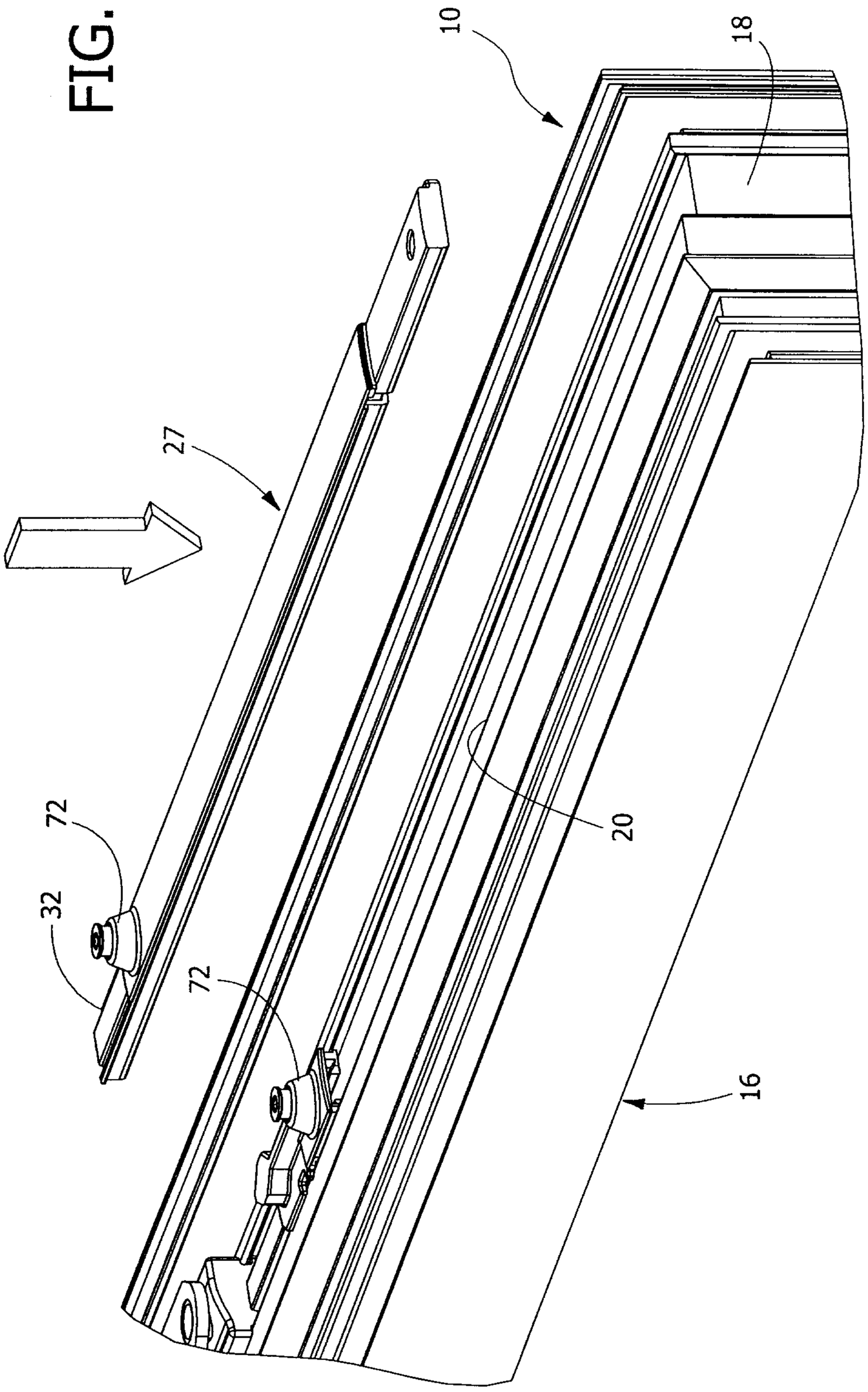


FIG. 13

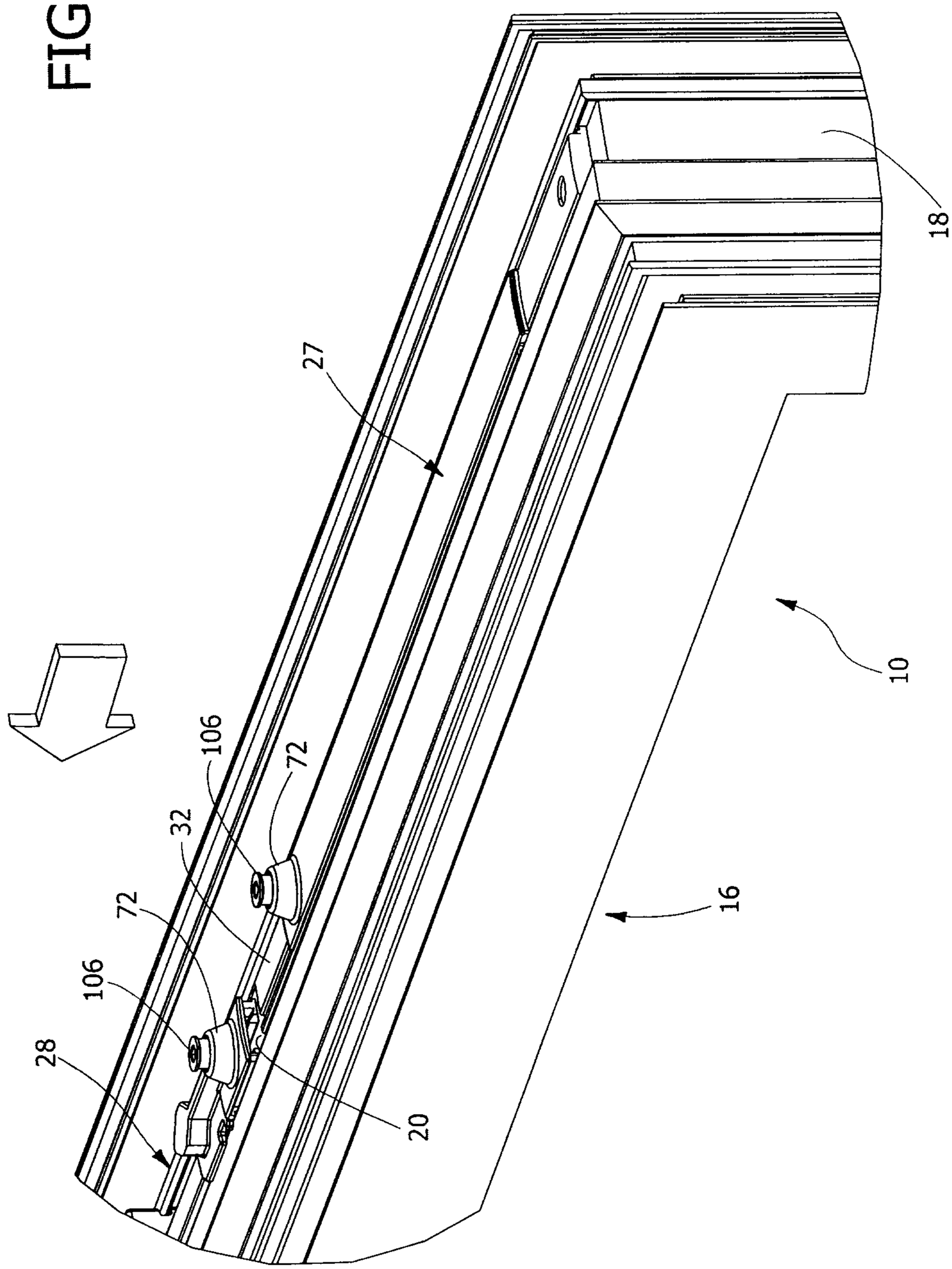


FIG. 14

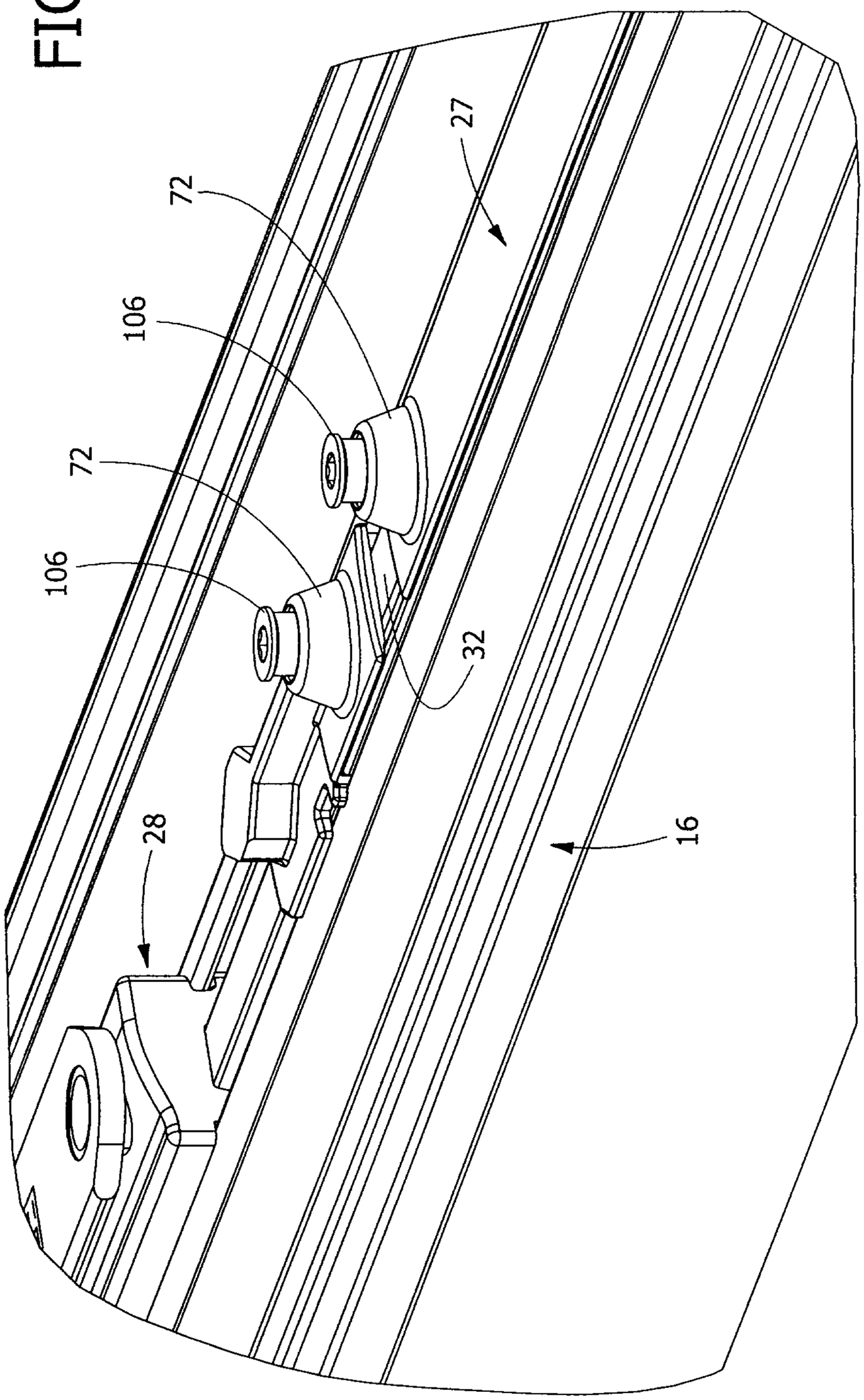


FIG. 15

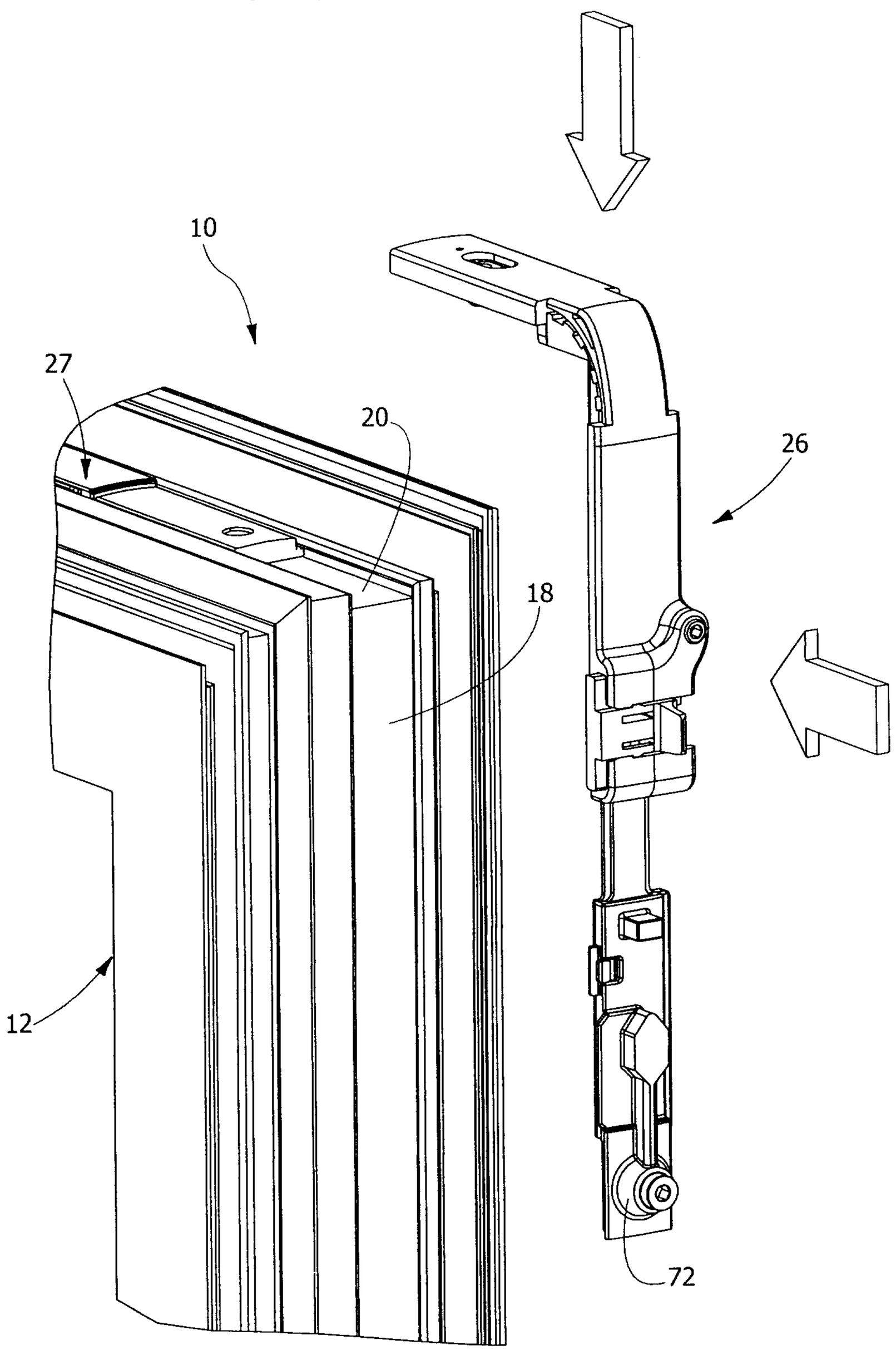


FIG. 16

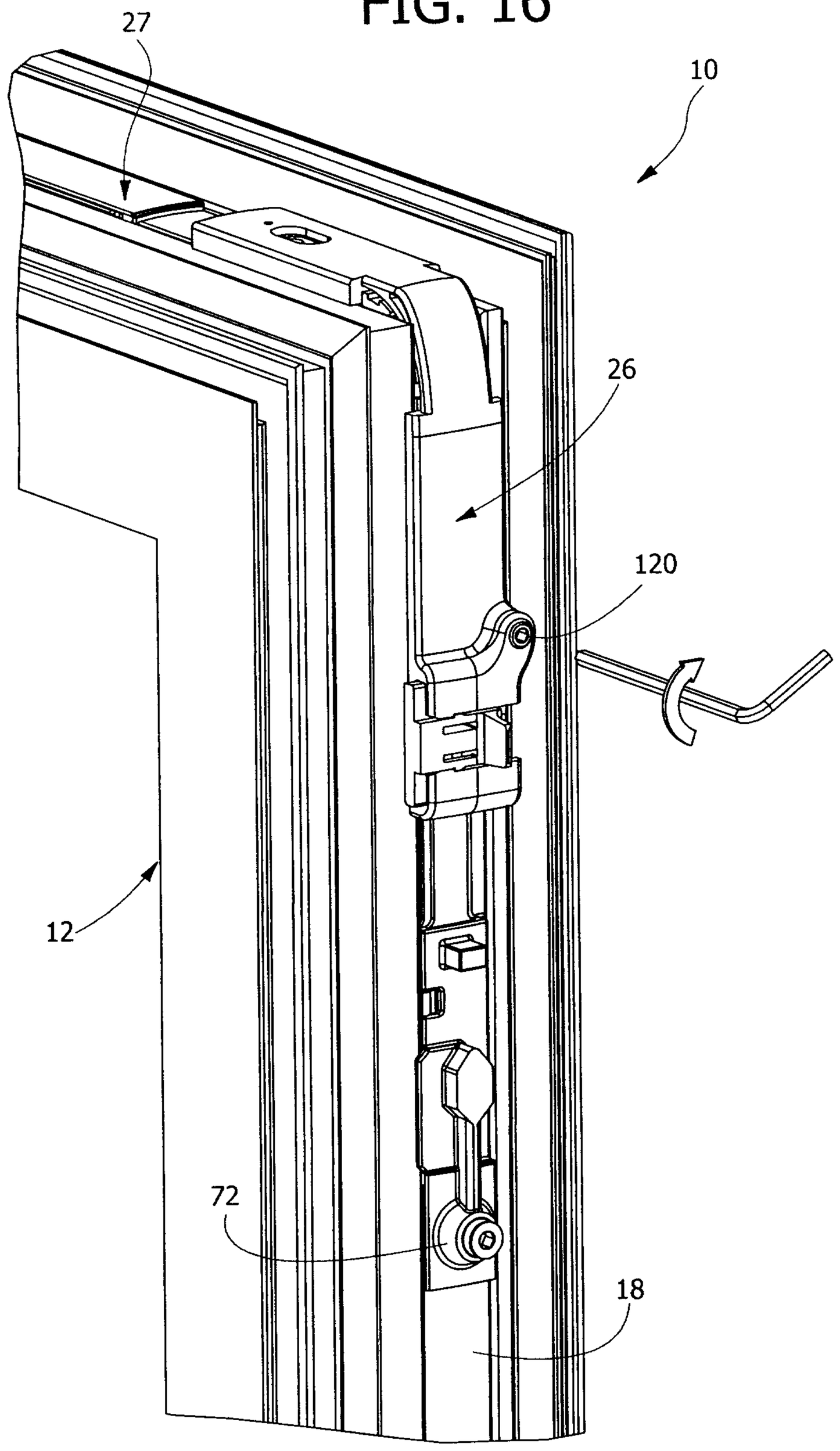


FIG. 17

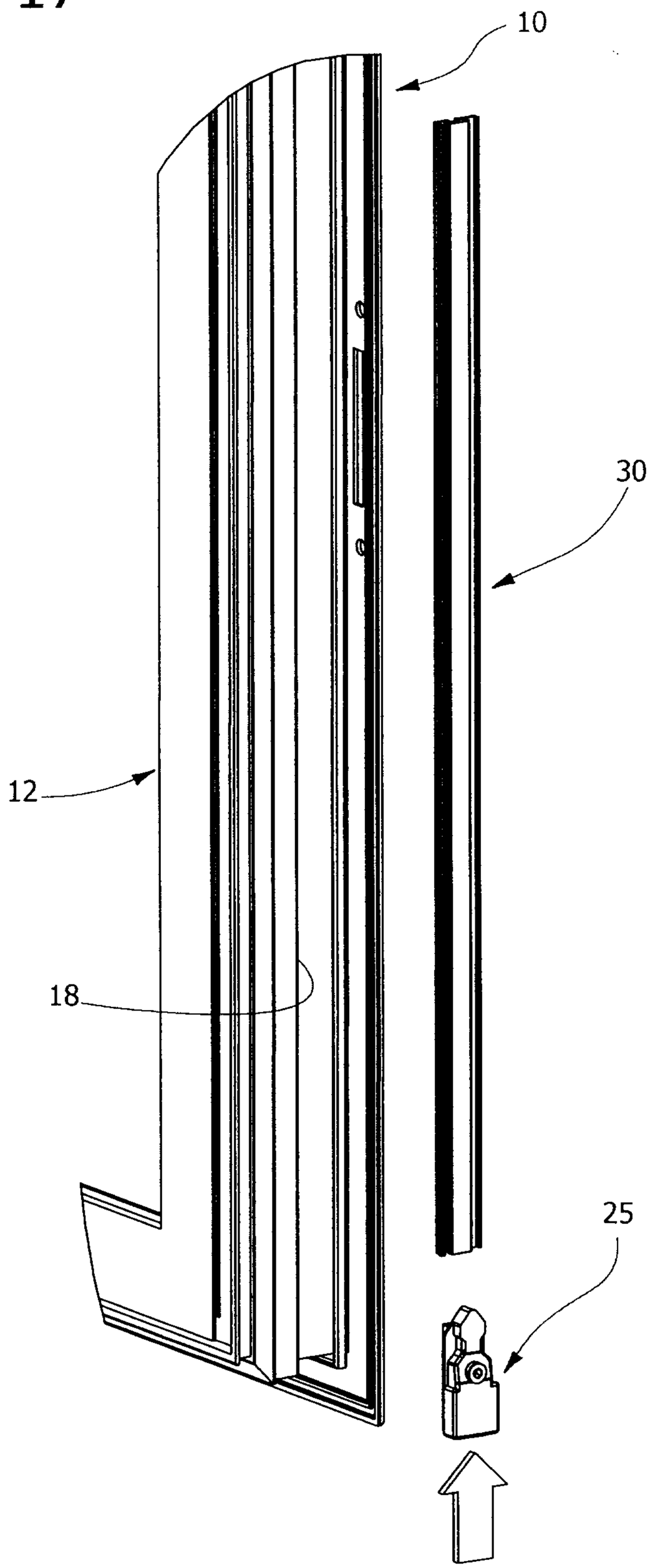


FIG. 18

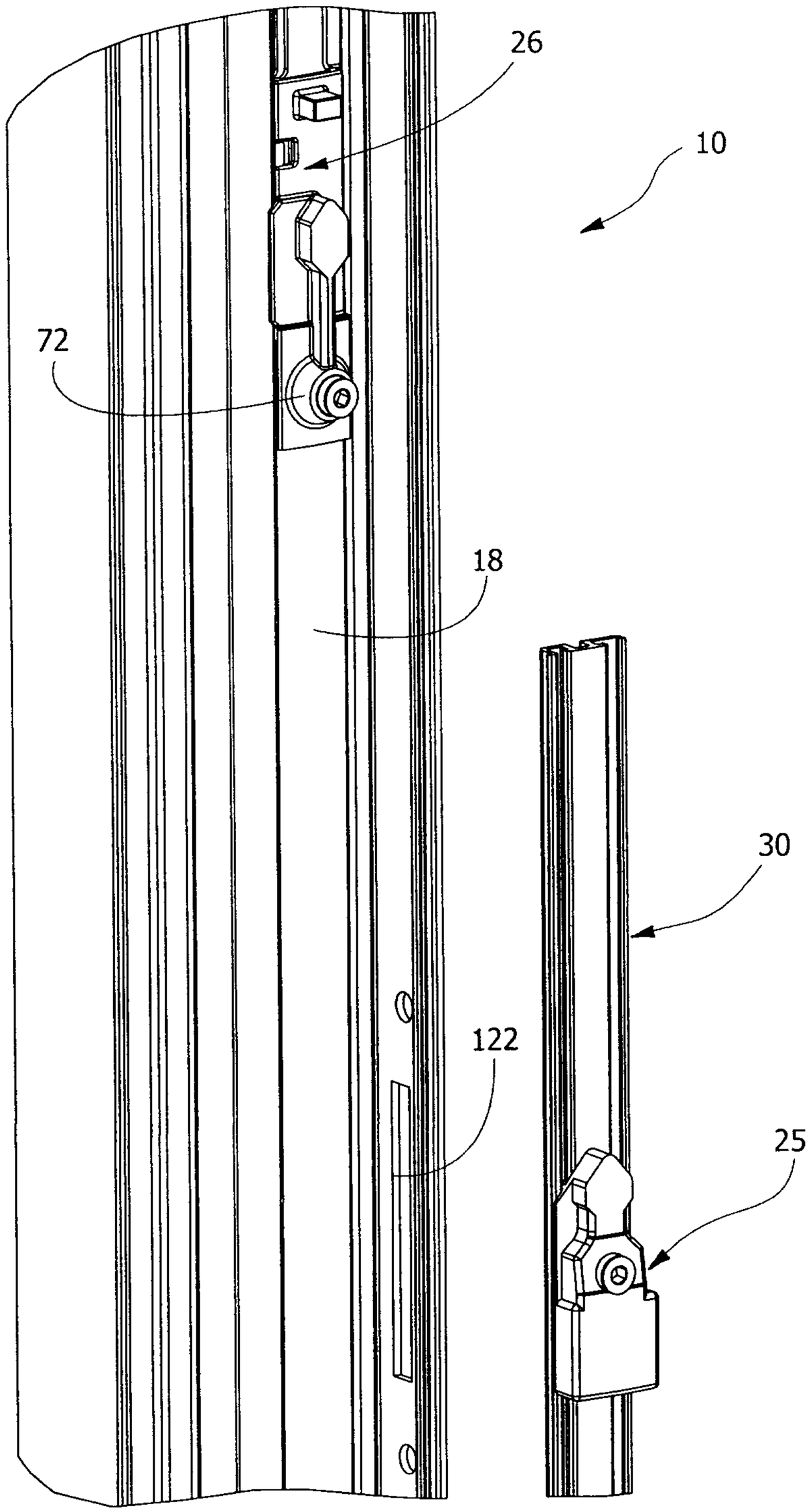


FIG. 19

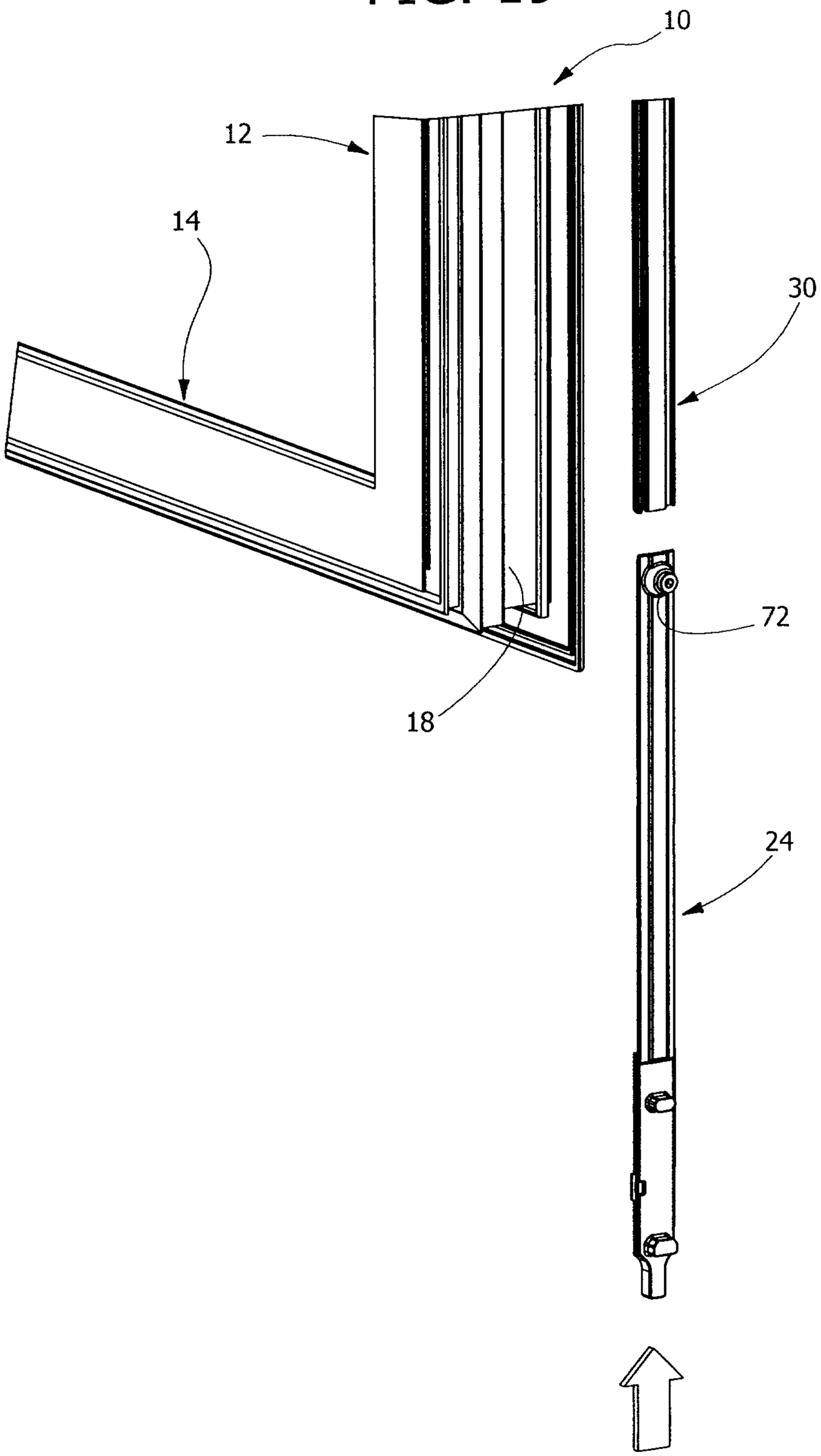


FIG. 20

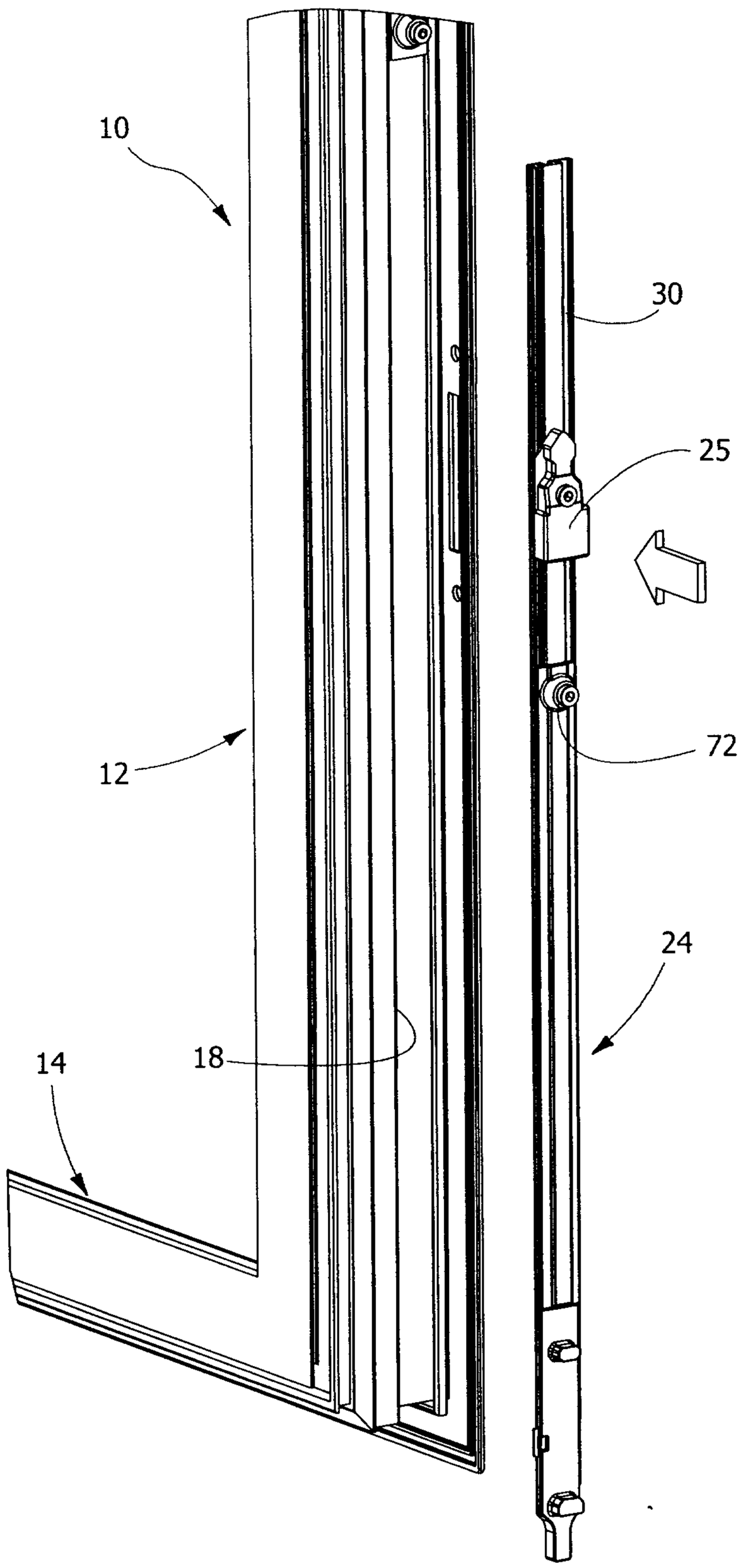


FIG. 21

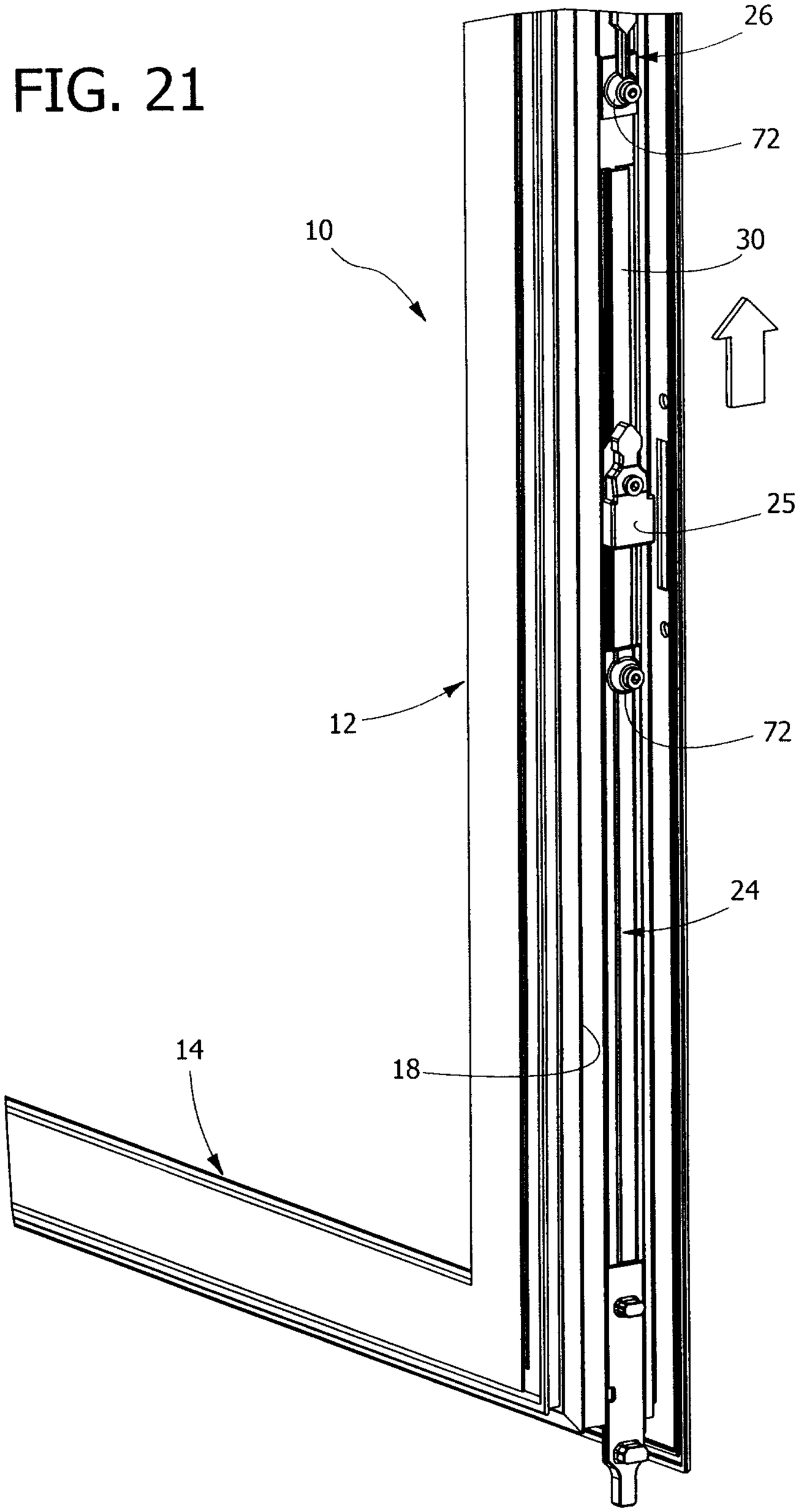


FIG. 22

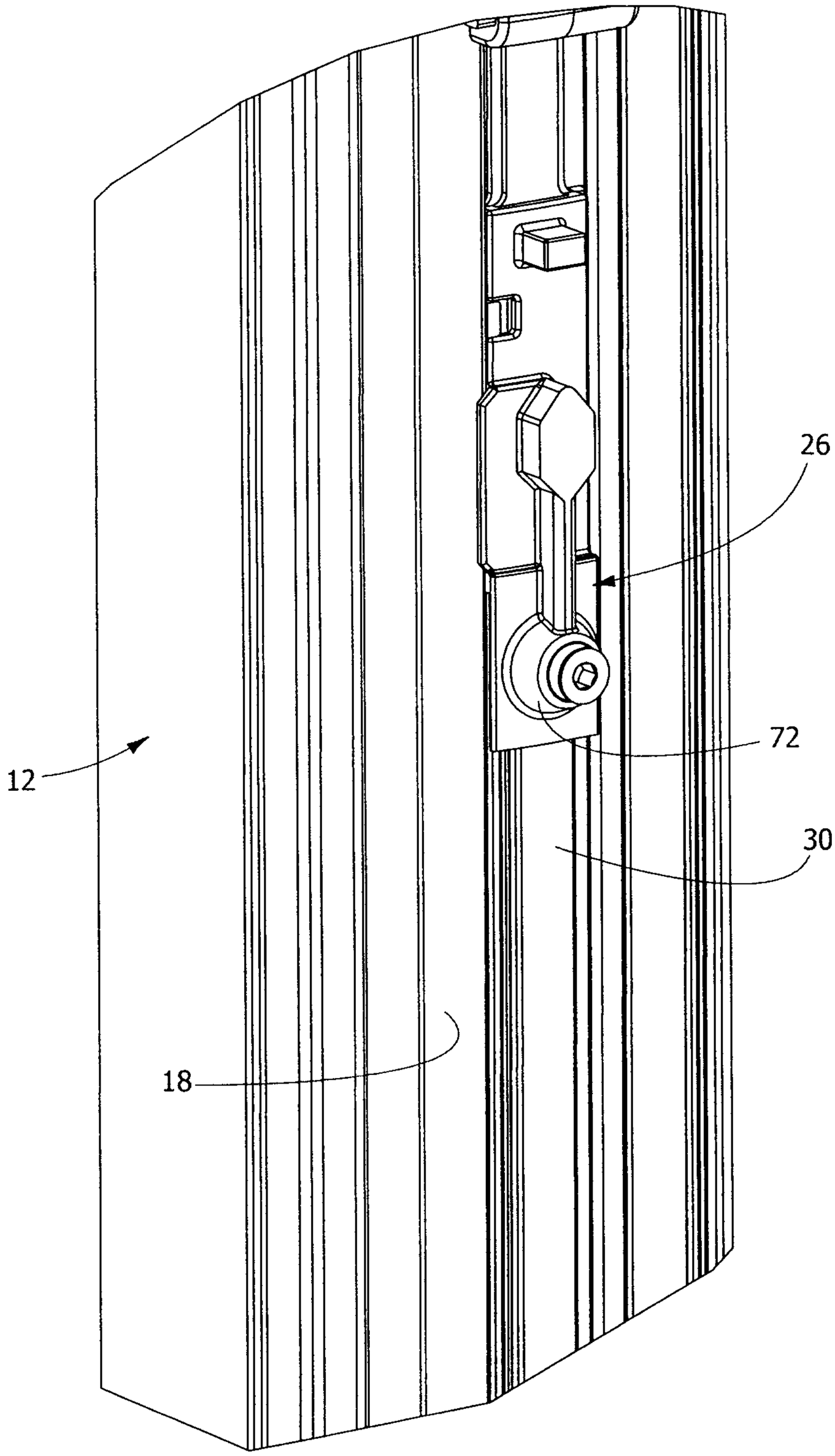


FIG. 23

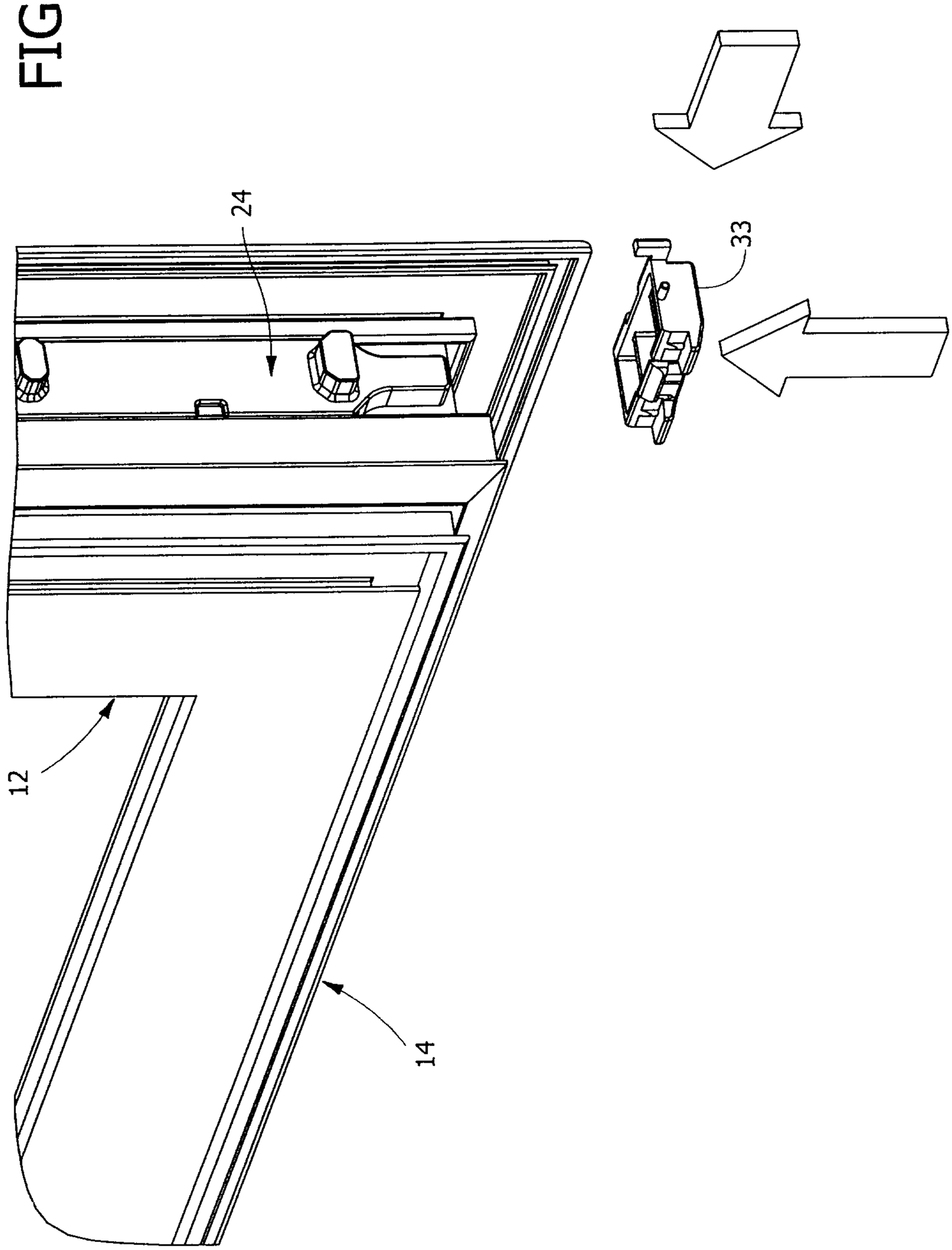


FIG. 24

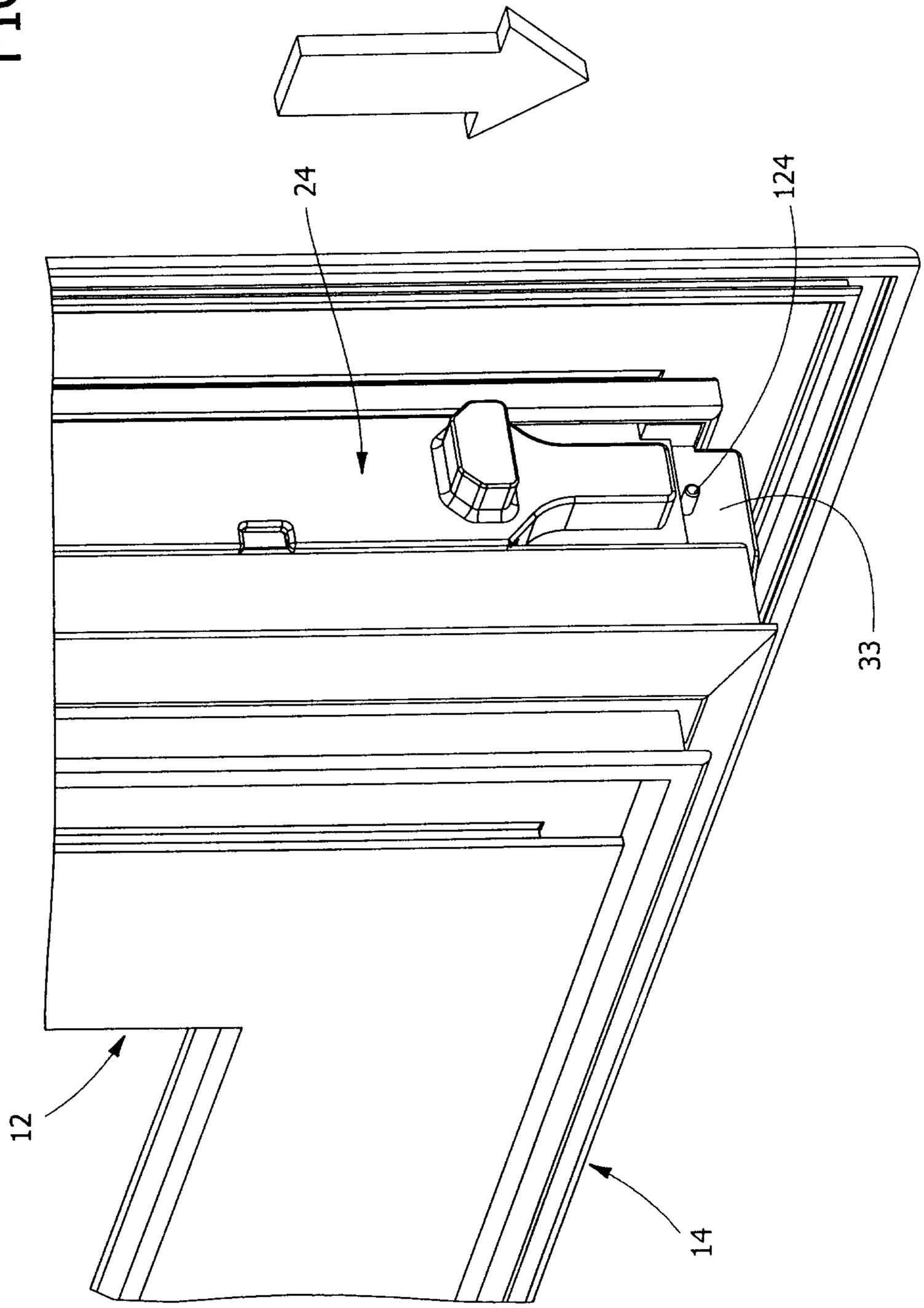


FIG. 25

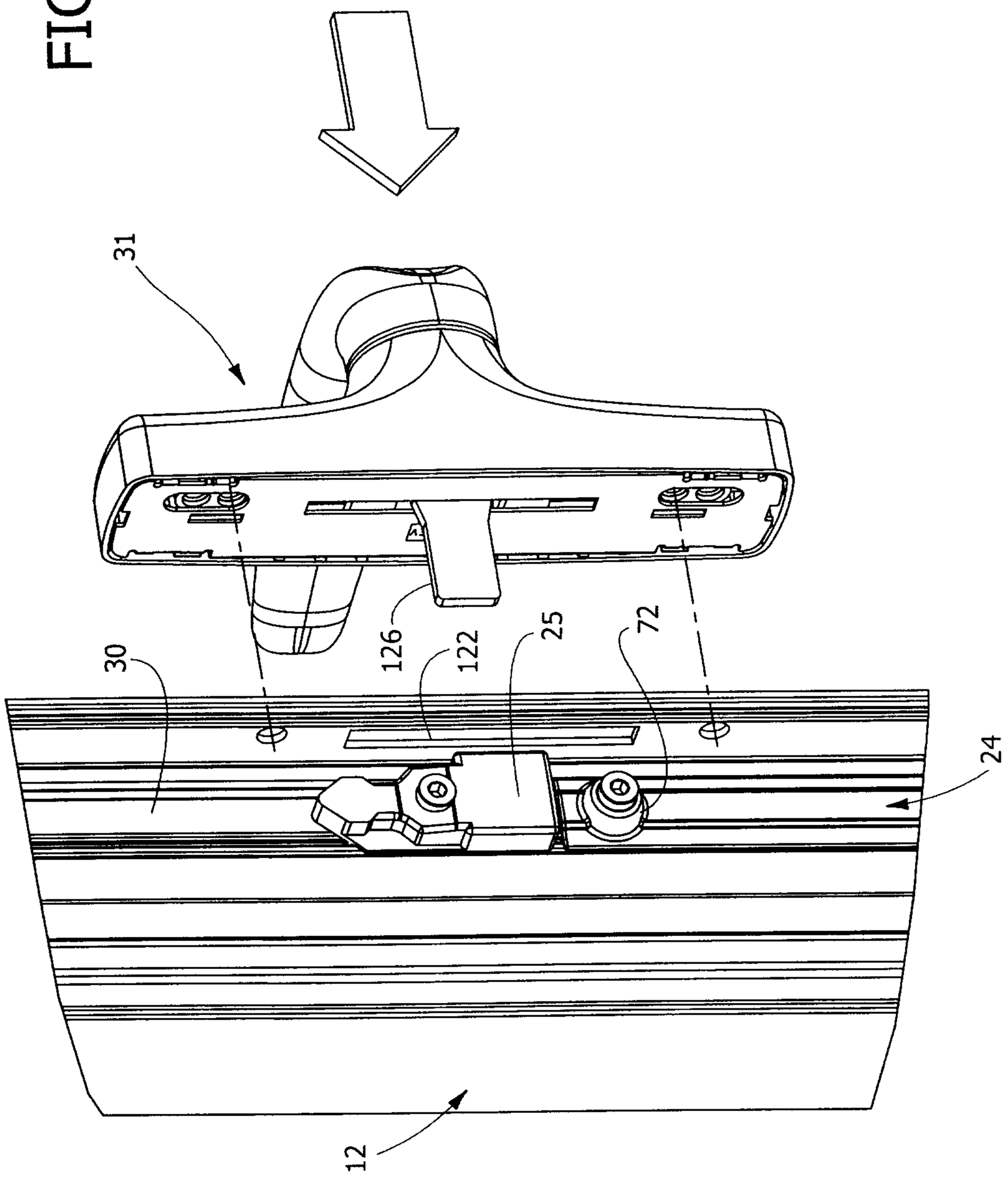


FIG. 26

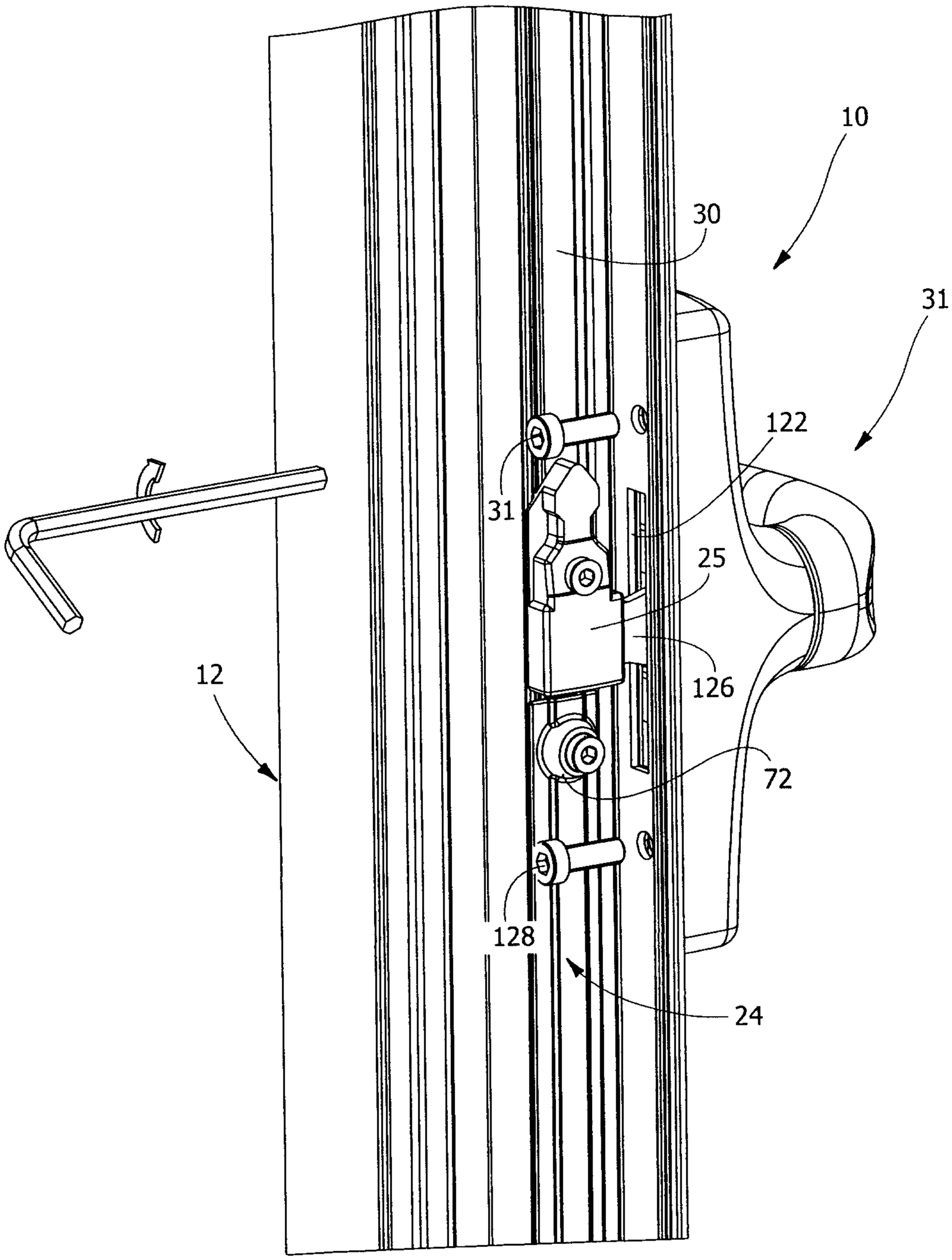
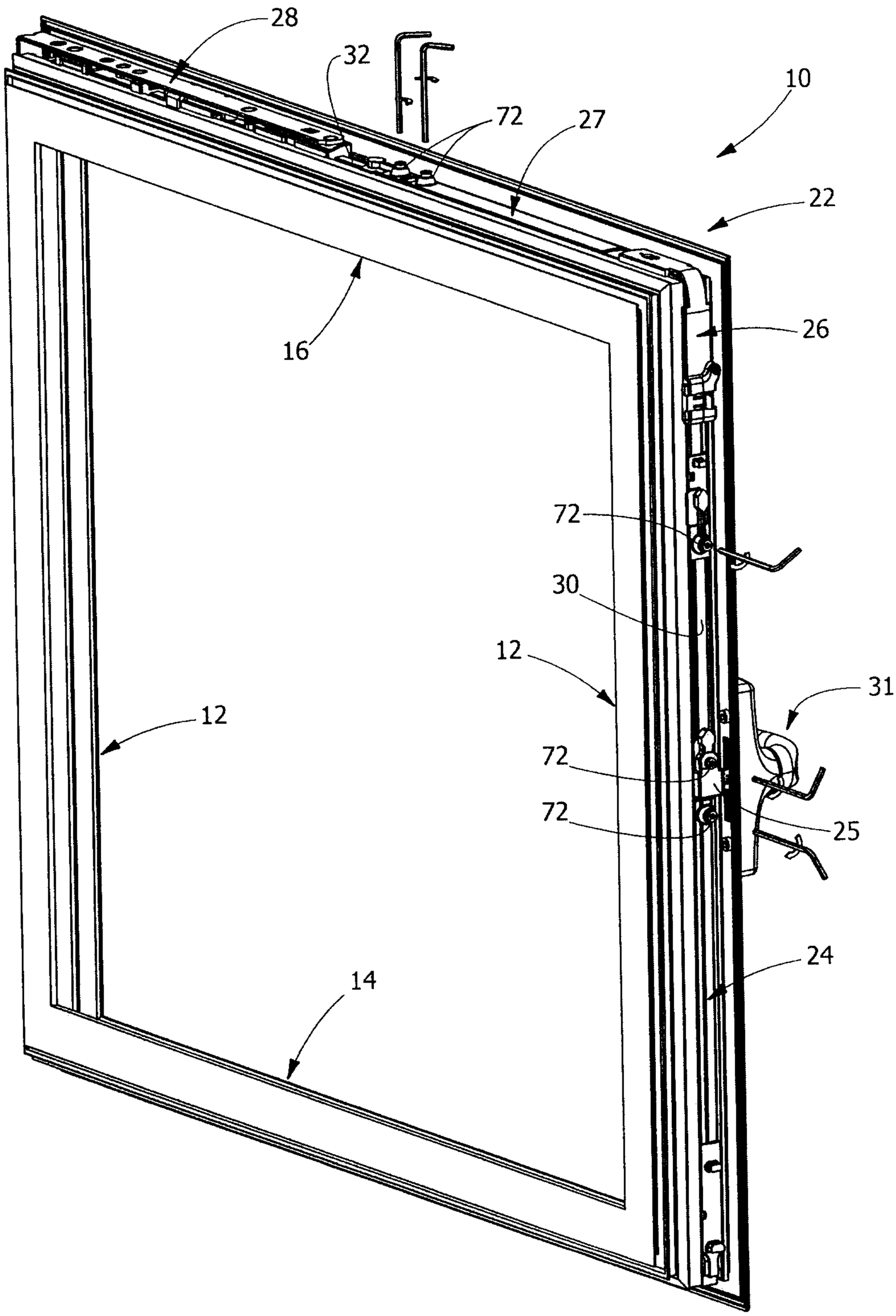
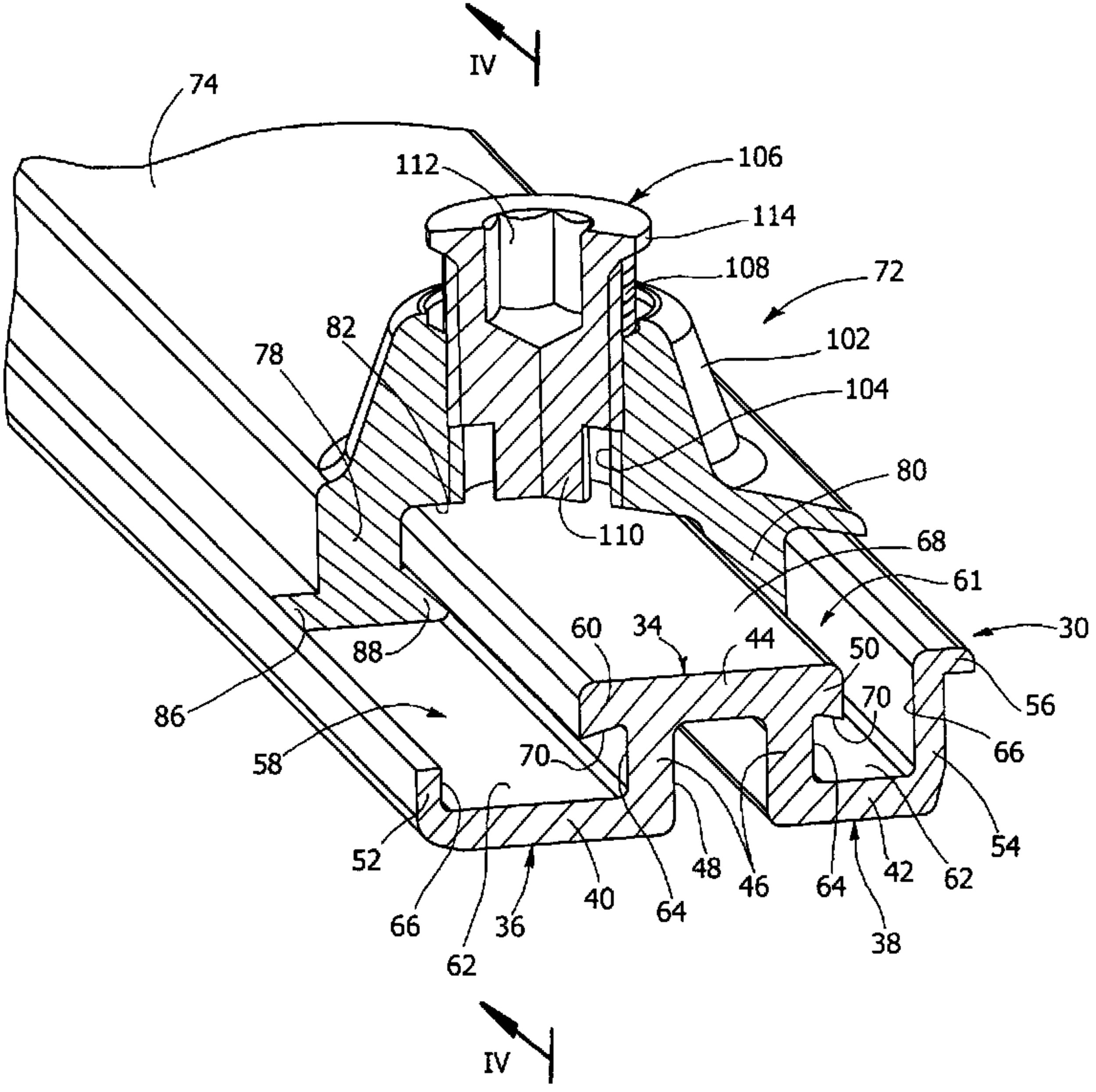


FIG. 27




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IV