



(11) (21) (C) **2,067,936**  
(22) 1992/05/04  
(43) 1993/02/22  
(45) 2001/03/06

(72) Hedly, Atwell B., US

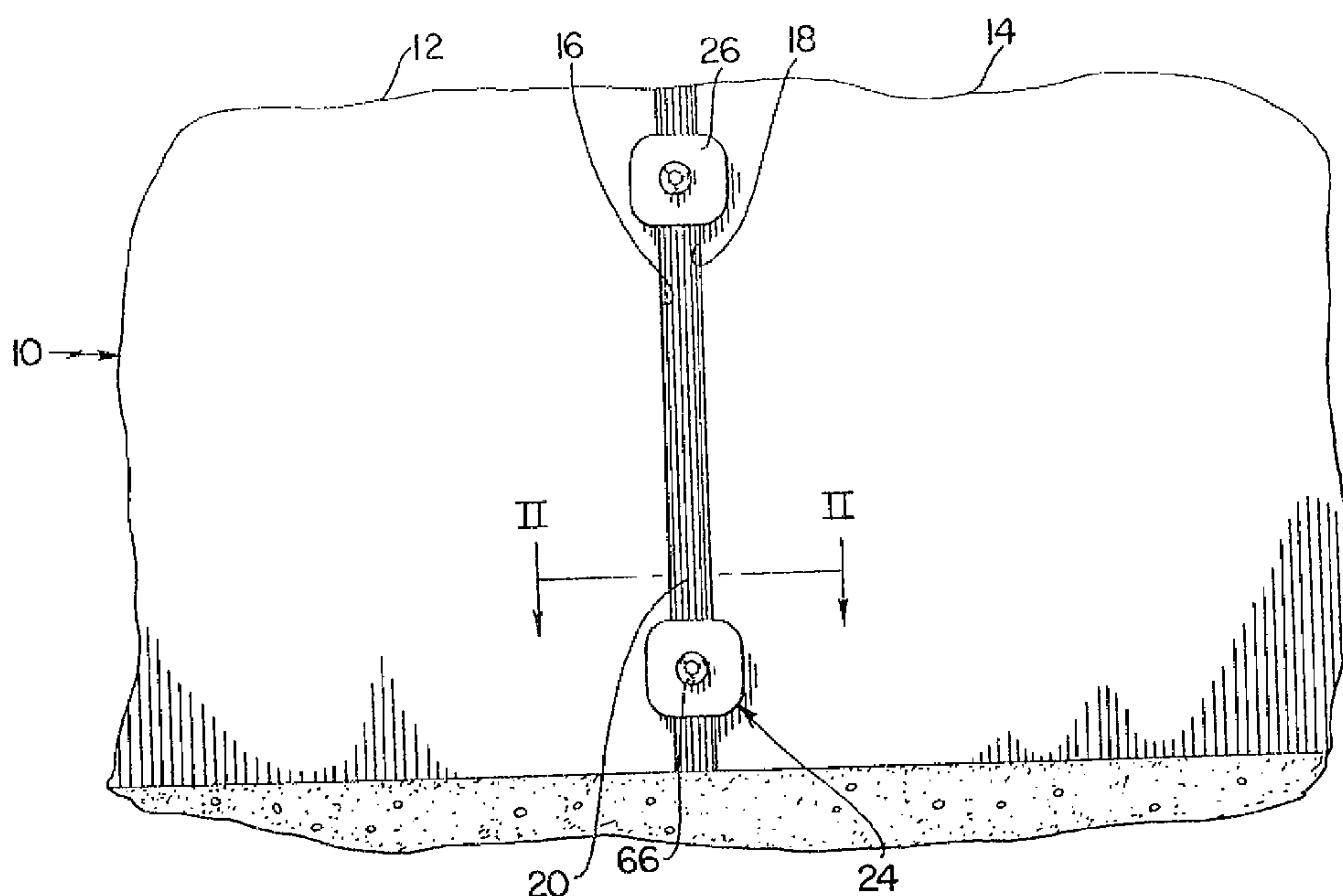
(73) TAMER INDUSTRIES, INC., US

(51) Int.Cl.<sup>5</sup> E04C 2/38

(30) 1991/08/21 (747,945) US

(54) **SYSTEME DE CLOISONS MURALES ET DISPOSITIFS DE  
FIXATION CONNEXES**

(54) **WALL PANEL SYSTEM AND FASTENER THEREFOR**



(57) Wall panel system having a fastener including a clamping plate, a bolt, and a locking bar mounted on the bolt, wherein the plate has two spaced, parallel tongues that extend through a gap between panel elements and has a stop to regulate swinging of the locking bar about the bolt from a first position extending between the tongues to a second position bridging the gap.

1    **ABSTRACT**

2           Wall panel system having a fastener including a  
3    clamping plate, a bolt, and a locking bar mounted on the  
4    bolt, wherein the plate has two spaced, parallel tongues  
5    that extend through a gap between panel elements and has  
6    a stop to regulate swinging of the locking bar about the  
7    bolt from a first position extending between the tongues  
8    to a second position bridging the gap.

1 WALL PANEL SYSTEM AND FASTENER THEREFOR

2 **Background of the Invention**

3 In the installation of modular wall systems, it is  
4 common practice to provide a plurality of similar panel  
5 elements and to join them in order to complete a wall  
6 assembly. These systems are used to provide machine  
7 enclosures, booths, office rooms, work stations, and the  
8 like. The panel elements are joined in various ways,  
9 including simple nut-and-bolt means. In order to  
10 overcome some of the disadvantages of such means, various  
11 forms of fasteners have been developed for this purpose.  
12 For instance, the U.S. patent of Daw et al No. 4,909,013  
13 shows an extension of the nut-and-bolt system in which  
14 the nut is in the form of a large rectangular element  
15 having grooves that engage flanges on panel elements to  
16 be joined. Such structures developed in the past have  
17 suffered from a number of disadvantages, including the  
18 fact that they have been complex and expensive. Some of  
19 the systems have required more than one person to  
20 assemble, because one person has been required to work at  
21 the rear of the assembly, while another person operates  
22 the fastener from the front. Other systems have had  
23 fasteners made up of a number of unassembled small parts  
24 that are easily mislaid or lost. These and other

difficulties experienced with the prior art devices have been obviated or at least mitigated in a novel manner by the present invention.

#### **Summary of the Invention**

The invention provides a wall panel system that includes a fastener that permits assembly of panels by a single person from the front of the system without any alignment problems. This invention also provides a wall panel system including a fastener whose parts need not be disassembled before being applied to panel elements. Also provided is a wall panel system including a fastener that can be pre-adjusted so as to minimize the number of turns required to effect locking of the panels to each other. Further, the present invention provides a fastener for use in a wall panel system, which fastener is simple and rugged in construction, which can be easily manufactured from readily-available materials, and which is capable of a long life of useful service with a minimum of maintenance. Still further, the invention provides a wall panel system which is aesthetically pleasing in appearance. Further the invention provides a fastener for a wall system, which fastener consists of a number of small parts which are completely assembled at the factory, so that the parts cannot be mislaid or lost during the application of the fastener to panel elements.



In general, the invention relates to a wall panel system comprising a plurality of panel elements located adjacent one another in the same general plane, the panel elements having spaced, parallel edges defining a narrow gap between them. The system includes a fastener having a clamping plate for contact with outside surfaces of the panel elements, the plate having two spaced, parallel tongues adapted to extend through the gap to determine the width of the gap. A bolt extends through the clamping plate having a head located on the outside of the plate and a locking bar threaded on the bolt. The bar has a width that is less than the distance between the tongues and has a length that is greater than the width of the gap, so that it can swing from a first position between the tongues to a second position at a right angle to the first position. A stop extends

1 rearwardly from the clamping plate for engagement by one  
2 edge of the locking bar when it is moved to the first  
3 position and for engagement by the other edge of the  
4 locking bar when it is moved to the second position. A  
5 locking nut is threadedly mounted on the bolt, and a  
6 first coil spring of frusto-conical shape is carried on  
7 the bolt between the rear surface of the clamping plate  
8 and the locking bar, while a second similar coil spring  
9 is positioned on the bolt between the locking bar and the  
10 nut.

11

#### 12 **Brief Description of the Drawings**

13 The character of the invention, however, may be best  
14 understood by reference to one of its structural forms,  
15 as illustrated by the accompanying drawings, in which:

16 Figure 1 is a front elevational view of a wall  
17 panel system incorporating the principles of the  
18 invention;

19 Figure 2 is a horizontal sectional view of the  
20 invention, taken on the line II-II of Figure 1, with a  
21 portion broken away for purposes of illustration;

22 Figure 3 is an exploded perspective view of a  
23 fastener forming part of the invention;

24 Figure 4 is a front elevational view of a modified  
25 form of the invention;

1           Figure 5 is a horizontal sectional view of the  
2 invention, taken on the line V-V of Figure 4 with the  
3 locking bar shown in its lock position and with a portion  
4 broken away for purposes of illustration;

5           Figure 6 is a fragmentary vertical view of the  
6 invention showing the locking bar in its non-lock  
7 position; and

8           Figure 7 is a sectional view of the invention taken  
9 on line VII-VII of Figure 5.

10

#### 11           **Description of the Preferred Embodiment**

12           Referring first to Figure 1, wherein are best shown  
13 the general features of the invention, the wall panel  
14 system, indicated generally by the reference numeral 10,  
15 is shown as including two panel elements 12 and 14  
16 located adjacent to one another in the same general  
17 plane. The panels have spaced, parallel edges 16 and 18,  
18 respectively, that define a narrow gap 20 between them.

19           Several fasteners, such as the fastener 24, hold the  
20 panels in a fixed relationship so as to define a wall or  
21 enclosure.

22           As shown in Figures 2 and 3, the fastener 24  
23 includes a clamping plate 26, a locking bar 28, and a  
24 threaded bolt 30. The inner surface of clamping plate 26  
25 contacts marginal portions of the outer surfaces of the

1 panel elements 12 and 14, thus bridging the gap 20. An  
2 aperture 32 is positioned substantially centrally of  
3 plate 26 in alignment with the midpoint of the gap. The  
4 clamping plate has two spaced, parallel tongues 34 and 36  
5 extending through the gap 20 to the rear side of the  
6 panel elements, with the side edges of said tongues  
7 preferably abutting the edges 16, 18 so as to define the  
8 width of gap 20. The locking bar 28 has a threaded  
9 central aperture 32 through which bolt 30 extends in  
10 threaded engagement.

11 A nut 40 is threadedly attached to the bolt 30,  
12 while friction springs 42 and 44 are positioned on the  
13 bolt between the clamping plate and the locking bar and  
14 between the locking bar and the nut, respectively. These  
15 springs are coil springs of frusto-conical configuration.  
16 In the version of the invention shown in Figures 1-3, the  
17 panel elements 12 and 14 are shown as flat walls or  
18 panels sandwiched between clamping plate 26 and flange  
19 parts 55 of hollow walls 58 and 60, which walls have a  
20 hollow post 50 of generally square cross-sectional shape  
21 located therebetween, said post having inwardly extending  
22 flanges 62 and 64, the edges of which also abut the side  
23 edges of tongues 34, 36. It should be noted that the  
24 panels 12, 14 are not actually essential to the integrity  
25 of the system, and may be eliminated, although for



1 aesthetic reasons, and in order to provide a  
2 substantially flat overall wall, it is preferred that  
3 they be used.

4 Figure 3 shows the details of the fastener 24, which  
5 is intended for use in any wall panel system in which two  
6 panel elements are located adjacent one another in the  
7 same general plane and the panel elements have spaced,  
8 parallel edges defining a narrow gap between them. The  
9 fastener includes the clamping plate 26 for contacting  
10 outside surfaces of the panel elements and the two  
11 spaced, parallel tongues 34 and 36 which are adapted to  
12 extend through the gap and to determine the width of the  
13 gap. The plate has the bore 32 whose center is located  
14 midway between the tongues and is intended to be located  
15 midway between the edges defining the gap. The bolt 30  
16 extends through the bore with a head 66 to be located on  
17 the outside of the clamping plate, and the locking bar 28  
18 is threaded on the bolt 30 and has a length that is less  
19 than the distance between the tongues 34, 36, although  
20 longer than the width of the gap, so that it can swing  
21 from a first position between the tongues to a second  
22 position bridging the gap at a right angle to the first  
23 position. A stop 54 extends rearwardly from the clamping  
24 plate and is intended to be engaged by one end of the  
25 locking bar when it is moved to the first position and

1 engaged by the other end of the locking bar when it is  
2 moved to the second position so as to define the limits  
3 of movement of the locking bar. The coil spring 42 has  
4 a frusto-conical shape and is carried on the bolt between  
5 the rear surface of the clamping plate and the locking  
6 bar. In the version of the invention shown in Figures  
7 1-3, the nut 40 is mounted on the bolt 30 rearwardly of  
8 the locking bar and the frusto-conical coil spring 44 is  
9 carried on the bolt between the locking bar and the nut.

10 Each of the tongues 34 and 36 is formed with spaced,  
11 parallel edges, the distance between the edges being the  
12 desired width of the gap between the edges of the panel  
13 elements. The stop 54 is preferably fastened to the  
14 tongue 36, is of generally rectangular shape, extends at  
15 a right angle to the tongue, and has a width that is  
16 approximately one-half the distance from the centerline  
17 of the bolt to the tongue. The locking bar 28 is narrower  
18 than the width of the gap, so that, when the locking bar  
19 is in the first position, it can pass through the gap.

20 The operation of the invention will now be readily  
21 understood in view of the above description. The panel  
22 elements 12 and 14 are brought together in the same plane  
23 with their edges 16 and 18 in spaced, parallel  
24 relationship and a gap is formed of the desired width.  
25 A plurality of fasteners 24 are located in the gap in

1 vertically spaced relation. The width of the tongues 34  
2 and 36 is used to locate the edges 16 and 18, and the  
3 bolt 30, which has a socket head 66, is then turned.  
4 This serves to turn the locking bar 28 from its vertical  
5 position (in which it extends between the tongues) to a  
6 horizontal position (shown in Figure 2) where it bridges  
7 the gap 20 and engages the back surfaces of the panel  
8 elements. As the locking bar is turned in this way, it  
9 eventually reaches a final position against the stop 54,  
10 so that further turning of the bolt 30 causes the locking  
11 bar only to advance (without rotating) toward the back  
12 surfaces of the panel elements. Eventually, the panel  
13 elements are tightly clamped between the locking bar and  
14 the clamping plate. It should be noted that the springs  
15 42 and 44 serve to provide sufficient friction to hold  
16 the locking bar in place in either the first position  
17 (between the tongues) or the second position (bridging  
18 the gap), and also provide sufficient friction so that  
19 when bolt 30 is first turned, the locking bar swings from  
20 the aforesaid first position until it engages stop 54, at  
21 which time it is in the aforesaid second position.

22 The initial position of the locking bar along the  
23 bolt 30 may be pre-adjusted so as to minimize the number  
24 of turns required to effect tight clamping of the  
25 assembly. The position of the nut determines the amount



1 of friction provided by the conical spring 44, while the  
2 position of locking bar 28 on bolt 30 determines the  
3 tension of spring 42. The friction imparted by spring 42  
4 assures that turning of the bolt 30 causes the locking  
5 bar to turn in the direction that the bolt is turned.  
6 Once the locking bar engages the stop 54, the friction of  
7 the spring is overcome, and further turning of the bolt  
8 causes the locking bar to proceed either toward or away  
9 from the panel elements. In other words, the locking bar  
10 clamps the panel elements tightly or moves away from them  
11 for removal of the fastener and disassembly of the  
12 panels.

13 The advantages of the invention are evident from the  
14 above description of the operation. It is clear that  
15 once a rough application of the fastener 24 has been  
16 made, it is possible to tighten it from the front side  
17 alone. In other words, it is not necessary to hold any  
18 of the fastener elements at the back side of the panels.  
19 A single person can, therefore, assemble the panels and  
20 completely tighten the locking bar in place by turning  
21 the bolt 30. The tongues 34 and 36 serve to determine  
22 the distance between the edges 16 and 18 and to determine  
23 the width of the gap 20. There is no necessity for  
24 forming the panel elements in any special form; in the  
25 preferred embodiment of the invention, the panel elements



1 are formed with plain, straight edges. Any number of  
2 fasteners can be used, depending on the height and nature  
3 of the installation. The clamping plate can be formed in  
4 any decorative form, so that the exposed part of the  
5 fastener has aesthetic appeal and does not have any sharp  
6 edges or appendages that could cause injury or damage to  
7 clothing. It should also be noted that all the operative  
8 parts of the fastener can leave the factory in assembled  
9 form and that there is no need to remove them before  
10 applying the fastener to panel elements. Therefore, the  
11 likelihood of losing small parts is eliminated. The use  
12 of conical springs gives the advantage that they can be  
13 compressed a considerable amount without engagement  
14 between adjacent coils. This means that damage to the  
15 spring will not take place even when the springs are  
16 tightly compressed. Furthermore, by adjusting the  
17 position of nut 40 on bolt 30, the spring 44 can always  
18 be maintained under tension, no matter what the initial  
19 adjusted position of locking bar 28 on bolt 30 may be,  
20 thus preventing the locking bar from flopping around  
21 between its first and second positions.

22 Figures 4 through 7 show a variation of the  
23 invention which differs from Figures 1 through 3 only in  
24 that a decorative cover or channel 68 in the form of an  
25 elongated U-shaped channel bridges the gap 20. Speci-

1        fically, as will be seen most clearly in Figures 4 and 5,  
2        the depth of channel 68 is approximately equal to the  
3        thickness of plate 26 so as to snugly receive same, the  
4        outer wall 70 of channel 68 having a plurality of  
5        openings 72 therein in alignment with the openings 32  
6        whereby bolts 30 extend through aligned openings 72  
7        and 32 so that only the bolt heads 66 are visible from  
8        the front side of the system. Thus when, as aforesaid,  
9        the fasteners 24 are turned to effect clamping of the  
10       post flanges 62, 64 and the flange parts 55, as well as  
11       panels 12 and 14, if the latter are used, between  
12       plates 26 and locking bars 28, the cover or channel 68 is  
13       also clamped therebetween, said channel covering the  
14       gap 20 and also covering the clamping plates 26, so as to  
15       provide a more aesthetically pleasing appearance to the  
16       system.

17        It is obvious that minor changes may be made in the  
18        form and construction of the invention without departing  
19        from the material spirit thereof. It is not, however,  
20        desired to confine the invention to the exact form herein  
21        shown and described, but it is desired to include all  
22        such as properly come within the scope claimed.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE  
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

- 1           1.    Wall panel system, comprising  
2                   (a)   two panel elements located adjacent to one  
3 another in the same general plane, the panels having  
4 spaced, parallel edges defining a narrow gap  
5 therebetween,  
6                   (b)   a fastener holding the panels in fixed  
7 relationship, the fastener including a clamping plate, a  
8 locking bar, and a bolt, the clamping plate contacting  
9 one side surface of both panel elements, bridging the  
10 gap, and having an aperture aligned with the gap, the  
11 plate having means extending through the gap to the other  
12 side of the panel elements, said means defining the width  
13 of the gap, the locking bar having a threaded central  
14 aperture, and the bolt extending through the aperture in  
15 the clamping plate and being threaded to the threaded  
16 aperture in the locking bar, and  
17                   (c)   a nut threaded on the bolt, and friction  
18 springs on the bolt between the clamping plate and the  
19 locking bar and between the locking bar and the nut,  
20 respectively.

- 1           2.    Wall panel system as recited in claim 1,  
2 wherein the springs are of frusto-conical form.



3. Wall panel system as recited in claim 1 or 2, wherein said means comprise a pair of spaced parallel tongues the width of which define the width of the gap.

4. Wall panel system, comprising

(a) two panel elements located adjacent to one another in the same general plane, the panels having spaced, parallel edges defining a narrow gap therebetween,

(b) a fastener holding the panels in fixed relationship, the fastener including a clamping plate, a locking bar, and a bolt, the clamping plate contacting one side surface of both panel elements, bridging the gap, and having an aperture aligned with the gap, the plate having means extending through the gap to the other side of the panel elements, said means defining the width of the gap, the locking bar having a threaded central aperture, and the bolt extending through the aperture in the clamping plate and being threaded to the threaded aperture in the locking bar, and

(c) stop means carried by said plate for limiting rotatable movement of said locking bar from a first position wherein it extends longitudinally within said gap to a second position wherein it bridges said gap.



1           5. Fastener for use in a wall panel system in  
2 which two panel elements are located adjacent one another  
3 in the same general plane, the panel elements having  
4 spaced, parallel edges defining a narrow gap between  
5 them, comprising:

6           (a) a clamping plate contacting outside  
7 surfaces of the panel elements and having two  
8 spaced, parallel tongues adapted to extend through  
9 the gap defining the width of the gap, the plate  
10 having a bore located between the tongues and  
11 between the edges defining the gap,

12           (b) a bolt extending through the bore with a  
13 head located on the outside of the clamping plate,

14           (c) a locking bar threaded on the bolt and  
15 having a length that is less than the distance  
16 between the tongues and longer than the width of the  
17 gap, so that it can swing from a first position  
18 between the tongues to a second position  
19 substantially perpendicular to the first position,  
20 and

21           (d) a stop extending rearwardly from the  
22 clamping plate to be engaged by one end of the  
23 locking bar when it is moved to the first position  
24 and engaged by the other end of the locking bar when  
25 it is moved to the second position.

6. Fastener as recited in claim 5, wherein a coil spring of frusto-conical shape is carried on the bolt between the rear surface of the clamping plate and the locking bar.

7. Fastener as recited in claim 5 or 6, wherein a nut is mounted on the bolt rearwardly of the locking bar, and wherein a frusto-conical coil spring is carried on the bolt between the locking bar and the nut.

8. Fastener as recited in claim 5, 6 or 7, wherein the tongues are formed with spaced, parallel edges, the distance between the edges being the desired width of the gap between the edges of the panel elements.

9. Fastener as recited in any one of claims 5 to 8, wherein the stop is fastened to one of the tongues, is of generally rectangular shape, extends at a right angle to the said one of the tongues, and has a width that is approximately one-half the distance from the centerline of the bolt to the said one of the tongues.

10. Fastener as recited in any one of claims 5 to 9, wherein the locking bar is narrower than the width of the gap,  
so

that, when the locking bar is in the first position, it can pass through the gap.

11. Wall panel system as recited in claim 1, 2 or 3, wherein an elongated cover extends over the outer surface of the panel elements and covers the fastener and gap, and wherein the cover has an aperture in alignment with the clamping plate aperture through which the said bolt extends.

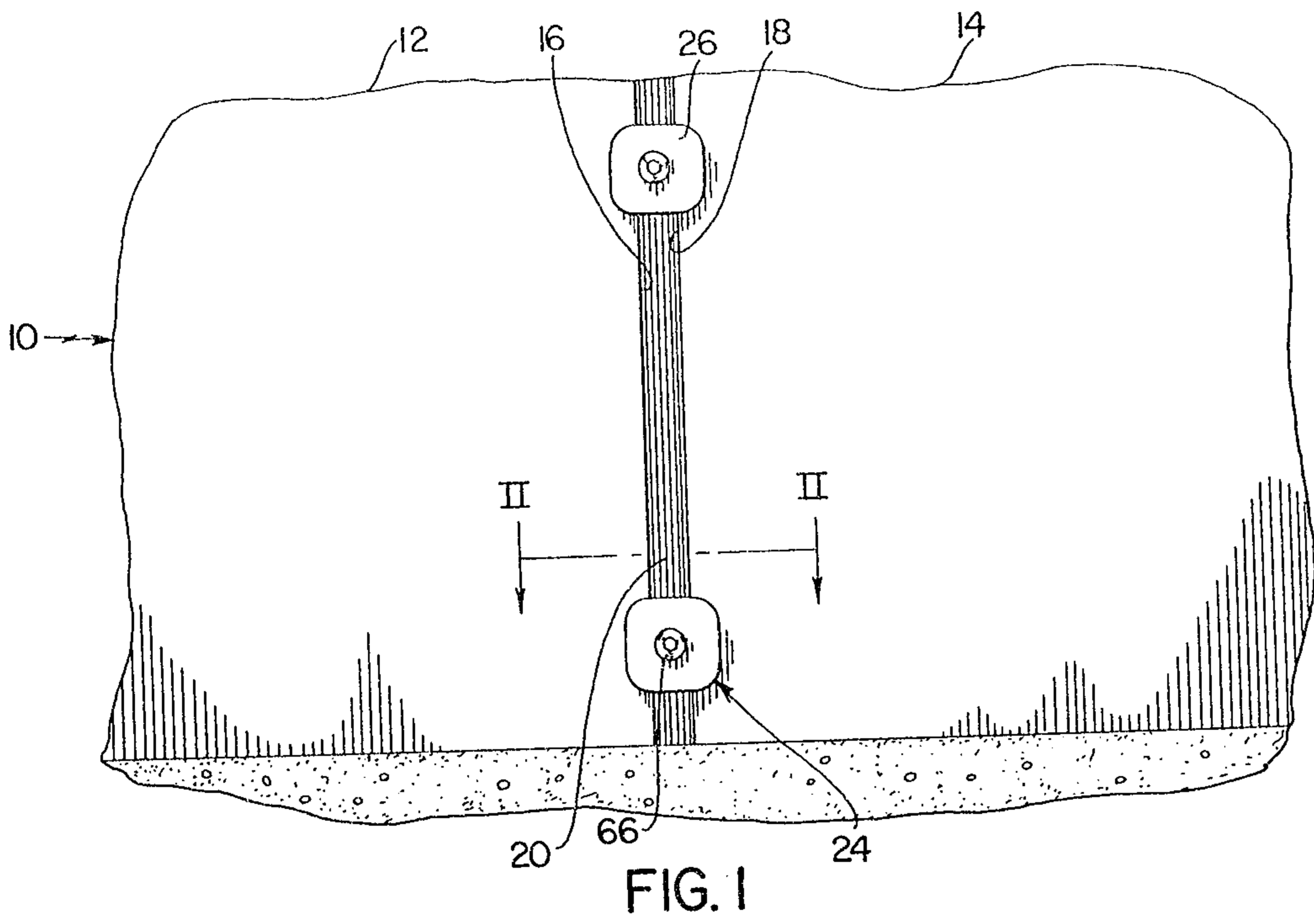


FIG. 1

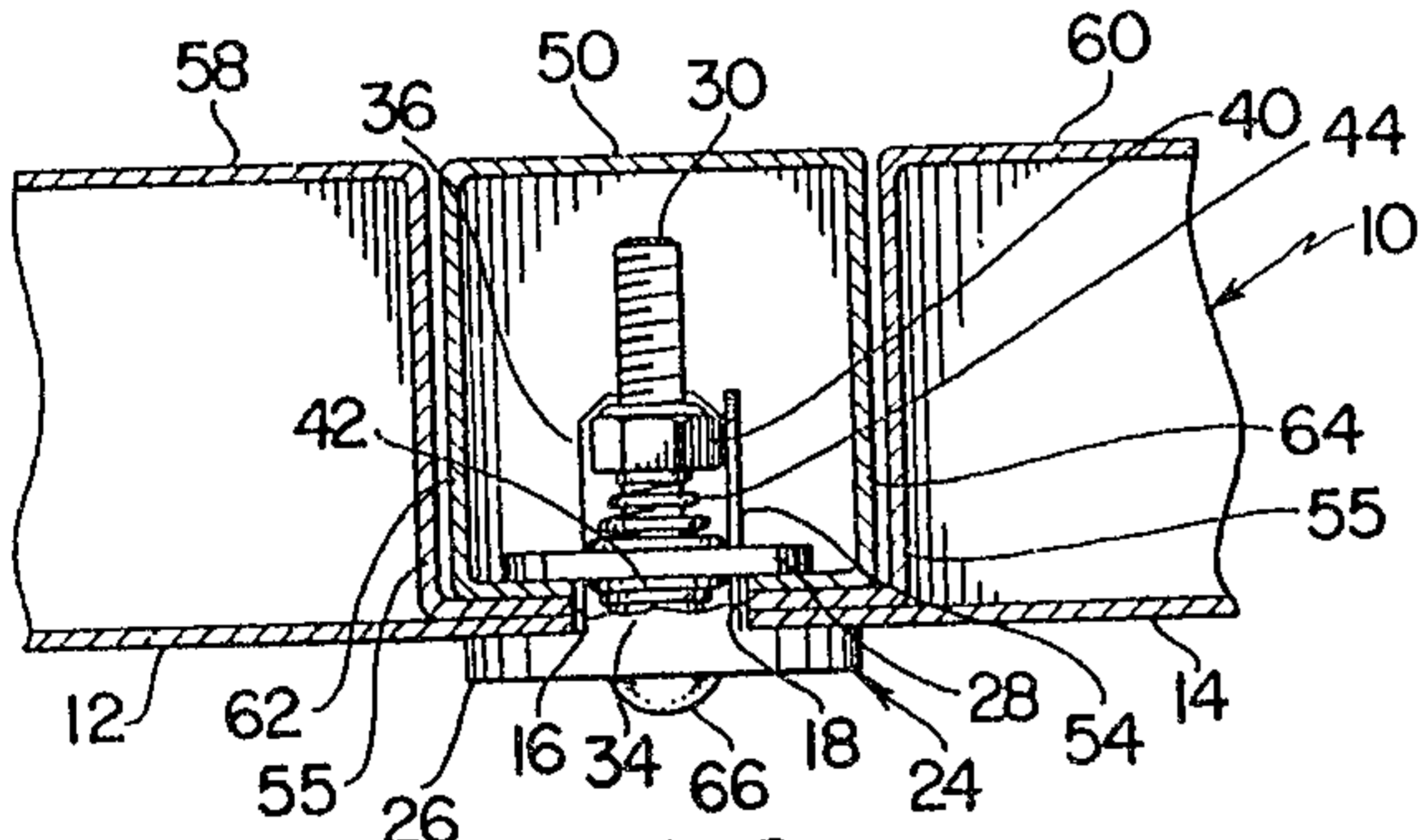


FIG. 2

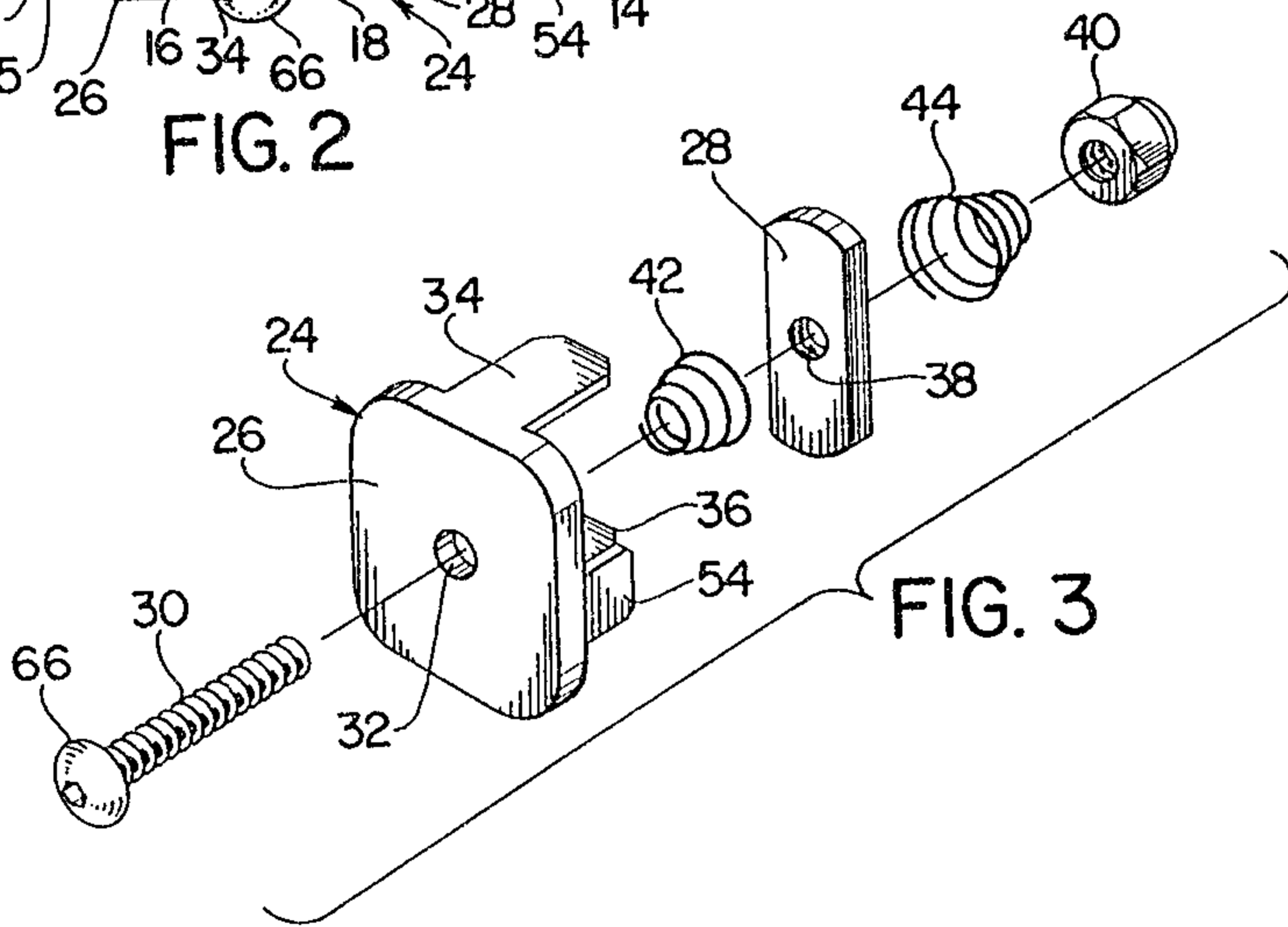


FIG. 3



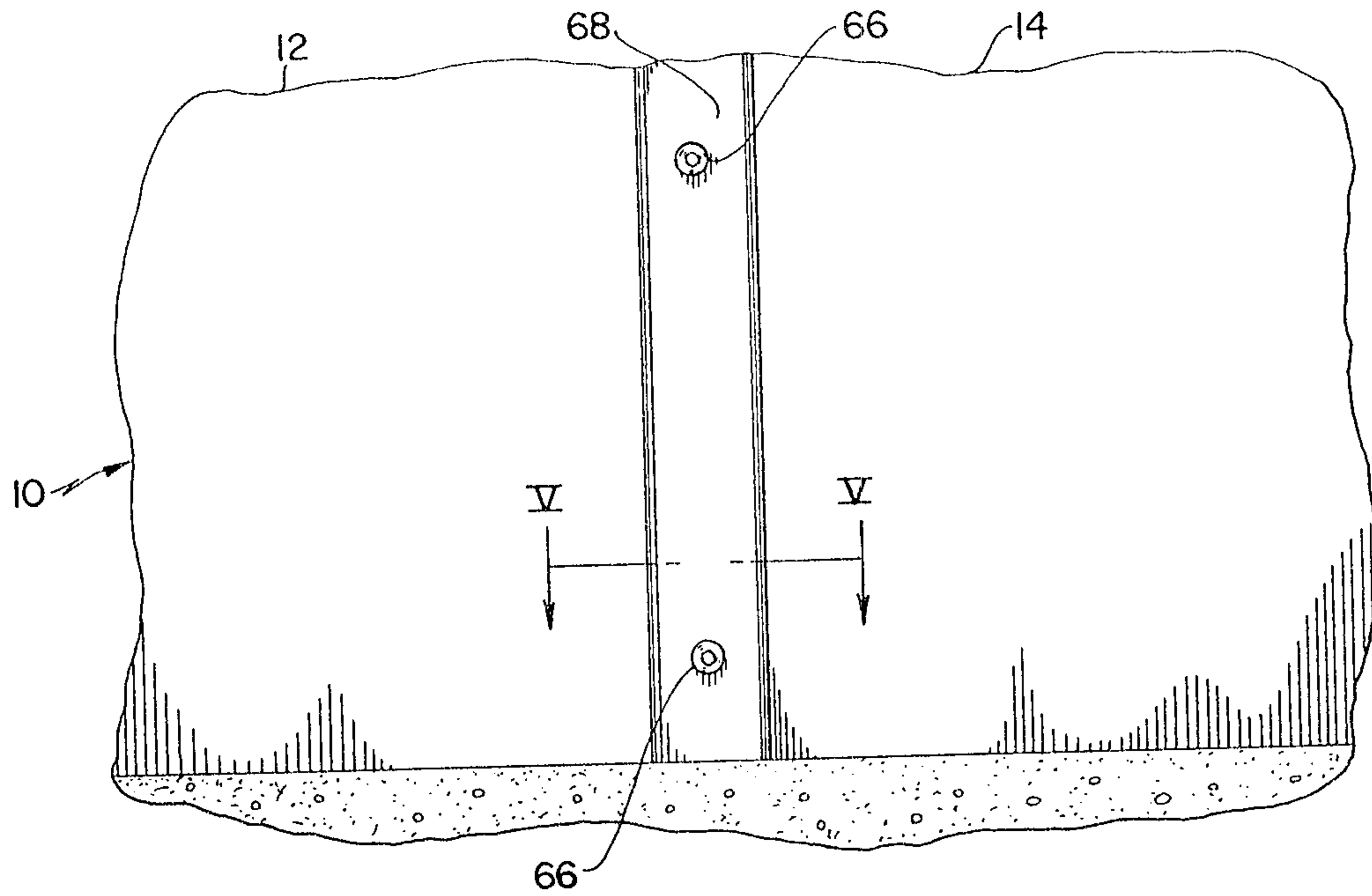


FIG. 4

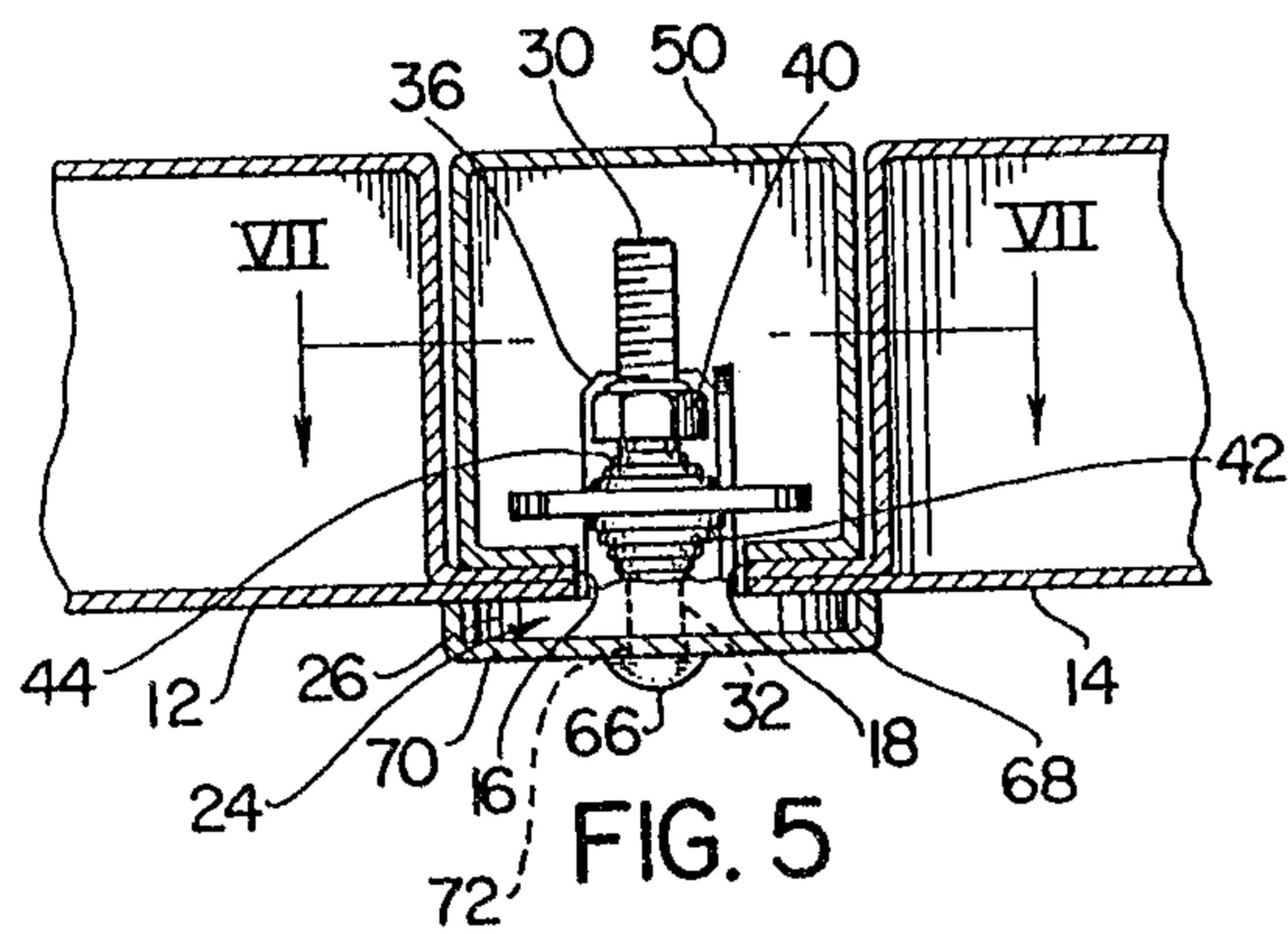


FIG. 5

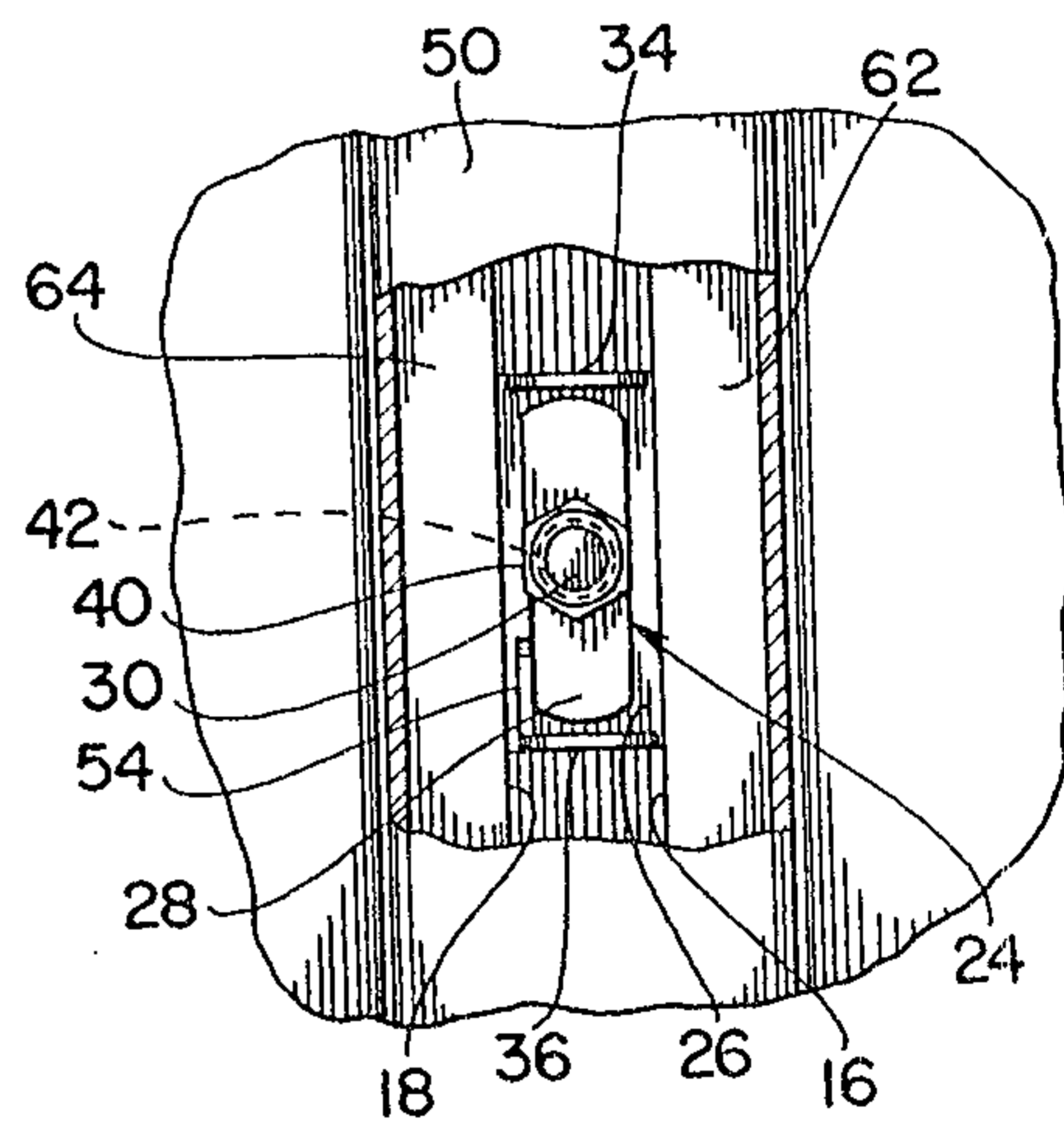


FIG. 6

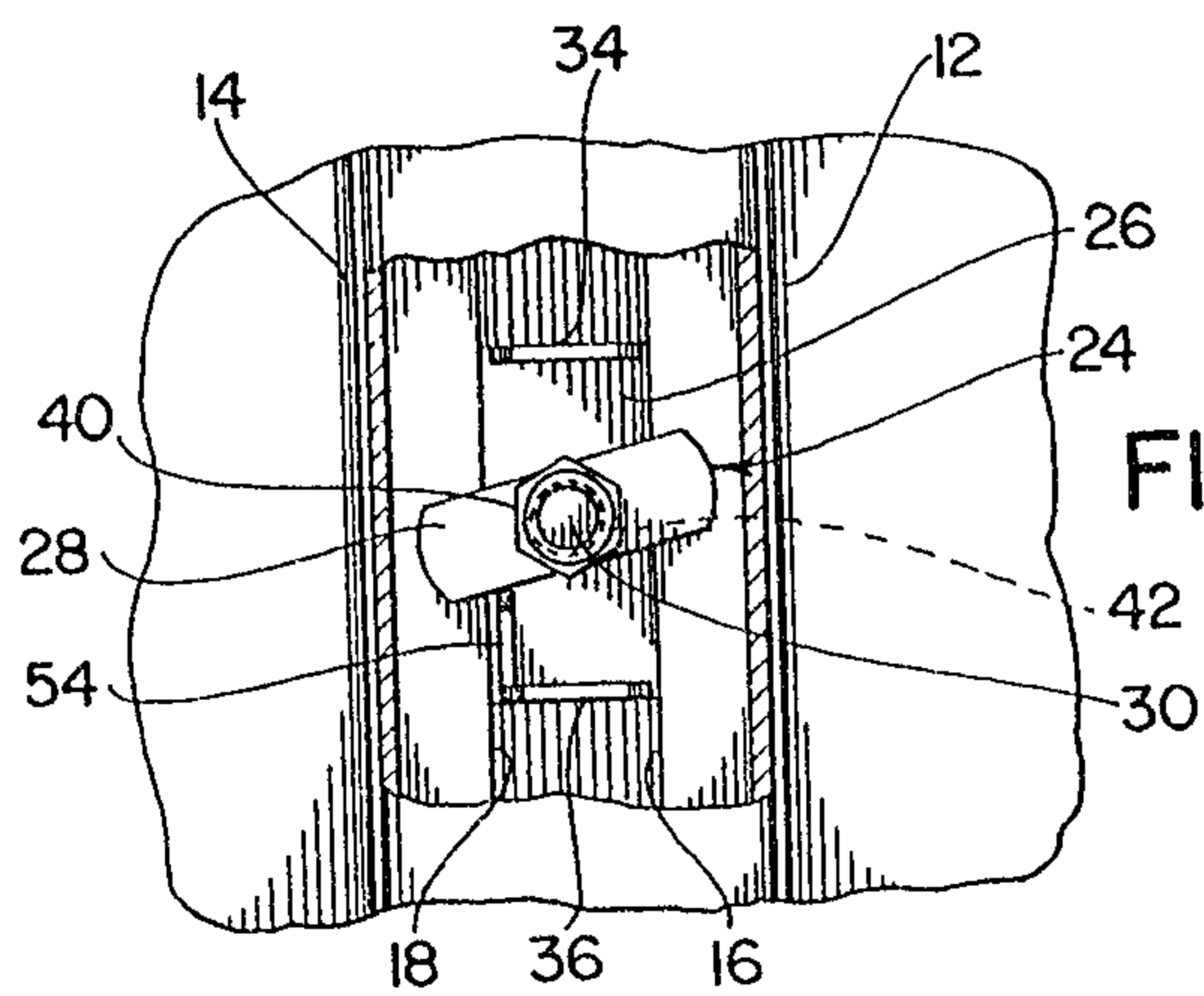


FIG. 7

*Scott & Aylen*

