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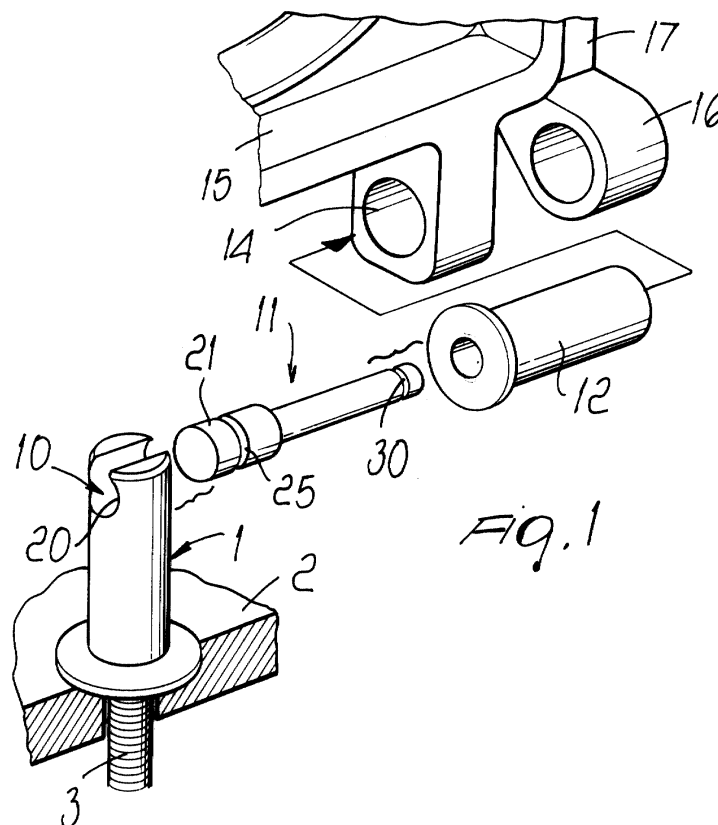
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(54) **Quick coupling device, particularly for connecting the seat assembly to a toilet bowl**

(57) A quick coupling device, particularly for connecting a seat assembly to a toilet bowl, comprising a post (1) which can be fixed to a toilet bowl. On the post (1) there is provided an open socket (10) for inserting therein, and extracting therefrom, at least one pivot (11)

for the connection of a seat assembly (15,17). The socket (10) forms an engagement portion (20) which can be detachably engaged by a mating portion (21) of the connection pivot (11) for the removable retention of the connection pivot (1) in the socket (10).



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Description

[0001] The present invention relates to a quick coupling device, particularly for connecting a seat assembly to a toilet bowl.

[0002] It is known that a problem currently occurring in the manufacture of elements for connecting one another a seat assembly and a toilet bowl is that of providing devices which allow to perform coupling and uncoupling very rapidly, thereby allowing easy removal for cleaning operations.

[0003] EP-0853916, incorporated herein by reference, discloses an embodiment which is substantially based on the adoption of a slider element having a particular shaping, so as to engage and disengage with the shaped end of a post being fixed to the toilet bowl.

[0004] This embodiment, while having proved to be valid in many regards, has been found to be susceptible of improvements, especially for enhancing the stability of the connection of a seat assembly to a toilet bowl by increasing the surface for coupling with the post that is connected to the toilet bowl.

[0005] The aim of the invention is to solve the above problem, by providing a quick coupling device, particularly for connecting a seat assembly to a toilet bowl, which allows to obtain a stable locking with respect to the post that is fixed to the bowl, while maintaining the possibility of a quick and easy uncoupling.

[0006] Within this aim, a particular object of the invention is to provide a coupling device which allows to pass from the locking position to the release position and/or vice versa with extremely simple movements.

[0007] Another object of the present invention is to provide a quick coupling device which, thanks to its particular constructive characteristics, is capable of giving the greatest assurances of reliability and safety in use.

[0008] Another object of the invention is to provide a quick coupling device which can be easily obtained starting from commonly commercially available elements and materials and is also competitive from a merely economic point of view.

[0009] This aim and these and other objects which will become better apparent hereinafter are achieved by a quick coupling device particularly for connecting a seat assembly to a toilet bowl, according to the invention, comprising a post which can be fixed to a toilet bowl, characterized in that it comprises, on said post, an open socket for inserting therein, and extracting therefrom, at least one pivot for the connection of a seat assembly, said socket forming at least one engagement portion which can be detachably engaged by at least one mating portion of said connection pivot for the removable retention of said connection pivot in said socket.

[0010] Further characteristics and advantages will become better apparent from the following detailed description of some preferred but not exclusive embodiments of a quick coupling device, particularly for connecting a seat assembly to a toilet bowl, illustrated only

by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a schematic perspective view of the quick coupling device according to the invention;
Figure 2 is a side elevation view of the quick coupling device;

Figure 3 is a partially sectional front view of the device with one pivot in the locking position and one pivot in the release position;

Figures 4, 5, 6 and 7 are side elevation views of posts having open sockets provided with a different configuration;

Figure 8 is a partially sectional view of a post with a mating portion which is separate from said socket;
Figure 9 is a sectional view, taken along the line IX-IX of Figure 8;

Figure 10 is an exploded perspective view of a quick coupling device for seat assemblies having wing hinges;

Figure 11 is a sectional view of the quick coupling device of Figure 10 in the release position;

Figure 12 is a partially sectional view of the device in the locking position;

Figure 13 is a sectional view, taken along the line XIII-XIII of Figure 12;

Figure 14 is a view of a device for a wing hinge with closed bushes;

Figure 15 is a schematic perspective view of another embodiment of the quick coupling device;

Figure 16 is a partially sectional view of the device of Figure 15 in the release position;

Figure 17 is a view of the device of Figure 15 in the locking position;

Figure 18 is a front view of the coupling device of Figure 15;

Figure 19 is a schematic perspective view of an embodiment of the quick coupling device with an interlocking connection pivot;

Figure 20 is a cut away plan view of the post as taken in an upper part thereof;

Figure 21 is a view of the device of Figure 19 in the release position;

Figure 22 is a partially sectional view of the device of Figure 19 in the locking position;

Figure 23 is a perspective view of still another embodiment with an interlocking connection pivot;

Figure 24 is a plan view of the device, with the post shown in cross-section;

Figure 25 is a view of the device of Figure 23 in the release position;

Figure 26 is a view of the device of Figure 23 in the locking position.

[0011] With reference to the figures and particularly to Figures 1 to 3, the quick coupling device, particularly for connecting a seat assembly to a toilet bowl, comprises a post 1 which can be fixed in a per se known manner

to a toilet bowl 2 by way of a threaded pivot 3 which can be inserted directly in the hole 4 provided in the toilet bowl 2 or which, in a per se known manner, can be connected to an eccentric assembly so as to adjust the center distance of the connection.

[0012] The post 1 defines, at its upper end, a socket 10 which is open upwardly and is preset for the insertion and extraction of a connecting pivot 11, which can be inserted in a bush 12 acting as an element for rotary connection with the eye 14 of the seat 15 and with the eye 16 of the cover 17 of the seat assembly.

[0013] The important particularity of the invention consists in that the socket 10 defines an engagement portion 20 which is wider than the open portion of the socket.

[0014] A mating portion 21 can detachably couple with the engagement portion 20, is formed in the pivot 11 and is shaped complementarily to the engagement portion 20.

[0015] As shown in Figures 1 to 3, the socket 10 is shaped like a cylindrical portion with an upper opening which is narrower than the diameter; accordingly, the mating portion 21, formed in the pivot 11, is constituted by a cylindrical expansion shaped complementarily to the engagement portion 20.

[0016] A groove 25 is provided on the surface of the expansion 21 and acts as a grip element for the translatory motion of the pivot 11, which has a diameter being equal to, or smaller than, the width of the opening of said socket 10.

[0017] In further specific embodiments shown respectively in Figures 4, 5, 6 and 7, the socket 10 is configured so as to have a trapezoidal shape, in which the longer parallel side of the engagement portion 20a is directed toward the bottom of the socket.

[0018] The pivot 11 has a mating portion being shaped complementarily, so that stable fixing occurs when the correspondingly shaped mating portion 21 is inserted in the socket 10.

[0019] By causing the pivot 11 to perform a translatory motion, the body of such pivot is arranged at the socket, the dimensions of said body allowing free extraction in an upward direction, i.e., from the open part of the socket 10.

[0020] As shown in Figure 5, the engagement portion has a dovetail shape 20b whose operation is similar to what has been described above; likewise, Figure 6 illustrates a circular and cylindrical engagement portion 20c having an open part which has smaller dimensions.

[0021] In Figure 7, the socket 10 is shaped like an inverted T and the engagement portion 20d is directed downwardly, performing a function which is similar to the preceding one in combination with a pivot being shaped complementarily.

[0022] With reference to Figures 8 and 9, in a preferred embodiment, the engagement portion is separate from the socket and is constituted by an opening 20e which is arranged below the open socket and can be

engaged by a mating portion constituted by a folded part 21a formed at the end of the pivot 11.

[0023] The pivot 11 is advantageously provided with a notch 30 which engages a corresponding protrusion 31 formed inside the bush 12, so as to act as a stroke limiter for the sliding of the pivot in order to prevent its accidental extraction from the bush; obviously it is also possible to reverse the arrangement of the notch and of the protrusion.

[0024] In Figures 10 to 14, the same constructive criterion is used on a coupling device provided with wings which can be connected to the seat and to the cover, respectively.

[0025] In this embodiment, the pivot, designated by the reference numeral 11', is provided with an engagement portion being constituted by lateral protrusions 35 which detachably engage in an engagement portion being constituted by lateral recesses 36 formed in the post, which is again designated by the reference numeral 1.

[0026] The pivot 11' is inserted at its ends in bushes 37 and 38 which can be rotatably engaged by the wings 39 and 40, are arranged opposite one another with respect to the pivot 1 and engage the seat and the cover, respectively.

[0027] In both embodiments, the pivot 11 and the pivot 11' can have a grip element constituted by an upper grip protrusion 41, which allows to perform sliding.

[0028] In the case of a wing-type coupling device, as shown in Figures 10 and 11, it is optionally possible to provide the bushes 37 and 38 open, so that the pivot can exit axially from said bushes in order to position it by pushing from either side.

[0029] If blind bushes are used, as shown in Figure 14, the movement of the pivot from the locking position to the release position can be performed by using the grip protrusion 41.

[0030] With reference to Figures 15 to 18, a different solution is provided, in which an upper socket 50, which is open upward, is provided in the post 1; a transverse pivot 51 can be inserted in said socket and enters a transverse bush 52.

[0031] The pivot 51 can be retained in the socket by way of a U-shaped element 55 slidably supported by the post 1 and having a locking arm 56 which can detachably overlap the open part of the upper socket 50, locking the transverse pivot 51.

[0032] The translatory motion of the U-shaped element 55 occurs along a direction which is substantially perpendicular to the direction defined by the post 1 and to the direction defined by the pivot 51.

[0033] With reference to the embodiments of Figures 19 to 22, the quick coupling device comprises a post, designated by the reference numeral 1', which can be fixed like the post 1 to a toilet bowl 2 and is provided in an upward region with a socket 10 being open upwards, and in which it is possible to insert a connecting pivot 11" constituted by a strip 60 which can be inserted in a bush, again designated by the reference numeral 12,

which acts as an element for rotary connection to the eye 14 of the seat 15 and to the eye 16 of the cover 17.

[0034] The strip 60 has, at its free end, a folded portion 61 which is narrower than the strip 60 and is designed to lock under an annular protrusion 62 formed at the free end of post 1'.

[0035] With reference to Figures 23 to 26, a post 1" is provided which forms, proximate to its free end, an annular recess 70 in which it is possible to insert, with an interlocking coupling, the curved end 71 of an interlocking connection pivot 11" constituted by a strip 72 having a constant width and which can also be inserted in a bush, again designated by the reference numeral 12.

[0036] In the release position, the folded portion 61 and the curved portion 71 are arranged so that they do not interfere with the post 1' or 1", thus allowing to freely remove the toilet seat assembly, while when the folded portion 61 is inserted below the annular protrusion 62 or the curved portion 71 is inserted in the annular recess 70 there is a firm coupling between the connection pivot and the post for fixing the seat assembly to the toilet bowl.

[0037] It should also be observed that the interlocking connection pivots 11" and 11'" also can be provided with the notch, which can engage a corresponding protrusion provided in the bush 12, so as to provide the stroke limiter for the sliding of the pivot in order to prevent its accidental extraction from the bush.

[0038] From the above description it is thus evident that the invention achieves the intended aim and objects and in particular that a quick coupling device is provided which allows to lock the seat assembly simply by utilizing the translatory motion of a pivot which can be arranged in the locking position inside the post for connection to the toilet bowl or in a release position in which the pivot can be easily extracted from its socket.

[0039] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0040] All the details may further be replaced with other technically equivalent elements.

[0041] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements.

[0042] The disclosures in Italian Patent Application No. MI2000A000220 from which this application claims priority are incorporated herein by reference.

[0043] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A quick coupling device particularly for connecting a seat assembly to a toilet bowl, comprising a post (1) which can be fixed to a toilet bowl (2), characterized in that it comprises, on said post (1), an open socket (10) for inserting therein, and extracting therefrom, at least one pivot (11) for the connection of a seat assembly (15,17), said socket (10) forming at least one engagement portion (20) which can be detachably engaged by at least one mating portion (21) of said connection pivot (11) for the removable retention of said connection pivot (11) in said socket (10).
2. The quick coupling device according to claim 2, characterized in that said socket (10) has an upward opening.
3. The quick coupling device according to one or more of the preceding claims, characterized in that said connection pivot (11) can be inserted in bushes (12) which are adapted to act as an element for rotary connection to the eye (14) of the seat (15) and the eye (16) of the cover (17) of the seat assembly.
4. The quick coupling device according to one or more of the preceding claims, characterized in that said engagement portion (20) is wider than said opening of said socket (10).
5. The quick coupling device according to one or more of the preceding claims, characterized in that said mating portion (21) can engage and disengage said engagement portion (20) by sliding along the direction of the extension of said connection post (1).
6. The quick coupling device according to one or more of the preceding claims, characterized in that said socket (10) is shaped like a cylindrical portion in which said engagement portion (20) is constituted by the lateral regions of said socket (10), said mating portion (21) being constituted by a cylindrical expansion.
7. The quick coupling device according to one or more of the preceding claims, characterized in that said socket (10) has a trapezoidal shape in which said engagement portion (20a) constituted by the longer parallel side is directed toward the bottom of said socket (10).
8. The quick coupling device according to one or more of the preceding claims, characterized in that said engagement portion (20b) is substantially dovetail-shaped and said mating portion (21) is complementarily shaped.

9. The quick coupling device according to one or more of the preceding claims, characterized in that said socket (10) is shaped like an inverted T and said engagement portion (20b) is directed towards the bottom of said socket. 5
10. The quick coupling device according to one or more of the preceding claims, characterized in that said engagement portion is separate with respect to said socket (10) and is constituted by an opening (20a) which is arranged below said socket (10) and can be engaged by a mating portion (21a) being constituted by a folded part of said connection pivot (11). 10
11. The quick coupling device according to one or more of the preceding claims, characterized in that it comprises, on said cylindrical expansion (21), a groove (25) adapted to act as a grip element for the sliding of said connection pivot (11). 15
12. The quick coupling device according to one or more of the preceding claims, characterized in that said pivot (11) has a notch (30) which can be engaged in a corresponding protrusion (31) formed inside said bush (12) in order to act as a stroke limiter for the sliding of said connection pivot (11). 20 25
13. The quick coupling device according to one or more of the preceding claims, characterized in that said connection pivot (11') can be inserted in bushes (37,38) which can be rotatably engaged by the wings (39,40) for connection to the seat (15) and to the cover (17) of the seat assembly, said connection pivot (11') having an upper protrusion (41) adapted to act as a grip element for the sliding of said pivot (11'). 30 35
14. The quick coupling device according to one or more of the preceding claims, characterized in that said bushes (37,38) are axially open in order to allow the exit of the ends of said connection pivot (11') for the actuation thereof. 40
15. The quick coupling device according to one or more of the preceding claims, characterized in that said engagement portion is constituted by lateral protrusions (35) which can detachably engage said mating portion by lateral recesses (36) formed in said socket (10). 45 50
16. The quick coupling device according to one or more of the preceding claims, characterized in that it comprises, on said post, an upper socket (50) which is open upwardly and in which a transverse pivot (51) can be detachably inserted, a U-shaped element (55) being further provided which can perform a translatory motion in a direction substantially perpendicular to the direction defined by the post (1) and to the direction defined by the connection pivot (51), said U-shaped element (55) having a locking arm (56) which can be removably superimposed on the open part of said upper socket (50). 55
17. The quick coupling device according to one or more of the preceding claims, characterized in that it comprises an interlocking connection pivot (11'') constituted by a strip (60) which can be inserted in said bush (12) and ends, at its free end, with a folded portion (61) which can engage, in the locking position, under an annular protrusion (62) formed at the free end of said post (11''), with said strip (60) inserted in said socket (10).
18. The quick coupling device according to one or more of the preceding claims, characterized in that said folded portion (61) is narrower than said strip (60).
19. The quick coupling device according to one or more of the preceding claims, characterized in that it comprises an interlocking connection pivot (11''') constituted by a strip (72) which can be inserted in said bush (12) and defines, at its free end, a curved portion (71) which can be removably inserted, in the locking position, in an annular recess (70) formed by said post (11'').

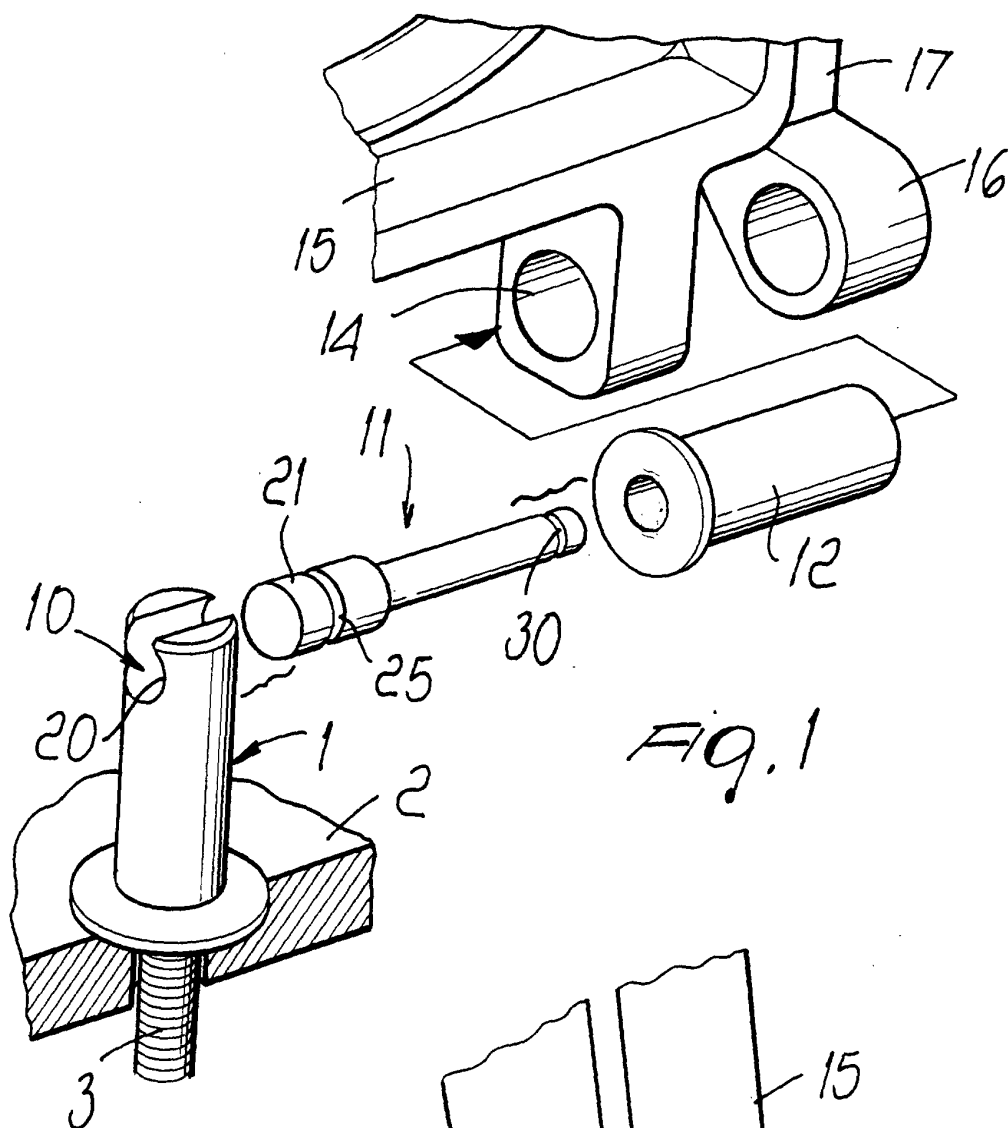


Fig. 1

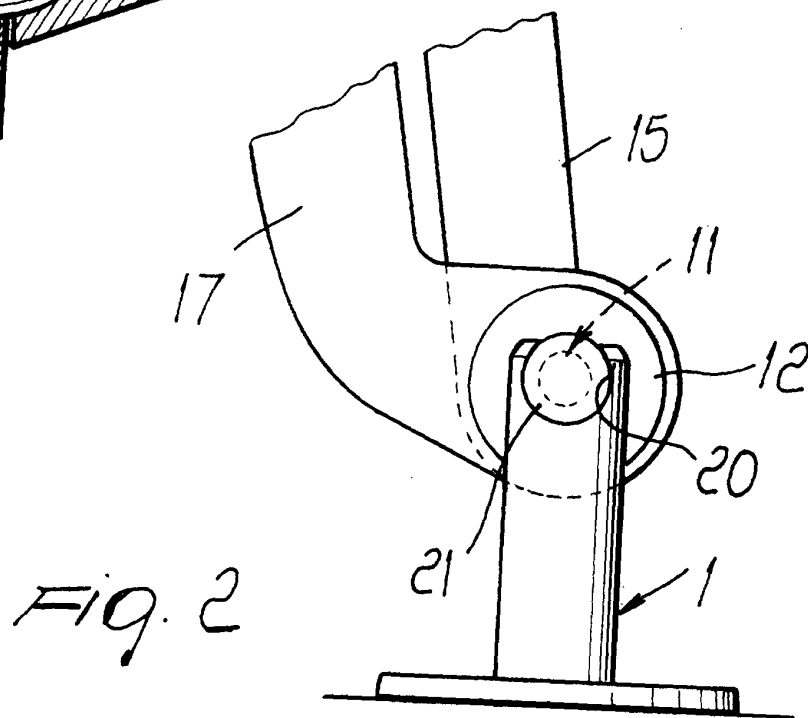


Fig. 2

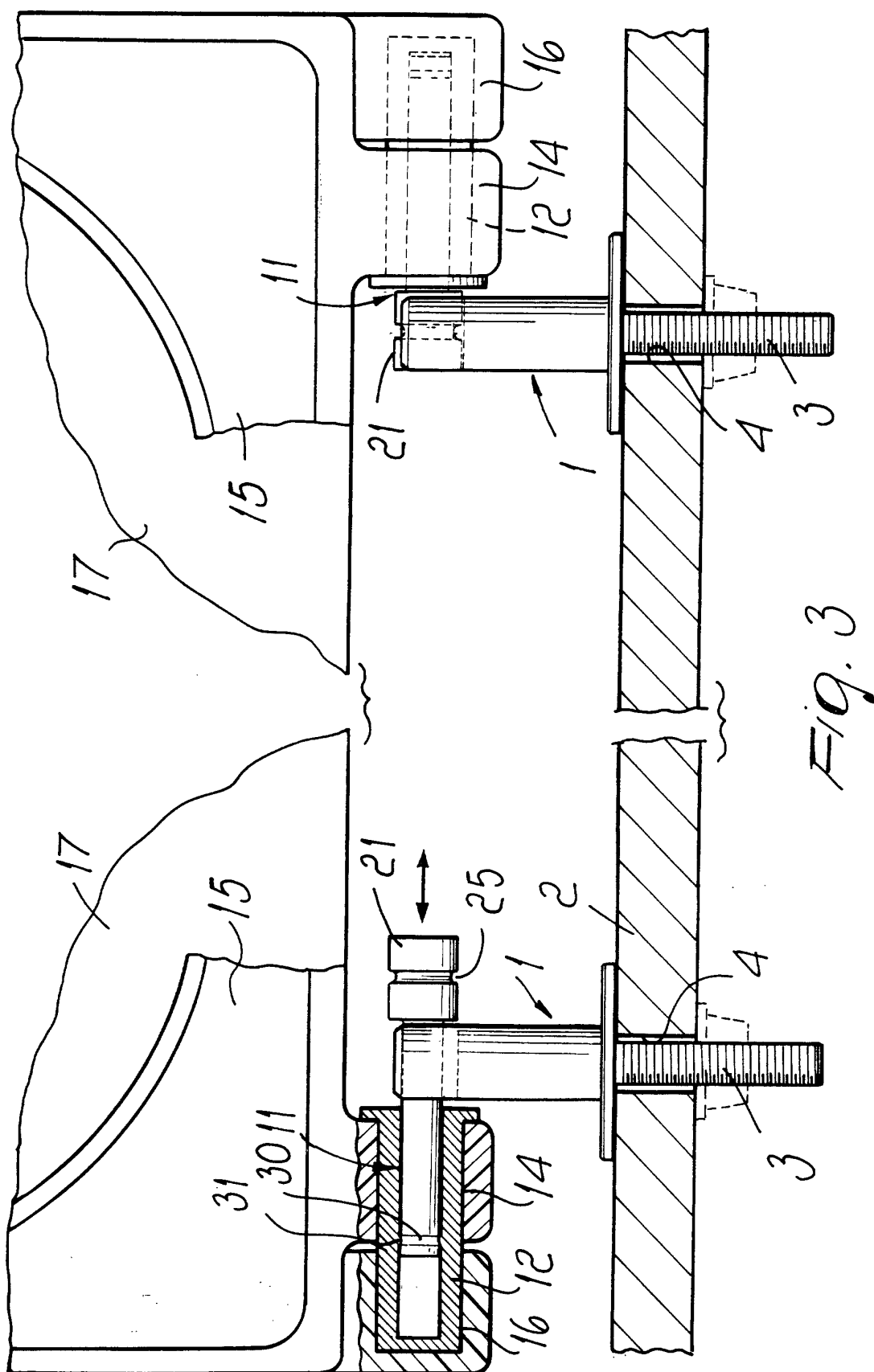


Fig. 3

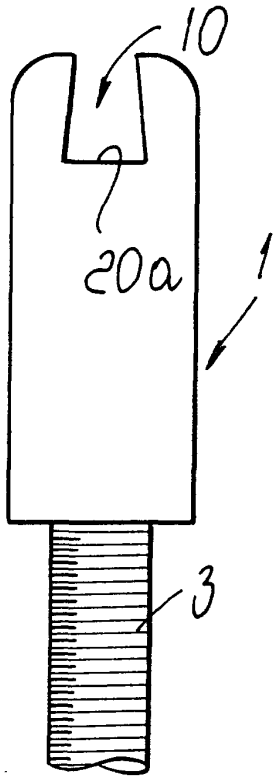


FIG. 4

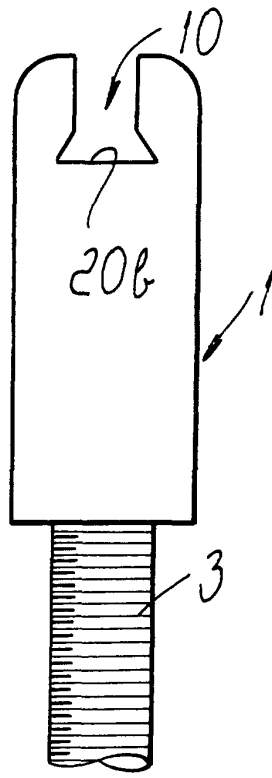


FIG. 5

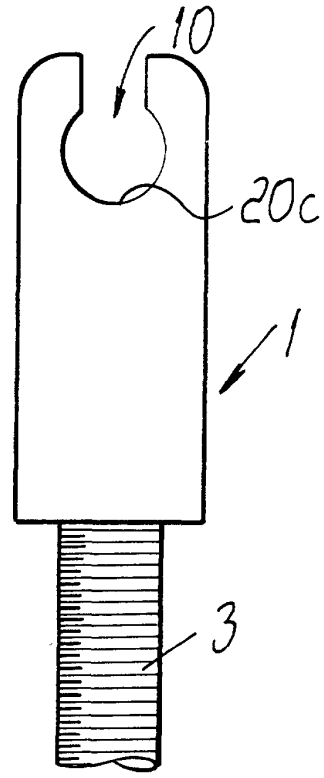


FIG. 6

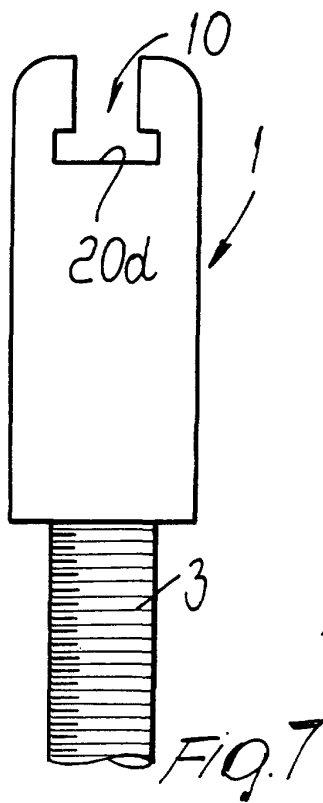


FIG. 7

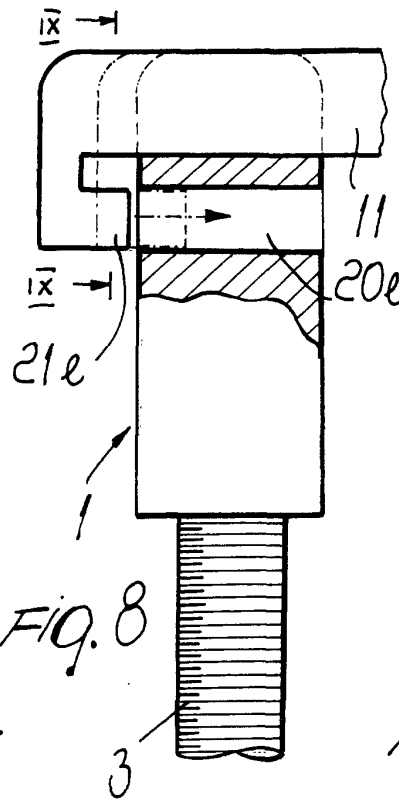


FIG. 8

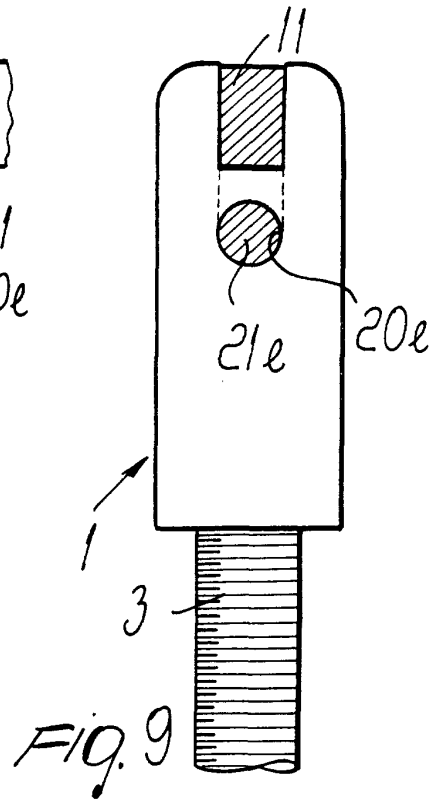
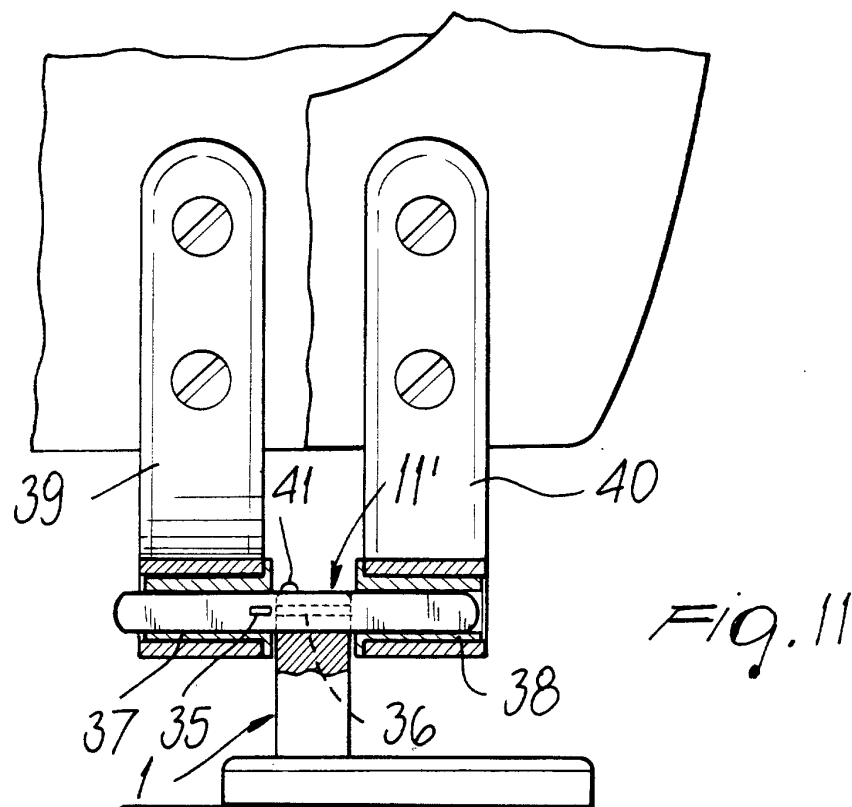
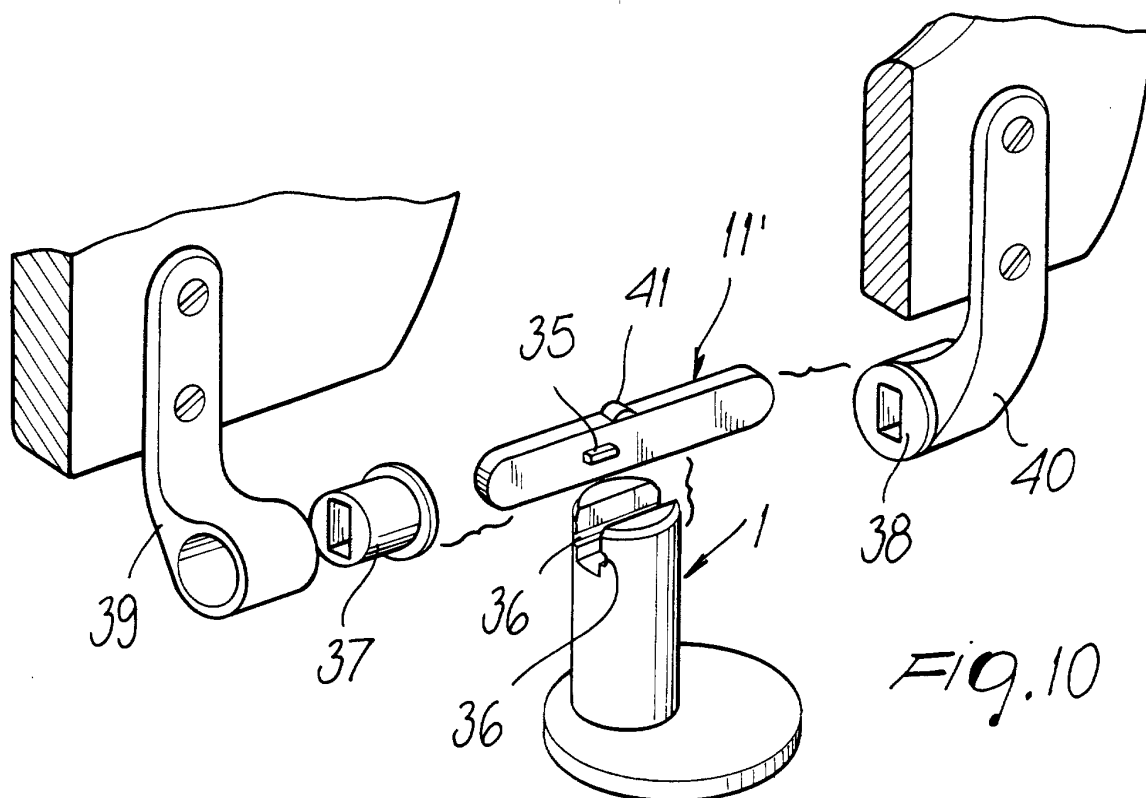


FIG. 9



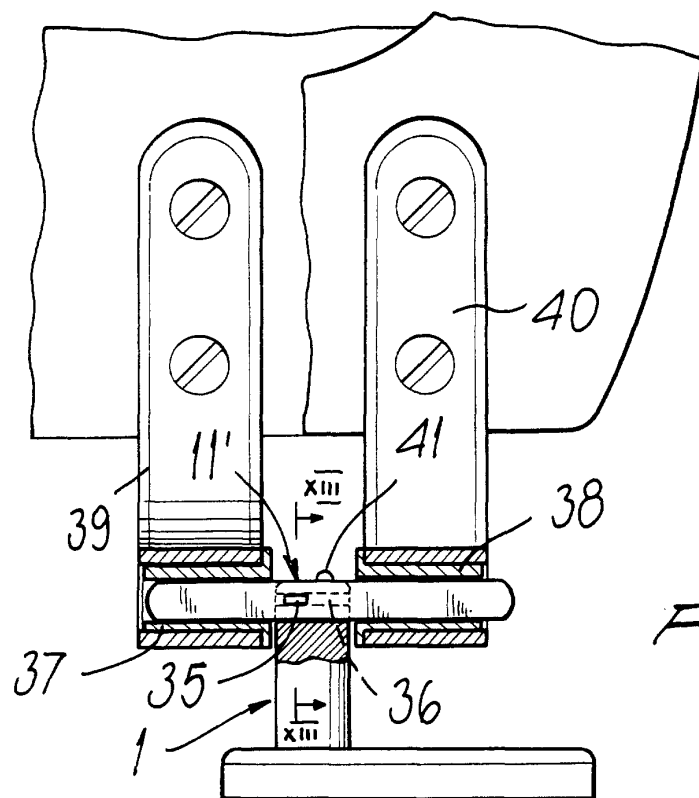


Fig. 12

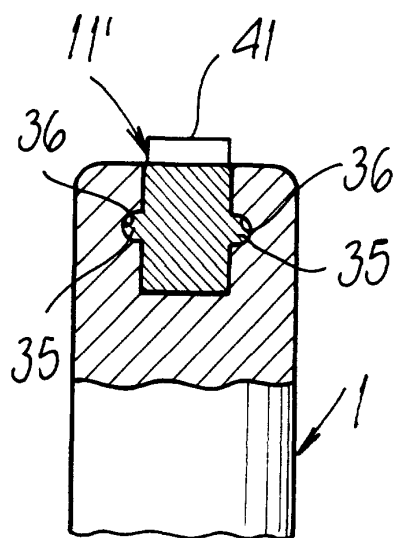


Fig. 13

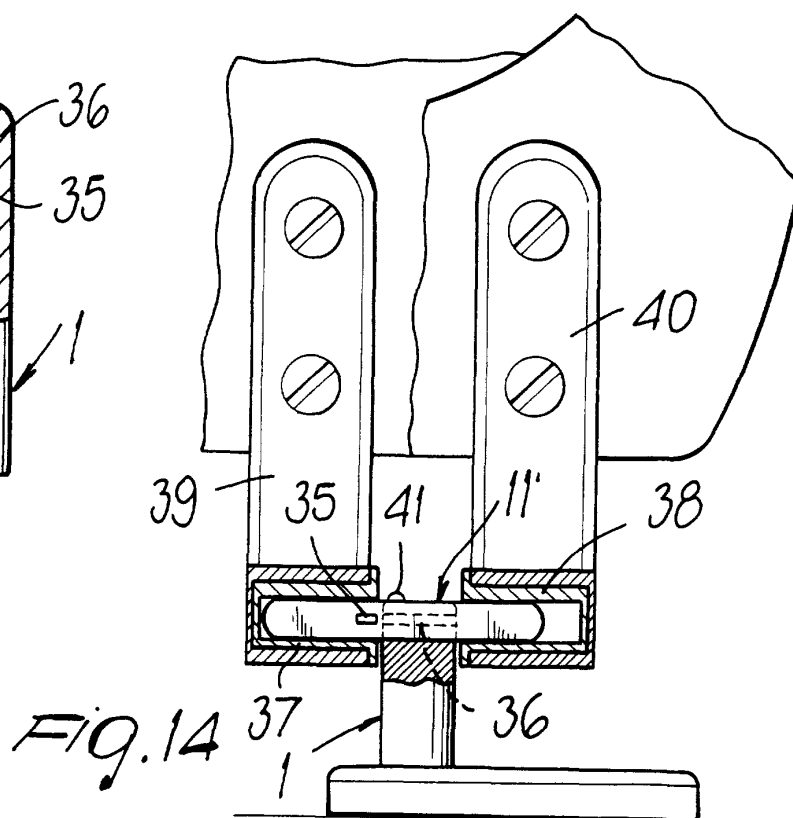


Fig. 14

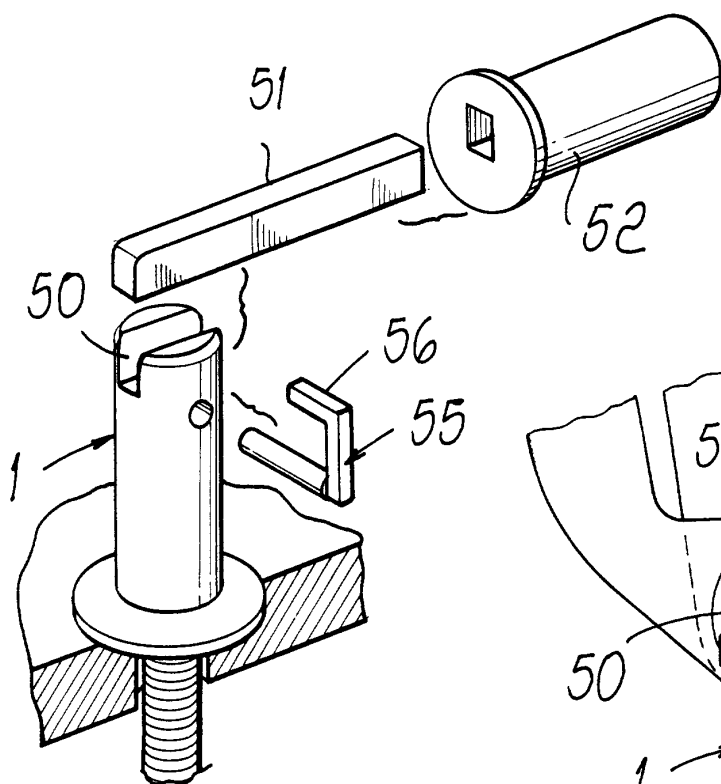


Fig. 15

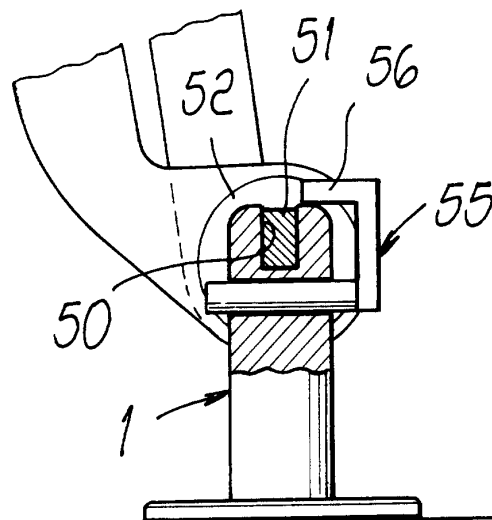


Fig. 16

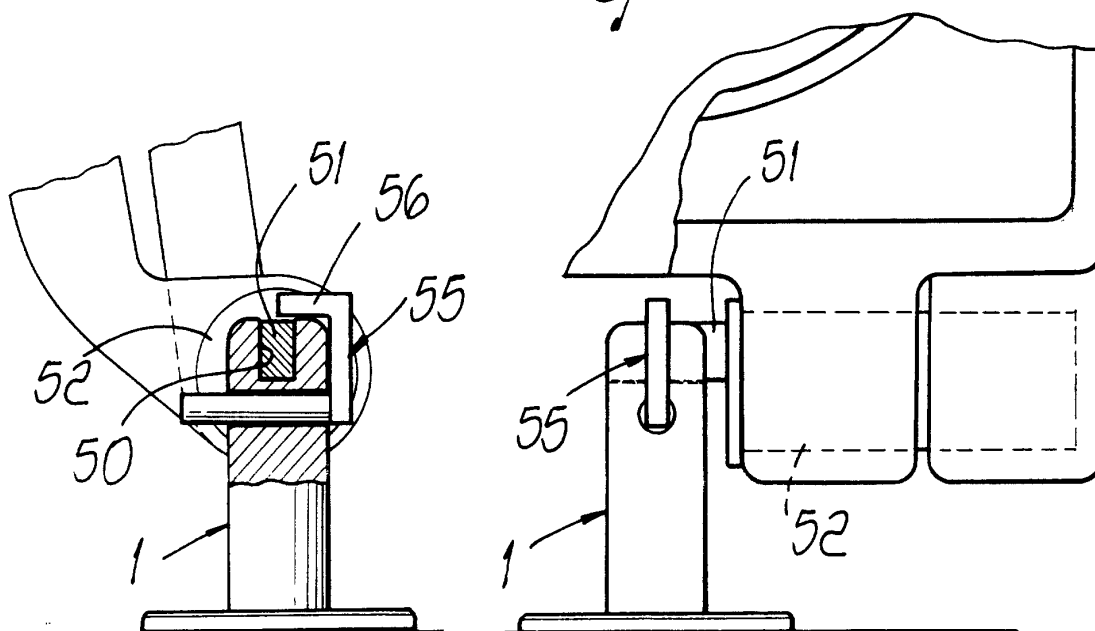


Fig. 17

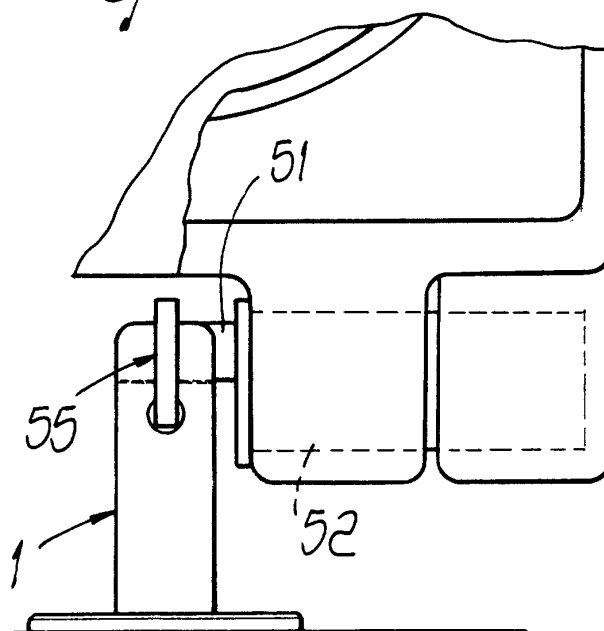
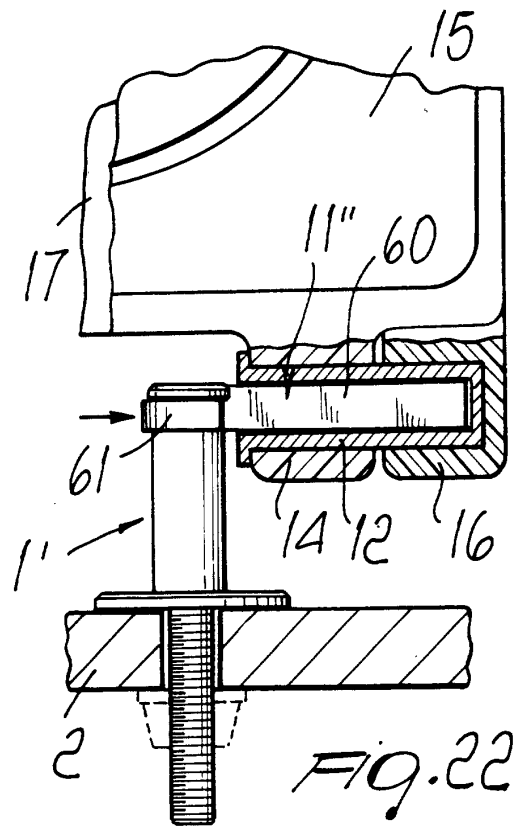
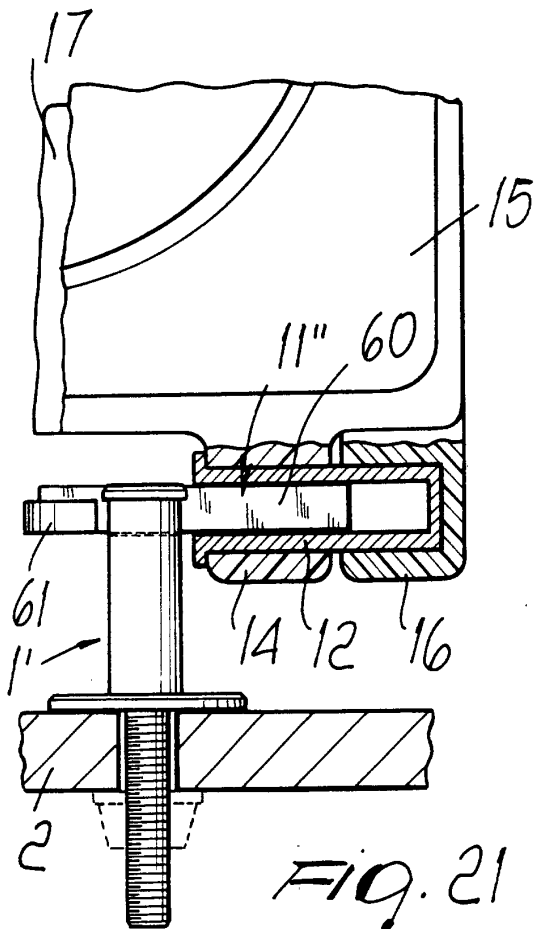
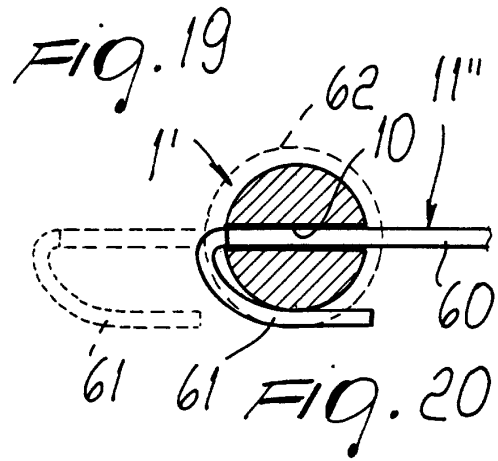
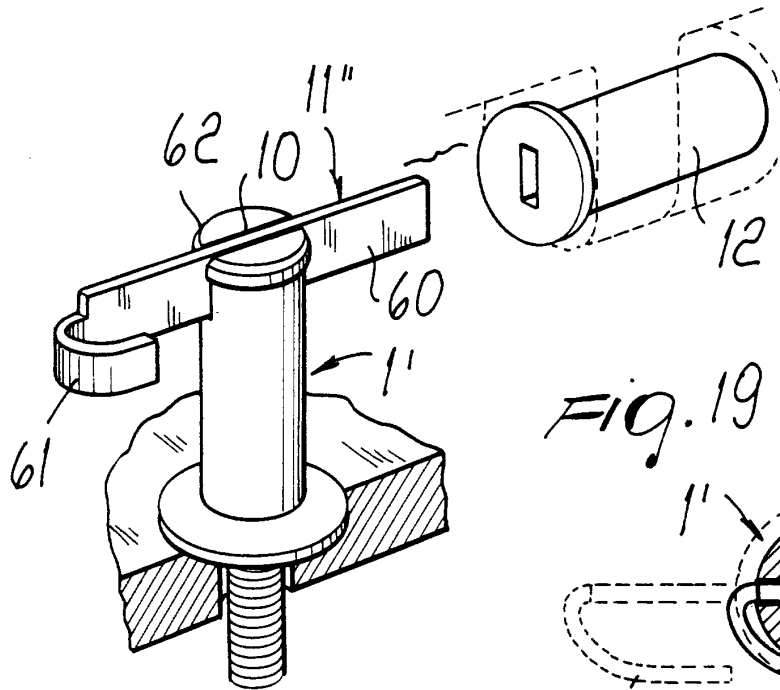


Fig. 18



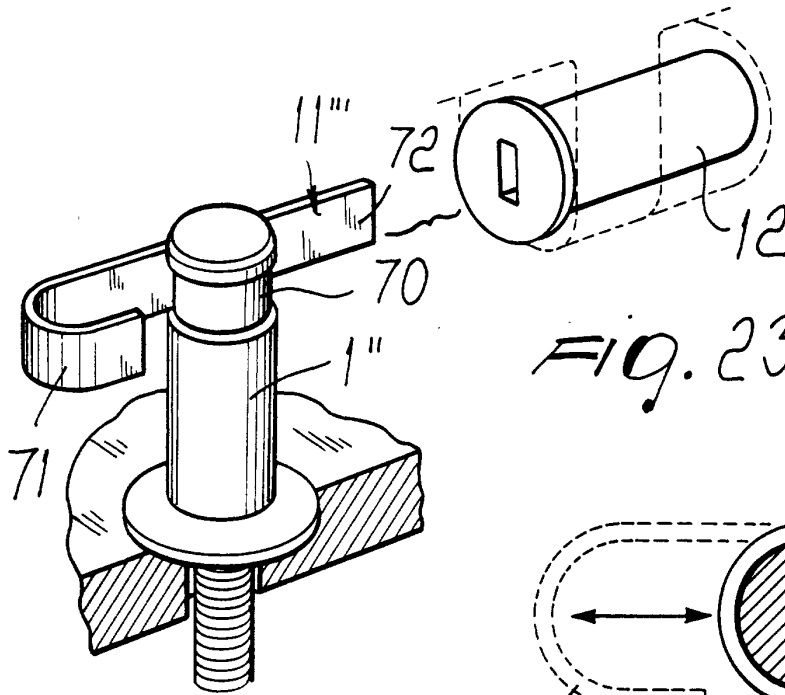


FIG. 23

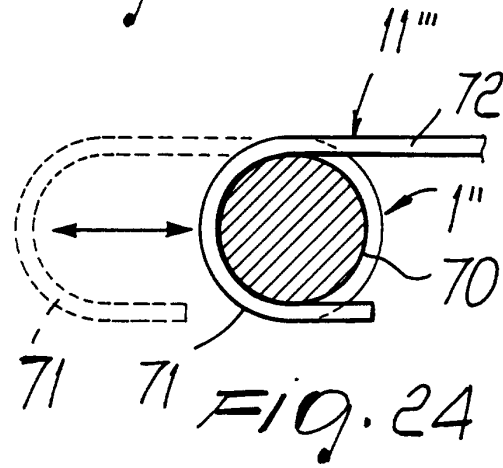


FIG. 24

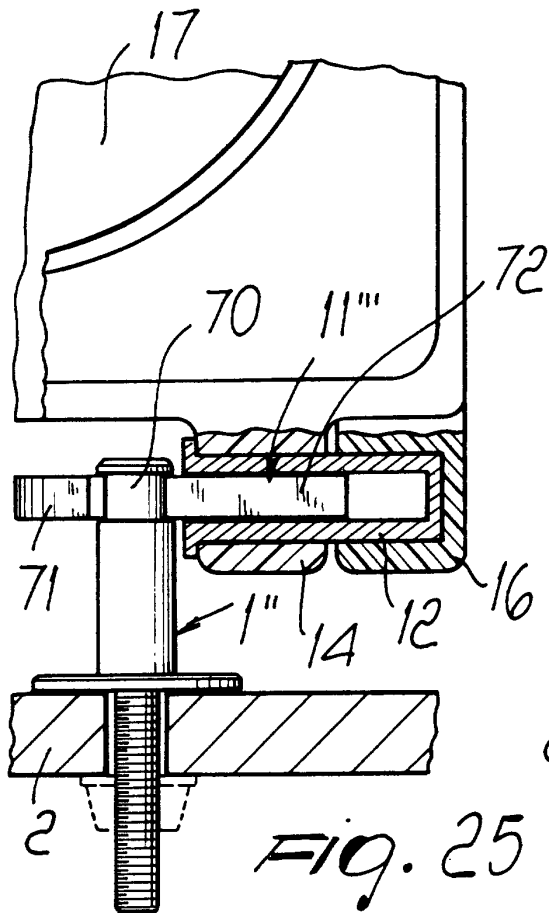


FIG. 25

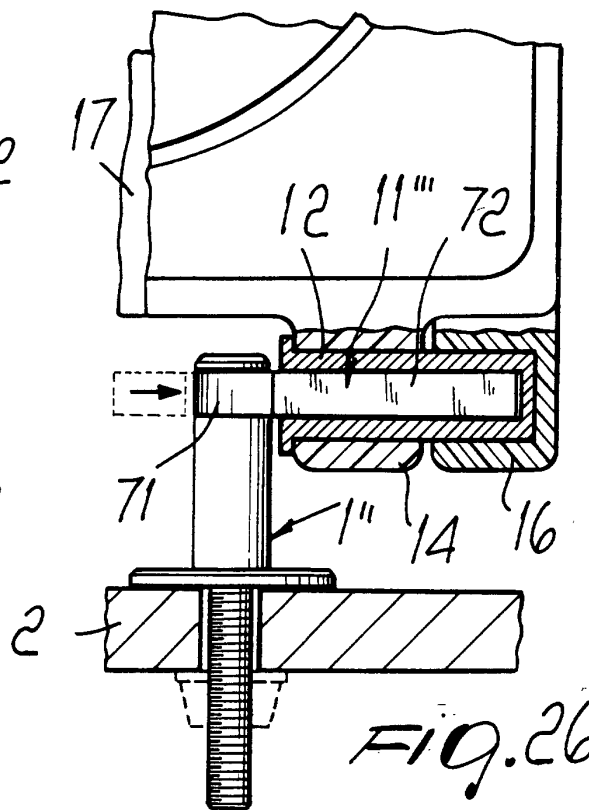


FIG. 26