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(54) Hinge.

(57) A hinge comprises a casing member (1) and a frame member (3, 4) interconnected by means of a pivot (7), said frame member (3, 4) comprising a lower part (3) secured to the door or window frame (5) by means of mounting means, and an upper part (4) secured to the lower part (3) and covering said mounting means.

In order to efficiently ensure the above securing of the upper part (4), said upper part (4) can be inserted in or surround the lower part (3) as said parts tightly fit in one another. The pivot (7) retains the upper part (4) in a position in which it is locked to the lower part (3) because in the completely mounted position said pivot extends through flushing mating openings (6) in these two parts (3, 4).

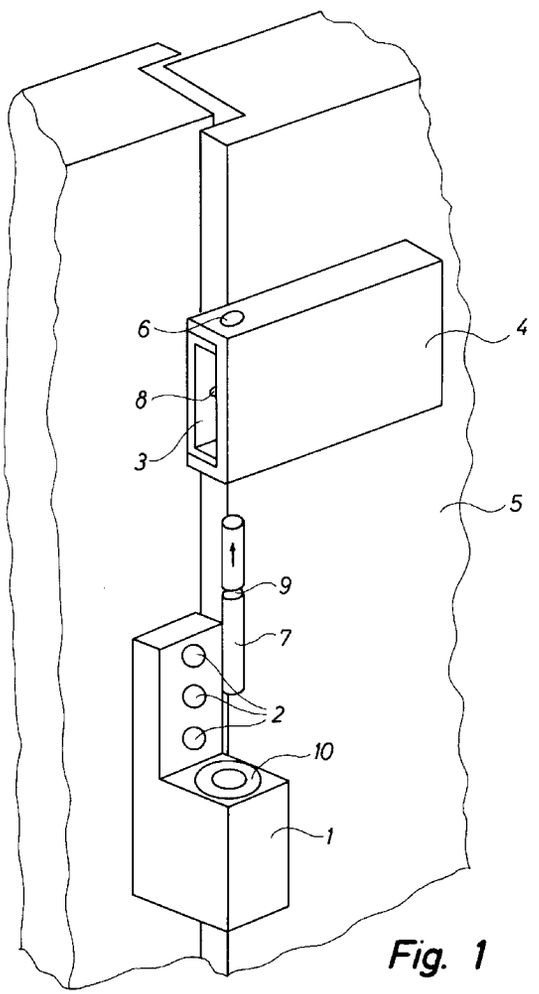

Fig. 1

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The invention relates to a hinge of the type stated in the preamble of claim 1.

By known hinges of the above type, a casing member is secured to the door or the window casing, and a frame member is secured to the openable door or to the window. A pivot interconnects the hinge members by one end thereof being inserted in the casing member and the other end thereof being inserted in the frame member. The casing member is screwed into the casing by means of screws or the like means not accessible to an unauthorized disassembling for purposes of burglary, said screws or the like means being non-accessible because their heads are covered by the portion of the frame member housing the pivot, viz. the bearing member of the pivot.

In order to ensure a correct positioning of the frame member on the frame of the door or the window, the lower part of said frame member is secured in such a manner that it is adjustable in a direction perpendicular to the casing. The known hinges solve this problem by the lower part comprising some elongated slots extending in said adjustment direction. The lower part is secured to the frame by means of hardware fixing the lower part to the frame by means of screws being inserted through holes in said hardware and through the slots in the lower part into the frame. In addition, fixed pins are often provided in the hardware, said pins also extending through the slots in the lower part and into drilled mating openings in the frame. Thus, when the lower part is fixed between the frame and the hardware secured on said frame, said lower part can be displaced against a strong frictional force and consequently be adjusted in a direction perpendicular to the casing. The frictional force is usually overcome by an Allen screw™ being arranged in an additional slot extending parallel to the remaining slots in the lower part. The Allen screw™ is of the same length as the slot and is threadedly engaging a nut or bolt secured to the hardware. As the head of the Allen screw™ is accessible to an Allen key™ from the outside through an opening in the lower part, said lower part is easily adjusted in the said direction perpendicular to the casing, while, of course, the hardware remains in position.

Finally, an upper part hiding the hardware with the screws is secured to the lower part either by way of fixing or by said upper part being hooked to the lower part at the end facing away from the pivot and followed by the end facing said pivot being secured by means of a pointed screw. In the open position of the door or the window, the pointed screw can be screwed through an opening in the lower part adjacent the pivot.

When burglary is attempted, the hinge side of a door is more exposed than the side with the lock. The weak part is often the frame member because by the known types of hinges it is rather simple to remove a fixed upper part by means of a crowbar or to knock off the upper part secured by means of the pointed screw by hammering in the direction of the pivot. Subsequently, it is quite easy to screw off the hardware and thereby remove the remaining frame member of the hinge.

The object of the present invention is therefore to provide a hinge of the above type where the upper part is very difficult to remove in connection with burglary while the hinge maintains the adjustment possibilities of the known hinges.

This object is according to the invention obtained by the hinge stated in the introduction being shaped in the manner described in the characterising clause of claim 1.

In this manner the upper part and the lower part present a closed unit, which not only includes the mounting means, but also the area about the pivot. After the securing of the lower part to the frame and the following positioning of the upper part in the correct completely mounted position, the pivot is inserted through the associated four mating openings with the result that a very reliable securing of the upper part on the lower part is simultaneously obtained. Accordingly, it is not easy to break up the hinge when the door is closed because the mounting means are non-accessible when the upper part cannot be removed. It is not possible to remove the door from the hinges until it has been legitimately opened in the lock side, whereby the dowel can be removed and the upper part subsequently be separated from the lower part.

As indicated in claim 2, the space housing the mounting means is closed at the ends of the upper part.

The subject matter of claim 3 provides an additional security against burglary. It should be noted, that it is impossible to break up the upper part by hammering thereon in the direction of the pivot in the manner allowed by a previously known hinge, because the upper part is shaped so as to tightly fit in the lower part.

Claim 4 describes an advantageous embodiment of the coupling means.

The subject matter of claim 5 provides an additional security against burglary because the described collar ensures that the pivot cannot be knocked out. In addition, the collar ensures a well-defined depth of insertion of the pivot into both the casing member and the frame member. Finally, the collar makes it extremely difficult to saw through the pivot between the casing member and the frame member.

The subject matter of claim 6 implies that it is possible in a manner known per se to displace the frame member in a direction perpendicular to the pivot and thereby to obtain the correct position of the completely mounted hinge.

The invention is described in greater detail below with reference to the accompanying drawing, in which

Figure 1 is a perspective view of a first embodiment of a hinge according to the invention, with the parts spaced apart,

Figure 2 is a perspective view of a second embodiment of the frame member, where the upper part has been separated from the lower part with the mounting means,

Figures 3a, b, and c are top, front, and end views, respectively, of the lower part of Figure 2,

Figure 4 is a perspective view of the frame member of Figure 2 in the assembled state and before the insertion of the bearing pin in a bearing bushing also shown in Figure 2, which in turn is to be inserted in the assembled frame member,

Figure 5 illustrates the bearing pin inserted in the frame member immediately before the opposite end of the bearing pin is to be inserted in the casing member, an additional bearing pin with collar and bearing bushing applied thereon also appearing,

Figure 6 is a perspective view of a portion of a door or a window with a hinge according to the invention mounted thereon,

Figure 7 illustrates a third embodiment of the lower part and the upper part of the frame member according to the invention just before the upper part is to be arranged on the lower part, and

Figure 8 illustrates the embodiment of Figure 7 in the assembled state.

Figure 1 illustrates a casing member 1 secured to the casing by means of three screws 2. In addition, a frame member is shown which comprises a lower part 3 and an upper part 4. The lower part 3 is secured to a door or a window 5 by means of mounting means, such as bolts, screws or the like means, which do not appear from Figure 1 because they are covered by the upper part 4.

As illustrated, the upper part 4 is of such a shape that it can sealingly surround the lower part 3. Both the lower part and the upper part comprise equally large openings 6 of the same diameter as the pivot 7 also shown in the drawing. When the upper part is arranged in the completely mounted position on the lower part, the two openings 6 in the lower part flush with the two openings 6 in the upper part, only one opening 6 appearing from the drawing. In this completely mounted position, the pivot 7 can be inserted through the openings 6 whereafter the upper part 4 is retained in position on the lower part 3 in such a manner that the above mounting means are covered. In order to retain the bearing pin 7, a pointed screw not shown can be screwed through the lower part from the back in a threaded opening 8 so as to engage a groove 9 in the pivot 7. Now the frame member with the pivot 7 can be mounted in the casing member 1 by the lower end of the pivot 7 being inserted in a bearing bushing 10 in the casing member 1.

Subsequently, when the door or the window is closed it is no longer possible to reach the above mounting means in order to disassemble the lower part 3 until the upper part 4 has been removed. It is not easy to break up the upper part 4 because the solid pivot extends through the above four mating openings 6.

Figure 2 illustrates a further developed embodiment of the frame member which also comprises a lower part 11 with mating openings 12 for the pivot or rather a bearing bushing for said pivot. Figure 2 shows furthermore an upper part 23, which also comprises mating openings 12 for the above bearing bushing. In addition, Figure 2 shows mounting means in form of mounting hardware 13 and four screws 14 and pins 15 fixed on said mounting hardware 13. Furthermore, the head 16 of an Allen screw™ appears, said screw being screwed into a nut 17 fixed in an opening in the middle of the mounting hardware 13.

It appears from Figure 3b that the lower part 11 comprises two elongated slots 18 for the insertion of the screws 14 and the mounting pins 15. In addition, a slot 19 is provided which comprises a broad portion 20 for housing the nut 17 as well as a short narrow portion 21 for housing the head 16 of the Allen screw™.

By turning the head 16 of the Allen screw™ by means of an Allen key™ not shown, but inserted through a small opening 22, it is possible to displace the lower part 11 after securing thereof to a door in a direction towards or away from the door casing, the nut being retained in said direction by the mounting means 13 while the Allen screw™ forces the nut 17 with the lower part 11 in the desired direction. It should be noted that such an adjustment is commonly known technique.

After the securing of the lower part 11 to a door frame or a window, an upper part 23 can be inserted in said lower part 11, cf.

Figure 4. As a result, the lower part 11 and the upper part 23 form a closed space surrounding the mounting means 13 to 17. Figure 4 shows furthermore that a bearing bushing 24 of a type known per se can be inserted in the mating openings 12. Subsequently, the upper portion 25 of the bearing pin 26 shown in Figure 4 is inserted so far into the bearing bushing 24 that a collar 27 abuts the outer side of the bearing bushing 24.

As subsequently shown in Figure 5, the completely mounted frame portion 11, 23 with inserted pivot 26 can then be mounted in the corresponding bearing bushing 29 of the casing member 1, the lower end 28 of the pivot being inserted in said bearing bushing 29.

Figures 7 and 8 illustrate a third embodiment of the frame member according to the invention. As illustrated here, the lower part 30 comprises a notch or groove 31, while the upper part 32 comprises an inwardly projecting pin 33. As illustrated in Figure 7, the

upper part 32 can be secured to the already mounted lower part 30 by inserting the pin 33 in the groove 31 in the inclined position shown in Figure 7. Subsequently, the upper part 32 is turned into position in the lower part 30, whereby the interlocking of the pin 33 and the groove 31 is efficient in the end of the frame member facing away from the mating openings 12. When the pivot or the bushing of the frame member are subsequently inserted through the four mating openings 12, the upper part 32 has been additionally reliably secured to the lower part 30.

Figure 6 illustrates the completed hinge upon assembling and closing of the door or the window. In order to hide the mating openings of the pin, a small cover plate 34 is secured to the lower part 30.

As illustrated in Figures 1 and 6, the hinge is particularly suited for the type of windows or doors which are made ov PVC plastics, these known types presenting the shown profiling with a slightly retracted casing.

Claims

1. A hinge comprising a casing member and a frame member interconnected by means of a pivot, and where the frame member comprises a lower part secured to the frame by means of mounting means, and an upper part secured to the lower part and covering the mounting means, characterised in that the upper part is shaped such that it can be inserted in the lower part or can surround said lower part in the completely mounted position, and that both the lower part and the upper part comprise flushing mating openings for the pivot, said openings flushing in said completely mounted position.

2. A hinge as claimed in claim 1, characterised in that in the completely mounted position, the ends of the upper part form a closure to the space housing the mounting means between the lower part and the upper part.

3. A hinge as claimed in claim 2, characterised in that the end of the upper part and the lower part facing away from the mating openings comprises coupling means interlocking said parts when they enter a mutually inclined position before they are in the completely mounted position, the mating openings flushing with one another in said inclined position.

4. A hinge as claimed in claim 3, characterised in that the coupling means comprise an inwardly projecting pin on the upper part, said pin engaging a notch or groove in the lower part.

5. A hinge as claimed in the preceding claims 1 to 4, characterised in that the pivot comprises a circumferential collar separating the portion of the pivot inserted in the casing member from the portion of said pivot inserted in the frame member.

6. A hinge as claimed in the preceding claims 2 to 5, characterised in that the end of the upper part facing away from the mating openings is provided with a small opening for a tool, such as an Allen key™.

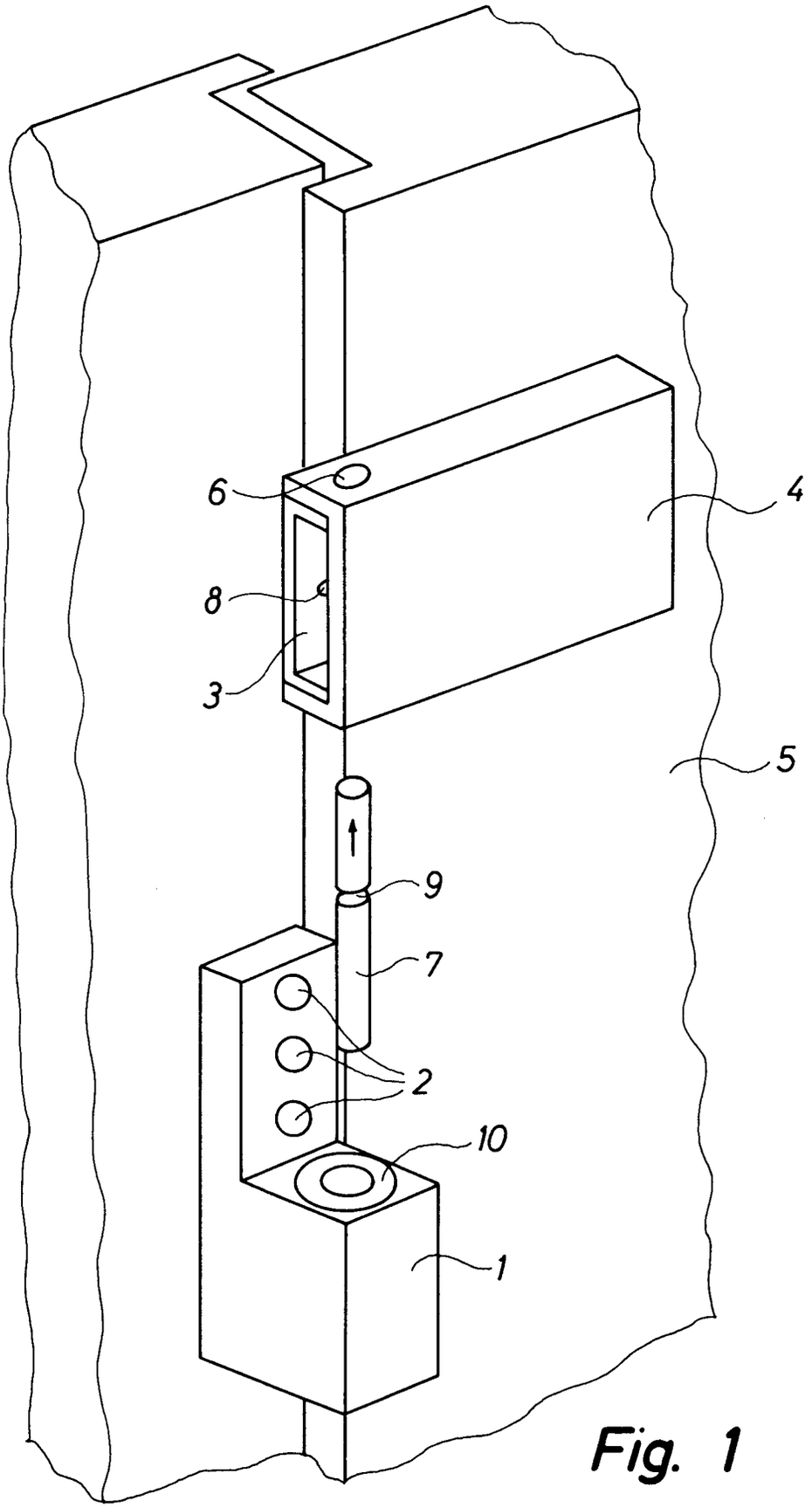

Fig. 1

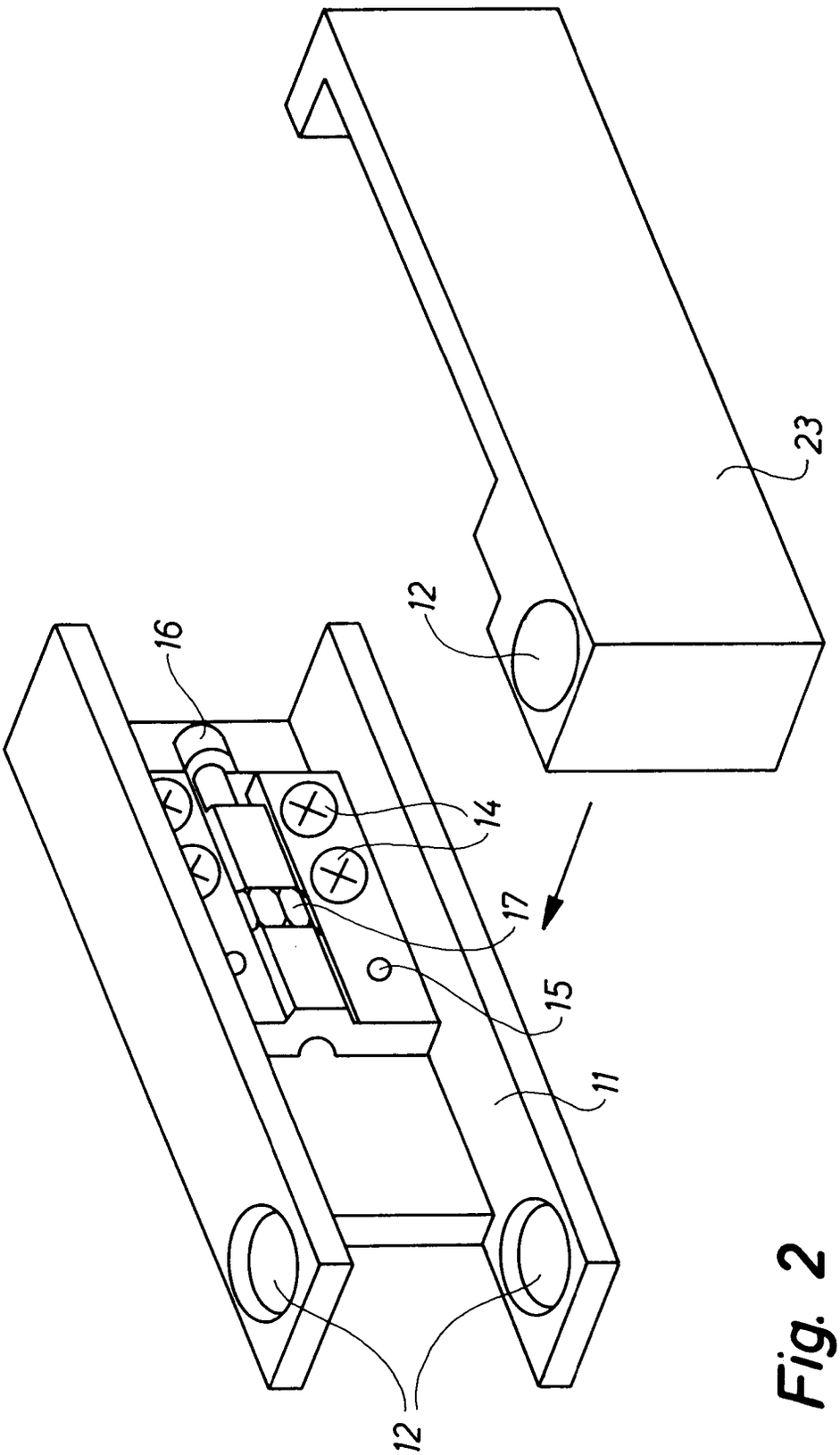

Fig. 2

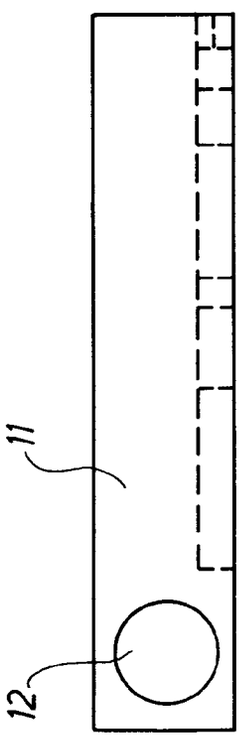

Fig. 3a

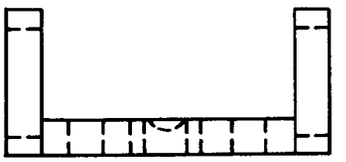

Fig. 3c

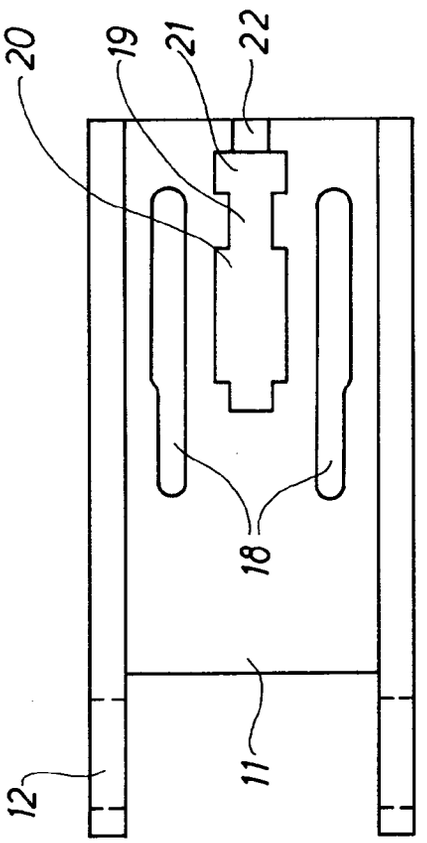

Fig. 3b

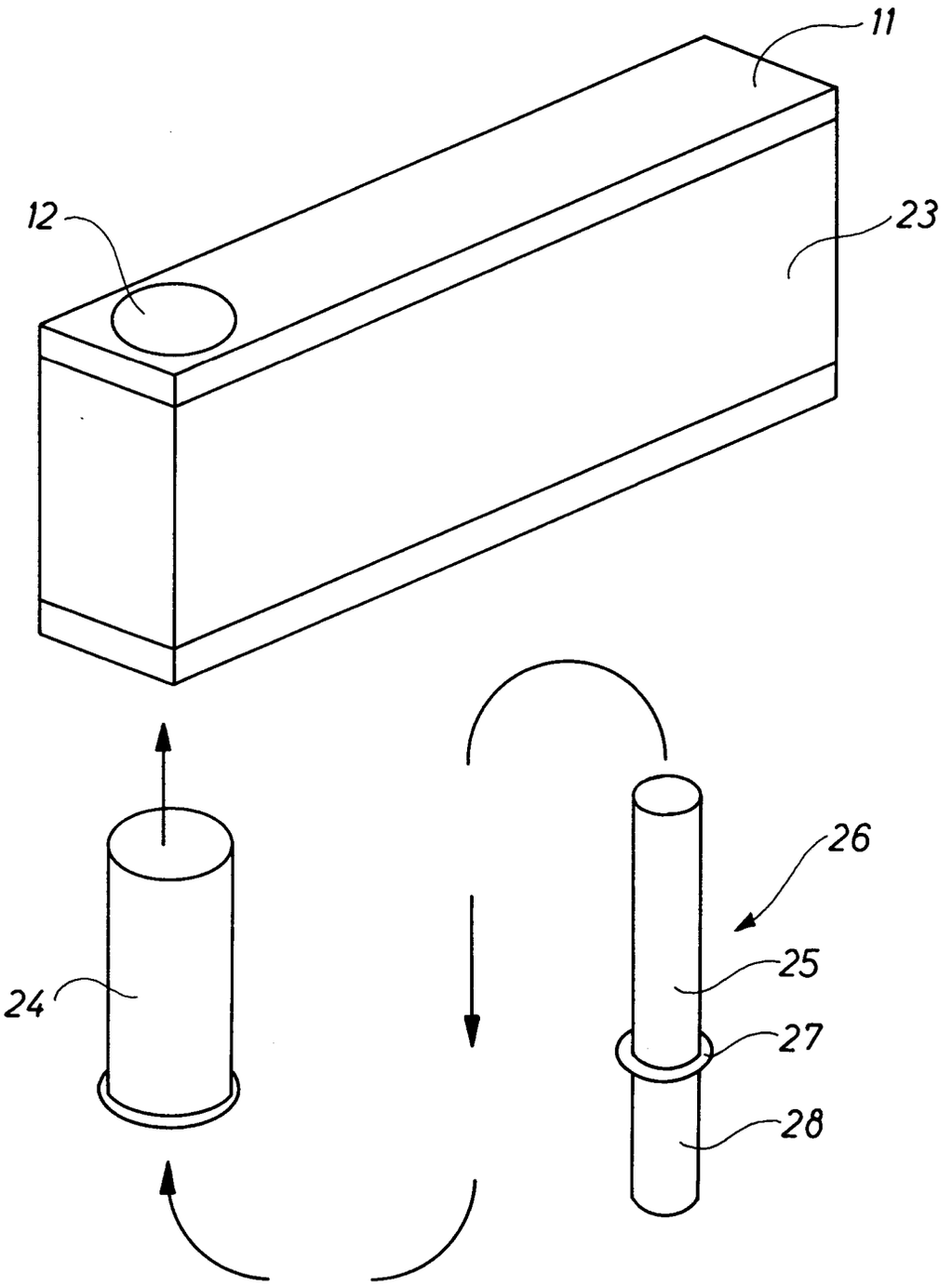

Fig. 4

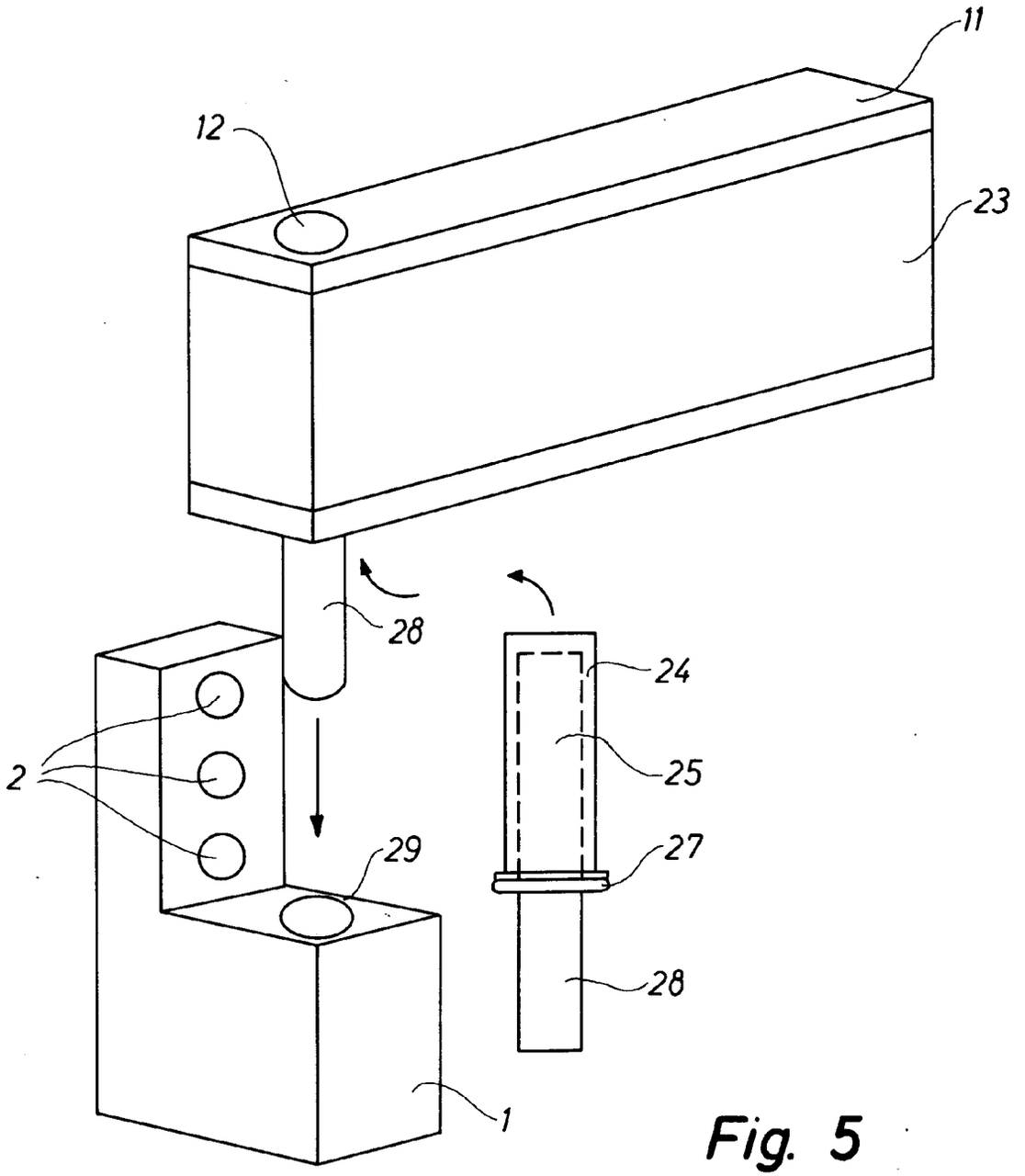

Fig. 5

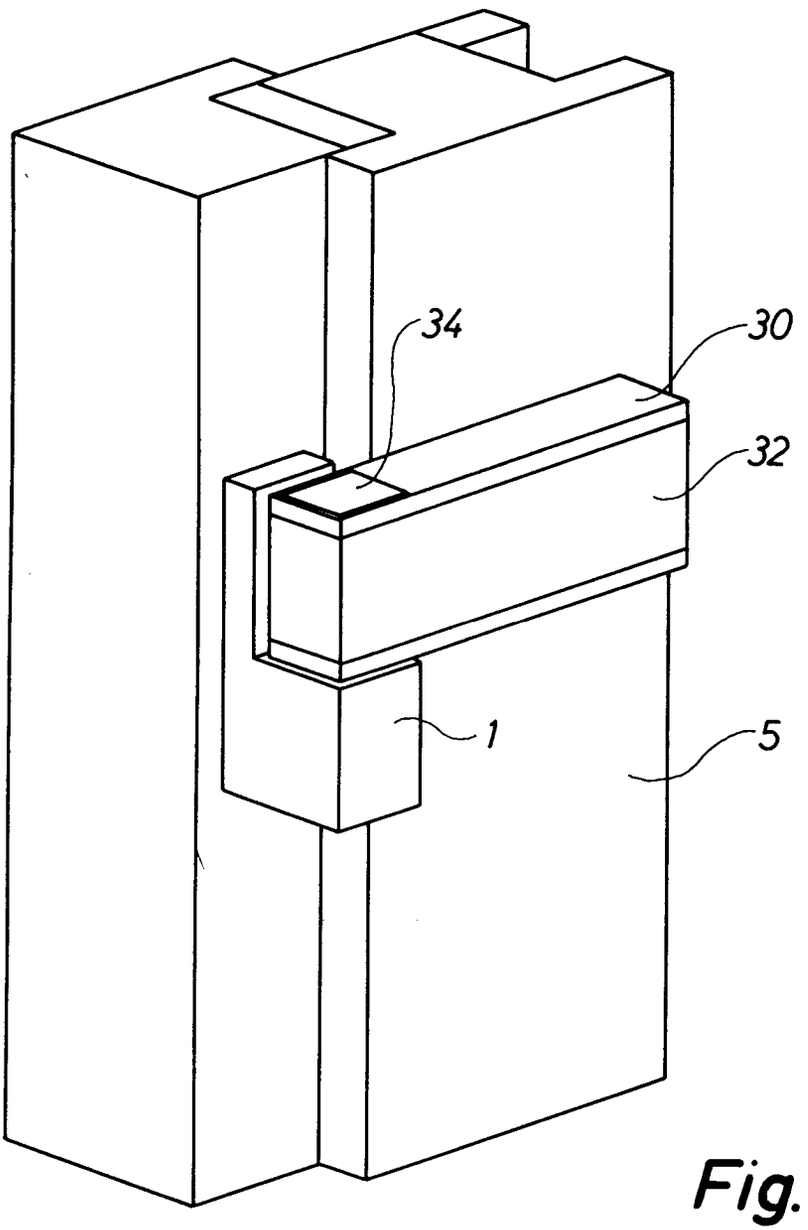

Fig. 6

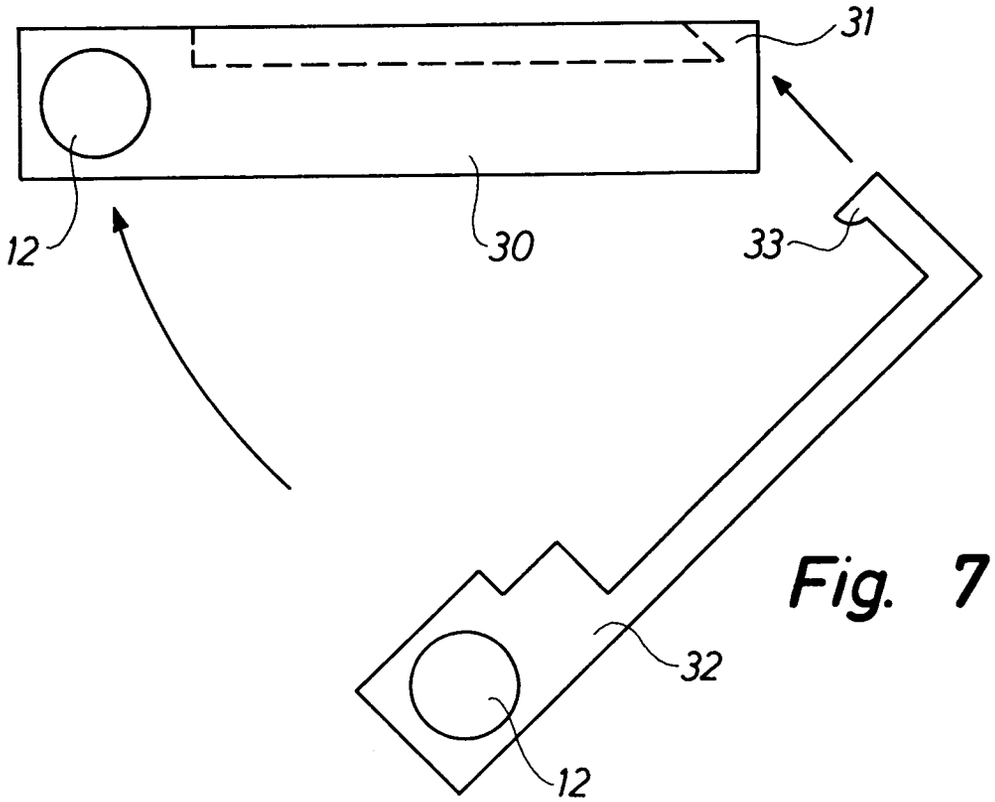

Fig. 7

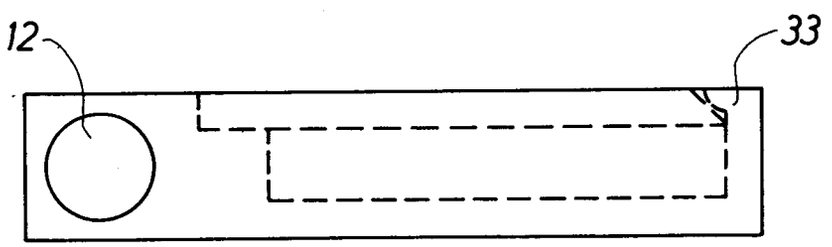

Fig. 8