

Aug. 27, 1963

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3,101,982

CABINET WITH SHIFTABLE SHELVES

Filed Nov. 14, 1958

2 Sheets-Sheet 1

FIG. 1.

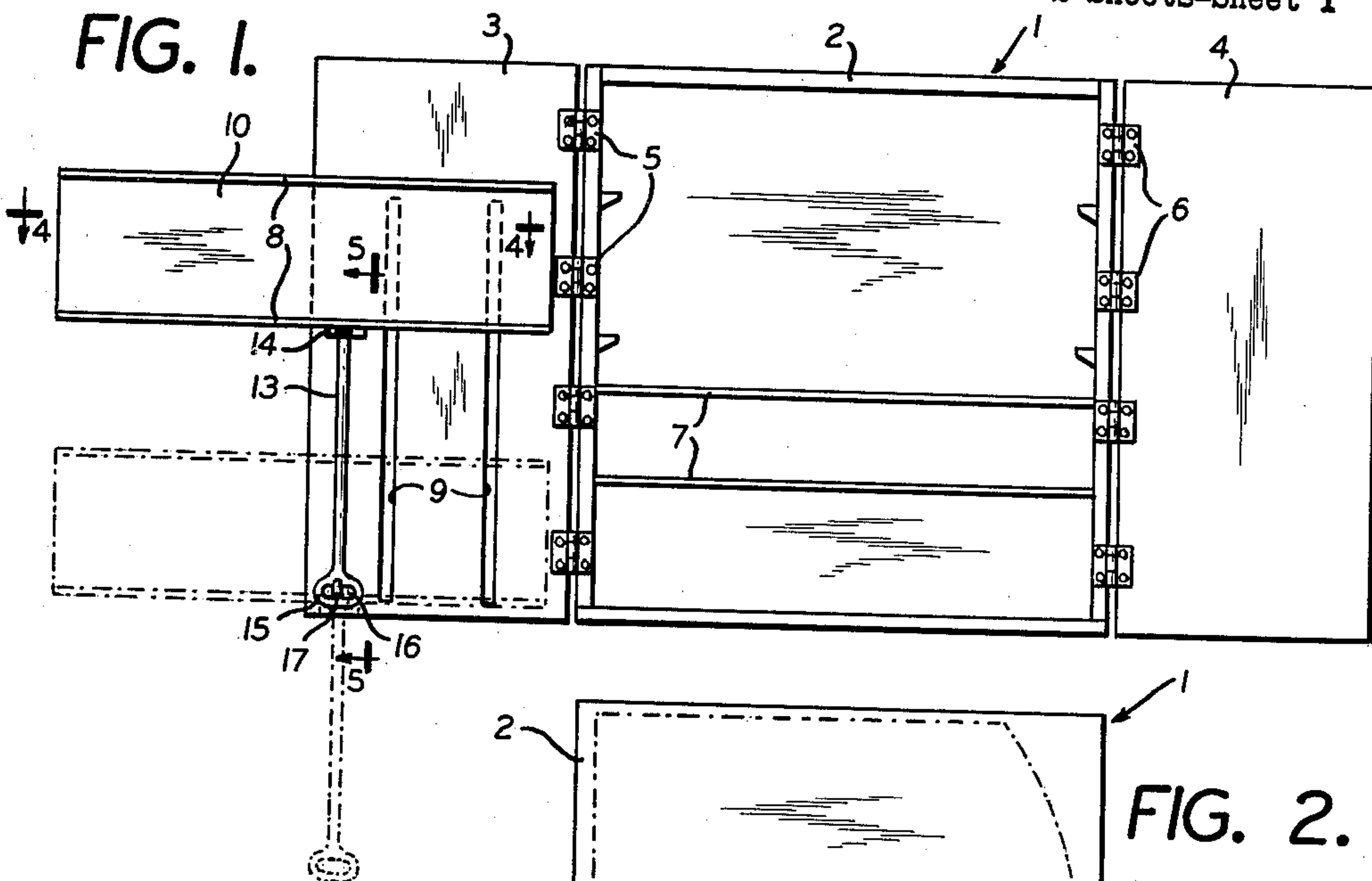


FIG. 2.

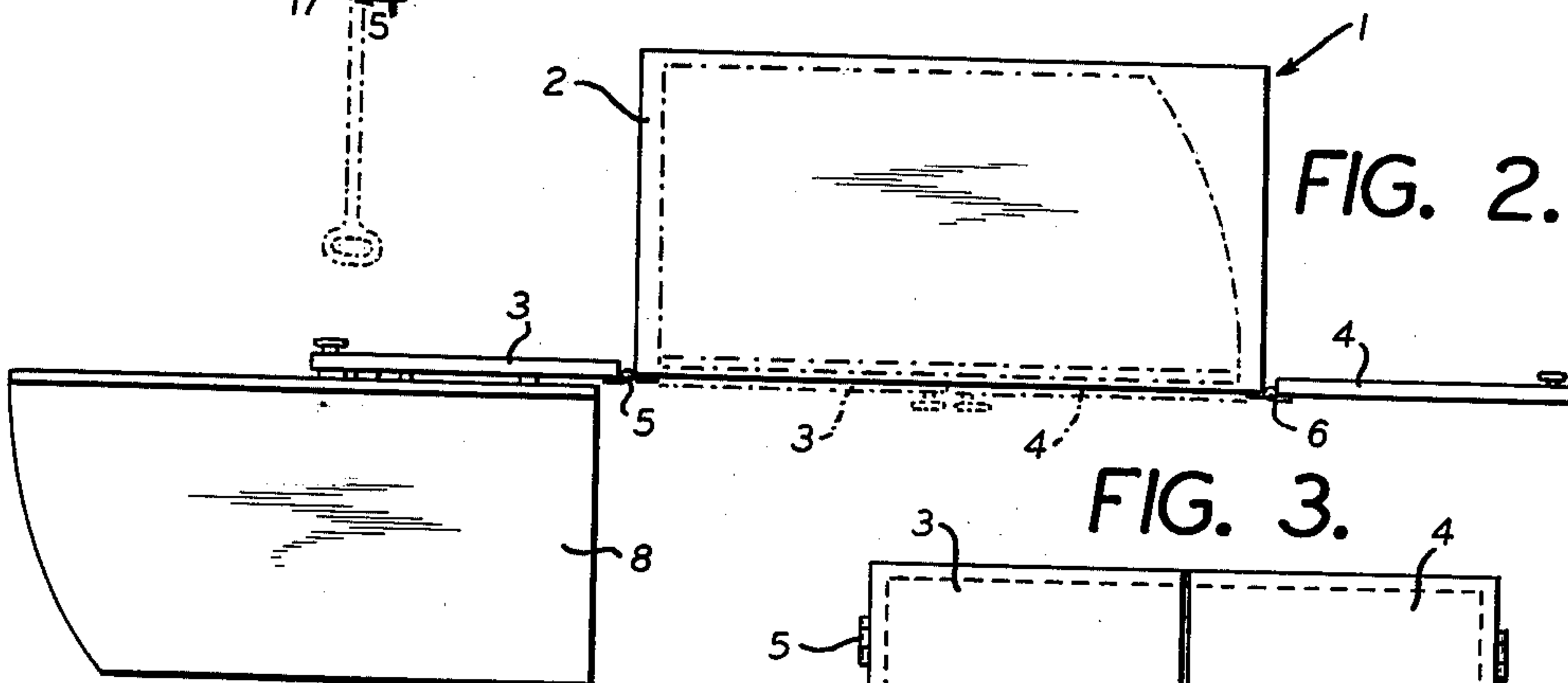


FIG. 3.

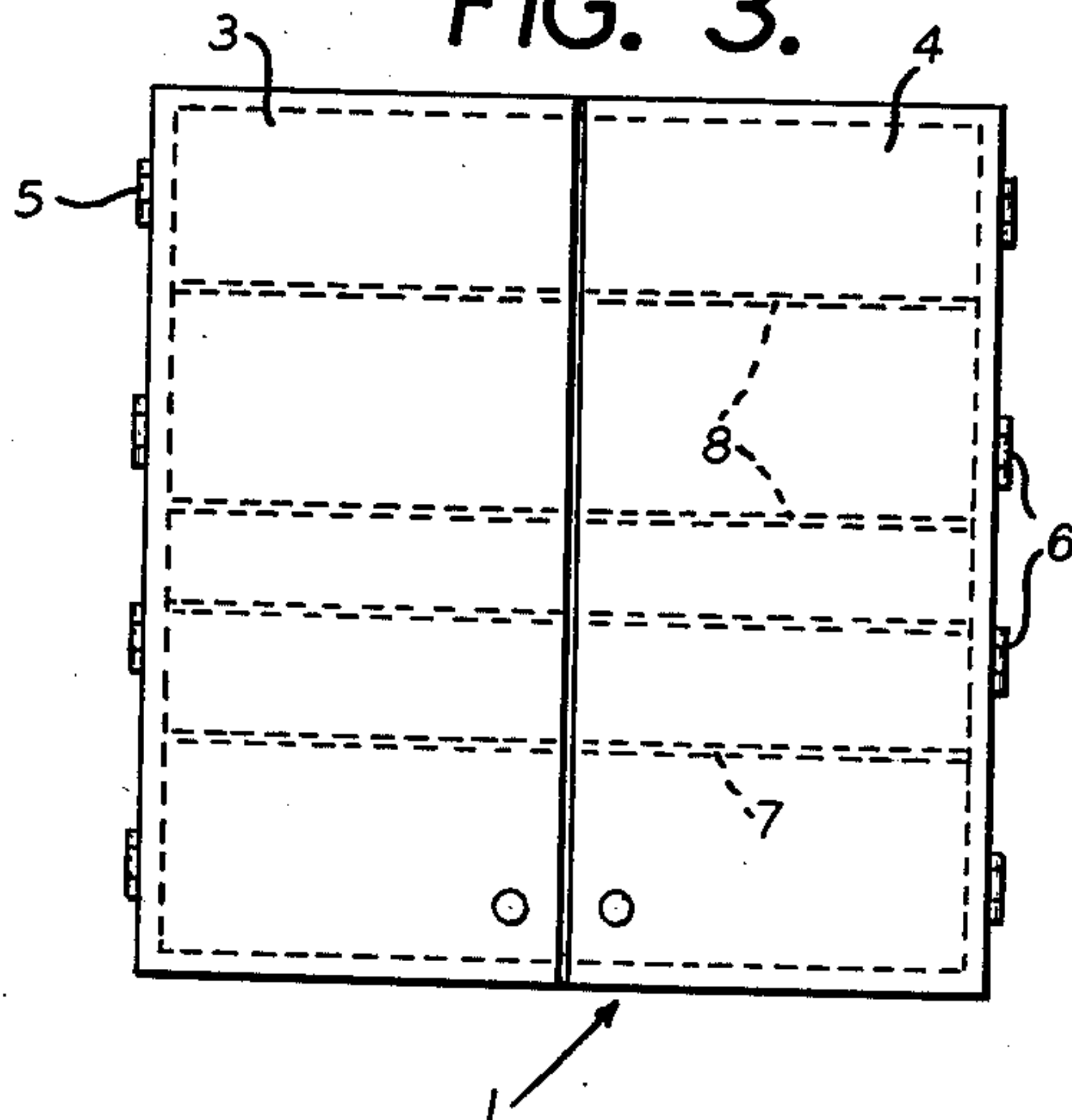


FIG. 4.

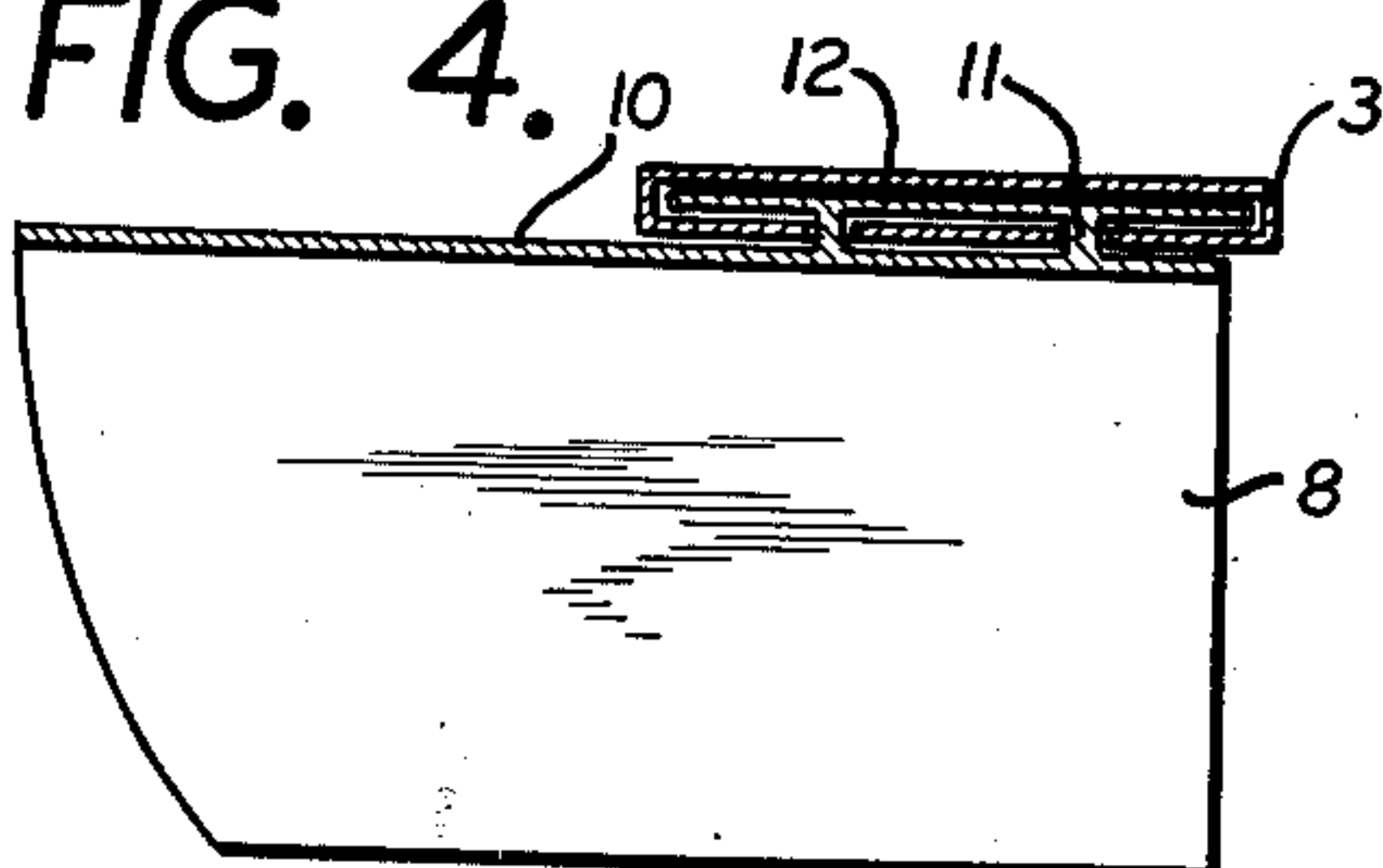
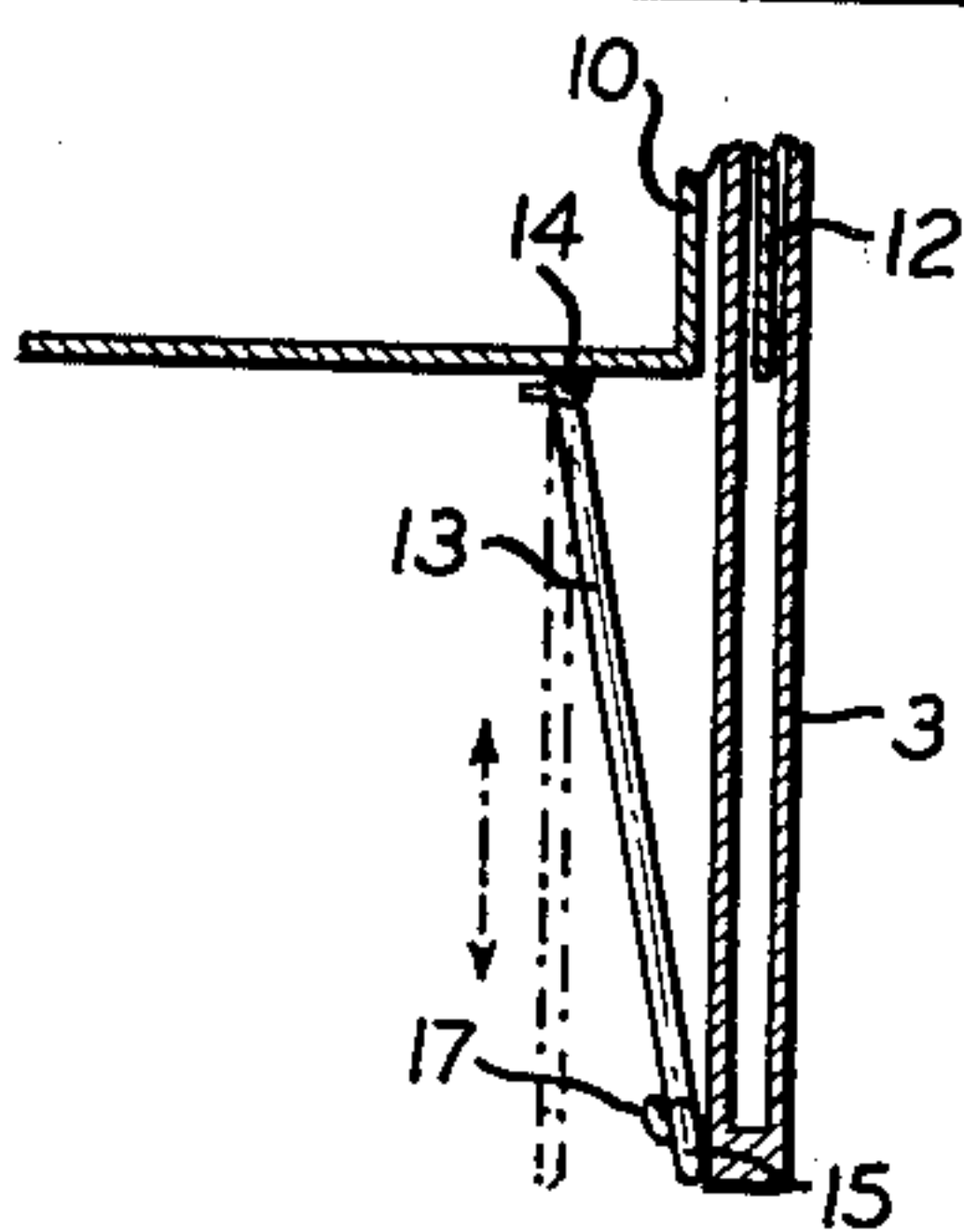


FIG. 5.



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FIG. 6.

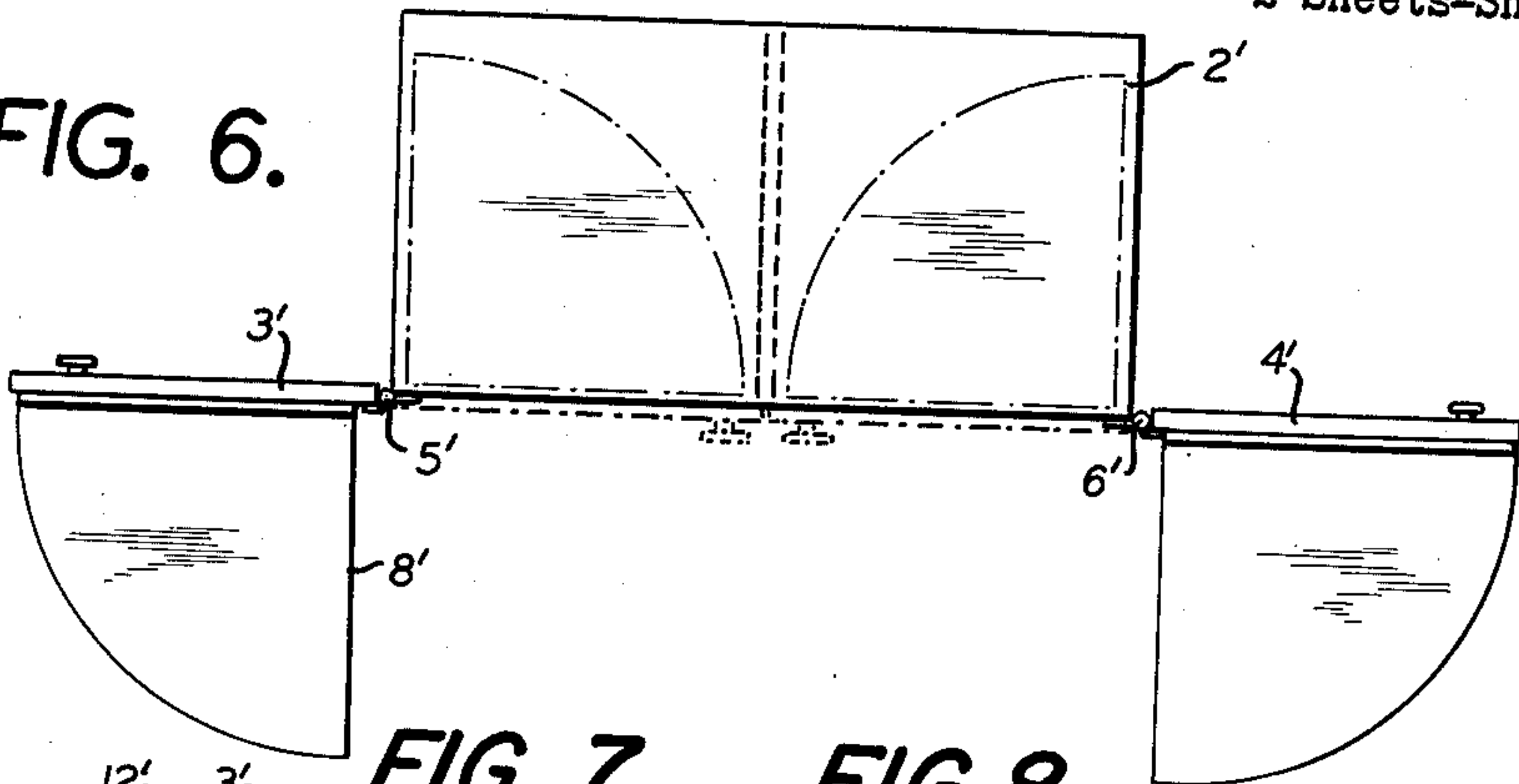


FIG. 7.

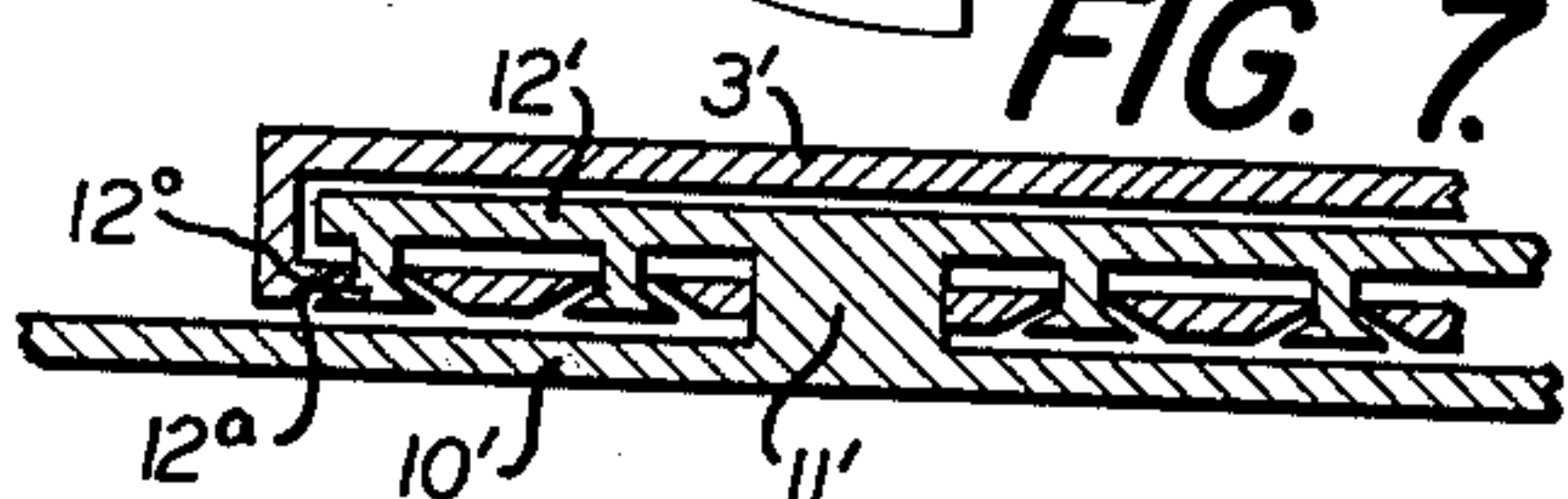


FIG. 8.

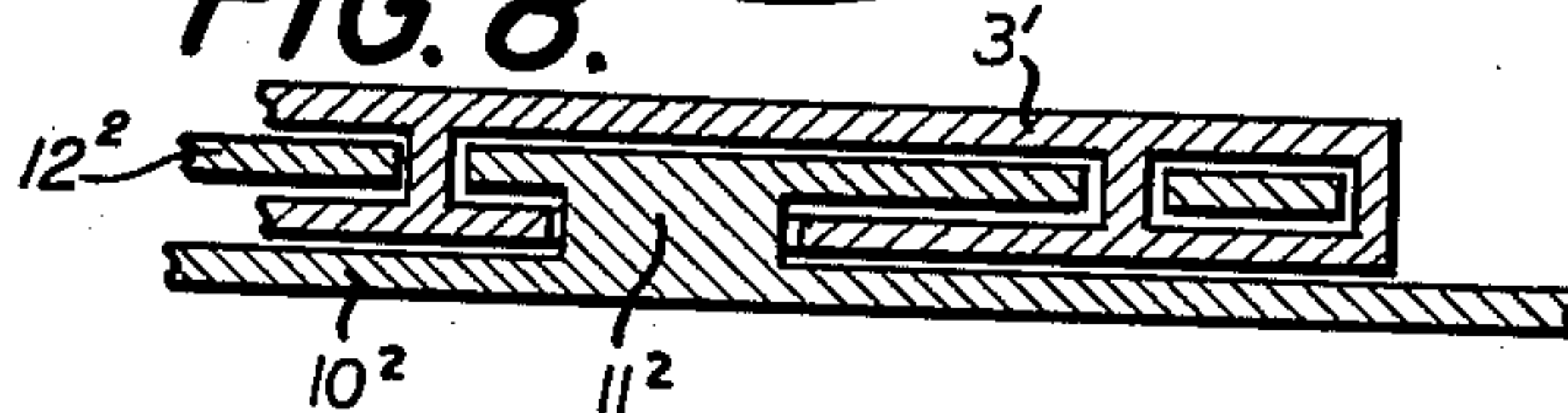


FIG. 9.

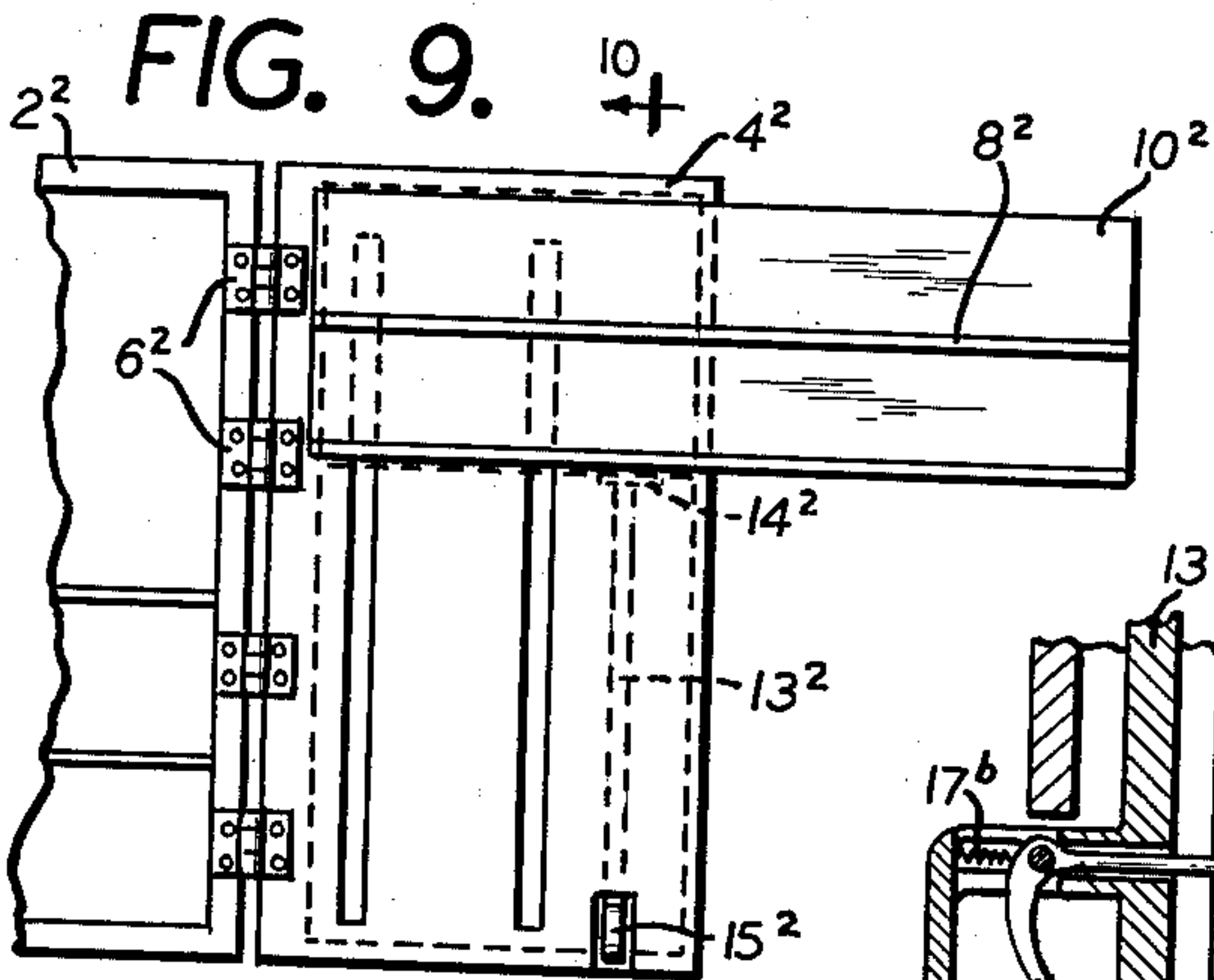


FIG. 11.

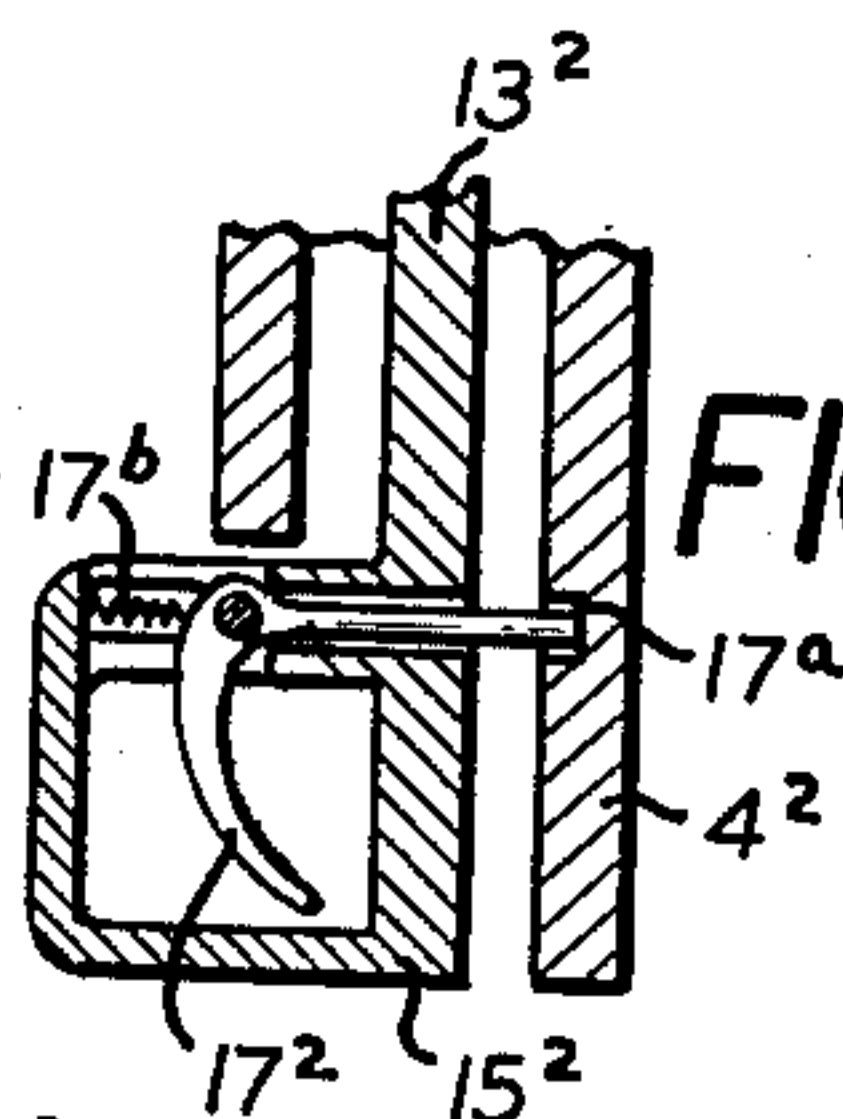


FIG. 10.

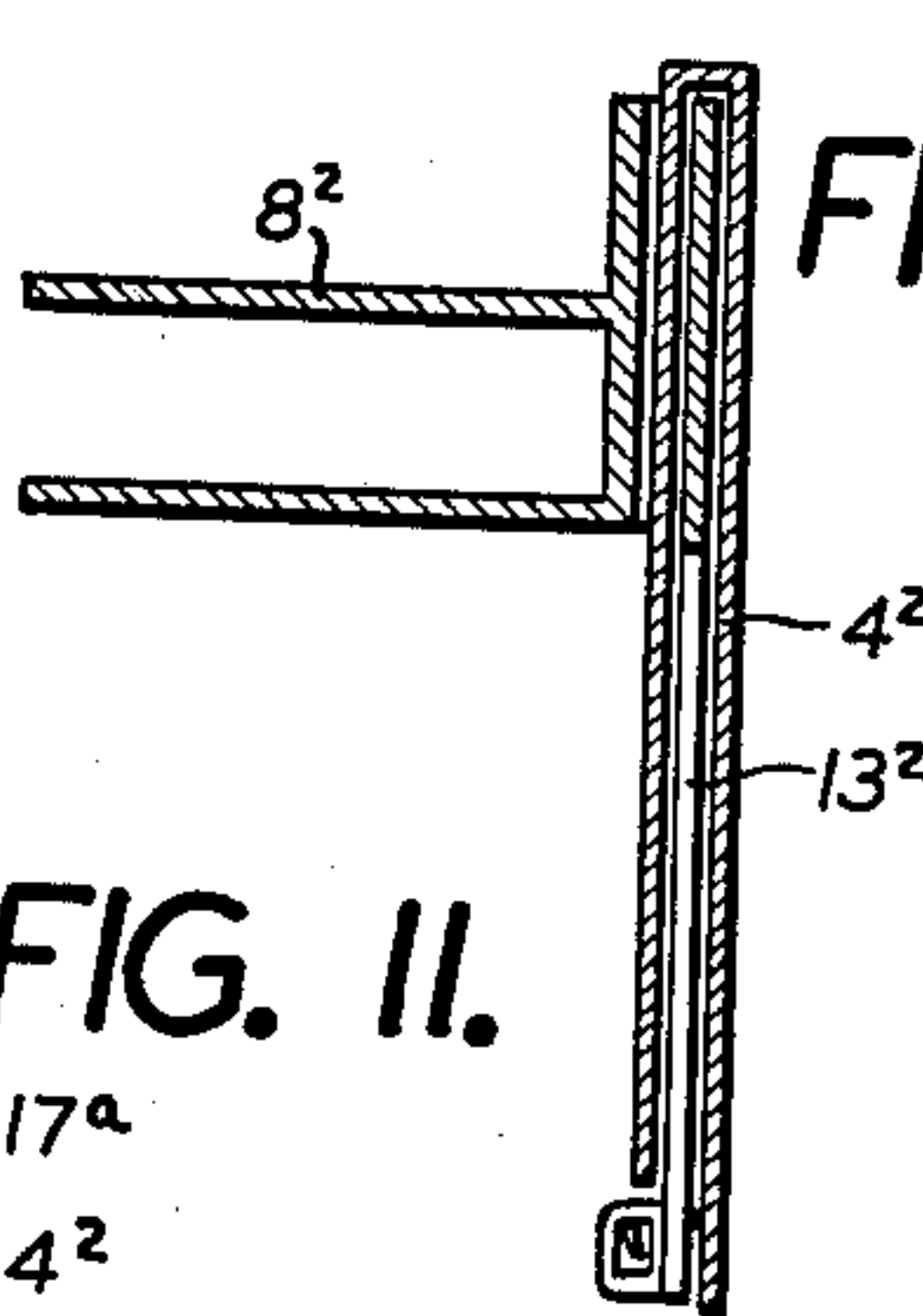


FIG. 12.

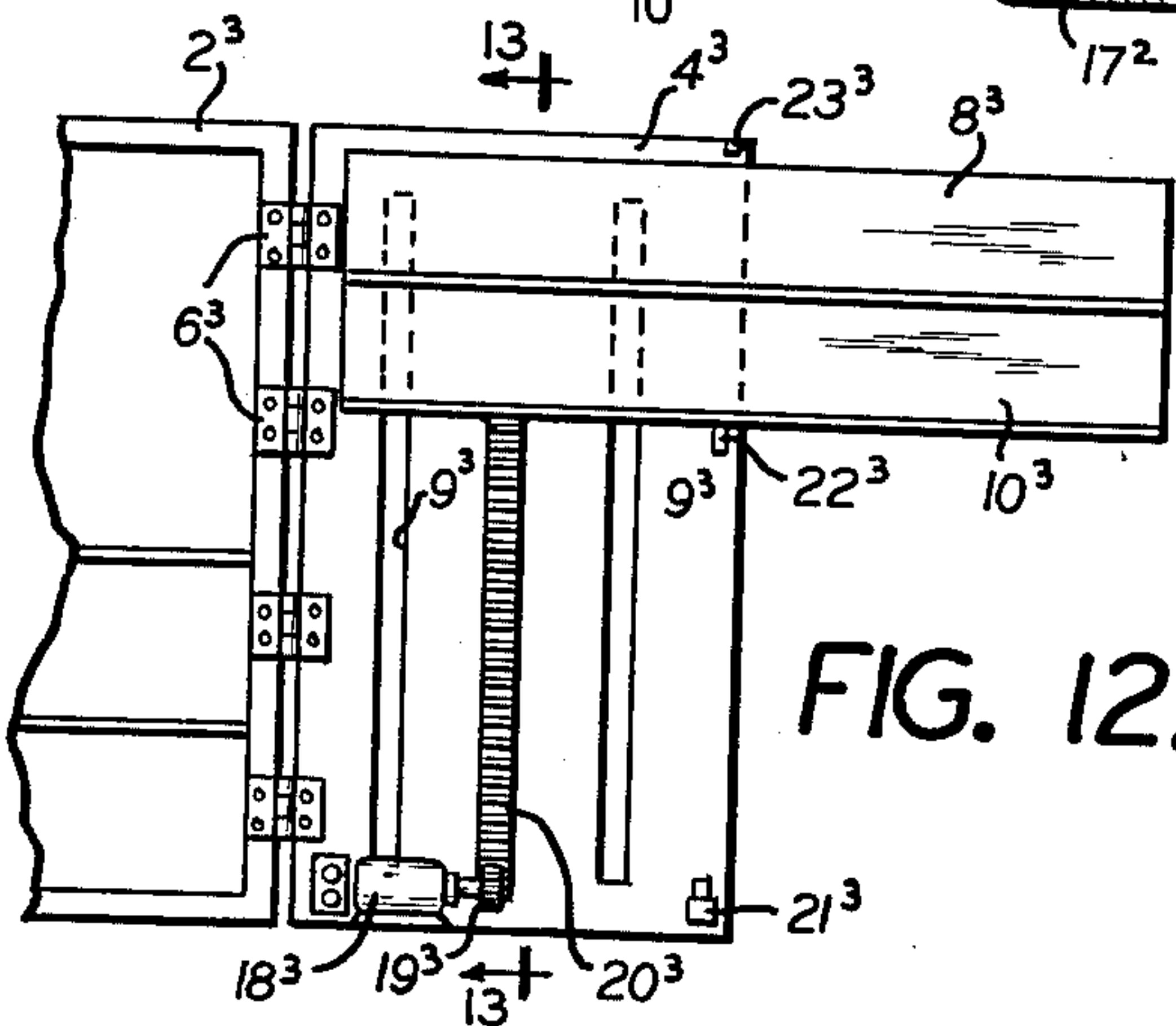
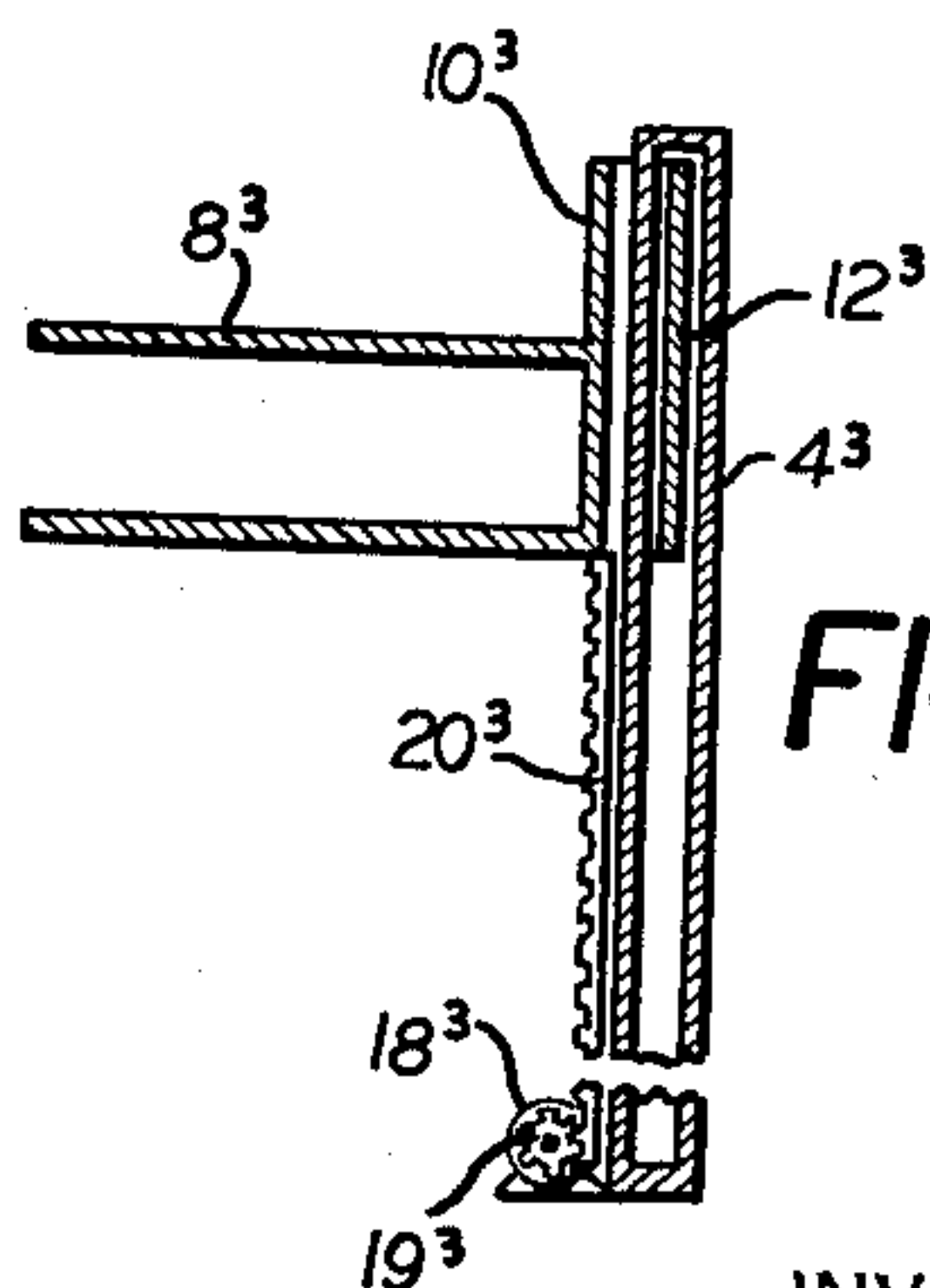


FIG. 13.



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CABINET WITH SHIFTABLE SHELVES

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3 Claims. (Cl. 312-223)

The present invention relates to a cabinet or the like having vertically adjustable shelves.

It is well known that cabinets or the like structures have a plurality of shelves in superposed position and the shelves which are arranged on a higher level, in particular in cabinets which are mounted on the walls, are not easily accessible because they are at a height which is appreciably higher than the normal height of a human being. In order to provide access to such upper shelves, it is usually required to use a step-ladder or any other means to step on in order to provide access to the upper shelves.

It is therefore, one object of the present invention to provide means for lowering one or more upper shelves to a height which lends itself for easy access for a human being of normal height.

It is another object of the present invention to provide manually or electrically operated means for moving the shelves from their upper normal position into a lower position at which access is had to the shelves, whereupon the shelves may again be returned to the upper position and properly adjusted in the cabinet or the like.

It is still a further object of the present invention to provide manual means for moving the upper shelves from their upper position into a lower position, whereby the means for shifting the shelves into the respective positions function simultaneously as a means for retaining the shelves in their upper position.

With these and other objects in view, which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawings in which:

FIGURE 1 is a front elevation of a cabinet in open position and showing the upper shelves in upper and lower position, respectively;

FIG. 2 is a top plan view of the cabinet shown in FIG. 1;

FIG. 3 is a front elevation of the cabinet shown in FIG. 1, however, in closed position;

FIG. 4 is a section along the lines 4-4 of FIG. 1;

FIG. 5 is a section along the lines 5-5 of FIG. 1;

FIG. 6 is a top plan view of a second embodiment of a cabinet structure incorporating the features of the present invention;

FIG. 7 is a horizontal section through the door with the shelves of the cabinet in FIG. 6;

FIG. 8 is a horizontal cross-section through a door of the cabinet shown in FIG. 6, yet disclosing a different embodiment of the guide means for the shelves;

FIG. 9 is a fragmentary elevation of a cabinet with one door disclosing a second embodiment of such arrangement;

FIG. 10 is a section along the line 10-10 of FIG. 9;

FIG. 11 is a fragmentary view of the stop means for the shelves in the respective upper and lower positions;

FIG. 12 is a fragmentary elevation of a cabinet with a door disclosing another embodiment which incorporates electrically operating means for movement of the shelves; and

FIG. 13 is a vertical section of the door together with the shelves indicating simultaneously the driving means.

Referring now to the drawings, and in particular to FIGS. 1 to 5, it is clearly shown that the cabinet 1 has a main body 2 of conventional rectangular configuration, though any other configuration may be provided, and doors 3 and 4 are connected to the main body by means

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of the hinges 5 and 6. A plurality of lower shelves 7 is permanently or adjustably, as to their height, provided in the main body 2, while a plurality of upper shelves 8 are secured to one of the doors 3 or 4. In the embodiment shown in FIG. 1 the upper shelves 8 are secured to the door 3 and in particular to the inner face of said door 3 in such a manner that the shelves 8 are permitted to move in downward direction.

As particularly clearly shown in FIG. 4, guide grooves and preferably two such guide grooves, are arranged in the door which leave a vertical slot on the inner face of the door 3 and the shelves 8 have a rear wall 10 which carry guide strips 11 secured to guide plates 12 which move together with the shelf in vertical direction in a recess provided in the door 3. A lever 13 is hingedly secured upon a horizontally disposed pivot 14 to the lowermost of the shelves 8, which lever 13 has at its lower end a handle 15, which handle defines an opening 16 and receives a bolt 17 projecting at the lower inner face of the door 3. If the shelves are in their upper position, the bolt 17 is received in the opening of the handle 15 and retains, thereby, the shelves 8 in the upper position. If the shelves 8 are to be moved into the downward position, shown in point dotted lines in FIG. 1, the handle 15 is slightly moved forwardly upon the hinge or pivot 14 and the sleeves are then pulled downwardly along the inner face of the door 3 to assume finally their lowermost position, where there is easy access to any objects which are on these shelves. If the shelves are no more used, they are pushed upwardly by gripping again the lever 13 and after they assume the uppermost position, the handle is pushed towards the inner face of the door 3 to receive again the bolt 17 and thus locking the upper shelves 8 in the uppermost position. In this uppermost position, it is now possible to close the doors whereby the door 3 will simultaneously move the shelves with the objects thereon into the main body 2 to assume the position as shown in FIG. 3 of the drawings.

Referring now to FIGS. 6 to 8 of the drawings, an embodiment is disclosed in which the shelves are supported by both doors instead of merely on one door, otherwise this embodiment is substantially identical with that in FIG. 1. Thus, this embodiment comprises again a main body 2' having doors 3' and 4' secured thereto by the hinges 5' and 6', respectively. FIGS. 7 and 8 indicate two different embodiments of guide means for the rear plate of the shelves 8'.

In FIG. 7 the rear plate 10' has a rearwardly projecting guide strip 11' connecting the rear plate 10' with the rear guide plate 12'. In this embodiment the guide plate 12' has forwardly projecting strips 12° which strips are received by vertical grooves 12^a provided in the front panel of the door 3'. This arrangement provides a very smooth and safe guiding of the shelves 8' along the inner face of the door 3'.

In the embodiment shown in FIG. 8 it is quite clear that again the rear wall 10² of the shelves 8' has a guide strip 11², which guide strip is connected with a plurality of guide plates 12² which are designed to move in vertical direction in complementary recesses provided between the panels of the rear door 3'.

Referring now to FIGS. 9 to 11, another embodiment of the present invention is disclosed which substantially follows the embodiment disclosed in FIG. 1, with the exception, however, that the lever is hidden in the panels of the door and is visible only upon moving the shelves in downward direction. In particular FIG. 9 discloses again the main body 2² showing the door 4², which door 4² is connected to the main body 2² by means of hinges 6². The entire shelves may be secured here to one door 4², though it is of course possible to provide an arrangement similar to that shown in FIG. 6, in which each of

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the doors carries shelves. Any one of the guide means disclosed in the previous embodiments may be used for guiding the shelves 8² in downward and upward direction, respectively. A lever or rod 13² is hingedly secured by means of the pivot 14² to the lowermost of the shelves 8², yet the lever moves here between the front and rear panels of the door 4². The lower end of the lever 13² terminates again into a handle 15² which is equipped with a spring biased double armed lever 17², one arm of said lever operating like a bolt in a recess 17^a provided in the rear panel of the door 4². A spring 17^b has a tendency to keep the lever 17² in locked position in which the shelves are retained in the uppermost position. Upon pulling forwardly the lever 17² against the force of the spring 17^b the bolt-like arm will be withdrawn from the recess 17^a of the rear panel of the door 4² and the lever 13² may now be pulled in downward direction, thereby moving the shelves 8² in the same direction. If the shelves are no more used in their downed position, the lever may be gripped again and the shelves may be pushed upwardly until the bolt-like arm assumes again the position in the opening 17^a.

Referring now to FIGS. 12 and 13, an arrangement similar to that shown in FIG. 9 is disclosed, with the exception that an electric automatic drive is arranged. In order to bring about a downward movement of the shelves, the main body 2³ has again a door 4³ which is secured to the main body by means of the hinges 6³. The shelves 8³ are mounted for vertical movement by guide means similar to those disclosed in the other embodiments and the inner panel of the door 4³ has for this purpose vertical grooves 9³. A small electric motor 18³ is disposed and secured to the lower portion of the inner panel of the door 4³ which electric motor has on its shaft a pinion 19³ which meshes with the gear rack 20³. The rear wall 10³ of the shelves 8³ is secured to the gear rack so that upon turning the motor 18³ the gear rack will be forced in downward direction, at the same time moving the shelves likewise in the same direction. Automatic switch arrangements 21³ may be provided in conventional manner to stop the motor upon operating the switch by an abutment 22³ provided and projecting downwardly from the lowermost of the shelves 8³. Upon switching on the motor in the reverse direction, the gear rack 20³ will be moved upwardly and takes simultaneously the shelves 8³ until they reach the uppermost position, where again an abutment 23³ will provide for stopping the movement of the motor 18³. If the shelves have reached the uppermost position, the door can be closed and the position shown in FIG. 5 may be brought about.

While I have disclosed several embodiments of the present invention, it is to be understood that these embodiments are given by way of example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

I claim:

1. A cabinet or the like comprising a top wall, a bottom wall, two oppositely disposed side walls and at least

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one front door hingedly secured to the front end of one of said side walls, at least one first shelf disposed in and secured to the lower portion of said cabinet, and at least one second shelf non-disengageably secured to the inner face of said door for vertical sliding movement and received in the upper portion of said cabinet in the closed position of said door and movable to its lower position only upon opening said door for at least 180°, means associated with the inner face of and disposed within said door and accessible from the inside of said door, causing the movement of said second shelf from its upper position to a lower position substantially to the level of said first shelf, and means retaining said second shelf in its lower position, thereby disposing both shelves at a height within reach of a normal person, said door having at least two panels spaced apart from each other, the inner panel of said door having at least one vertically disposed groove, a guide member vertically slidable between said panels and within said door, and a connecting member connecting said guide member with said second shelf, and said guide member disposed between the panels of said door having forwardly projecting members sliding in additional grooves of the inner panel of said door, in order to provide a safe guidance for moving said second shelf to the level of said first shelf.

2. The cabinet or the like, as set forth in claim 1, which includes a longitudinal member mounted for vertical movement between said panels of the door, the lower end of said member including a spring biased bolt, and the inner panel of said door having a cut-out to receive a handle-like portion of said member, the inner face of the outer panel of said door having a recess to receive said spring biased bolt disposed at the lower end of said member and thereby retaining said second shelf in its upper position.

3. The cabinet or the like, as set forth in claim 1, which includes an electric motor permanently mounted at the lower portion of the inner face of said door, a gear rack secured to the rear face of said second shelf and projecting in downward direction, a pinion driven by said motor and meshing with said gear rack, so that upon turning said motor, the gear rack is forced downwardly simultaneously moving said second shelf in downward direction and upon reversal of said motor, to move said gear rack in upward direction and restoring said second shelf to its upper position.

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