Aug. 17, 1948. A. VANDERVELD 2,447,219

SLIDING DOOR LOCK

Filed April 30, 1947 2 Sheets-Sheet 1

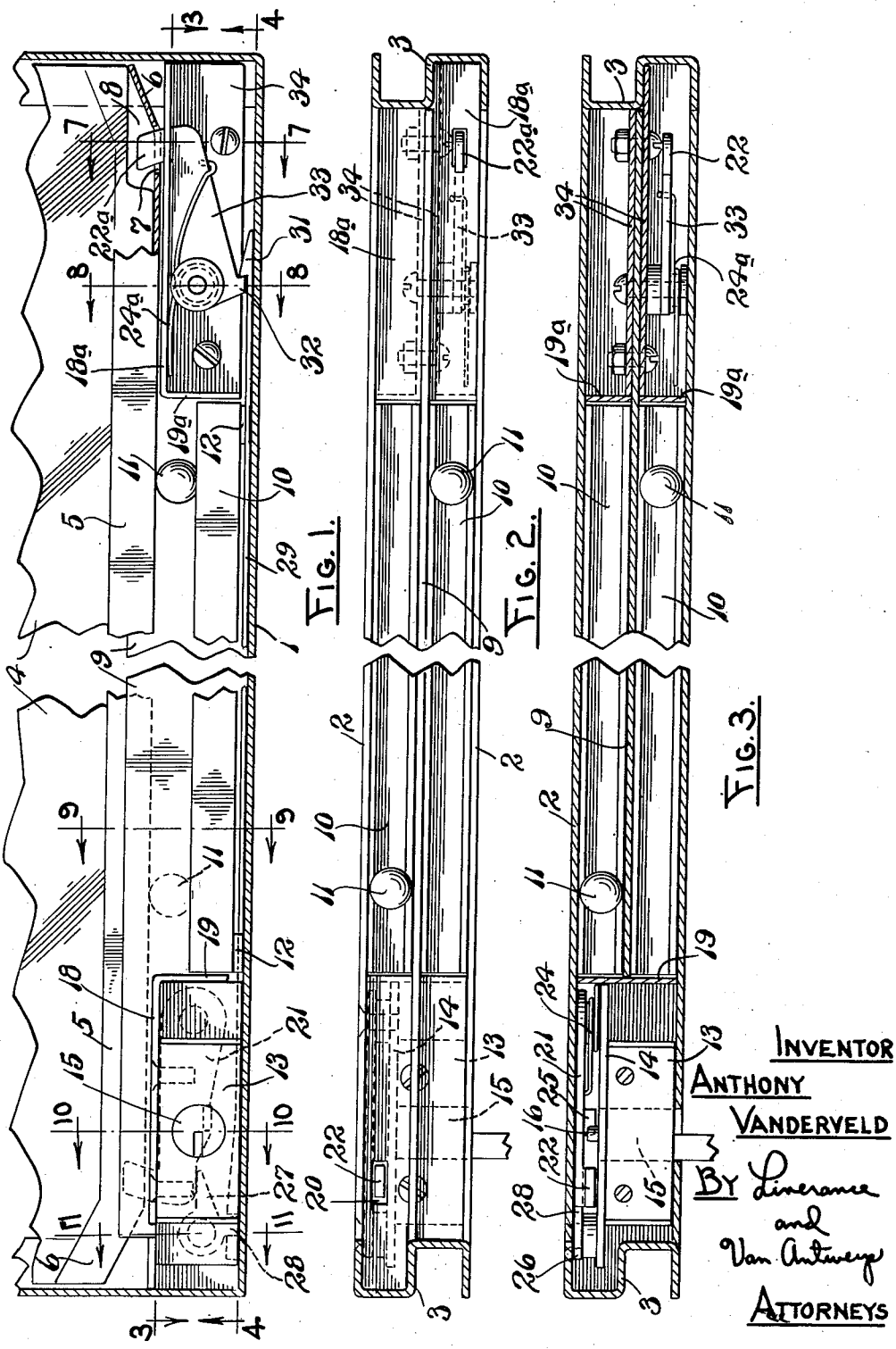


FIG. 1.

FIG. 2.

FIG. 3.

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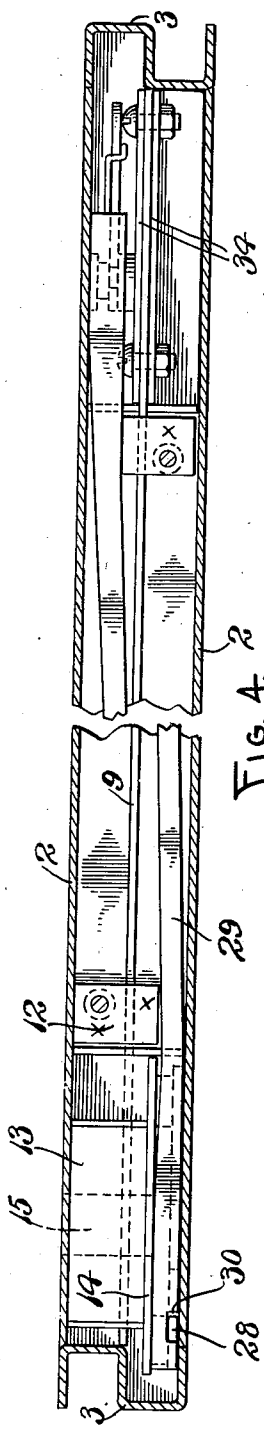


FIG. 4.

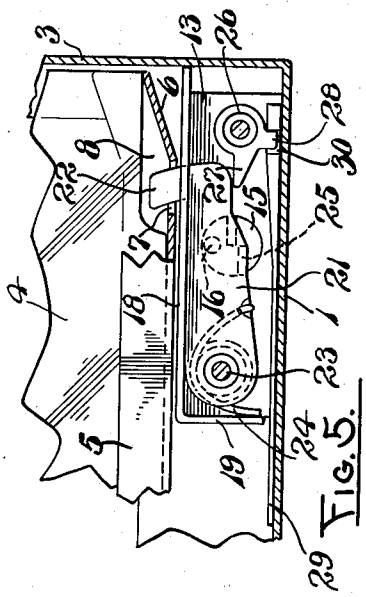


FIG. 5.

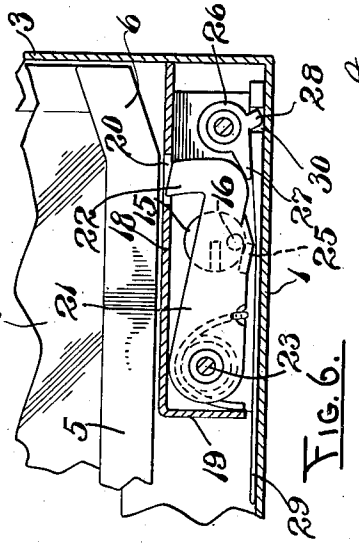


FIG. 6.

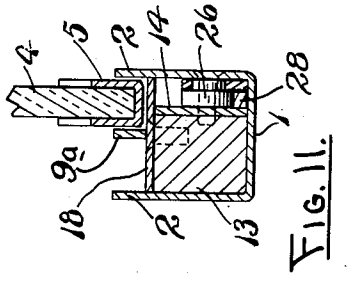


FIG. 11.

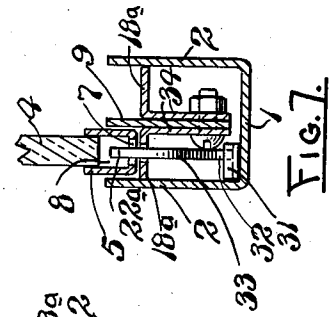


FIG. 7.

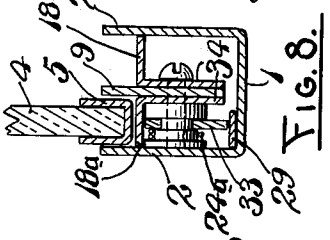


FIG. 8.

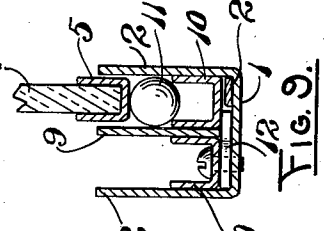


FIG. 9.

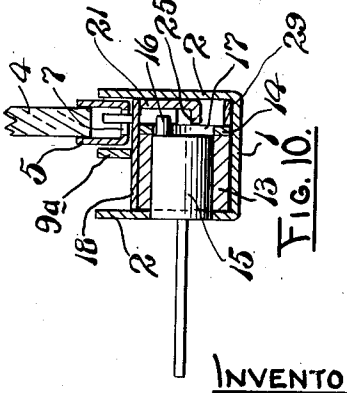


FIG. 10.

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Patented Aug. 17, 1948 2,447,219

UNITED STATES PATENT OFFICE

2,447,219

SLIDING DOOR LOCK

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Application April 30, 1947, Serial No. 744,923

8 Claims. (Cl. 70—82)

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This invention relates to locks for sliding doors, which in practice are located at the open side of a showcase or display cabinet in vertical position, and are movable slidably in parallel, closely adjacent vertical planes. When the doors are in closed position they in general overlap at their adjacent vertical edge portions. Such doors frequently are known as "all glass," that is, without surrounding border frames. However, while the invention is disclosed in use with such all glass doors, it is not limited solely thereto.

In many uses of the sliding glass doors for closing the fronts of upper display compartments in cases or cabinets used in stores for holding and displaying merchandise, it has been desirable to have a lock for the doors which will hold them against opening when they are closed after a day's business has been transacted, and which lock may be key operated and simultaneously serve to lock both doors, or unlock them, and which is housed within the lower carrying support for the doors which receives and guides them at their lower edges. Locks of this character for sliding doors have not heretofore been successfully produced.

With the present invention the locking means used is below the lower edges of the doors. One lock for one door is key operated and is connected to a second lock for the other door so that both locks work together in simultaneously locking or unlocking the doors. When the doors are unlocked and one or both of them moved from closed position, means are provided so that if the lock is operated while a door or both doors are open, an automatic engagement and holding of the doors will occur when they are moved to close the entrance opening in which they are mounted. When applied to display compartments of merchandise cases which may be located against a wall of a store, the doors will be at the front of the upper display compartment, and the lock at approximately head or shoulder level of a clerk of the store, so as to be easily operated. The lock, of course, is applicable to showcases which are accessible for entrance at the back, in which case the lock will be closer to the floor.

It is an object and purpose of the present invention to provide a lock having the desirable characteristics noted, which is readily manufactured and installed, is economical to produce and sure in its operations.

An understanding of the invention may be had from the following description, taken in connection with the accompanying drawings, in which

Fig. 1 is a fragmentary elevation of the lower part of a sliding glass door equipped case or compartment, having my invention applied, the supporting guide means at the lower edges of the doors having the front side thereof removed,

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Fig. 2 is a plan of the lower guide support for the doors with the locks mounted therein, one at each end thereof,

Figs. 3 and 4 are horizontal sections substantially on the planes of lines 3—3 and 4—4 of Fig. 1, looking in opposite directions as indicated by the arrows,

Figs. 5 and 6 are fragmentary, somewhat enlarged elevations and partial sections, showing the key operated lock in its locked and unlocked positions, respectively, and

Figs. 7 to 11, inclusive, are transverse vertical sections on the planes of lines 7—7, 8—8, 9—9, 10—10 and 11—11, respectively, of Fig. 1, looking in the direction indicated by the arrows.

Like reference characters refer to like parts in the different figures of the drawings.

A door carrying member in which the doors are mounted, for example, at the front of the upper display compartment of a wall case, or at the back of a showcase, includes a horizontal lower member of channel form having a bottom web 1 and inner and outer spaced vertical flanges 2 extending from the longitudinal edges thereof. The vertical sides 3 of the frame are of an S-bar form as shown in Figs. 2, 3 and 4. The frame is completed by an upper horizontal member, not shown. The frame structure is not in itself new and its structure need not be entered into detail. The width of the lower channel is greater than the combined thickness of two sliding doors 4 which are to be mounted vertically within the frame. Each door at its lower edge is equipped with a channel border 5 of metal which at its outer end portion is inclined upwardly as at 6, the bottom of each channel 5 at its end where it joins with the inclined section 6 having an opening 7 therethrough for the passage of a locking tongue. The lower corner portions of the glass plates 4 from which the doors are made, are cut away to leave a space 8 (Fig. 1) for the passage thereinto of the locking tongues which are used, as hereinafter described.

A longitudinal vertical plate 9 is located lengthwise of the lower frame channel midway between its sides 2. Connected with it at opposite sides are two narrow channels 10 filling the lower parts of the spaces between the vertical flanges 2 and the dividing plate 9. Balls 11, or other antifriction means, suitably spaced may ride upon the upper spaced flanges of the channels 10 and on

these balls the border members 5 at the lower edges of the doors 4 bear to ride thereon. The lower edge of the plate 9 does not reach to the bottom web 1, nor do the bottom webs of the channels 11 reach thereto. Spaced flat plates 12 are interposed between the bottom 1 and the channels 10 and lower edge of the plate 9 (Fig. 9), and said plate 9 and connected channels 10 are secured thereto and to the bottom 1 of the main lower frame member by screws. The channels 10 do not extend the full length of the bottom frame member (Fig. 1), as they are cut off to provide for the locks, one for each of the doors, therefore, one at each end of the lower door frame member.

A key actuated lock, having a body 13, is located toward one end of the lower open door carrying frame and secured in place, at its inner side having a vertical plate 14 which parallels the flanges 2 and the dividing plate 9. At the inner side of the frame (Fig. 2) it is screw connected to the adjacent inner flange 2 as indiated in Fig. 2. A key operated barrel 15 is rotatably mounted to turn on a horizontal axis and extends through the body 13. It has a pin 16 at its inner end extending into an opening 17 in the plate 14 (Fig. 10). Pin 16 is offset and moves with the turning of the barrel 15 in said opening 17.

A horizontal cover plate 18 (Figs. 5 and 6) lies over and is secured to the body 13 of the lock and at its inner end has a down-turned flange 19. Toward its other end it has an opening 20 which is located immediately below the opening 7 at the outer end of the lower border member 5 of the inner glass door, that is, the one which is guided at its lower edges between the inner flange 2 and the dividing plate 9 of the lower door frame member.

A locking dog 21 is provided at one end with an upwardly extending tongue 22, and at its other end is pivotally mounted to turn on a horizontal axis on a pin 23 carried by the lock body 13. A torsion spring 24, as shown in Figs. 5 and 6, normally, when free of restraint, turns the tongue 22 to an upper position to pass through the opening 7 and into the recess at 8 when its associated door 4 is in its closed position, as in Fig. 5. By turning the barrel 15, by a key, about its axis, the pin 16 comes against an inwardly turned ledge 25 at the lower edge of the dog 21 and between its ends, thereby depressing the tongue 22 (Fig. 6) and unlocking the door.

A bell crank lever 26 is pivotally mounted at the same side of the body 13 as the locking dog 21. It has one arm 27 extending under the lower edge of the free end portion of the dog 21 so as to be turned counter clockwise when the dog is forced down to the position in Fig 6, and has a second arm or projection 28 extending downwardly. An elongated flat bar 29, lying at the upper side of the bottom web 1 of the door frame, extends at one end underneath the lever 26, is vertically thickened at said end, and has an opening 30 into which the projection 28 extends. Therefore, when the locking dog 21 is withdrawn, being moved from the position in Fig. 5 to that in Fig. 6, simultaneously the bar 29 is bodily moved in the direction of its length to the right. (Figs. 5 and 6.) The intermediate vertical dividing plate 9 is cut away at the end thereof which reaches to the lock described, and has a narrowed upper portion 9a (Fig. 10) above the cover plate 18 so that the guides for the lower edges of the doors extend the full length of the lower door frame member.

The bar 29 extends lengthwise of the under web 1 of the lower door frame member from the outer flange 2 to the inner flange (Fig. 4) and is provided with a hook or dog 31 (Fig. 1) which is in engagement with a downwardly extending tooth 32 on a locking dog 33 pivotally mounted on one of the vertical plates 34 (Fig. 4), which are located, one at each side of the longitudinally dividing plate 9 near the opposite end of the lower door frame member. The dog 33 has an upwardly extending tongue 22a to pass through the opening 7 in the lower channel border member 5 of the other sliding door 4, and normally will move to its upper position (Fig. 1) when free to do so under the influence of a spring 24a. The vertical plates 34 have oppositely extending flanges 18a at their upper edges, serving substantially the same purpose as the plate 18, and also at their inner ends may have down-turned parts 19a (Fig. 1), between which and the down-turned sections 19 the ball carrying, longitudinal channels 10 are located.

When in unlocking the door through a key operated lowering of dog 21 (Fig. 6), bar 29 is moved longitudinally, it simultaneously pulls upon the tooth 32 and swings the dog 33 downward, simultaneously unlocking the door with which it has been engaged. Both sliding doors are freed for sliding movement at the same time. On rotating the barrel 15 back to its initial position, the locking dog 21 is released to move upwardly, as in Fig. 5, whereupon the spring 24a returns the locking dog 33 to upper position as in Fig. 1 and moves the bar 29 back to the position from which it was pulled. The inclined sections 6 ride over and depress the locking tongues 22 or 22a if the lock is key released with the doors or either of them partly open, when afterward the doors are moved to closed position.

The structure described is economical to build and assemble in place, and with it the entire locking mechanism is housed in the lower side of the frame in which the doors are slidably located. No part of the locking mechanism is mounted upon the doors, except the keeper structures which receive the projecting tongues of the locking dogs. With upper compartments of display cases the key operated mechanism is directly accessible to the store clerk so that the operation of locking or unlocking the doors is almost instantly performed.

The invention is defined in the appended claims, and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In a structure as described, a door carrying frame, vertical doors mounted for sliding movement therein, one within the other, said frame having a lower frame member and mountings for the lower edges of the doors upon which the doors are slidably movable, a key operated lock at one end of said lower frame member, over which one of said doors comes when it is in closed position, a movable locking member included in said lock movable into and out of locking connection with said door when it is in closed position, a second movable locking member located at the opposite end of said lower frame member, movable into and out of locking connection with the other door when it is in closed position, and means connecting said locking members for simultaneously locking both doors when they are in closed position.

2. A structure as defined in claim 1, each of said doors at its outer lower corner portion having a downwardly and inwardly inclined lower edge and a recess to receive its locking member, whereby, when the locking members are in operative locking position with the doors open, they are forced downwardly by said inclined edges riding thereover until said receiving recesses are positioned to receive the locking members.

3. In a structure as described, a door carrying frame, vertical doors slidably mounted therein in parallel planes one within the other, said frame having a lower horizontal frame member means thereon to guide said doors at their lower edges, means within said lower frame member upon which the lower edges of the doors slidably rest, a key operated lock at one end of the lower frame member including a pivotally mounted locking dog having an upwardly turned tongue at a free end thereof, each of said doors adjacent its lower outer corner having a recess therein, key operated means for turning said dog downwardly to lower the tongue thereof, a second pivotally mounted locking dog at the other end of said lower frame member having an upwardly extending tongue at its free end, yielding means normally tending to turn said locking dogs upwardly, and connections between said dogs for simultaneously turning the second locking dog downwardly upon key operation of the first mentioned dog in a downward direction.

4. A structure as defined in claim 3, said connecting means comprising, an elongated bar, and means at its ends operatively connecting it with the locking dogs.

5. In a structure as described, a door carrying member having a lower horizontal frame member of channel form with a horizontal bottom and spaced vertical outer and inner sides, an elongated plate midway between its sides dividing said member into outer and inner parallel guide channels, door carrying means located in the lower portions of said channels, a sliding door resting at its lower edge on each of said carrying means, each of said doors at its lower corner portion being recessed, a member having an opening therein covering each of said recesses, a locking dog movably mounted one at each end of the lower frame member, each having a projection adapted to enter a recess in an associated door through said openings to said recesses, when the doors are in closed position, yielding

means normally moving said locking members to enter said projections into said recesses, key operated means for moving one of said locking members to disengage it from its associated door, and means connected with the other of the locking members and actuated by the movement of the first mentioned locking dog for simultaneously moving it to disengage from its associated door.

6. A structure as defined in claim 5, each of said doors at its outer lower corner portion having a downwardly and inwardly inclined lower edge section extending outwardly from the opening made for entrance into the recess of each door for riding over the projections of the associated locking members when said locking members are released with the doors in open position.

7. A construction as defined in claim 5, each of said locking members being pivotally mounted at one end and having said projections at their opposite ends, said key operated means comprising a rotatable barrel, a pin extending from the inner end of said barrel, and a ledge on the first locking member engaged by said pin at its upper side when the barrel is rotated to thereby move said locking member in a downward direction.

8. A structure as defined in claim 5, said locking members being located at opposite ends of the lower frame member below the lower edges of the doors, said means upon which the doors are slidably mounted extending longitudinally between said locking members, means for mounting said door carrying means a short distance above the bottom of said lower frame member, and said means connecting the locking members comprising an elongated bar extending between them under said door carrying means.

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The following references are of record in the file of this patent:

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