April 2, 1940. A. VANDERVELD 2,196,001

SHOWCASE SLIDING DOOR LOCK

Filed Jan. 3, 1939 2 Sheets-Sheet 1

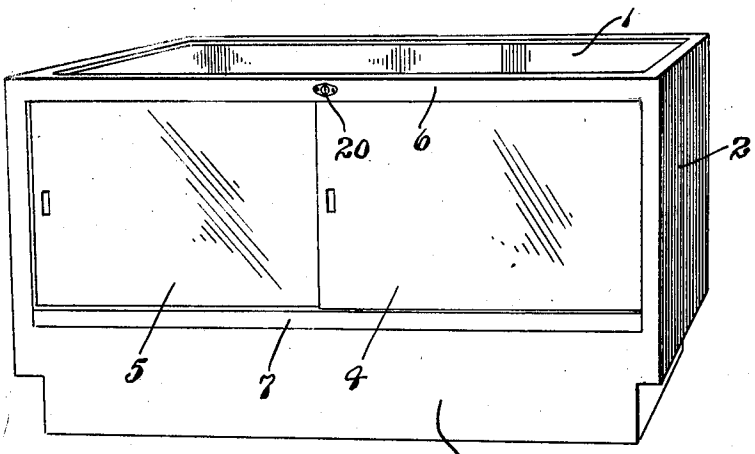



Fig. 1.

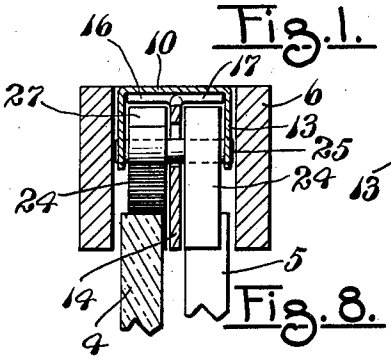



Fig. 8.

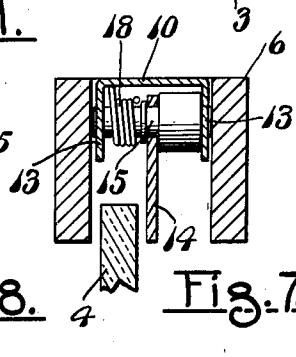
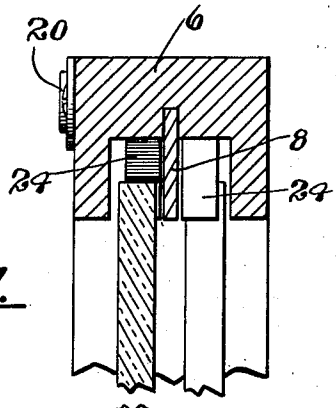



Fig. 7.



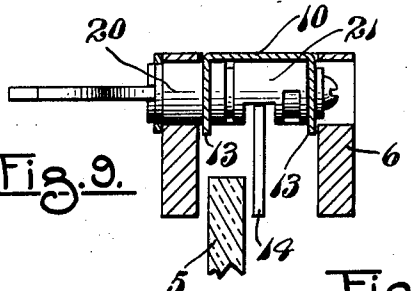




Fig. 9.

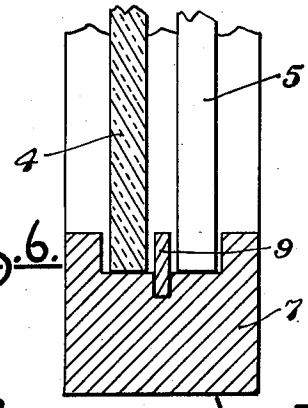



Fig. 6.

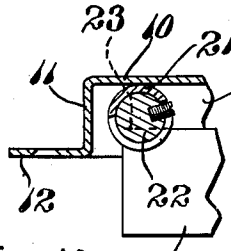



Fig. 10.

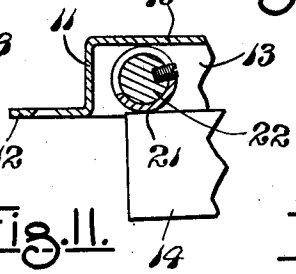



Fig. 11.

Inventor
Anthony Vanderveld
By Livernace and Van Antwerp
Attorneys

April 2, 1940. A. VANDERVELD 2,196,001

SHOWCASE SLIDING DOOR LOCK

Filed Jan. 3, 1939 2 Sheets-Sheet 2

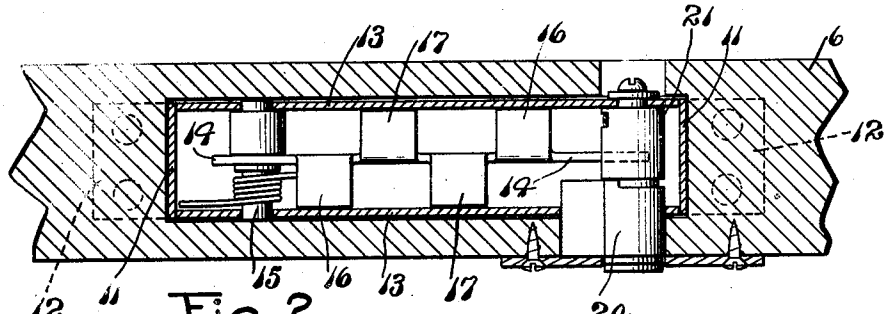


Fig. 2.

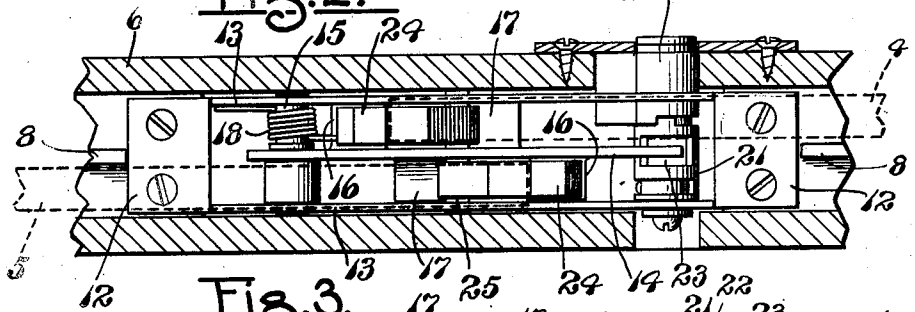


Fig. 3.

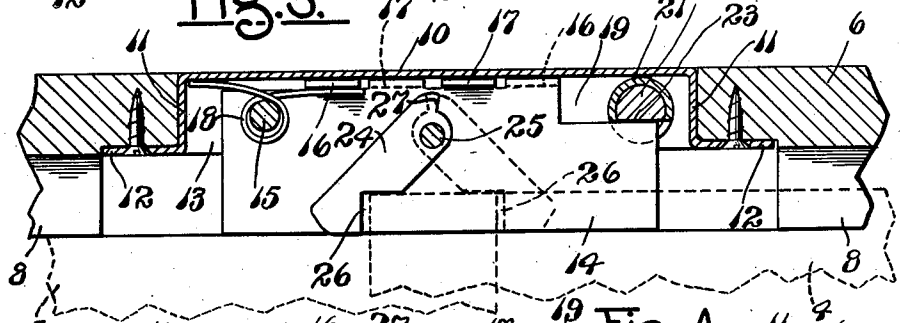


Fig. 4.

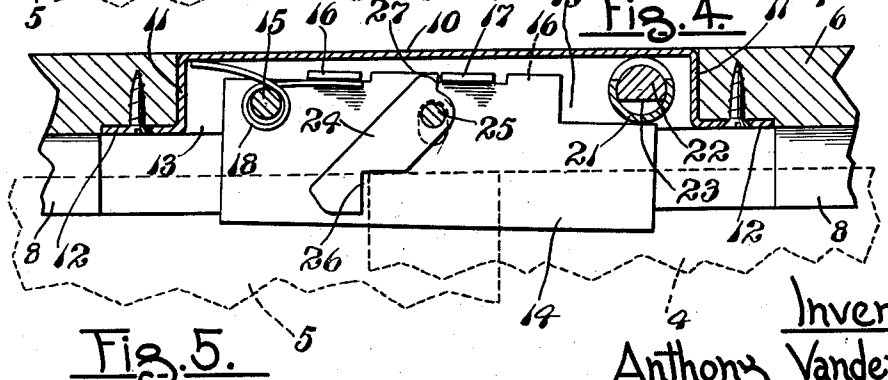


Fig. 5.

Inventor
Anthony Vanderveld
By Lawrence and Van Antwerp
Attorneys

Patented Apr. 2, 1940 2,196,001

# UNITED STATES PATENT OFFICE

2,196,001

## SHOWCASE SLIDING DOOR LOCK

Anthony Vanderveld, Grand Rapids, Mich., assignor to Grand Rapids Store Equipment Company, Grand Rapids, Mich., a corporation of Michigan

Application January 3, 1939, Serial No. 248,970

10 Claims. (Cl. 70—95)

This invention relates to locks for sliding doors, and more particularly of the type in which two doors located in different planes may be moved slidably in opposite directions to fill and close an opening in a showcase, cabinet or the like, each of the doors being slidably mounted whereby it may be moved to open position in such showcase or cabinet at either end for substantially one-half the area of the showcase opening. When said doors are moved in opposite directions to completely close the entrance opening, it is desirable that means be provided to lock them against movement. My invention is directed to a very practical and efficient lock which may be key-operated to release the lock whereby the doors may be moved, and also may be key-operated when the doors have been closed to lock them against movement.

A preferred form of construction which embodies the invention is described in the following description and illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of a showcase which may be equipped with my invention.

Fig. 2 is a partial horizontal section and plan view of the lock, the section being taken so as to remove the upper side of the lock housing.

Fig. 3 is an underplan view of the lock, the adjacent portion of the showcase rail in which the lock is mounted being shown in horizontal section.

Fig. 4 is a longitudinal section through the lock, showing the lock in its unlocked position.

Fig. 5 is a view similar to Fig. 4 with the lock in its operative locked position.

Fig. 6 is a transverse vertical section through the rear side of a showcase, at which the sliding doors are mounted.

Figs. 7, 8 and 9 are vertical transverse sections through the upper rail of the showcase and the lock at different planes thereof, and

Figs. 10 and 11 are fragmentary longitudinal sections at one end of the lock, illustrating unlocked and locked positions of the key-operated elements of the lock.

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

The enclosure, in Fig. 1 being shown as a showcase, to which the invention is applied, may have a glass top 1, vertical ends 2, a base 3, the usual front and a back which is open, the opening being adapted to be closed by sliding doors 4 and 5. In practice in a showcase the doors are glass plates, but so far as the present invention is concerned, the lock may be applied to vertically positioned sliding doors irrespective of the materials used to make the doors. The doors 4 and 5 are located in different vertical planes, for example the door 4 is shown as located to the rear of the door 5 with the adjacent vertical edge portions of said doors overlapping when the showcase is closed. In practice such overlapping of the doors may approximate one inch. The showcase includes a rear vertical open frame in which the doors are slidably mounted having an upper horizontal rail 6 and a lower horizontal rail 7 with intermediate vertical separator tongues 8 and 9 extending into horizontal grooves in the lower and upper sides respectively in the upper and lower rails 6 and 7, as shown in Fig. 6. The manner in which the doors are mounted for reducing friction in movement and other details are not illustrated forming no part of the present invention.

The lock which I have produced is adapted to be mounted at the central portion of the upper rail 6, being set in an opening mortised through said upper rail from the bottom of the groove therein to the upper side of the rail, as shown in Figs. 4 and 5, also in Figs. 7, 8 and 9. The lock includes a sheet metal housing having an upper horizontal side 10 with ends 11 bent downwardly at right angles for a distance and then continued outwardly as horizontal ears 12 through which screws may pass upwardly into the adjacent portions of the rail 6. Vertical sides 13 are bent to extend downwardly from the longitudinal edges of the upper side or web 10.

A flat plate 14 is positioned in a vertical plane in alinement with the separating tongue 8 of the upper rail 6, which tongue is cut away at its central portion for the reception of the lock (see Figs. 4 and 5). The plate 14 is pivotally mounted adjacent one of its upper corners on a pivot pin 15 and from its upper edge has integral spaced apart horizontally extending ears 16 and 17. The two ears 17 substantially midway between the ends of the plate 4 extend oppositely, while the two outer ears 16 spaced short distances from the adjacent ears 17 like-wise extend in opposite directions. An actuating spring 18 coiled around the pin 15, has one end bearing against the upper side 10 of the housing and the other end coming underneath the adjacent ear 16, the action of said spring when free to do so, lifting the free end of the plate 14 to an upper position, as in Fig. 4, in which the lower edge of the plate 14 is in the same horizontal plane with the lower edge of the tongue 8, the upper

sides of the several ears 16 and 17 bearing against the under side of the top 10 of the housing.

At the upper corner of the free end of the plate 14 a rectangular section is cut away leaving a recess 19. A key-operated locking element is mounted on and between the sides 13 of the housing and extends beyond one side or through the rear portion of the upper rail 6, as shown in Fig. 9. The lock includes a fixed cylinder 20 which extends through a side 13 of the housing, in alinement with which is a rotatable sleeve 21 mounted within the housing and through both cylinder and sleeve a rotatable key-operated rod 22 extends. The rotatable sleeve 21 is slotted at one side in the same vertical plane with the plate 14. The rod 22 is flattened at one side at 23, likewise in the same vertical plane with the plate 14. When the key which operates the rod 22 is rotated, the sleeve 21 is rotated through a pin and slot connection shown in Figs. 10 and 11, to bring the slot therein opposite the upper edge of the plate 14 and, on a continued rotation, bring the flat side 23 of the rod 22 directly over said plate 14 whereupon the plate is automatically spring lifted until stopped by engaging against said flat side 23 (Fig. 3). On reverse turning of the key through a complete revolution, the rod 22 is turned the complete revolution, but the sleeve 21 only one-half a revolution, or the parts have been moved from the position shown in Fig. 4 to that shown in Fig. 5, whereupon the plate 14 is tilted downwardly about the axis of the pivot pin 5 and against the force of spring 18.

Two locking dogs 24 are pivotally suspended from a horizontal pin 25 which is supported at its ends by the opposite sides 13 of the housing and extends between them, passing through a vertical slot in the plate 14, shown in dotted lines in Fig. 5, to permit the limited pivotal movements of said plate. Said dogs 24 are mounted on the pin adjacent their upper ends, one at each side of the plate 14, and if free to do so, would hang vertical through the influence of gravity. Said dogs at their lower portions and at their adjacent sides are cut away to provide right-angle notches 26 and at their upper ends above the pivot 25 are provided with projecting lugs 27. When the plate 14 is in its elevated position as in Fig. 4, the ears 17 are lifted above the lugs 27, but in the lowermost position of the plate 14, as in Fig. 5, said ears 17 are interposed in the path of rotative movement of the lugs 27, thereby limiting the upward swinging movement of the locking dogs 24.

In Fig. 5 the lock is shown in its operative position, the sliding doors being closed and with their adjacent vertical edge portions overlapping. The inner upper corners of said doors 4 and 5 seat in the right angle notches 26 of the dogs 24. Attempting to slide the doors, door 4 to the left or door 5 to the right in Fig. 5, is prevented for the reason that the dogs 24 cannot be lifted sufficiently, as any attempt to rotate them and lift them is stopped by the engagement of the lugs 27 against the adjacent edges of the ears 17. On key-operation so that the rod 22 is turned through a complete revolution and the sleeve 21 through half a revolution, or to the position shown in Fig. 4, followed by the elevation of the plate 14 by spring 18, said ears 17 are lifted above the lugs 27, thus freeing the locking dogs so that they may be swung upwardly about the pin 25. This frees the doors for sliding movement, and they may be moved past each other for access to the interior of the showcase or cabinet. When a door has been moved away from its closed position so as to elevate its associated locking dog 24, the key-operated elements cannot then be turned, as the lug 27 of such dog thus moved will have been swung over underneath its associated ears 17, positively holding plate 14 from downward pivotal movement; and it is only when the doors have been completely closed so that the dogs 24 may drop into operative position with the upper inner corners of said doors received within the right angle recesses 26, that the rotatable locking element can then be turned to force the plate 14 down to the position shown in Fig. 5 and thus lock the doors against sliding movement.

The construction of lock described is one which is economical to produce, the parts thereof being almost entirely of sheet metal and all parts being of a readily fabricated, easily produced and assembled construction. For showcases or cabinets which have cooperating sliding doors mounted to slide past each other and with adjacent edge portions overlapping, the lock which I have produced has proved very practical and useful.

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. A lock of the class described including, a support, dogs pivotally suspended from the support alongside each other and in different planes, a member movably mounted on the support having means to engage with said dogs to hold them against swinging away from each other beyond predetermined positions when said member is in one position, and to disengage from said dogs freeing them for swinging movement away from each other beyond said predetermined positions when in another position, and means for locking said member in the first position or releasing it to permit its movement to the second position.

2. A lock for sliding cabinet or show case doors which are adapted to slide past each other in different planes comprising, a support, two dogs pivotally suspended from said support whereby they are adapted to be located in substantially the same planes as the doors with which they are adapted to be used, a member pivotally located in a vertical plane mounted at one end on said support and extending between the dogs, interengaging means on said member and dogs to prevent upward swinging movement of the dogs away from each other beyond a predetermined position when said member is in a lower position, but permitting the dogs to swing farther away and beyond said predetermined positions when said member is in an upper position, and means engageable with the free end of said member to hold it in the first mentioned lower position, said means being manually operable to release said member for movement to upper position.

3. A construction containing the elements in combination defined in claim 2, combined with yielding means normally lifting the member to its upper position when free to do so.

4. A lock for the purposes described comprising, a housing support having a horizontal top and depending spaced apart sides, a member located in a vertical plane betwen the sides of the housing, a pivot pin passing through one end of said member and connected at its ends to the

sides of said housing, two dogs pivotally suspended adjacent their upper ends upon and substantially midway between the ends of said housing sides, one at each side of said member, interengaging means on the upper ends of said dogs and at the upper edge of said member preventing swinging of the depending portions of said dogs away from each other beyond a predetermined position when said member is tilted downwardly, said interengaging means being free and permitting swinging movement of the dogs away from each other beyond said positions when the member is elevated about its pivot, and manually operable means engaging with the free end portion of said member to hold it in its downward tilted position, said manually operable means being operable to release said flat member to move to upper position.

5. A construction containing the elements in combination defined in claim 4, combined with spring means mounted upon said pivot pin and engaging with the housing and said member, normally acting to lift said member to upper position when free to do so, said dogs adjacent their lower ends and at their adjacent vertical edges having right angle recesses shaped to receive each the upper corner of a door, as specified.

6. A lock comprising, a housing having a horizontal flat top, spaced apart depending sides and spaced apart depending ends, a flat plate located vertically in a plane substantially midway between the sides of said housing, a pivot pin on which said plate is mounted for pivotal movements passing through the plate adjacent one end and adjacent the upper edge thereof, said pivot pin being carried at its ends by the sides of the housing, said plate having two horizontal ears at its upper edge and at its middle portion extending oppositely from each other and spaced a short distance apart, a pin extending between and mounted on the sides of the housing approximately at their middle portions, said plate having a slot through which the pin passes, a dog at each side of the plate suspended from its upper end portion on said pin, each dog at its upper end having an upwardly projecting lug each adapted to engage an adjacent edge of one of said ears when the plate is tilted downwardly, said ears being elevated above said lugs when the plate is tilted upwardly, said plate adjacent its free end having a recessed portion, and a rotatable manually operable member mounted on and extending through the sides of said housing and extending through the recess in said plate, adapted to depress the plate at its free end when in one position, and permit elevation of the plate when turned to another position.

7. A lock of the class described comprising, a support, dogs pivotally suspended from said support alongside each other and movable in different vertical planes, a member pivotally mounted on the support having means to engage with said dogs to hold them against swinging away from each other beyond predetermined positions when said member is in one position, and freeing said dogs for swinging movement away from each other beyond said predetermined positions when in another position, and means for locking said member in the first position or releasing it to permit its movement to the second position.

8. A lock of the class described comprising, a support, dogs pivotally mounted and freely depending from the support, a plate movably mounted on the support having spaced apart flanges thereon to engage said dogs to hold them against swinging away from each other beyond predetermined positions when said plate is in one position, and freeing said dogs for free swinging movement away from each other beyond said predetermined positions when in another position, and means for locking said plate in the first position or releasing it to permit its movement to the second position.

9. A lock of the class described comprising, a support, dogs pivotally suspended from the support, a plate pivotally mounted at one of its ends on the support having spaced apart flanges thereon to engage said dogs to hold them against swinging away from each other beyond predetermined positions when said plate is in one position, and freeing said dogs for swinging movement away from each other beyond said predetermined positions when in another position, and means for locking said plate in the first position or releasing it to permit its movement to the second position.

10. The combination of elements defined in claim 9, combined with spring means to urge said plate to said second position.

ANTHONY VANDERVELD.