April 17, 1934. D. M. ROBINSON 1,955,439

OVERHEAD DOORLOCK

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Fig. 1

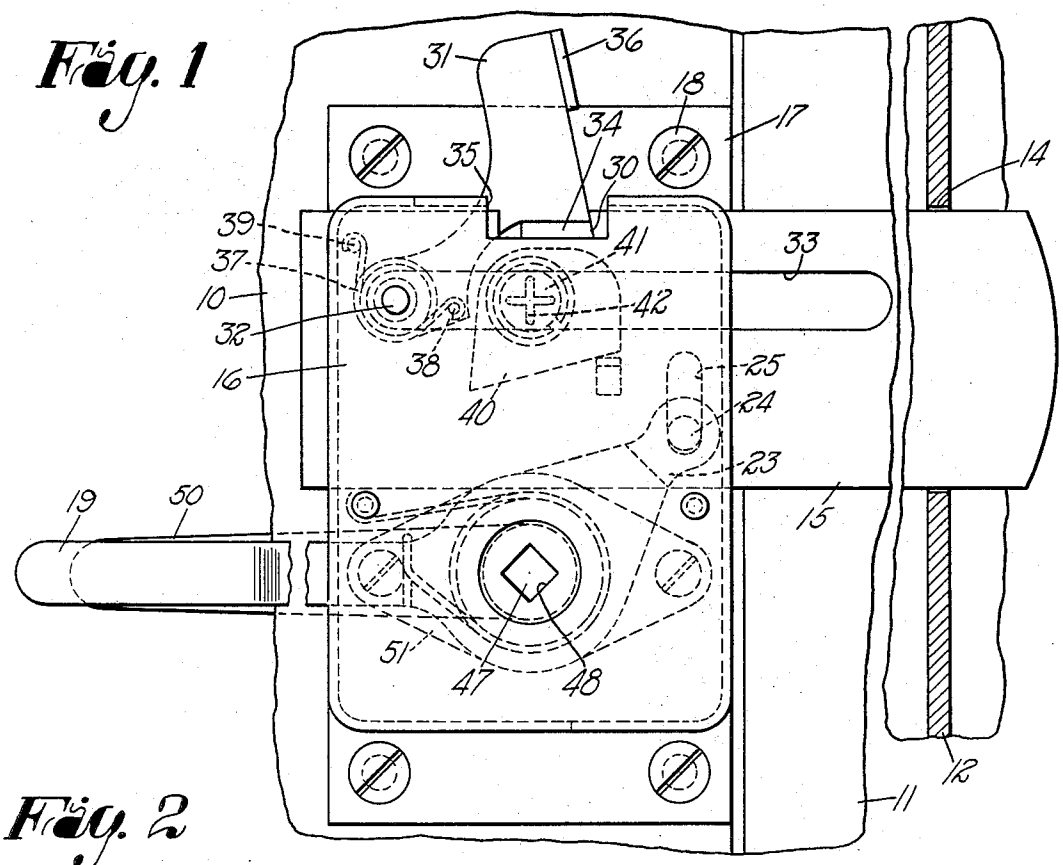
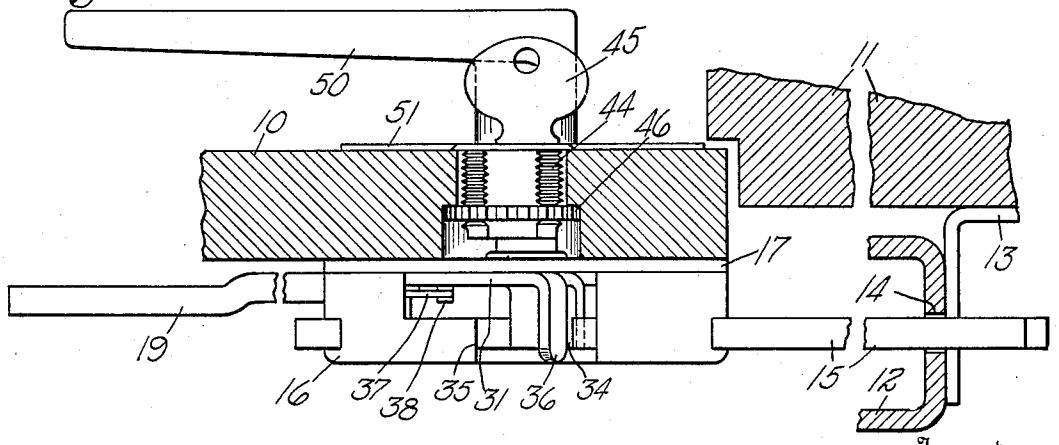


Fig. 2



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Fig. 3

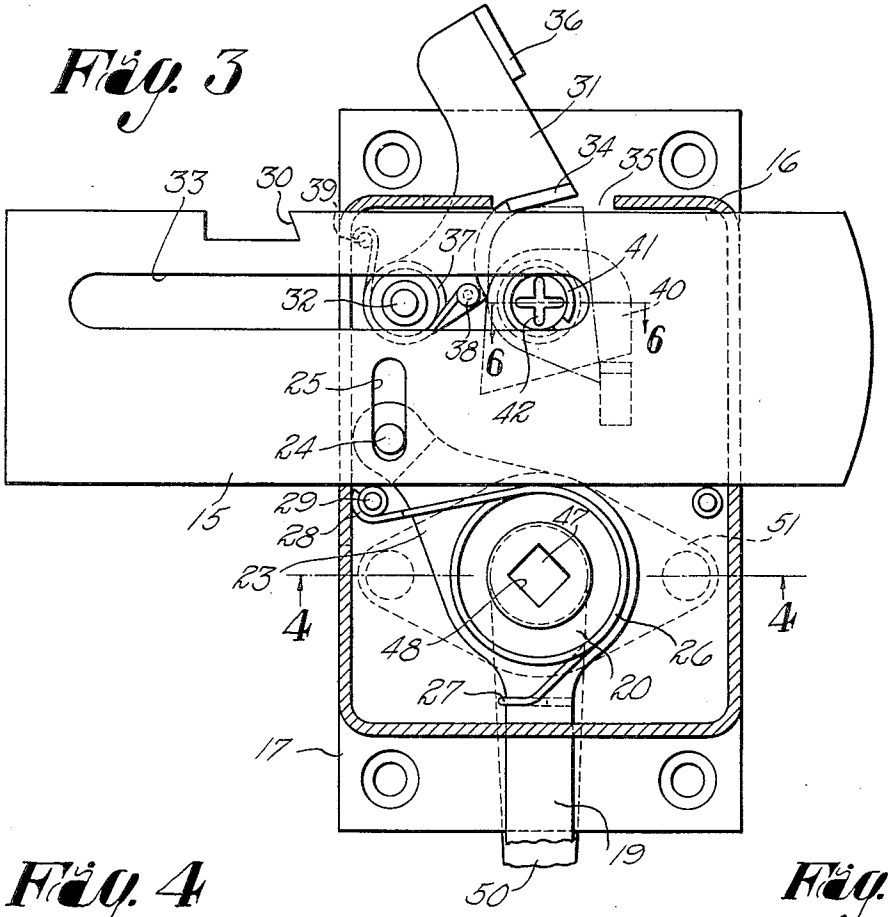


Fig. 4

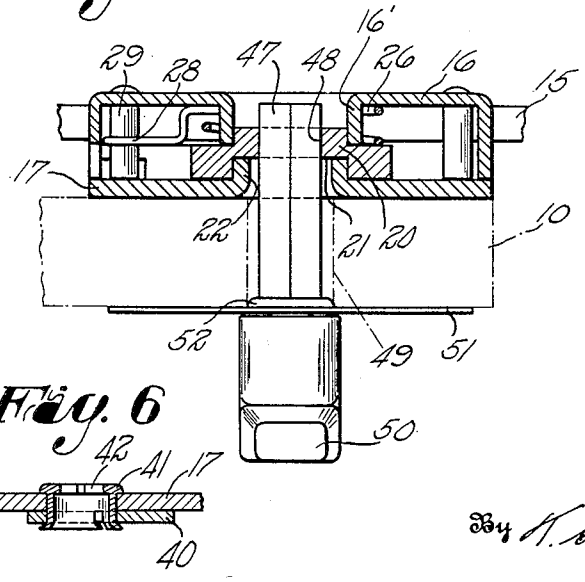


Fig. 5

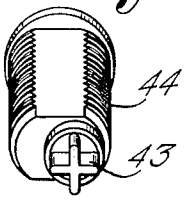


Fig. 6

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UNITED STATES PATENT OFFICE

1,955,439

OVERHEAD DOORLOCK

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Application February 17, 1932, Serial No. 593,453

6 Claims. (Cl. 70—29)

The present invention relates to locks for doors and the like, and more particularly to a lock for application especially to that type of door known as an overhead door and wherein the door assumes a vertical position when closed and is adapted for vertical sliding movement in the door jamb.

The purpose of this invention is to so improve the lock structure as to provide locking and operating devices which are quick acting, strong and durable, which embody but few relatively large parts effectively interfitting and interconnected to provide strength and a minimum of bearing surfaces and frictional contact; and which have their hand engaging parts so located and disposed as to be of easy access from both the interior and exterior of the door.

The invention also provides a trip lever, for cooperation with the sliding bolt of the lock, which is easily accessible at the inner side of the door for releasing the bolt manually, and which is also provided with an adaptor for cooperation with a cylinder or other suitable type of lock which may be key operated from the outer side of the door.

Other objects will be in part obvious, and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings wherein is shown, for illustrative purposes, one of the embodiments which the present invention may take:

Fig. 1 is a fragmentary inner side elevation of a vertically sliding door, with its jamb, and having a lock constructed according to the present invention applied thereto and shown in locking position;

Fig. 2 is an upper edge view of the lock, showing the door and jamb parts in section;

Fig. 3 is an inner side view of the lock in released position, the inner frame plate being broken away;

Fig. 4 is a transverse section taken through the lower end portion of the lock substantially on line 4—4 of Fig. 3;

Fig. 5 is a detail perspective view of one form of key or cylinder lock which may be used with the door lock of this invention; and

Fig. 6 is a detail sectional view through the trip lever and the hollow pivot to which it is fixed, this view being taken substantially on line 6—6 of Fig. 3.

Referring now to the drawings, the improved lock is shown as applied to an overhead door, but it is to be understood that the lock structure may be used in any other adaptable manner and in connection with doors of other types. As shown, the lock may be applied to an overhead door 10 which is adapted to move vertically with relation to a door jamb 11 and which is retained in place by a vertical guide or channel rail 12 providing a trackway for the door. The channel rail 12 is supported upon brackets 13 mounted on the inner side of the door jamb 11, and the trackway 12 is provided at a suitable point with a keeper slot or opening 14 adapted to receive the lock plate or bolt 15 of the improved lock.

This bolt 15, as shown in the present instance, comprises a relatively flat elongated plate of suitable thickness to provide the necessary inherent strength in the bolt, and the keeper opening 14 is of sufficient length to freely receive the outer end of the bolt 15. The bolt 15 is slidably mounted through a frame or casing 16 which may be of any suitable construction but, in the present instance, comprises a back plate 17 adapted to be secured at its upper and lower end portions by screws 18 or the like against the inner face of the door 10. The body portion of the frame 16 may be in the form of an enclosing housing consisting of a front plate with marginal flanges adapted to seat against the bracket plate 17. The body portion of the frame 16 is provided with registering slots in its opposite ends for receiving the opposite end portions of the sliding bolt 15 therethrough to not only provide suitable bearings for the bolt, but to hold the same from canting or tilting.

Means is provided for manually retracting the bolt 15 out of the keeper opening 14. This means comprises a hand lever 19 which has a hub portion 20 upon its inner end. The hub portion may be stamped, or otherwise suitably provided with a bearing recess 21 in one side adapted to engage over an inwardly pressed boss or annular bearing flange 22 provided on the back plate 17 and upon which the lever 19 is adapted to turn. The hub 20 is rotatably received by an inwardly pressed boss or flange 16' provided on the casing 16. The hub portion 20 of the hand lever carries at one side, and at a suitable angle to the shank of the handle 19, an arm 23 which carries a pin 24. This pin engages in a vertical slot 25 provided in the body portion of the bolt

15 intermediate the ends thereof. The slot 25 is of sufficient height to admit of the rise and fall of the pin 24 during the swinging of the arm 23 back and forth in the frame or casing 16 in the operation of projecting and retracting the bolt. The shank of the lever 19 extends laterally from the frame 16 and through a slot formed in the inturned flange of the front plate of the frame.

The sliding bolt 15 is biased to a retracted position, and this may be accomplished by providing a coil spring 26 disposed about the boss 16'. It has one end overturned to provide a hook 27 engaging about the shank of the lever 19, and its other end bent back to provide a second hook 28 adapted for engagement about a through stud or rivet 29 used in securing the plates of the casing together. The spring 26 exerts a tension upon the lever 19 to swing the same in the direction required for retracting the bolt 15 into the position shown in Fig. 3 and at which time the lever 19 preferably extends downwardly through the bottom of the casing or frame 16.

The sliding bolt 15 is provided in its upper edge portion and near its rear end with a recess providing a shoulder 30, and pivotally mounted in the frame 16 is a trip lever 31 of substantially L-shape. This lever is pivotally supported at one end upon a stud 32 which is carried in the frame between the front and rear walls thereof. The sliding bolt 15 is provided with a longitudinal slot 33 through which the stud 32 may project, the slot 33 being of sufficient length to admit of the free and noninterrupted movement of the bolt into and out of locking position. The trip lever 31 projects upwardly through the top of the frame or casing 16 and is provided at its angled portion with a laterally bent projection or dog 34 proportioned to drop into the slot in the upper edge of the bolt 15 and behind the shoulder 30. It will be noted from Fig. 3 that the projection or dog 34 operates through a slot 35 provided in the upper portion of the frame or casing 16, and the free end portion of the trip lever 31 extends above the casing 16 and is provided with a laterally turned lip or projection 36 for receiving the thumb of the operator to retract the projection or dog 34 out of engagement with the shoulder 30.

While the arrangement and mounting of the trip lever 31 is such that it will normally drop into the slot of the bolt 15 when the slot is brought into register with the dog, means is provided for normally urging the trip lever downwardly into interlocking engagement with the bolt 15. This means may comprise a coil spring 37 arranged about the stud 32 with one end hooked upon a pin 38 carried by the trip lever 31 and its other end hooked about a pin or stud 39 carried in the casing 16.

In order to admit of the release of the trip lever from the sliding bolt 15 from the outer side of the door 10, a cam plate 40 is disposed against the inner side of the bracket plate 17 and is mounted upon a hollow stud or pivot 41 which engages through the bracket plate 17 and is flanged or turned over against the outer side thereof for holding the bearing member 41 from withdrawal from the plate. The cam 40 is suitably fixed upon the inner end of the stud 41 so as to turn therewith, and the stud 41 is provided in its outer end with a non-circular opening or slot 42 for cooperation with an adaptor 43 of suitable interlocking configuration. The adaptor is mounted upon the inner end of a cylinder lock 44, or a lock of any other suitable type which may be mounted through the door 10 and operated by a key 45 at the exterior of the door, as shown in Fig. 2. The cylinder lock 44 may be of the usual construction with external threads and a marginal flange at its outer end. A retaining nut 46 is threaded upon the inner end of the cylinder lock 44 and shouldered against the inner portion of the door 10 to hold the lock 44 from withdrawal. The adaptor 43 is so positioned upon the inner end of the cylinder lock 44 as to register with the hollow pin 41 and interlock therewith.

A spindle 47 is provided with a non-circular inner end adapted for engagement in a non-circular opening 48 provided at the center of the hub 20. The spindle 47 is adapted to be mounted in an opening 49 formed through the door 10 in register with the hub 20, and a handle 50 is mounted on the outer end of the spindle by means of which the spindle may be turned for rotating the hub and moving the sliding bolt 15. The spindle 47 rotatably extends through a face plate 51 adapted to be secured by screws or the like against the outer face of the door 10. The plate 51 is located between the handle 50 and a ring or washer 52 which is secured in fixed relation upon the spindle 47 and engages the rear side of the plate 51. The spindle 47 may thus freely turn within the plate 51 when operated by the handle. The free end of the hand lever 19, at the inner side of the door 10, may be offset or given any other suitable shape to facilitate the grasping of the lever for manually operating it to slide the bolt 15 into locking position.

In the operation of the improved lock, the bolt 15 is held normally retracted by action of the spring 26. When the door is closed, and it is desired to lock it from the inner side of the door, it is only necessary to clasp the hand lever 19 and swing it upwardly to the position shown in Fig. 1. This action turns the hub 20 and swings the arm 23. The arm 23 carries the pin 24 which engages in the slot 25, so that as the pin 25 is carried forwardly with the arm, it rides up in the slot and thence back again into the lower end thereof and operates against the marginal edge of the slot to slide the bolt 15 into projected position. The bolt 15 thus enters the keeper opening 14 and is held therein by means of the locking dog or projection 34 on the trip lever 31. The trip lever 31 snaps down behind the shoulder 30 under action of the spring 37 as soon as the shoulder 30 reaches the correct position.

When it is desired to unlock the door 10 from the inner side, it is only necessary to press the hand against the upper end of the trip lever 31 and swing the latter backwardly into substantially the position shown in Fig. 3. This operation raises the dog 34 out of the slot and away from the shoulder 30, whereupon the bolt, under the influence of the spring 26, moves backwardly under the dog 34. This retraction of the bolt 15 also returns the hand lever 19 to normal position so that the parts are automatically returned for subsequent manual locking operation.

When it is desired to lock the door from the outer side thereof, it is only necessary to swing the handle 50 in a direction away from the jamb 11, whereupon the spindle 47 is turned and rotates the hub 20. As the hub 20 turns, the arm 23 projects the bolt 15 against the tension of the spring 26. As before, when the bolt 15

is fully projected, the trip lever 31 swings down and interlocks the dog 34 with the shoulder 30. The bolt cannot be retracted from the outer side of the door without inserting the key 45 in the cylinder lock 44 and operating the latter to turn the adaptor 43 and rotate the hollow pin 41 and its cam plate 40. The cam plate 40, when turned, engages against the underside of the locking dog or projection 34 and swings the trip lever 31 upwardly against the tension of the spring 39 so as to release the bolt 15. The bolt 15, under the action of the spring 26, immediately snaps back into open position.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. A lock, comprising a frame, a sliding bolt mounted to move transversely through the frame and having a shoulder in its upper edge portion, a hand lever mounted in the lower part of the frame and operatively connected to said bolt, a spring disposed between the frame and the hand lever for normally urging the same to turn in one direction to retract said bolt, and a spring pressed trip lever mounted in the top of the frame in line with said shoulder for interlocking engagement therewith when said bolt is projected.

2. A lock, comprising a frame, a plate bolt slidably engaged through the frame and having a bearing in the opposite sides thereof, a lever pivotally mounted in the frame and having a pin and slot connection with said bolt for projecting the same upon the swinging of the lever, a spring between said lever and said frame for normally urging the lever in a direction to retract the bolt, and a spring pressed trip lever carried by the frame and normally urged into the path of the bolt for interlocking engagement therewith when the bolt is projected.

3. A lock comprising a frame or casing, a bolt slidably mounted for movement in an endwise direction through the casing and having a shoulder on its upper edge, a hand lever journaled in the casing and having a pin and slot connection with said bolt, a spring within the casing and normally urging the hand lever in a direction to retract the bolt, a spring pressed trip lever mounted in the top of the casing and having a projection adapted to engage said shoulder to hold said bolt in retracted position, said trip lever also having a thumb piece, a spindle extending through and rotatable with said hand lever, and a handle on said spindle.

4. A lock comprising a frame, a bolt slidably mounted on the frame, a hand lever pivoted on the frame and connected to the bolt for sliding the same, a spring operatively connected to said hand lever and normally turning the same in a direction to retract the bolt, a trip lever carried by the frame, spring means connected with the trip lever for normally urging the same into the path of the bolt for locking it when projected, a handle operatively connected to said hand lever and located outside of the door to which the lock is secured, and a key operated cam member mounted in the frame and adapted, when turned in one direction, to release the trip lever from the bolt.

5. A lock comprising a frame, a bolt slidably mounted for movement on said frame, a lever pivotally connected on the frame and directly connected to the bolt so that the lever will move with the bolt in both directions, said lever being located inside of the door to which the lock is connected, a spring for normally urging said lever in a direction to normally retract said bolt, a releasable grip lever on the frame biased toward a position in the path of the bolt for direct interlocking engagement therewith when the bolt is retracted, said trip lever being accessible from the inside of the door, and a handle operatively connected to said lever and located outside of the door to which the lock is secured.

6. A lock comprising a frame, a bolt slidably mounted for movement on said frame, a lever pivotally connected on the frame and directly connected to the bolt so that the lever will move with the bolt in both directions, said lever being located inside of the door to which the lock is connected, a spring for normally urging said lever in a direction to normally retract said bolt, a releasable grip lever on the frame biased toward a position in the path of the bolt for direct interlocking engagement therewith when the bolt is retracted, said trip lever being accessible from the inside of the door, a handle operatively connected to said lever and located outside of the door to which the lock is secured, and a key-operated cam mounted in the frame and adapted when turned in one direction to release the trip lever from the bolt.

DAVID M. ROBINSON.