May 12, 1931. H. F. KEIL 1,805,451

LOCKING MECHANISM

Filed Oct. 22, 1925

Fig. 1.

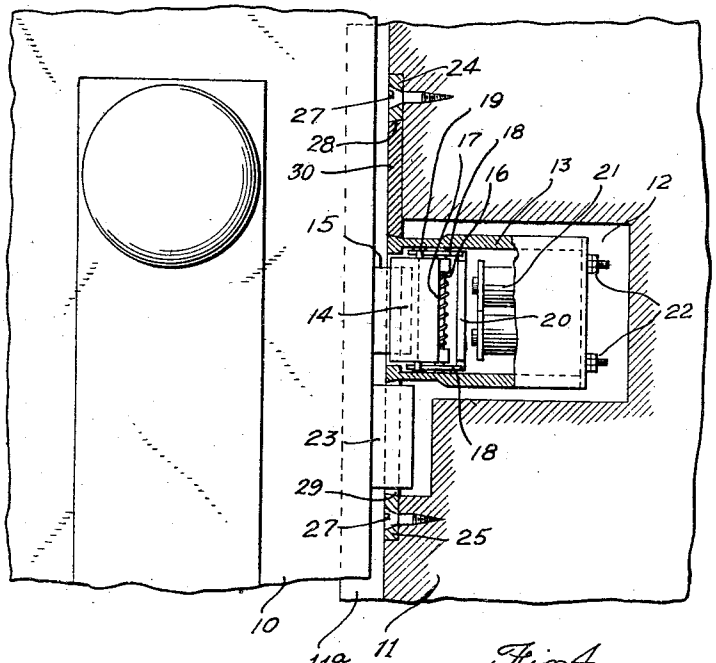



Fig. 2.

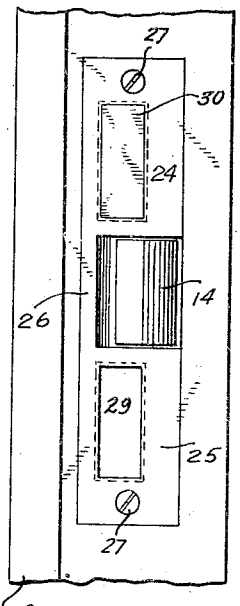



Fig. 4.

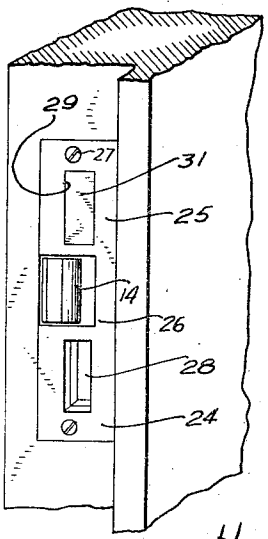



Fig. 3.

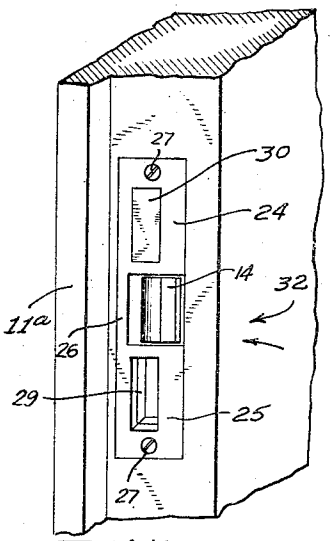
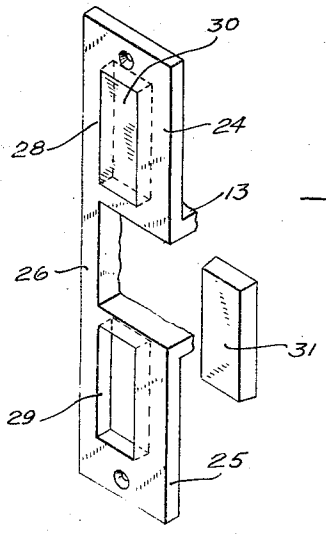



Fig. 5.




Henry F. Keil INVENTOR

BY

Robert S. Blair

ATTORNEY

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# UNITED STATES PATENT OFFICE

HENRY F. KEIL, OF SCARSDALE, NEW YORK, ASSIGNOR TO FRANCIS KEIL & SON, INC., A CORPORATION OF NEW YORK

## LOCKING MECHANISM

Application filed October 22, 1925. Serial No. 64,216.

This invention relates to locking mechanism for doors and more particularly to such mechanism wherein there are employed a releasable latch and an additional bolt as a night lock.

One of the objects of the invention is to provide a mechanism of the above nature which is practical and efficient and capable of meeting the requirements of use in a highly satisfactory manner. Another object is to provide a device of the above nature which is capable of a wide range of use under varying conditions. Another object is to provide a device of the above nature which is simple and which is capable of being mounted in operative position with the greatest convenience and without the need of undue alterations or adjustments to meet varying conditions. Another object is to provide a device of the above nature which is strong and dependable. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings in which is shown one of the various possible embodiments of this invention,

Figure 1 is a front view of the lock mechanism in operative position, the door frame and parts of the mechanism being broken away to disclose the inner structure;

Figure 2 is an elevation viewing the door frame edgewise;

Figure 3 is a perspective of the door frame portion shown in Figure 2;

Figure 4 is a view similar to Figure 3 and showing the same locking mechanism applied to a door frame wherein the door swings in the opposite direction, and

Figure 5 is a perspective of certain parts of the locking mechanism removed from the door frame.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now to the drawings in detail and first to Figure 1, there is shown a door 10 adapted to swing into a door frame indicated at 11 and against a stop 11*a*. The door frame 11 is recessed at 12 to accommodate a metal casing 13 which forms a part of the locking mechanism. This casing 13 may be made conveniently of brass and in the embodiment shown in the drawings it is a casting, it being understood that the casing might also be shaped out of sheet metal.

Adjacent the open outer end of the casing 13 is mounted therein a member 14 which is adapted to receive and catch the latch 15 of the door 10 and thereby hold the door closed. This member 14 is provided with any suitable mechanism contained within the casing 13 whereby it may be moved, by control from a remote point, to a position in which the latch 15 is disengaged, thereby permitting opening of the door.

In the embodiment of the latch-releasing mechanism shown in the drawings, the member 14 is pivotally mounted upon a vertical pin 16 and is urged by spring 17 to swing, in the direction indicated by the arrow in Figure 3, into engagement with the latch 15. Two lever arms 18 are pivoted in the casing 13 and engage with the member 14 adjacent their outer ends through pins 19 projecting from the top and bottom ends of the member 14. The inner ends of the lever arms 18 normally engage the edge of a plate-like armature 20 which is pivoted in the casing 13 and which is positioned therein to be actuated by the electromagnet 21. The coils of the electromagnet are connected through the binding posts 22 to any suitable source of current and through a switch which may be located at any convenient point.

The lever arms 18 in engagement with the armature 20 normally hold the member 14 against rotation in the direction opposite to that indicated by arrow in Figure 1. When the electromagnet 21 is energized by closing of its circuit, the armature 20 is attracted out of the path of the arms 18. The restraining force upon the member 14 is thus released and the door 10 may be opened, the latch 15 forcing the member 14 to swing back against

the urge of the spring 16 to a position in which the latch is enabled to slip by. It may be here noted that this releasing mechanism is not shown in greater detail since of themselves the specific features thereof are unimportant as relating to this invention.

The casing 13 is provided at its front end with right angle extensions 24 and 25 in plate form extending outwardly therefrom on opposite sides thereof; that is, when the mechanism is in position upon the door frame, one of these plate extensions projects upwardly from the casing 13 and the other projects downwardly therefrom. The parts 24 and 25 preferably are permanently secured to the casing 13. They may be made integral with the casing if desired, or they may comprise a single integral plate secured to the casing 13, for example by welding, and the two parts of which are joined by a central portion 26, as best shown in Figures 2 and 5. The parts 24 and 25 are adapted to rest flatwise against the surface of the door frame 11, as shown and preferably the door frame is recessed to receive them. Screws 27 passing through the parts 24 and 25 into the door frame 11 serve to position and hold in place the entire lock mechanism of the door frame.

Referring again to Figure 1, the lock mechanism mounted upon the door 10 is provided with a bolt 23 in addition to the latch 15. This bolt is in the nature of a night lock and may be operated, for example, by a thumb knob on the inner side of the door and by a key from the outer side.

In some doors the night bolt 23 is positioned below the latch 14, as shown in the drawing, and in other doors it is positioned above the latch. The locking mechanism employed upon the door frame herein disclosed is adapted to meet the requirements in either case. The plate parts 24 and 25 of the casing 13 are preferably substantially identical and each is provided with an opening therethrough which may receive a night bolt 23. As shown in Figure 5, the part 24 is provided with the opening 28 and the part 25 is provided with the opening 29.

These openings 28 and 29 are furnished with means whereby either one thereof may be rendered operative or inoperative as desired. Removable metal pieces 30 and 31 are provided which fit snugly into the respective openings 28 and 29. Preferably these metal pieces and the openings in which they fit are correspondingly tapered, being larger at the rear of the plate than at the front, so that the metal pieces are removable only from the rear. Thus when the device is positioned against the door frame, the metal piece which is left in its opening is locked in position therein by the door frame. The metal pieces are preferably of the same thickness as the metal of the plate parts into which they fit so that the surfaces are substantially flush.

Thus in the door frame shown in Figures 1, 2 and 3, wherein the night bolt is positioned below the latch, and wherein the door swings as indicated by the arrow in Figure 3 against the stop 11*a*, the piece 31 is knocked out so that the opening 29 in the part 25 is rendered operative to receive the night bolt, and the piece 30 is left in position in its opening 28 effectively closing this opening and being locked in position by the door frame against which it rests. If the bolt of the night lock were above the latch in this door, the piece 30 would be knocked out to render the opening 28 operative and the piece 31 would be left in position.

Referring now to Figure 4, there is shown a door frame wherein the door swings against a stop 11*b* in a direction opposite to the direction of swing of the door in the preceding figures. In this instance the locking mechanism of the door frame is simply turned end for end, the part 25 being now above the latch-receiving means and the part 24 below. If the night bolt is below the latch the piece 30 is knocked out to render the opening 28 operative (as shown in Figure 4) and the piece 31 is left in. If the night bolt were above the latch the piece 31 would be knocked out and the piece 30 left in place. It will be seen, therefore, that the locking mechanism is capable of fulfilling any requirement without being altered or adjusted and without re-arrangement of any parts except for simply knocking out one of the metal pieces 30 or 31 according to the opening to be utilized. These metal pieces may be termed "knock-outs."

From the foregoing it will be seen that there is herein provided a device which embodies the features of this invention and achieves the objects thereof including advantages of great practical importance. The devices are preferably furnished with both the pieces 30 and 31 intact. The carpenter setting up the locking mechanism has then simply to knock out the piece not required in order to fit the mechanism to any conditions which may be met. The plate members 24 and 25 being permanently secured to the casing 13, full strength and serviceability is assured.

As many possible embodiments may be made of the above invention, and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings, is to be interpreted as illustrative and not in a limiting sense.

I claim as my invention:

1. In a device of the class described, in combination, an elongated metal plate member adapted to be positioned flatwise against a door frame and having therein a plurality of openings, any one of which is adapted to receive a bolt from a lock on the door, opposed

wall portions of said openings being tapered toward the outer surface of said plate member, and removable metal pieces shaped to fit into and close said openings to render any of said openings inoperative independently of the others, said metal pieces being adapted in position to rest substantially flush with the outer surface of said plate and being removable only from the rear thereof.

2. In a device of the class described, in combination, a casing adapted to be set into a door frame and having therein means adapted to hold the latch of a door and means for releasing said holding means, a metal plate secured to said casing having a part adapted to rest flatwise against the door frame above said casing and a part adapted to rest flatwise against the door frame below said casing, each of said two parts having therein an opening adapted to receive the bolt of a night lock, and a pair of metal pieces adapted respectively to fit into and close said two openings, said metal pieces being independently removable to render either of said openings operative as desired and said metal pieces when in position in their respective openings being adapted to rest substantially flush with the outer surface of said plate and being removable therefrom only from the rear.

3. In a device of the class described, in combination, a metal plate-like member adapted to be secured flatwise upon a door frame and having thereon at a central portion thereof means adapted to receive and catch the latch of a door, said latch-receiving means requiring that a predetermined side of said plate face in the direction from which the door swings toward the same, and said plate being adapted to be inverted to coact with a door swinging toward the same from either direction, said plate having a pair of bolt-receiving openings, one adjacent each end thereof, and a knock-out for closing each opening whereby either knock-out may be removed to expose the opening with which the bolt is to coact.

4. In a device of the class described, in combination, a metal plate-like member adapted to be secured flatwise upon a door frame and having thereon at a central portion thereof means adapted to receive and catch the latch of a door, said latch-receiving means requiring that a predetermined side of said plate face in the direction from which the door swings toward the same, and said plate being adapted to be inverted to coact with a door swinging toward the same from either direction, said plate having a pair of bolt-receiving openings, one adjacent each end thereof, and means for closing said two bolt openings independently of one another, said closing means being locked in position when said plate is secured in position against the door frame.

5. In a devise of the class described, in combination, a metal plate-like member adapted to be secured flatwise upon a door frame and having thereon at a central portion thereof means adapted to receive and catch the latch of a door, said latch-receiving means requiring that a predetermined side of said plate face in the direction from which the door swings toward the same, and said plate being adapted to be inverted to coact with a door swinging toward the same from either direction, said plate having a pair of normally closed bolt-receiving openings, one adjacent each end thereof, and a pair of metal pieces carried by said openings and closing the latter and removable therefrom, whereby only that metal piece need be removed to render operative the desired opening.

6. In a device of the class described, in combination, a metal plate-like member adapted to be secured flatwise upon a door frame and having thereon at a central portion thereof means adapted to receive and catch the latch of a door, said latch-receiving means requiring that a predetermined side of said plate face in the direction from which the door swings toward the same, and said plate being adapted to be inverted to coact with a door swinging toward the same from either direction, said plate having a pair of normally closed bolt-receiving openings, one adjacent each end thereof, and a pair of metal pieces adapted respectively to fit into said openings and closing the latter and removable therefrom whereby either of said openings may be rendered operative, said metal pieces being removable only from the back side of said plate whereby the one coacting with its opening is locked in position when the plate is secured against the door frame.

7. In a device of the class described, in combination, a casing adapted to be set into a door frame, said casing having therein means adapted to hold the latch of a door and means for releasing said holding means, said holding means requiring that a predetermined side of said casing face in the direction from which the door swings toward the same, a metal plate permanently secured to said casing, said casing with said latch-holding and said releasing means and said plate being connected together and thereby adapted to be inverted as a unit to coact with a door swinging toward the same from either direction, said plate having therein means adapted to receive the bolt of a night lock on the door regardless of whether said bolt is positioned above or below said latch and regardless of the direction from which the door swings toward the casing.

8. In a device of the class described, in combination, a casing adapted to be set into a door frame, said casing having therein means adapted to hold the latch of a door

and means for releasing said holding means, said holding means requiring that a predetermined side of said casing face in the direction from which the door swings toward the same, plate-like means secured to said casing having two similar parts projecting from opposite sides thereof and adapted to rest flatwise against the door frame one above said casing and the other below said casing and adapted to be secured to said door frame to support said casing, said casing and said plate-like means therewith being adapted to be inverted to position said latch-holding means to coact with a door swinging toward the same from either direction, each of said two parts of said plate-like member having therein an opening adapted to receive the bolt of a night lock on the door.

9. In a device of the class described, in combination, a casing adapted to be set into a door frame, said casing having therein means adapted to hold the latch of a door and means for releasing said holding means, said holding means requiring that a predetermined side of said casing face in the direction from which the door swings toward the same, plate-like means secured to said casing having two similar parts projecting from opposite sides thereof and adapted to rest flatwise against the door frame one above said casing and the other below said casing and adapted to be secured to said door frame to support said casing, said casing and said plate-like means therewith being adapted to be inverted to position said latch-holding means to coact with a door swinging toward the same from either direction, each of said two parts of said plate-like member having therein a normally closed opening adapted when not closed to receive the bolt of a night lock on the door, and means closing said openings adapted to permit exposure at will of either of said openings independently of the other according to the direction of swing of the door and the position of the bolt above or below said latch.

10. In a device of the class described, in combination, a casing adapted to be set into a door frame, said casing having therein means adapted to hold the latch of a door and means for releasing said holding means, said holding means requiring that a predetermined side of said casing face in the direction from which the door swings toward the same, plate-like means secured to said casing having two similar parts projecting from opposite sides thereof and adapted to rest flatwise against the door frame one above said casing and the other below said casing and adapted to be secured to said door frame to support said casing, said casing and said plate-like means therewith being adapted to be inverted to position said latch-holding means to coact with a door swinging toward the same from either direction, each of said two parts of said plate-like member having therein a normally closed opening adapted when not closed to receive the bolt of a night lock on the door, and means closing said openings comprising a pair of knock-outs, whereby either knock-out may be removed to render said openings operative in accordance with the position of the bolt on the door.

In testimony whereof, I have signed my name to this specification this sixteenth day of October, 1925.

HENRY F. KEIL.