

A. J. PREVOST.
 LOCKING MECHANISM FOR EMERGENCY DOORS.
 APPLICATION FILED FEB. 26, 1910.

975,456.

Patented Nov. 15, 1910.

2 SHEETS—SHEET 1.

FIG. 1.

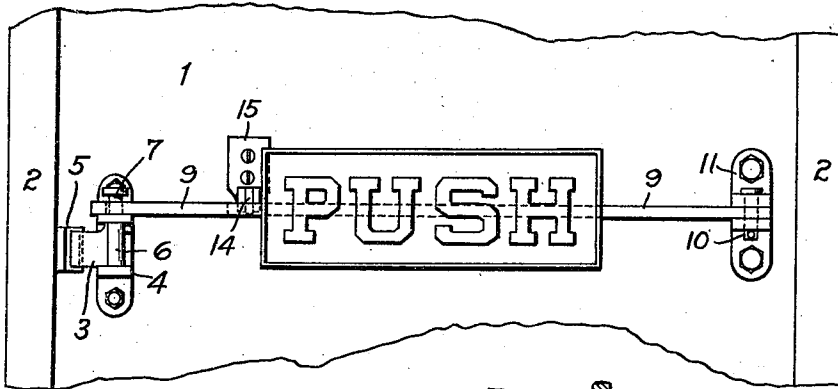


FIG. 2.

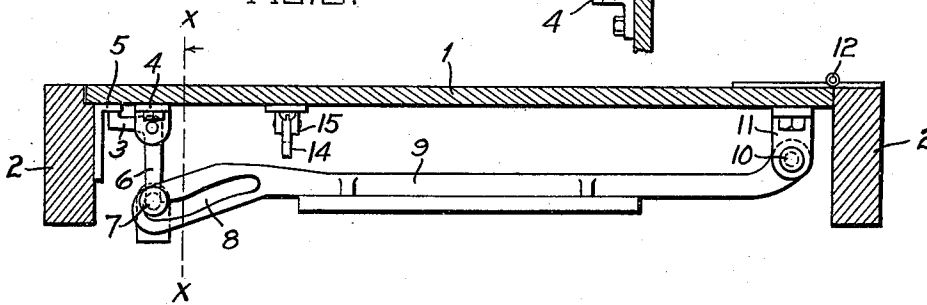


FIG. 3.

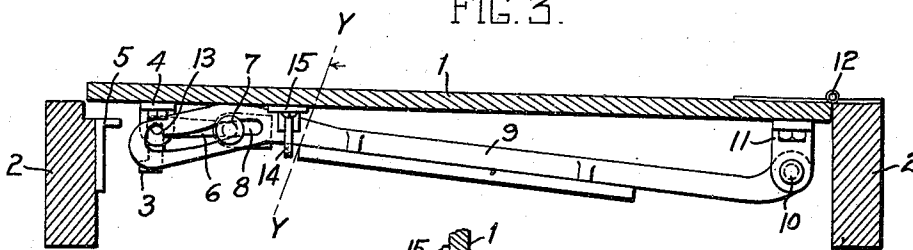
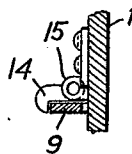


FIG. 5.



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2 SHEETS-SHEET 2.

FIG. 6.

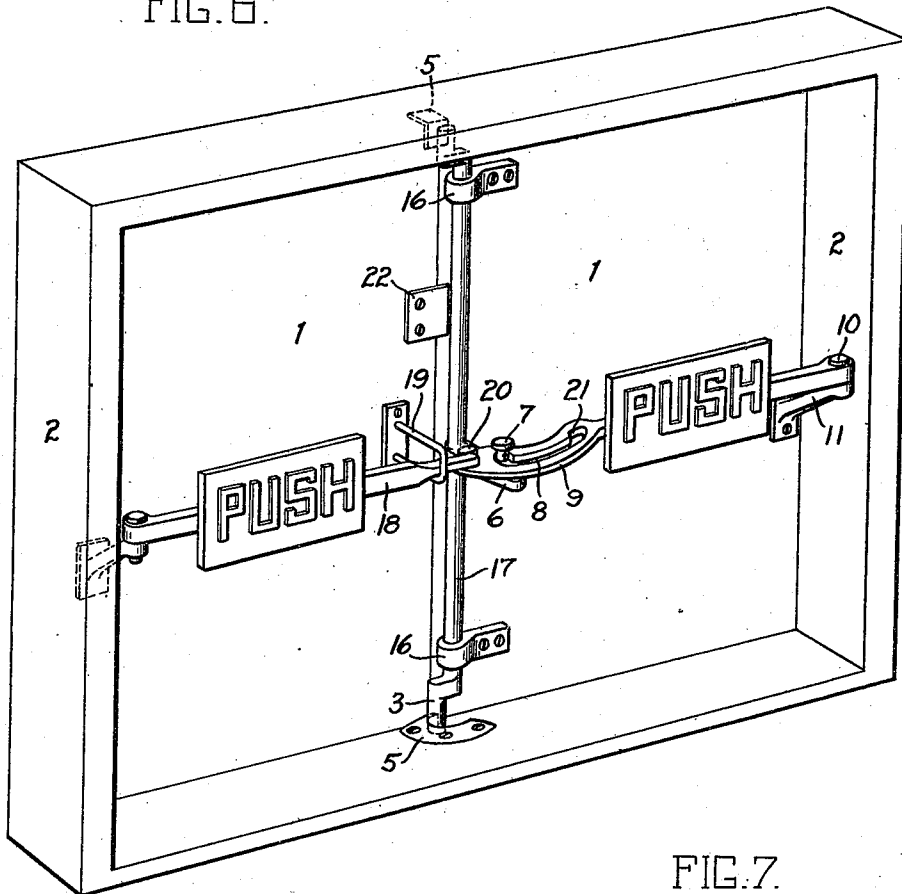


FIG. 7.

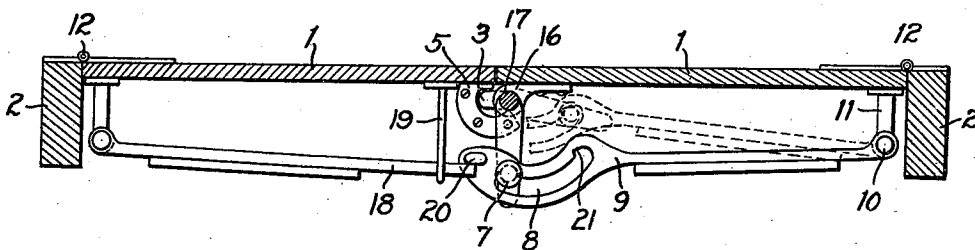
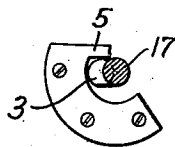


FIG. 8.



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UNITED STATES PATENT OFFICE.

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LOCKING MECHANISM FOR EMERGENCY-DOORS.

975,456.

Specification of Letters Patent.

Patented Nov. 15, 1910.

Application filed February 26, 1910. Serial No. 546,291.

To all whom it may concern:

Be it known that I, ARTHUR J. PREVOST, a subject of the King of Great Britain, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Locking Mechanisms for Emergency-Doors, of which the following is a specification.

This invention relates to mechanism for locking and unlocking emergency exit doors, such as are used in theaters and other public places. In such a mechanism it is necessary that the door be normally secured against opening either from without or by accidental contact against the door from within, while the door must be readily released from within when egress is necessary. Since emergency doors of the type in question are designed primarily to permit the ready egress of large numbers of people, they are arranged to open outwardly, and the locking mechanisms are usually arranged to be released by mere pressure against an appropriate releasing member.

One object of the present invention is to insure the release of the door upon the application of slight pressure to the releasing device, and to this end I so arrange my lock that both the force of the door against the lock and the force applied to the releasing mechanism act to move the lock into inoperative or unlocking position. The lock is thus acted upon both directly and indirectly by pressure such as may be imposed against the door and the locking mechanism by persons indoors, so that the unlocking of the door is insured even though the locking mechanism be so affected by rust, or other causes, that its parts do not move freely.

Another object of the invention is to provide for the convenient operation of the mechanism in closing and relocking the door, and to this end I provide novel and simple means in my locking mechanism for retaining the releasing device in unlocking position while the door is being moved from open to closed position.

My invention consists in the features of construction and operation hereinbefore broadly referred to, together with certain details of construction and operation which will be disclosed in connection with the following description of the illustrated embodiment of the invention.

In the accompanying drawings, which illustrate the preferred embodiment of my invention: Figure 1 is an interior elevation of a locking mechanism constructed in accordance with the present invention, and applied to a single door. The figure shows portions of the door and the door-frame; Fig. 2 is a plan view of the locking mechanism in locked position, showing the door and door-frame in section; Fig. 3 is a plan view of the mechanism in unlocked position; Fig. 4 is a vertical section of the locking mechanism on the line X—X in Fig. 2; Fig. 5 is a vertical section of the releasing lever on the line Y—Y in Fig. 3, showing also the detent in side elevation; Fig. 6 is a perspective view of a double door provided with the locking mechanism; Fig. 7 is a plan view of the locking mechanism of Fig. 6, showing the door and door-frame in section; and Fig. 8 is a detail plan view of a lock and lock-plate in Figs. 6 and 7.

The illustrated embodiment of my invention shown in Figs. 1 to 5, inclusive, is a locking mechanism applied to a single door 1 which is hinged in a door-frame 2 in the ordinary manner, and arranged to swing outwardly, that is, upwardly as shown in Figs. 2 and 3. The lock consists in a short arm 3 mounted on a vertical pivot in a bracket 4 fastened to the inner surface of the door. This lock engages a lug on a lock-plate 5 secured to the inner surface of the door-frame. In order to retain the lock in locking position, it is provided with an inwardly-extending arm 6 having a pin 7 projecting upwardly near its inner extremity. The pin 7 moves in a slot 8 formed in the left-hand end of an arm 9 which constitutes the releasing device. This releasing arm is pivoted at 10 near the right-hand edge of the door, and between lugs on a bracket 11 fixed to the inner surface of the door. The door is mounted upon hinges 12 at its right-hand edge. The slot 8 in the releasing arm terminates at its left-hand end with a retaining notch 13.

When the door is in closed position, as in Fig. 2, the lock-arm 6 may be moved to its left-hand position, and the releasing arm may then be drawn back so that the retaining notch engages the retaining pin 7. The parts are so adjusted that in this position the door is drawn tightly against the frame, and

there is enough resiliency in the parts to cause the lock-arm to have some tendency to move to the right to release the pressure of the door against the frame, and in this way the retaining pin is held against the side of the retaining notch with sufficient pressure to hold the releasing arm frictionally in its normal position. With the parts locked as above described, any pressure directed solely against the door itself will not cause the door to be unlocked. Such pressure will be transmitted through the lock to the lock-arm 6, and thence, through the pin 7, to the releasing arm, but as long as the pin and notch remain in engagement, the lock cannot release the door. A very slight pressure, however, against the releasing arm operates to disengage the retaining notch and pin, whereupon the pull of the door against the lock immediately swings the lock back out of operative position and the door opens, as in Fig. 3. During this releasing movement of the lock, the lock-arm 6 swings to the right, and the pin 7 moves toward the right-hand end of the slot 8. The relative arrangement of the lock-arm 6 and the releasing arm is such that after the first releasing movement of the latter, its further inward movement, under the influence of pressure from within, operates to assist the unlocking movement of the lock, through the action of the slot 8 upon the pin 7, so that the lock is moved not only by the pull of the door but also by the action of the releasing device.

The means for retaining the parts in unlocking position while the door is being closed consist in a detent 14 pivotally mounted in a lug 15 on the inner surface of the door in position to engage the releasing arm when the latter assumes its innermost position, as shown in Figs. 3 and 5. This detent acts automatically, since its inner end is beveled to permit the releasing arm to pass freely under it. With the parts in the position of Fig. 3, the door may be closed by using the releasing arm as a handle to pull it inwardly. When the door has been brought in this manner to closed position, the detent 14 may be raised to release the releasing arm, and the lock may then be swung into locking position.

The application of my improved locking mechanism to a double door is illustrated in Figs. 6, 7 and 8. Here the lock 3 is duplicated, and is arranged at the ends of a vertical rod 17 journaled in bearings 16 mounted on the inner surface of the right-hand valve of the door. The lower lock-plate 5 is secured to the door-sill, and is beveled, as shown in Fig. 6, to diminish its obstruction to passage through the door. The upper lock-plate is provided with a lug, as shown in dotted lines in Fig. 6, and is secured to the top member of the door-frame. The locking

and releasing mechanism is substantially the same as in the form already described in so far as the right-hand valve of the door is concerned. In order that the mechanism may be operated from any part of the doorway, however, a second releasing arm 18 is pivotally mounted upon the left-hand valve of the door. The inner end of the releasing arm 18 is guided in a staple 19 fastened to the door, and is arranged to engage an upwardly-extending lug 20 at the left-hand extremity of the releasing arm 9. This arrangement is such that pressure against the releasing arm 18 acts to move the releasing arm 9 inwardly, in the same manner as pressure directly against the latter. The left-hand valve of the door is secured in locked position by a lug 22 mounted thereon and engaging the inner surface of the right-hand valve.

In connection with the double-door locking mechanism above described, I have illustrated my novel form of mechanism for retaining the releasing members in unlocking position. In this case the slot 8 is provided with a second retaining notch 21 at its right-hand end. As shown in dotted lines in Fig. 7, this notch acts to engage and retain the pin 7 so as to permit the door to be closed by the use of the releasing arm 9 as a handle, and, when the door has been so closed, the pin is disengaged from the notch by the operator to permit the lock to be moved to locked position.

My invention is not limited to the construction hereinbefore described and illustrated in the accompanying drawings, but may be embodied in various other forms within the nature of the invention and the scope of the following claims.

I claim:—

1. In combination with an outwardly-opening door, a lock connected with the door and constructed and arranged to be moved, when released, toward inoperative position by the force of the door against it when pressed outwardly from within, and detent mechanism comprising a releasing member operable by pressure from within the door, the detent mechanism normally retaining the lock in operative position but acting, when the releasing member is moved, first to release the lock and then to assist in moving the lock to inoperative position.

2. In combination with an outwardly-opening door, a lock pivotally mounted upon the door and movable into inoperative position by the opening movement of the door, and detent mechanism comprising a releasing arm pivoted upon the inner surface of the door and having a portion engaging the lock and normally operating to retain the lock in operative position.

3. In combination with an outwardly-

opening door, a lock pivoted to said door and constructed and arranged to be moved when released toward inoperative position by the opening movement of the door, a releasing member pivoted on the door, and a pin-and-slot connection between the lock and the releasing member comprising a detent

for retaining the lock in locked position and a detent for retaining the lock in unlocked position.

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Witnesses:

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