F. F. SMITH.

DOOR LOCK MECHANISM.

APPLICATION FILED MAR. 11, 1918.

1,357,007. **Patented Oct. 26, 1920.**

Fig. 1.

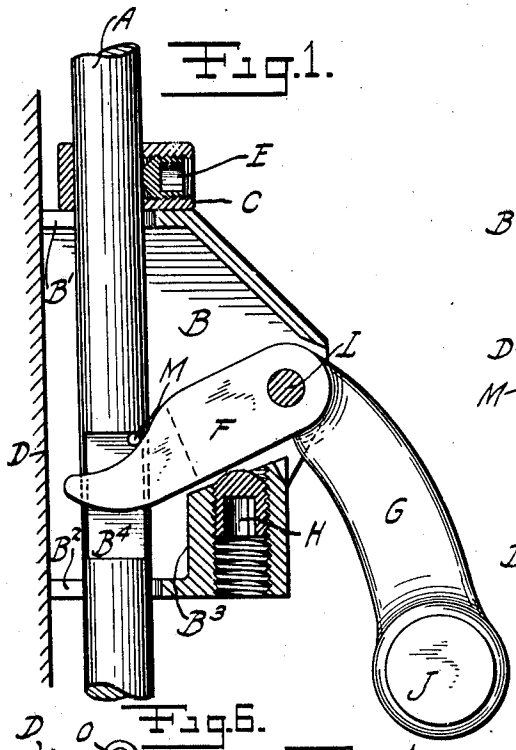


Fig. 2.

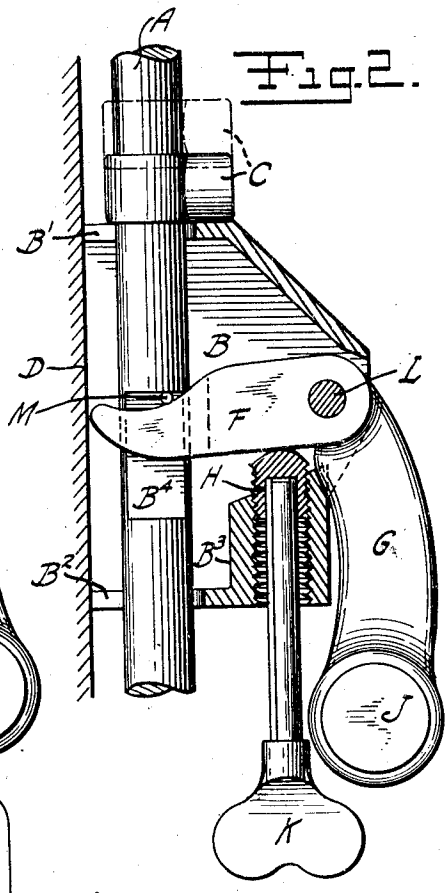


Fig. 6.

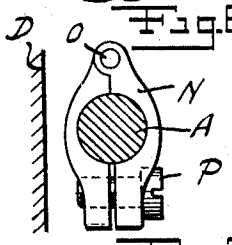


Fig. 4.

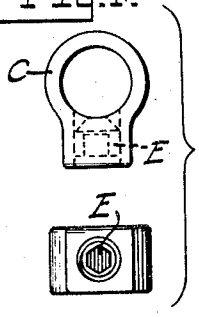


Fig. 7.

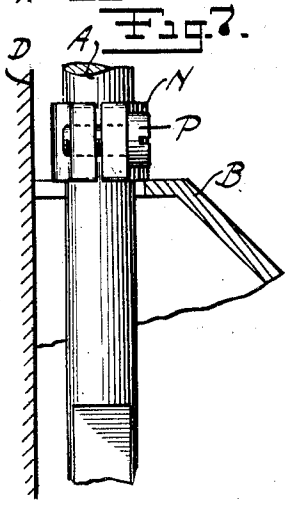


Fig. 5.

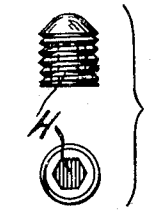
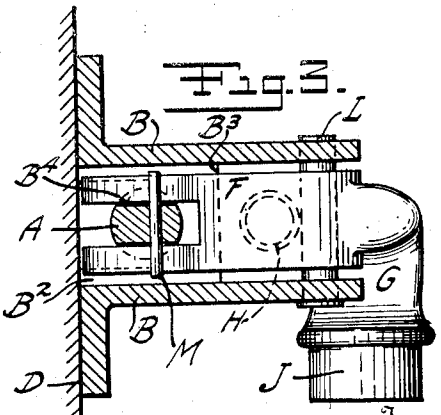


Fig. 3.



Inventor

Frank F. Smith

By his Attorney

S. J. Cox.

UNITED STATES PATENT OFFICE.

FRANK F. SMITH, OF NEWARK, NEW JERSEY, ASSIGNOR TO FRANK F. SMITH HARDWARE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

DOOR-LOCK MECHANISM.

1,357,007. Specification of Letters Patent. Patented Oct. 26, 1920.

Application filed March 11, 1918. Serial No. 221,661.

To all whom it may concern:

Be it known that I, FRANK F. SMITH, a citizen of the United States, and a resident of the city of Newark, in the county of Essex, State of New Jersey, have invented certain new and useful Improvements in Door-Lock Mechanism, of which the following is a specification.

The improvements relate to devices for locking and unlocking doors, and more particularly to locks of the emergency exit character and in which the operation of the bolt or bolts is effected by means of a reciprocating rod, which is moved by a pressible bar or arm so that in an emergency the pressure of a person seeking egress causes the door to unlock and open.

The objects of the present improvements are to provide means for securing the parts in unlocked position, and to attain other advantages incidental to the construction described and shown. They are illustrated in the accompanying drawings referred to herein.

In the said drawings, Figure 1 is a side elevation of a device embodying the improvements, with the housing and other parts in vertical section; Fig. 2 is a similar view with the parts in another position; Fig. 3 is a plan of the same with the housing and bolt-operating rod in horizontal cross-section; Fig. 4 is a plan and edge view of the preferred form of adjustable blocking collar of Figs. 1 and 2; Fig. 5 is an elevation and plan of the blocking screw-plug of Figs. 1 and 2; Fig. 6 is a plan of a modified form of the collar, and Fig. 7 an elevation of the said modified collar.

The rod A is mounted to move up and down in the housing B, and extends through apertures B′ and B^2 in the upper and lower part of said housing, which is secured to the door D in any suitable manner. In the embodiment of the invention illustrated in the drawings, the bolts for locking and unlocking the door are located at the upper and lower part thereof and are shot or locked by the downward movement of the rod A and unlocked by its upward movement. An example of this construction and arrangement is shown in my Patent No. 1,117,457, of November 17, 1914.

The collar C is secured to the rod A above the housing B by being passed over the said rod and fixed thereto by means of the key-operated screw-plug E, so that it may be moved up and down on said rod and set in its operative or inoperative position. When the collar is in the position shown in Fig. 1 it permits the rod A to move up and down to lock or unlock the door and acts as a stop to check the downward movement of the said rod only when it is in its lowermost and bolt-locking position. When it is desired to hold the bolts unlocked the rod is first raised—as by pressing the operating arm—and the collar then moved down until it is in contact with the upper part of the housing B, and secured by means of the plug set-screw E, when it will prevent the bar from returning to its original position and operating the bolts. This adjustment of the parts permits those seeking ingress or egress through the door to open it without manipulating the lock, and by simply pulling or pushing the door, and provides means whereby a person going out through the door may avoid locking himself out. It also saves wear on the locks of doors in frequent use, by putting the locking mechanism temporarily out of operation. The collar also enables one who wishes to block or dog the lock mechanism to secure the parts temporarily in their unlocked position, and then secure them in that position by the concealed dogging device about to be described.

The bottom of the housing is provided with a hollow threaded stud B^3, in the bore of which is located a threaded plug H adapted to be operated by the key K, and by rotating this plug in one direction or the other the bar is raised or allowed to fall, and may be held in its upper or unlocking position so that the door remains unlocked. This is by pressure of the plug on the finger F which, together with the arm G, covers a lever pivoted at L. The key is constructed to fit both plugs E and H so that a single key will operate both. In normal position the bar is raised by means of the horizontal arm J and falls of its own gravity, rocking the arm G and moving the arm J outwardly. A pin M extends through the flattened portion B^4 of the rod A, and the finger F is forked at its inner end to straddle this portion of the rod and bear against the pin with both forks to raise the bar. This greatly reduces the friction between the pin and the fork and prevents the parts from binding.

In the modification of Figs. 6 and 7 the

collar N is formed in two parts hinged at O and has the two parts provided with a screw P for clamping them on the bar and securing them in any desired position. A collar of this construction may be applied to the bar or removed therefrom after the parts have been assembled.

With a device of this character blocking the lock-operating rod or the arm by which it is moved adjacent to it the rod is positively held in its unlocking position, whereas with other devices a certain movement of the rod may be brought about by pressure on these parts or on the rod through the flexibility of the parts. Thus when the dogging device is applied to the far end of the horizontal panic bar the end nearest the bolt-operating rod may be moved to a slight extent, this movement being permitted by the flexibility of the bar. Again there is frequently a certain amount of lost motion between the connections, particularly after long use, and the dogging devices herein described and shown will always act to hold the latch positively and accurately to the proper position despite such lost motion in the connecting parts. Other advantages are in the concealed dogging device, which guards against meddling with the lock in public schools, where the lock is extensively used, or in other public buildings, factories, or other places, and in the quickly replaceable character of the parts likely to become worn or broken. Instances of the breaking of the arm such as the arm G have also occurred, and in such cases the rod can be raised by means of the key and the plug H bearing against the forked finger F. This may be done when the bar is intact, if desired, for the purpose of blocking the bolt-operating means.

The plug H may also be used to regulate the outward movement of the arm G and to adjust it so that the locking movement of the arm and the rod A will be checked at the locked position so as to avoid undue strain on the bolt and its connections. When so used the plug H will act as a stop adjustable to slight variations in the positions of the bolts and other parts and the collar C utilized from time to time to block the device against return to the locking position.

What I claim is:

1. The combination of a bolt-operating rod vertically mounted for reciprocation, a housing in which a portion of said rod reciprocates, a rod-operating lever mounted on said housing, a connection between said lever and the rod whereby movement of the lever in one direction raises the rod, a device movable to different positions with respect to the lever mounted in the lower part of said housing and adapted to bear against the same and to move the same and the rod in one direction, and to limit the movement of the same in the opposite direction at different points.

2. The combination of a vertically reciprocating bolt-operating rod, a lever mounted adjacent thereto and having a portion on one side or its fulcrum adapted to bear against a portion of said rod and to move the said rod in one direction, means interposed in the path of the lever for limiting its movement at a plurality of points in a direction other than the direction of its rod-operating movement, but leaving it free to move to the limit of said rod operating movement.

3. The combination of a vertically reciprocating bolt-operating rod, a lever mounted adjacent thereto and having a portion on one side of its fulcrum adapted to bear against a portion of said rod and to move the said rod in one direction, means interposed in the path of the lever for limiting its movement at a plurality of points in a direction other than the direction of its rod-operating movement, but leaving it free to move to the limit of said rod operating movement, and a housing surrounding said means and concealing the same from view.

4. The combination of a vertically reciprocating bolt-operating rod, a lever mounted adjacent thereto and having a portion on one side of its fulcrum adapted to bear against a portion of said rod and to move the said rod in one direction, means interposed in the path of the lever for moving the same in the direction of its rod-operating movement and preventing its movement in another direction, at different points to which the said lever is moved thereby.

5. The combination of a vertically reciprocating bolt-operating rod, a lever mounted adjacent thereto and having a portion on one side of its fulcrum adapted to bear against a portion of said rod and to move the said rod in one direction, means interposed in the path of the lever for moving the same in the direction of its rod-operating movement and preventing its movement in another direction, at different points to which the said lever is moved thereby, said means comprising a screw-threaded member adapted to move toward and from the lever by rotation thereof.

6. The combination of a vertically reciprocating bolt-operating rod, a lever mounted adjacent thereto and having a portion on one side of its fulcrum adapted to bear against a portion of said rod and to move the said rod in one direction, means interposed in the path of the lever for moving the same in the direction of its rod-operating movement and preventing its movement in another direction, at different points to which the said lever is moved thereby, said means comprising a screw-threaded member adapted to move toward and from

the lever by rotation thereof, and a key adapted to engage said member whereby it may be rotated.

7. The combination of a vertically reciprocating bolt-operating rod, a lever mounted adjacent thereto and having a portion on one side of its fulcrum adapted to bear against a portion of said rod and to move the said rod in one direction, means for moving the said lever in its rod-operating direction and in another direction, and means for limiting the movement of the lever in said other direction at all points between the limit of its rod-operating movement and its normal position.

8. The combination of a vertically reciprocating bolt-operating rod, a lever mounted adjacent thereto and having a portion on one side of its fulcrum adapted to bear against a portion of said rod and to move the said rod in one direction, means for moving the said lever in its rod-operating direction and in another direction, and means for limiting the movement of the lever in said other direction at all points between the limit of its rod-operating movement and its normal position, said means comprising a rotary member, means for rotating the same and thereby causing it to move to or from the said lever, said rotation being unaffected by the movement of the rod or the lever.

9. The combination of a vertically reciprocating bolt-operating rod, a lever mounted adjacent thereto and arranged to move the same in one direction, and means for limiting the movement of the rod in a direction other than its bolt moving direction, said means comprising a movable member adapted to be moved into the path of said lever, a fixed member in which said last named member is mounted, and a connection between them constructed and arranged to automatically hold the said first member against movement in its extreme and intermediate positions, a housing inclosing the lever and movable member so as to conceal them from view, and supporting said fixed member.

10. The combination of a vertically reciprocating bolt-operating rod, a lever mounted adjacent thereto and arranged to move the same in one direction, and means for limiting the movement of the rod in a direction other than its bolt moving direction, said means comprising a fixed member having a screw threaded portion, a movable member threaded therewith and arranged to be moved to and from the lever by rotation thereof, and means for rotating the same, a housing inclosing the lever and movable member so as to conceal them from view, and supporting said fixed member.

11. The combination of a vertically mounted reciprocating lock-operating rod arranged to be normally in its lower position and to gravitate automatically to such position, a transverse bar for raising the vertical rod, a pivot adjacent to the vertical rod on which said transverse bar is mounted to move, an arm connected with said transverse bar and arranged to move therewith, an operative connection between said arm and vertical rod, a housing inclosing the said pivot, arm, connection, and adjacent portions of the vertical rod, an interiorly threaded sleeve in said housing open at both ends and extending through said housing, an exteriorly threaded plug threaded in said sleeve, said plug having a key-receiving portion whereby it may be rotated and moved longitudinally of the sleeve, the inner end of the sleeve terminating in proximity to the said arm and the plug being arranged to be moved by rotation of its threads beyond said end of the sleeve and to press the said arm upwardly to raise the said rod and move the said bar in rod raising direction, and to retain the said parts in positions to which they are moved thereby.

12. The combination of a vertically mounted reciprocating lock-operating rod arranged to be normally in its lower position and to gravitate automatically to such position, a transverse bar for raising the vertical rod, a pivot adjacent to the vertical rod on which said transverse bar is mounted to move, an arm connected with said transverse bar and arranged to move therewith, an operative connection between said arm and vertical rod, a housing inclosing the said pivot, arm, connection, and adjacent portions of the vertical rod, an interiorly threaded sleeve in said housing open at both ends and extending through said housing, an exteriorly threaded plug threaded in said sleeve, said plug having a key-receiving portion whereby it may be rotated and moved longitudinally of the sleeve, the inner end of the sleeve terminating in proximity to the said arm and the plug being arranged to be moved by rotation of its threads beyond said end of the sleeve and to press the said arm upwardly to raise the said rod and move the said bar in rod raising direction, and to retain the said parts in positions to which they are moved thereby, and a key having engaging portion constructed to fit the key-receiving portion of the plug, said key adapted to rotate the plug and move it lengthwise of the sleeve in the manner specified.

Witness my hand this 2nd day of March, 1918, at the city of New York, in the county and State of New York.

FRANK F. SMITH.