H. H. DUPONT.

EMERGENCY EXIT LOCK.

APPLICATION FILED NOV. 9, 1908.

983,355.

Patented Feb. 7, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

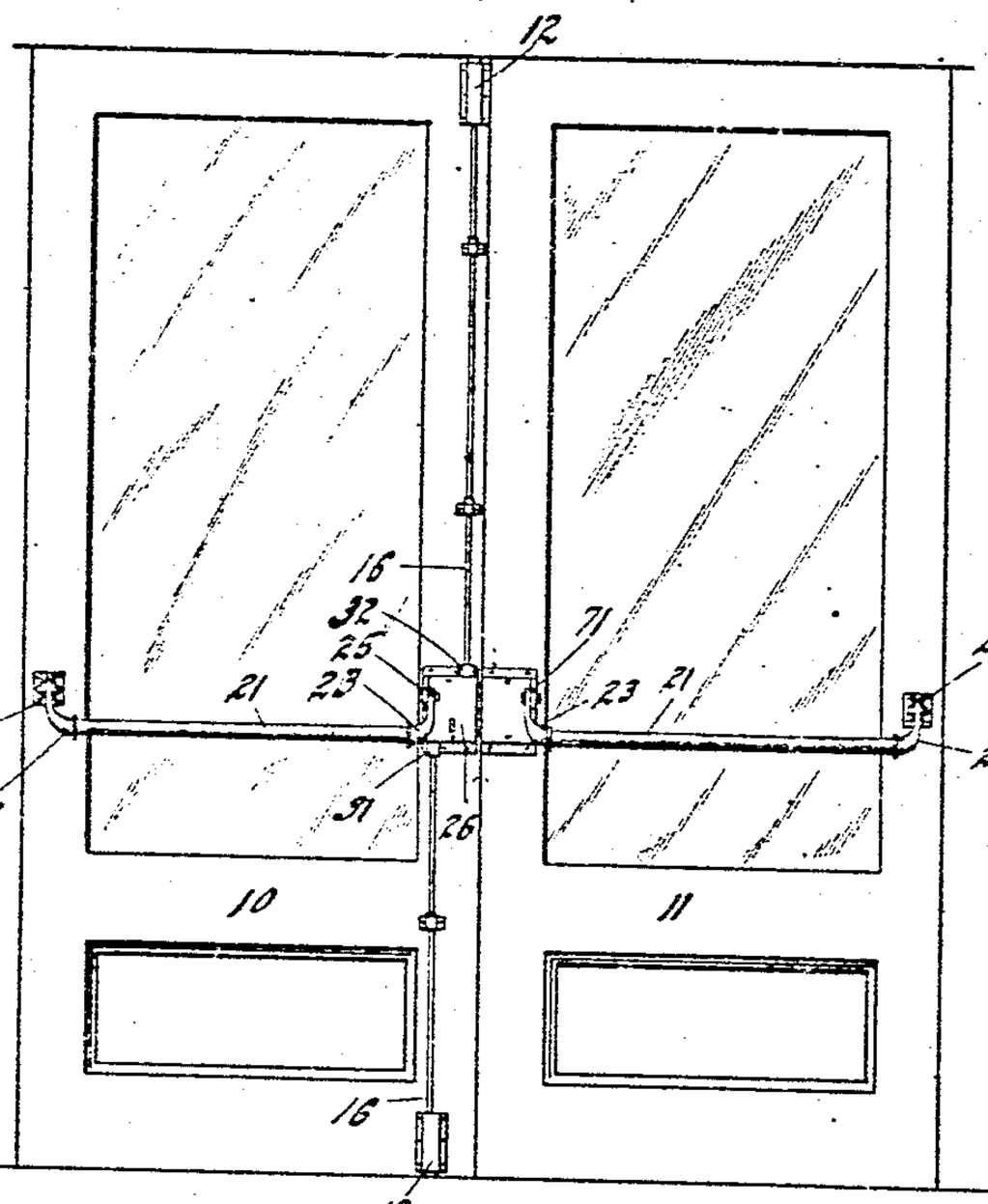


Fig. 4.

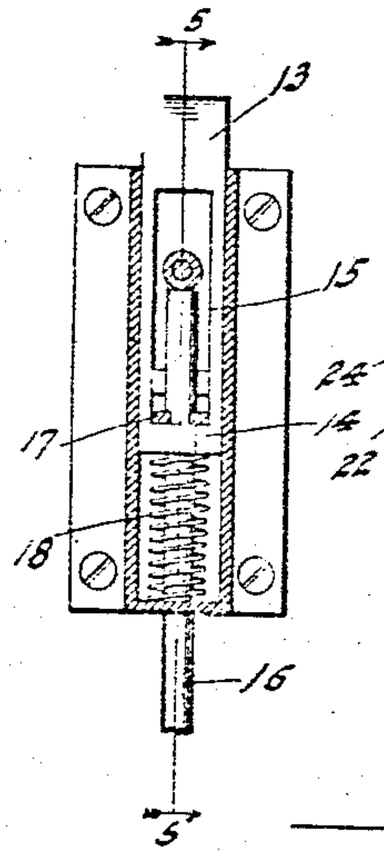


Fig. 5

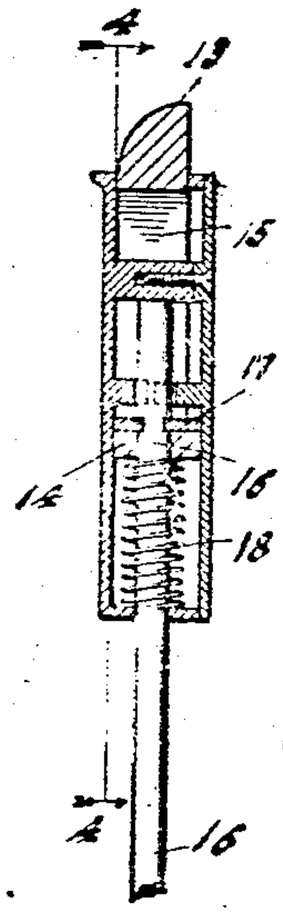


Fig. 2.

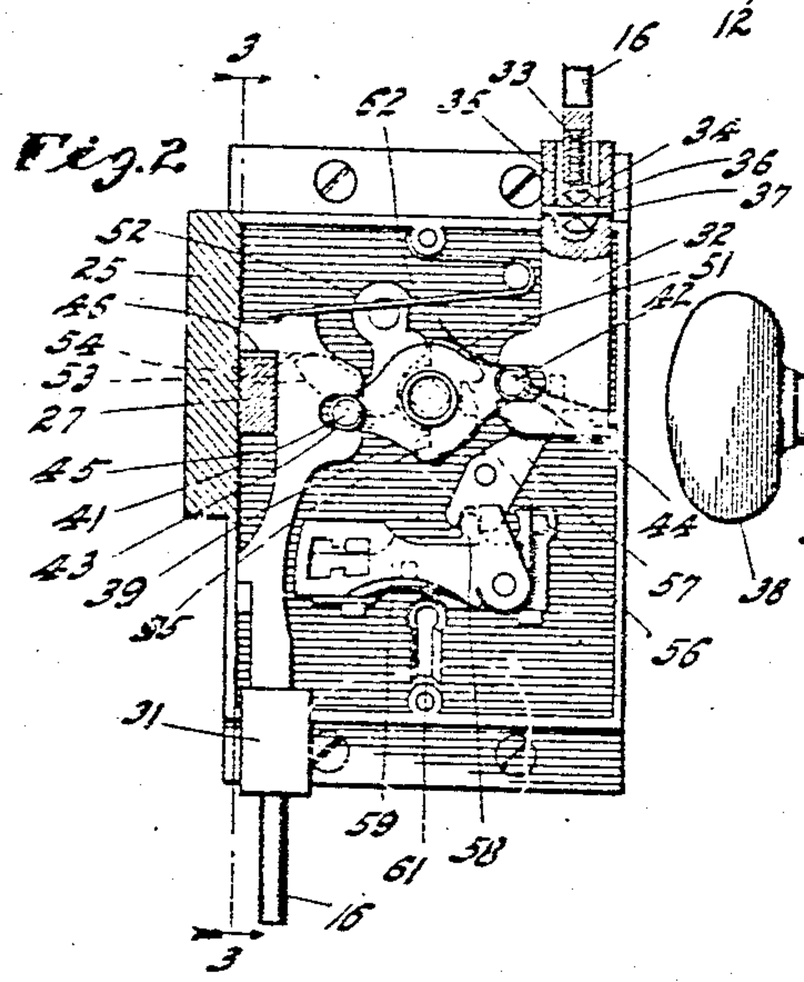
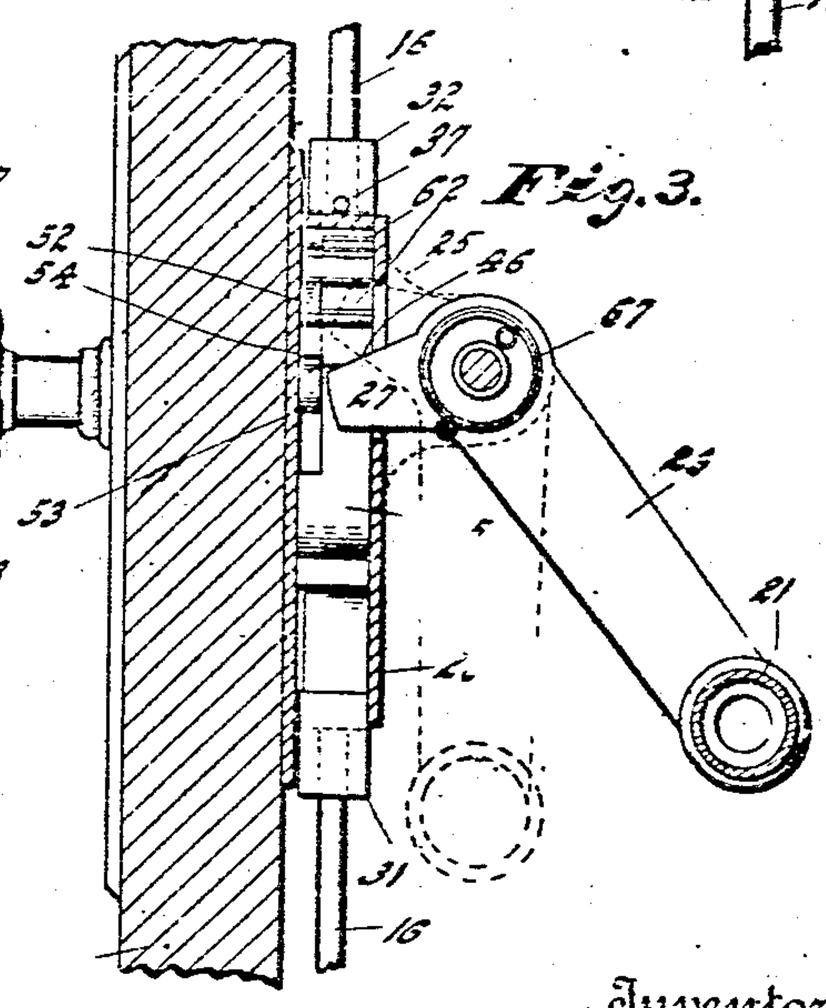


Fig. 3.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 6.

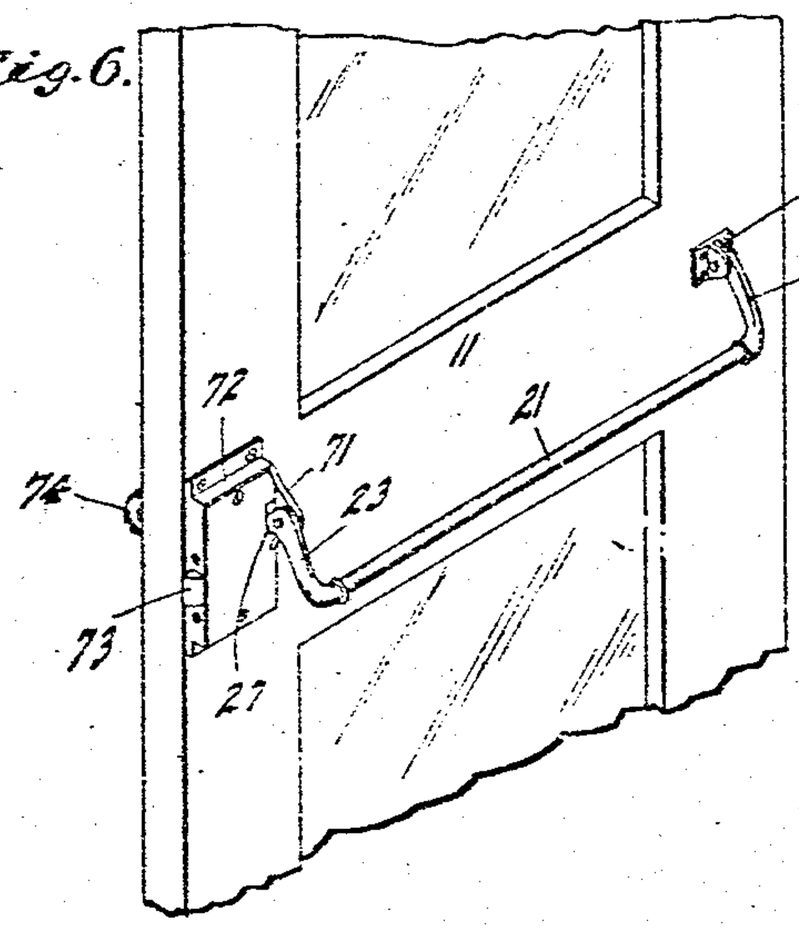


Fig. 7.

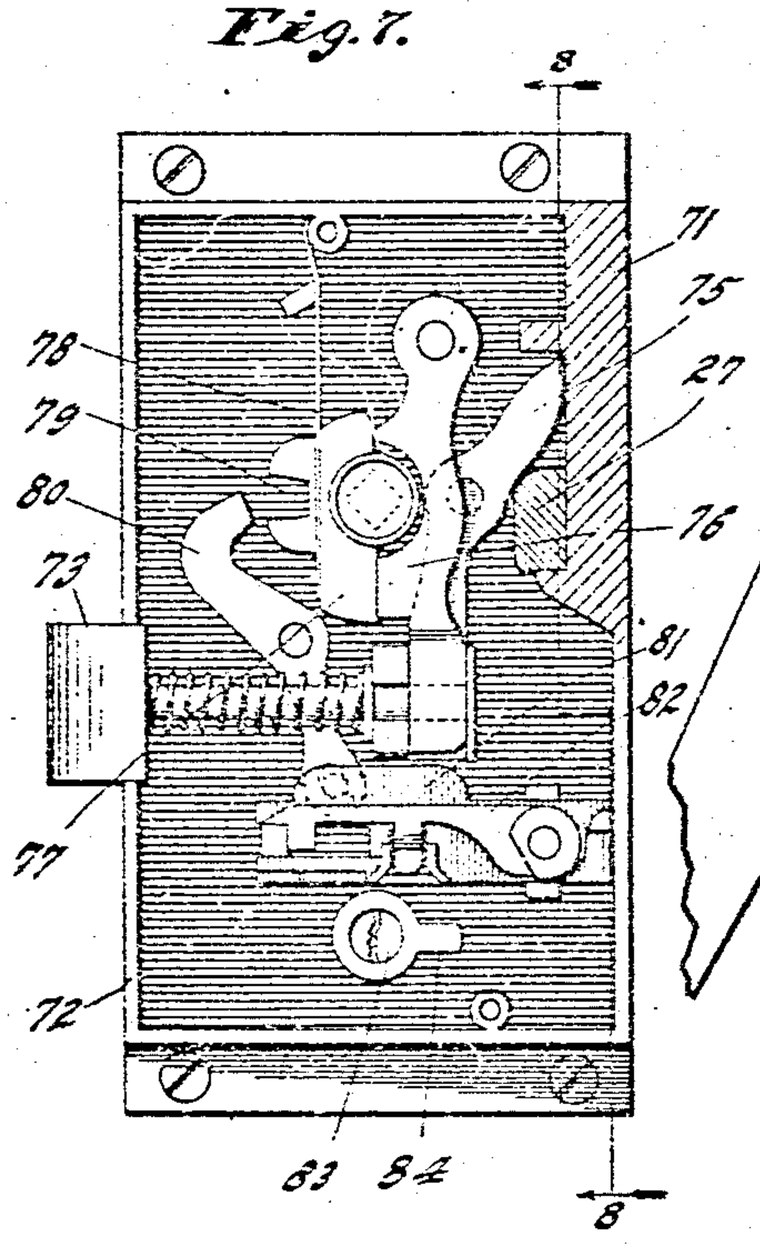
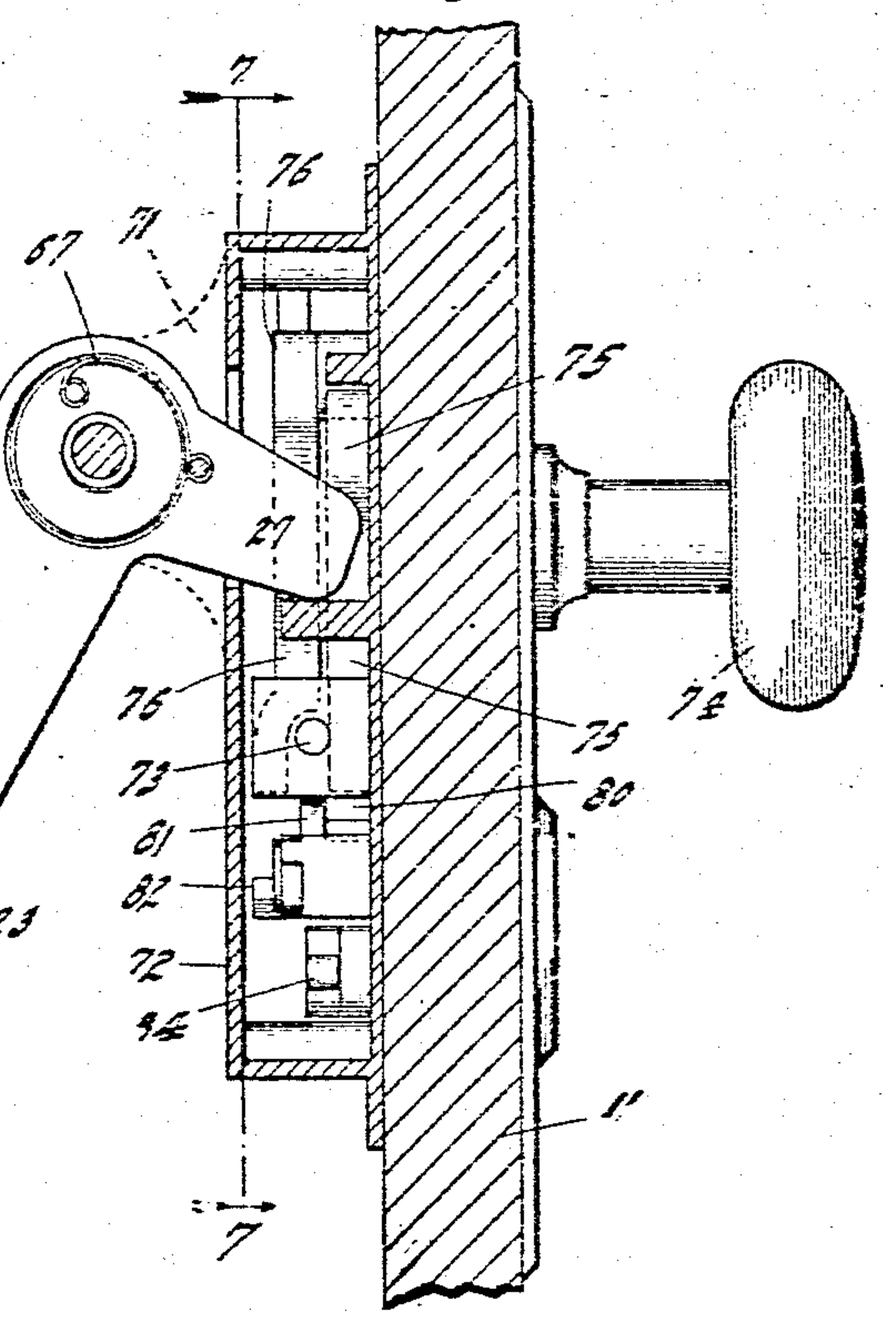


Fig. 8



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UNITED STATES PATENT OFFICE.

HENRY H. DUPONT, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO VON DUPRIN FIRE EXIT LATCH CO., A COPARTNERSHIP.

EMERGENCY EXIT-LOCK.

983,355. Specification of Letters Patent. Patented Feb. 7, 1911.

Application filed November 9, 1908. Serial No. 461,691.

To all whom it may concern:

Be it known that I, HENRY H. DUPONT, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Emergency Exit-Locks, of which the following is a specification.

In buildings where there are large assemblies, such for instance as school buildings, theaters, etc., exit doors are required by law to open outwardly but many lives have been lost in panics in such buildings owing to the fact that the exit doors were locked against opening from the outside and consequently locked against opening by mere pressure from the inside.

The object of my present invention is to produce a structure which may be readily attached to the inner face of exit doors and by means of which the door while normally openable from the outside in an ordinary manner, may nevertheless be readily locked against such manipulation, yet, in cases of panic, etc., will be openable by mere pressure in the direction of opening from the inside, the parts being so combined and arranged that they may be applied to single or twin doors in a manner which will not be in any way unsightly.

The accompanying drawings illustrate my invention.

Figure 1 is an inside elevation of a pair of twin doors equipped with my invention; Fig. 2 a detail of the internal members of the left hand lock shown in Fig. 1; Fig. 3 a section on line 3 3 of Fig. 2; Fig. 4 a section, on line 4 4 of Fig. 5, of the latching bolt for one of the twin doors; Fig. 5 a section on line 5 5 of Fig. 4; Fig. 6 a perspective detail of the right hand door shown in Fig. 1; Fig. 7 a detail of the interior mechanism of the lock shown in Fig. 6 the section being taken on line 7 7 of Fig. 8; Fig. 8 a section on line 8 8 of Fig. 7.

In the drawings, 10 indicates the normally stationary and unused door of a pair of twin doors, and 11 indicates the other of said doors. It is to be borne in mind that the door 11, with its attachments, may be used in the manner of an ordinary single door, without alterations. Door 10 is normally stationary and is held by bolts 12 at the top and bottom. In practice I find that these bolts 12 should be of special design in order that the door may be readily closed by a mere shutting swing and, in order that such an operation may not interfere with or change in any way the emergency actuating bar each of said bolts comprises a tongue 13 having a cross bar 14 at its inner end and an intermediate opening or slot 15. Extending freely through the cross bar 14 is one end of an operating stem 16 to which is secured a collar 17 adapted to engage the inner face of bar 14. A spring 18 lies within the casing and engages cross bar 14 so as to normally urge tongue 13 to the position shown in Fig. 5, at the same time holding the stem 16 and its collar 17 in the position shown in Fig. 5. It will be seen that if stem 16 be held against movement, tongue 13 may nevertheless be crowded back into the casing against the action of spring 18 without being interfered with by the then stationary stem 16; also, if stem 16 be pulled downward, tongue 13 will be withdrawn into the casing by reason of the pull exerted on cross bar 14 by collar 17.

Turning now to the emergency lock structure, the fundamental feature of the structure is a cross bar 21 which at its ends is provided with transversely extending arms 22 or 23 thus producing a neat U-shaped operating member. The arm 22 is pivoted to a bracket 24 adapted to be readily secured to the inner face of the door 10. Arm 23 is similarly pivoted to an ear 25 of a casing 26 which is also adapted to be readily secured to the inner face of door 10. Arm 23 carries a finger 27 which projects into the interior of the casing 26, as clearly shown in Figs. 2 and 3. Mounted within casing 26 are two plungers 31 and 32 which lie in a plane parallel with the face of the door and are capable of vertical movement within the casing. Plunger 31 has its lower end projected from the casing 26 and is adapted to receive a stem 16, while the plunger 32 has its upper end projected from the upper end of casing 26 and is adapted to receive a stem 16. In order to allow for inequalities and for possible warping of the door it is extremely desirable that, in order to prevent possible sticking of the parts, the stem 16 be connected to its plunger 31 or 32 by some means which will permit a limited amount of angular displacement and for that reason I provide the end of stem 16 with a threaded opening adapted to receive

a threaded shank 33 of a ball head 34 adapted to lie easily within a pocket 35 formed in the end of the plunger, and ball 34 is pierced diametrically by a doubly coned passage 36 which, at its smallest diameter, comfortably fits a pin 37 passed across the pocket 35.

It is very desirable that the two plungers 31 and 32 lie in a plane which is parallel with the face of the door in order that the casing 26 may be comparatively thin so as not to stick out into the room and be unsightly. As these two plungers need to work in opposite directions and should be operable independently by the emergency bar 21, or by a knob 38 from the outside of the door, I connect the two plungers 32 by a lever 39 which lies within casing 26 and is provided at its opposite ends with pins 41 and 42 which take into notches 43 and 44 formed respectively in the plungers 31 and 32. Plunger 31 is then provided with a notch 45 within which finger 27 may play, and with a shoulder 46 against which finger 27 may take in order to retract plunger 31 into casing 26. In an apparatus of this kind it is very desirable that manipulation of the door from the exterior by means of knob 38 be wholly independent of manipulation of the door by means of the emergency bar 21 and therefore, while lever 39 is concentric with the stem of the knob 38 yet it is not attached thereto and does not partake primarily of its motion. In order to operate the plungers 31 and 32 by means of the knob I secure to the knob stem, within casing 26, an arm 51 which is adapted to engage a lever 52 pivoted within casing 26 and provided with a finger 53 (dotted lines Fig. 2) which lies beneath a shoulder 54 (dotted lines Fig. 2) formed on plunger 31 the arrangement being such that a turning of knob 38 in one direction, will cause arm 51 to engage lever 52 and the finger of said lever to engage shoulder 54 of plunger 31 thus drawing plunger 31 into casing 26 and causing a similar movement, in the opposite direction, of plunger 32 through the medium of the lever 39. In order to actuate the plunger by a movement of knob 38 in the other direction I provide a spud 55 upon lever 39 which spud is adapted to be engaged in one direction only by arm 51 so that when the knob is turned in a clockwise direction (Fig. 2) the actuation of the plungers 31 and 32 will be through the medium of the lever 39, whereas when the knob is turned in a counter-clockwise direction the actuation of the plungers will be through the medium of lever 52. It will thus be seen that the knob may be positively locked against actuation without in any way interfering with the actuation of the plungers through the medium of the emergency bar, and in order to accomplish a locking of the knob I provide arm 51 in the usual manner with a notch 56 adapted to receive the hooked end of an ordinary dead-locking lever 57 pivoted within the casing 26, said lever 57 being engaged by an ordinary sliding bar 58 carrying locking members 59 which may be actuated by means of an ordinary key inserted through the key hole 61. The plungers 31 and 32 are normally held in projected position by means of a spring 62 which, in the present illustration, is shown as engaging plunger 31.

It is very essential that the emergency bar 21 be at all times in position to be effective in operation of the locking mechanism so that no carelessness or failure to set the apparatus will result in an inoperative condition. It needs therefore to be yieldingly held in its operative position by a means which is distinct from and unaffected by the mechanism by which the bolts may be withdrawn from the exterior of the door and I therefore normally yieldingly hold the bar 21 at some distance from the face of the door, in the position indicated in full lines in Fig. 3, by means of light springs 67 one of which is nested between the bracket 24 and arm 22 and another of which is similarly nested between arm 23 and ear 25, the arrangement being such that, throughout any actuation of the apparatus by means of knob 38, bar 21 will remain in the position shown in full lines in Fig. 3 and will therefore at all times be in position to be carried through its actuating movement to the position indicated in dotted lines in Fig. 3, by any force exerted thereon and having even a small component in the direction of opening the door.

The cooperating door 11 might be provided with an apparatus such as is applied to door 10 but this is not at all necessary as the bolts 12 are sufficient to hold both doors in place if mechanism is provided which will interlock with the door 10. As a consequence I provide for the door 11 a modified apparatus which is not only suitable for use on the twin door 11 but may also be used on an ordinary single door. In this form I provide a bar 21 having an arm 22 at one end and an arm 23 at the other. The arm 22 is connected to a bracket 24 and the arm 23 is provided with a finger 27, these parts being exactly the same as the similarly lettered parts in the structure already described. In the present form, arm 23 is pivoted to an ear 71 carried by a casing 72 which, in most particulars, is like the casing 26. The internal mechanism however is somewhat less complicated owing to the fact that the bolt or plunger 73 carried by this casing need not be in duplicate, and is arranged so as to engage directly with an ordinary strike carried by the opposing door 10 or by the adjacent jamb,

in case the apparatus is used upon a single door. In this structure, as well as in the structure previously described, it is quite essential that the mechanism for indrawing the bolt 73 by means of the emergency bar be independent of the external knob 74. Consequently I mount within casing 72 a lever 75 one end of which is adapted to be engaged in one direction only by finger 27 while the other end engages the plunger 73. Plunger 73 is also engaged by a lever 76 which is adapted to be engaged by either end of an arm 77 secured to the stem of knob 74 said arm 77 being normally held in medial position by a spring 78 in an ordinary manner, the arrangement being such that rotation of knob 74 in either direction will cause a movement of lever 76 to the right (Fig. 7) and a consequent indrawing of bolt 73. In order to dead-lock the knob, arm 77 is provided with the usual notch 79 into which may be projected the hook-shaped end of the dead-locking lever 80 which lever is connected to operating slide 81 carrying any desired form of tumbler 82 operable by any suitable key. In the present form I have shown this structure provided with an ordinary pin-tumbler lock 83 having an operating arm 84 adapted to engage tumbler 82 and slide 81. In this form of structure, as well as in the one previously described, bar 21 should at all times be maintained in operative position and I therefore provide springs 67 to accomplish this result.

It will be seen that the parts are arranged and combined in such manner that the operating parts may be contained in a casing of dimensions substantially the same as the dimensions of an ordinary face lock and that therefore there is nothing unsightly or cumbersome in the structure, the general appearance of the device differing from ordinary and standard hardware principally in the provision of the emergency bar 21.

The arms 22 and 23 extend upwardly toward the door in order that the bar 21 may occupy a position as close to the floor as possible so that even small children falling against the bar will cause an actuation of the locks and an opening of the door. The parts, however, immediately resume their normal positions so that the door may be swung closed and without any setting the parts will be in position for another emergency actuation.

I claim as my invention:—

1. An emergency exit lock comprising, a movable retaining bolt, an exterior operating member, intermediate connections between said exterior operating member and the retaining bolt permitting normal free actuation of the bolt by the exterior operating member, an interior operating member comprising a bar adapted to extend transversely across the door, means for supporting said bar for movement toward and from the face of the door, intermediate connections between said bar and the retaining bolt for withdrawing the retaining bolt by movement of the bar toward the door, and means for preventing actuation of the retaining bolt by the exterior operating member without interfering with actuation of the bolt by the interior bar.

2. An emergency exit lock comprising, a movable retaining bolt, an exterior operating member, intermediate connections between said exterior operating member and the retaining bolt, an interior operating member comprising a bar adapted to extend transversely across the door, means for supporting said bar for movement toward and from the face of the door, intermediate connections between said bar and the retaining bolt for withdrawing the retaining bolt by movement of the bar toward the door and acting upon the bolt in retracting direction only, a spring for yieldingly holding the bar in projected position, and means for preventing actuation of the retaining bolt by the exterior operating member.

3. An emergency lock for doors comprising, a casing adapted to be secured to the inner face of the door, a bolt movably mounted in said casing, means for yieldingly holding the said bolt in projected position, means by which said bolt may be retracted from the exterior of the door, an interior operator for said bolt comprising an operating bar pivoted upon an axis substantially parallel with the face of the door, intermediate connections between said bar and the bolt for withdrawing the bolt by movement of the bar toward the face of the door said intermediate connections engaging the bolt in retracting direction only, and independent of the external operating means, a spring for yieldingly holding said operating bar in operative position, and means for preventing the actuation of the bolt by the external operating member without interfering with actuation by the interior operator.

4. An emergency lock for doors comprising, a casing adapted to be secured to the inner face of the door, a bolt movably mounted in said casing, means for yieldingly holding the said bolt in projected position, means by which said bolt may be retracted from the exterior of the door, an interior operator for said bolt comprising an operating bar pivoted upon an axis substantially parallel with the face of the door, intermediate connections between said bar and the bolt for withdrawing the bolt by movement of the bar toward the face of the door independent of the external operating means, a spring for yieldingly holding said operating bar in operative position, and

means for preventing the actuation of the bolt by the external operating member without interfering with actuation by the interior operator.

5. An emergency exit lock comprising a main casing adapted to be secured to a door, a pair of plungers arranged in said casing with their adjacent ends separated and in a plane substantially parallel with the face of the door, an intermediate connection between the adjacent ends of said plungers to cause relative opposite movement, an operating member comprising an operating bar having its arms pivotally supported upon an axis substantially parallel with the door, means carried by said bar for operating said plungers by a movement of the main body of the bar toward the door, an external operating member adapted to be projected from that face of the door opposite that upon which the operating bar is arranged, intermediate connections between said external operating member and the plungers for operating the same permitting normal free actuation of the plungers by the exterior operating member, and means for preventing actuation of said plungers by said external operating member without interfering with the operation of the operating bar.

6. An emergency exit lock comprising, a main casing adapted to be secured to a door, a pair of plungers arranged in said casing with their adjacent ends separated and in a plane substantially parallel with the face of the door, an intermediate connection between the adjacent ends of said plungers to cause relative opposite movement, an operating member comprising an operating bar having its arms pivotally supported upon an axis substantially parallel with the door, means carried by said bar for operating said plungers by a movement of the main body of the bar toward the door, and a pair of spring latches and a connection between each of said latches and one of the plungers acting upon the latch in withdrawing direction only.

7. An emergency exit lock comprising, a main casing adapted to be secured to a door, a pair of plungers arranged in said casing with their adjacent ends separated and in a plane substantially parallel with the face of the door, an intermediate connection between the adjacent ends of said plungers to cause relative opposite movement, an operating member comprising an operating bar pivotally supported upon an axis substantially parallel with the door, means carried by said bar for operating said plungers by a movement of the main body of the bar toward the door, an external operating member adapted to be projected from that face of the door opposite that upon which the operating bar is arranged, intermediate connections between said external operating member and the plungers for operating the same, means for preventing actuation of said plungers by said external operating member without interfering with the operation of the operating bar, and a pair of spring latches and a connection between each of said latches and one of the plungers acting upon the latch in withdrawing direction only.

8. An emergency exit block comprising, a main casing adapted to be secured to a door, a pair of plungers arranged in said casing with their adjacent ends separated and in a plane substantially parallel with the face of the door, an intermediate connection between the adjacent ends of said plungers to cause relative opposite movement, an operating member comprising an operating bar pivotally supported upon an axis substantially parallel with the door, means carried by said bar for operating said plungers by a movement of the main body of the bar toward the door, and a pair of spring latches and a transversely loose connection between each of said latches and one of the plungers acting upon the latch in withdrawing direction only.

9. An emergency exit lock comprising, a main casing adapted to be secured to a door, a pair of plungers arranged in said casing with their adjacent ends separated and in a plane substantially parallel with the face of the door, an intermediate connection between the adjacent ends of said plungers to cause relative opposite movement, an operating member comprising an operating bar pivotally supported upon an axis substantially parallel with the door, means carried by said bar for operating said plungers by a movement of the main body of the bar toward the door, an external operating member adapted to be projected from that face of the door opposite that upon which the operating bar is arranged, intermediate connections between said external operating member and the plungers for operating the same, and means for preventing actuation of said plungers by said external operating member without interfering with the operation of the operating bar, and a pair of spring latches and a transversely loose connection between each of said latches and one of the plungers acting upon the latch in withdrawing direction only.

10. In a panic bolt, two alined oppositely projecting bolt members, means for projecting and retracting said bolts simultaneously and in opposite directions including two manually operable actuating devices independently mounted and independently movable.

11. In a panic bolt, two alined oppositely projecting bolt members, means for projecting and retracting said bolts simultaneously

and in opposite directions including two manually operable actuating devices independently mounted and independently movable, and a dogging device for blocking one of said actuating members, leaving the other free to be moved.

In witness whereof, I, have hereunto set my hand and seal at Indianapolis, Indiana, this fifth day of November, A. D. one thousand nine hundred and eight.

HENRY H. DUPONT. [L.S.]

Witnesses:

CARL J. PRINZLER,

ARTHUR M. HOOD.