

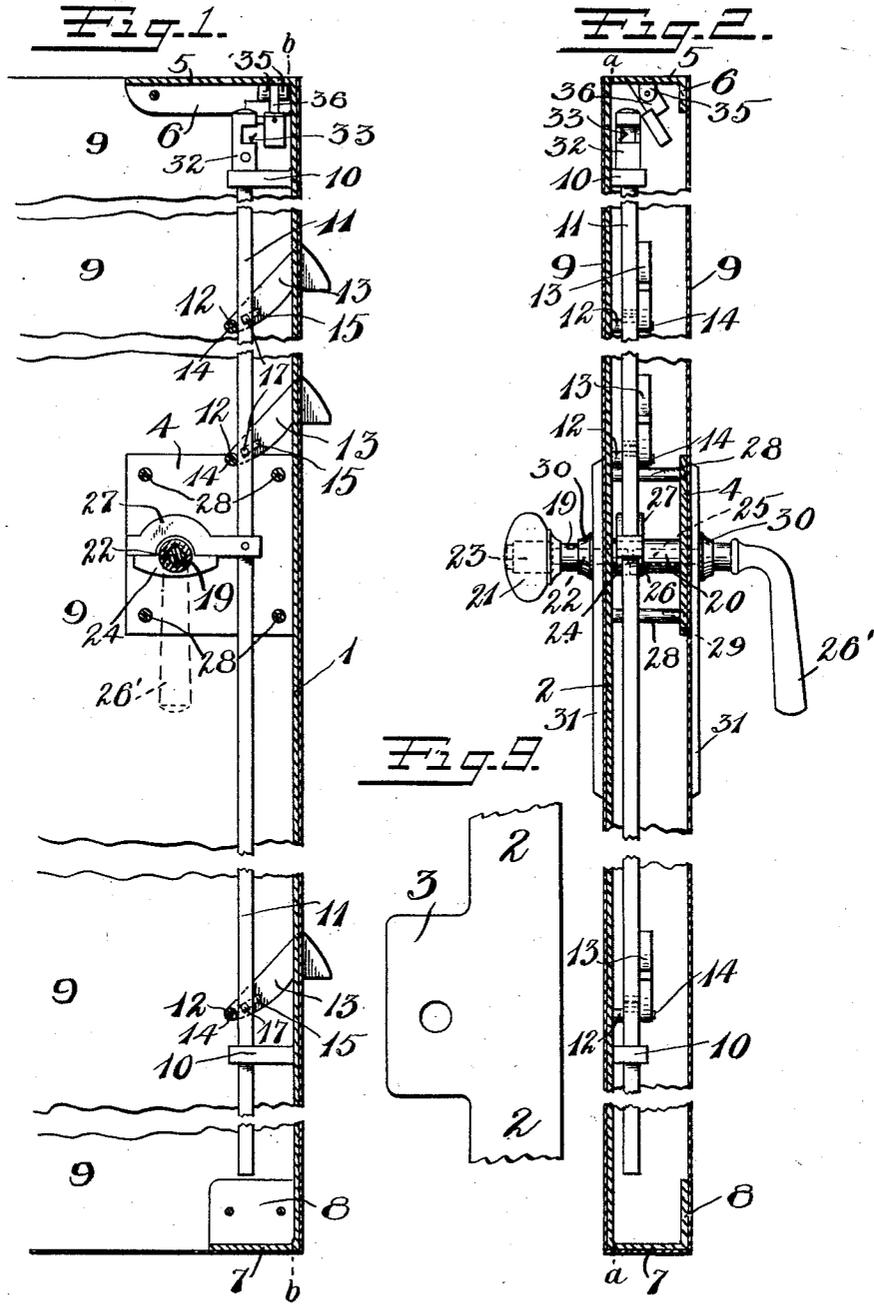
H. G. VOIGHT.  
FIRE DOOR LOCK.

APPLICATION FILED JULY 15, 1912.

1,047,900.

Patented Dec. 17, 1912.

2 SHEETS—SHEET 1.



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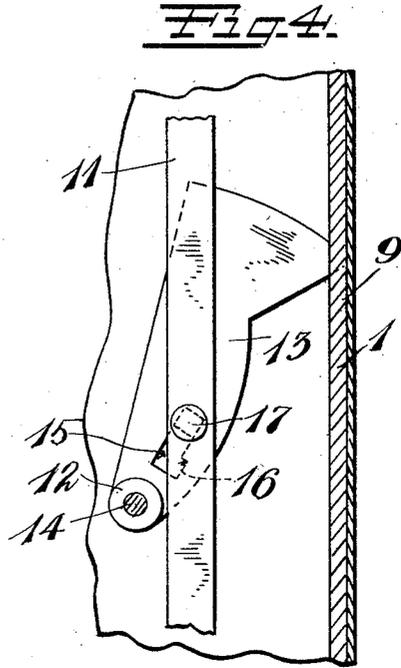
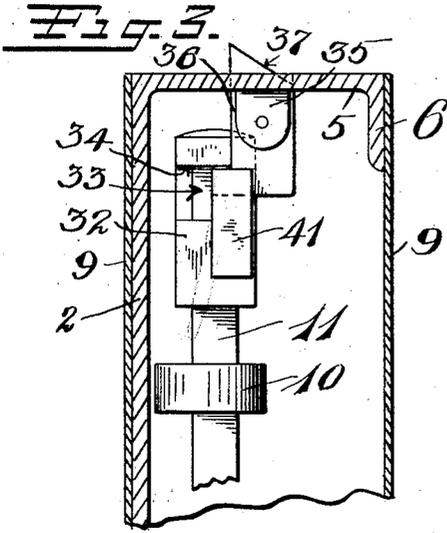
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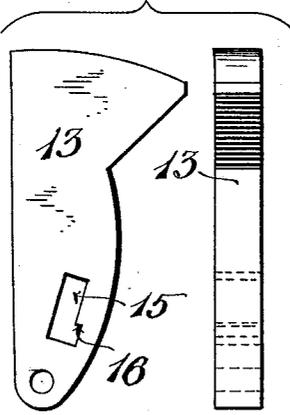
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2 SHEETS-SHEET 2.

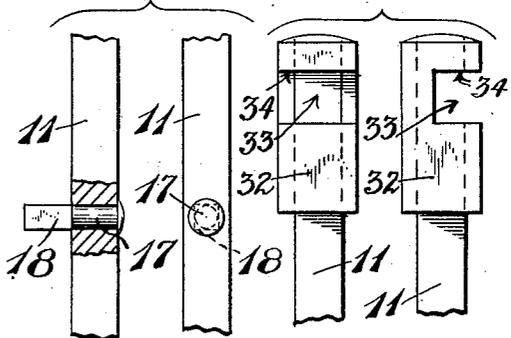
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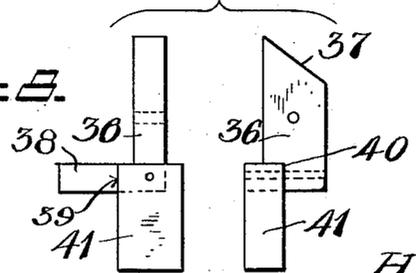
**Fig. 5.**



**Fig. 6. Fig. 7.**



**Fig. 8.**



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# UNITED STATES PATENT OFFICE.

HENRY G. VOIGHT, OF NEW BRITAIN, CONNECTICUT.

## FIRE-DOOR LOCK.

1,047,900.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Application filed July 15, 1912. Serial No. 709,393.

*To all whom it may concern:*

Be it known that I, HENRY G. VOIGHT, a citizen of the United States, residing at New Britain, Hartford county, State of Connecticut, have invented certain new and useful Improvements in Fire-Door Locks, of which the following is a full, clear, and exact description.

This invention relates to locks of the so-called "fire door" type and contemplates the provision of a plurality of spaced locking members controlled and retractable from one side of the door through a common operating means and so constructed and arranged as to be non-retractable from the opposite side of the door except through certain regulated channels, as key-controlled mechanism, for instance.

The invention includes means for automatically holding the locking members retracted after the door has been unlocked and opened, and for automatically releasing and moving them into locking position when the door is closed. These and other advantages will appear from the more detailed description following taken in connection with the accompanying drawings forming part thereof and illustrating one preferable embodiment of the invention.

In these drawings: Figure 1 is a longitudinal vertical section through a casing containing the locks comprising the present invention, the section being taken on the line *a-a* of Fig. 2. Fig. 2 is a transverse vertical section on the line *b-b* Fig. 1, parts being left in elevation. Fig. 3 is a fragmentary vertical section on an enlarged scale through the upper part of the lock casing, illustrating the automatic lock for the operating bar. Fig. 4 is a fragmentary longitudinal section on an enlarged scale through a part of the lock casing, illustrating the manner of connection of a latch bolt to the operating bar. Fig. 5 are face and edge views of one of the latch bolts. Fig. 6 are views in front elevation and transverse vertical section of a portion of the operating bar showing one of the latch actuators carried thereby. Fig. 7 is a detail view in front and side elevation of the top of the operating bar. Fig. 8 is a detail view in front and side elevation of the gravity lock for the

operating bar. Fig. 9 is a fragmentary view in elevation of the lock casing illustrating a detail of construction.

The various parts forming the lock are preferably mounted in and carried by a suitable frame so that they can be applied as a unit to a door suitably cut away to receive them. In the drawings, a metallic frame is shown comprising the vertical edge plate 1 having a side plate 2 extending from one side thereof and provided with an extension 3 forming a bearing for the knob shank. From the opposite side of the vertical plate projects a second extension plate 4 in alignment with the first, the two plates being provided with alined apertures for the knob shanks of the lock mechanism. At its top the edge plate 1 has a horizontal extension 5 provided with a vertical downwardly extending flange 6, while at its bottom is a somewhat similar extension 7 having a vertical upwardly extending flange 8. This frame is covered and the parts carried thereby concealed from view by a metal sheathing 9 suitably secured to and covering the frame and adapted to cover the part of the door to which the lock is applied, or the whole as may be desirable.

Projecting inwardly from the edge plate 1 of the frame are a plurality of guides 10 apertured to receive and guide an operating bar 11 extending vertically and substantially parallel with the edge plate 1 of the frame. Extending from the side plate 2 of the frame beyond the operating bar 11 and in vertical alignment are a plurality of studs 12 serving as hubs for a plurality of latch bolts 13 pivotally secured thereto by the pivot pins 14. These latch bolts adjacent their pivoted ends are each provided with an elongated slot 15 extending radially from its pivoted point and formed with an undercut portion at its inner end to afford a locking shoulder 16 for the purpose hereinafter described. Headed operating pins 17 are swiveled in the operating bar 11 at points closely adjacent the latch bolts 13 and extend from the face thereof in the form of squared shanks 18 of a cross sectional area somewhat less than the width of the slots 15 and of the length of their undercut portions. These squared shanks extend into the radial

slots 15 of the latch bolts and are adapted to move said bolts into and out of locking position as will be seen later.

Extending through the alined apertures in the spindle bearings 3 and 4 and from opposite sides of the door are the knob shanks 19 and 20. The shank 19 and its knob 21 which is located on the outer side of the door, are non-rotatable and serve merely as a handle. The shank, however, carries a spindle 22 which is rotatable through a key-controlled cylinder lock 23 mounted in the knob. The inner end of spindle 22 carries a roll-back 24. The shank 20 carries a spindle 25 freely rotatable through an operating crank 26' located on the inner side of the door. Spindle 25 carries at its inner end in proximity with roll-back 24, a second and independently operable roll-back 26. Both of these roll-backs are positioned under and against a yoke 27 rigidly attached to the operating bar 11 so that actuation of either roll-back from either side of the door will move the yoke 27 upwardly and through it the operating bar 11. The extension plates 3 and 4 forming the bearings for the knob shanks, etc., are connected to and spaced from each other by the tubular rods 28 carried by and extending from bearing plate 3 and engaged at their ends by screws 29 carried by bearing plate 4. The knob shanks are each provided with the usual roses 30 and escutcheon plates 31 mounted on the outer side of the door casing. This upward movement of the operating bar will cause the squared shanks 18 of the operating pins 19 to ride upwardly in the slots 15 of the latch bolts, swinging these bolts inwardly from locking position so that the door may be swung open, the swiveled ends of these pins turning the operating bars as the latch bolts swing on their pivots. These bolts cannot be retracted from the exterior independently of the operating bar by the insertion of a knife or other tool between the door edge and jamb by reason of the shoulders 16. If such a tool is used in an unauthorized attempt to open the door from the exterior, these latch bolts will move only slightly inwardly, bringing the squared shanks 18 of the operating pins into the undercut portions of the slots 15 and against the shoulders 16, which will form locking abutments preventing upward movement of the operating bar 11 and of these shanks 18 in these slots, thereby stopping further retraction of the latch bolts.

From the foregoing it will be seen that when either of the roll-backs 24 and 26 are oscillated either through the interior crank handle 26' operating roll-back 26 or through the cylinder lock 23 controlling the roll-back 24, the operating bar 11 will be moved

upwardly to move the squared shanks 18 of the operating pins 17 upwardly in the slots 15 of the latch bolts 13, thereby retracting the latches from locking position and withdrawing them within the casing out of the way. I should have stated heretofore that the edge plate 1 and the metallic sheathing 9 covering said plate, are both provided with suitable apertures through which these latch bolts may project, and that the co-operating casing of the door is provided with suitable sockets or socket plates positioned to receive the heads of the latch bolts when they are projected.

In order to hold the latch bolts within their casing after being once retracted and in order to automatically release them when the door is closed to permit them to move to locking position, I have provided the following mechanism. The upper end of the operating bar 11 is provided with a tubular head 32 through which it extends, this head being fixedly secured to said bar by any suitable means, and both the bar and head being cut away adjacent their upper ends to provide a locking recess 33 forming a locking shoulder 34. Depending from the under face of the horizontal plate 5 of the lock frame adjacent the door edge are two spaced ears 35, between which ears is pivotally mounted a gravity lock for the upper end of the rod. This lock is formed by an angle arm having its vertical portion 36 pivotally mounted between the aforesaid depending ears and having its upper end 37 extending out through plate 5 and beveled upwardly in the direction of door closing movement. At its lower end, the arm 36 has an angular extension 38 at right angles thereto, this extension being adapted to cooperate with the recessed portion 33 at the upper end of the operating bar 11, and in one position resting against the locking shoulder 34 and serving to hold the operating bar raised and the latch bolts controlled thereby retracted. This angular extension 38 extends beyond the lateral plane of the arm 36 forming an abutment shoulder 39. The arm 36 at its lower end is recessed to form a second abutment shoulder 40. A weight 41 is secured to the lower end of this angle arm with its upper end resting against the abutment shoulders 39 and 40 and is fixedly secured to said arm by any suitable means, as the pin shown in the drawings. When this angle arm swings on its pivot to bring its arm 36 in substantially vertical position, as seen in Fig. 3 of the drawings, the extension 38 will enter the recess 33 from the side of the head 32 and will abut against the locking shoulder 34, the weight 41, through gravity, normally tending to cause this locking movement. When the door is closed, the contact of the beveled up-

per end 37 of the arm 36 with the upper edge of the door casing or with a suitable strike plate carried thereby, normally throws the locking extension 38 out beyond the recess 33 and out of contact with the locking shoulder 34, as will be seen from Fig. 2 of the drawings.

With the foregoing in mind, the operation of a door provided with this lock is as follows. Assuming that the door is closed and the latch bolts projected to locking position as shown in Fig. 1, with the gravity lock inoperatively positioned by the closing of the door, and it is desired to open the door, say, for instance, from the interior, the person grasping the crank handle 26' and giving it a quarter turn in either direction will raise the operating bar 11, and through its operating pins 17, will retract the latch bolts 13 from locking position, as heretofore described. The door may now be moved to open position. As soon as the upper edge of the door clears the casing, the arm 36 of the gravity lock, which has been thrown outwardly by the contact of its beveled upper edge 37 with said casing, will be swung inwardly by the weight 41 attached thereto, this movement swinging its locking extension 38 within the recess 33 of the head 32 of the operating bar which has been moved upwardly by the crank handle 26' and positioned in line with this locking extension. The weight 41 will hold this locking extension in such position with its upper face abutting against the locking shoulder 34 and holding the operating bar raised and the latch bolts retracted. The same result will take place if the door were opened from the exterior through the cylinder lock 23 and roll-back 24. When the door closes, the beveled upper end 37 of the arm 36 will strike the upper edge of the door casing and will be thrown inwardly, thereby serving to retract its angular extension 38 from engagement with the locking shoulder 34 of the operating bar head 32, whereupon this bar will drop by gravity and through the engagement of the operating pins 17 with the slots of the latch bolts, project these bolts into locking engagement with their co-operating sockets in the door jamb. The contact of the beveled upper end of this arm 36 with the upper edge of the door casing will hold the gravity lock inoperatively positioned until the door is again opened, whereupon the recess and locking shoulder will be positioned to cooperate with said gravity lock and the latter will be moved to cooperate therewith, as has been heretofore pointed out.

I have described and illustrated a preferable and specific form of locking mechanism, but desire it understood that such form may be modified and changed within the spirit of

the invention and the scope of the appended claims.

What I claim, therefore, and desire to secure by Letters Patent is:

1. In a lock of the character described, in combination, a plurality of spaced latch bolts, means whereby said latch bolts may be retracted through a common operating means, and means whereby said latch bolts lock themselves against retraction through movement independent of said common operating means.

2. In a lock of the character described, in combination, a plurality of spaced latch bolts, freely operable means located on one side of said door whereby said latch bolts may be retracted through a common operating means, said bolts being constructed and arranged to automatically lock themselves against retraction from the opposite side by moving the same inwardly from the door jamb independent of said operating means.

3. In a lock of the character described, in combination, a plurality of spaced latch bolts, a common operating means for said latch bolts, means normally tending to position said operating means to project said bolts, means operable from one side of said door for actuating said operating means to retract said latch bolts, and means whereby said latch bolts lock themselves against retraction through movement independent of said operating means.

4. In a lock of the character described, in combination, a plurality of spaced latch bolts, a common operating means for said latch bolts, means normally tending to position said operating means to project said bolts into locking position, means whereby said operating means may be freely operated from the interior side of the door to retract said bolts from locking position, key-controlled means for independently actuating said operating means from the opposite side of the door, and means constructed and arranged to lock said bolts against retraction from said opposite side by moving said bolts inwardly from the door jamb independent of said common operating means.

5. In a lock of the character described, in combination, a plurality of spaced latch bolts, means whereby said latch bolts may be retracted through a common operating means, means for retaining said latch bolts in retracted position after the door has been opened, and for releasing and placing them in locking position when the door is closed, and means whereby said latch bolts are locked against retraction independent of said common operating means.

6. In a lock of the character described, in combination, a plurality of spaced latch bolts, a common operating means for said

latch bolts normally tending to project said bolts into locking position, means whereby said operating means may be actuated from the interior side of the door to retract said bolts, means automatically engaging said operating means upon the opening of the door to lock said operating means in latched retracted position, and automatically disengaging said operating means upon the closing of the door, and means whereby said latch bolts are locked against retraction independent of said operating means.

7. In a lock of the character described, in combination, a plurality of spaced latch bolts, a common operating means for said latch bolts normally tending to project said bolts into locking position, means whereby said operating means may be actuated from the interior side of the door to retract said bolts, key-controlled means operable from the exterior of the door to actuate said operating means to bolt-retracting position, means automatically engaging said operating means upon the opening of the door to lock said operating means in latched retracted position, and automatically disengaging said operating means upon the closing of the door, and means whereby said latch bolts are locked against retraction independent of said operating means.

8. In a lock of the character described, in combination, a plurality of spaced latch bolts, means whereby said latch bolts may be retracted through a common operating means, means whereby said latch bolts are locked against retraction independently of said common operating means, and a gravity lock constructed and arranged to automatically engage said operating means upon the opening of the door, and to retain said means in bolt retracted position while the door is open and provided with means positioned to engage the door casing upon the closing of the door whereby said lock is automatically disengaged from such operating means.

9. In a lock of the character described, in combination, a plurality of spaced latch bolts, a movable operating bar in operative connection with each of said bolts designed to project and retract the same and normally tending to project said bolts, an operating member on one side of the door in operative connection with said bar and adapted to be operated to move said bar to bolt-retracting position, and locking means automatically engaging said bar upon the opening of the door to retain said bar in bolt retracted position, and arranged to automatically disengage said bar upon the closing of the door.

10. In a lock of the character described, in combination, a plurality of spaced latch bolts, a movable operating bar in operative

connection with each of said bolts designed to project and retract the same and normally tending to project said bolts, an operating member on one side of the door in operative connection with said bar and adapted to be operated to move said bar to bolt-retracting position, locking means automatically engaging said bar upon the opening of the door to retain said bar in bolt retracted position, and arranged to automatically disengage said bar upon the closing of the door, and a locking abutment operatively positioned by retracting movement of said bolt independently of said operating bar whereby independent retraction of said bolts is prevented.

11. In a lock of the character described, in combination, a plurality of pivoted latch bolts each provided with a slot therein, a movable operating bar, a plurality of operating pins carried thereby and engaging in said bolt slots whereby movement of said bar projects and retracts said bolts, an operating member on one side of said door operatively connected with said bar and adapted to be actuated to move said bar to bolt retracted position, and abutments carried by said bolts positioned in the path of retracting movement of said operating pins by partial retracting movement of a bolt independently of said bar whereby further retraction of said bolt is prevented.

12. In a lock of the character described, in combination, a plurality of pivoted latch bolts each provided with an inclined slot therein undercut adjacent one end to form an abutment shoulder, a movable operating bar, a plurality of operating pins swiveled in said bar and having shanks projecting therefrom and engaging in said bolt slots whereby movement of said bar projects and retracts said bolts, an operating member on one side of said door operatively connected with said bar and adapted to be actuated to move said bar to bolt retracted position, said bolts being adapted by partial retraction independent of said bar and its operating pins, to position their abutment shoulders against said operating pins in the line of bolt retracting movement thereof whereby further retracting movement of said bolts is prevented.

13. In a lock of the character described, in combination, a plurality of spaced latch bolts, a movable operating bar in operative connection with said bolts designed to project and retract the same and normally tending to project said bolts, said bar being provided with a locking shoulder, an operating member mounted upon one side of the door and adapted to move said bar to bolt retracted position, and a pivoted locking member arranged to normally move by gravity into locking engagement with said oper-

ating bar shoulder when said bar has been moved to bolt retracting position and said door opened, said locking member having an end projecting from said door for engagement by its casing upon the closing of the door to move said member from bar locking position and thereby permit said bar to move to bolt projecting position.

14. A unit lock of the character described, comprising in combination a lock frame, a plurality of spaced bolts carried thereby, a movable operating member guided in said frame and operatively connected to each of said latch bolts to project the same, actuating means located at one side of said frame and in operative connection with said operating member adapted to be operated to move said member to bolt retracting position, and means whereby said latch bolts are locked against retracting movement independent of said operating member.

15. A unit lock of the character described, comprising in combination a lock frame, a plurality of spaced bolts carried thereby, a movable operating member guided in said frame and operatively connected to each of said latch bolts to project the same, independent actuating means located at opposite

sides of said frame and operatively and independently connected with said operating member and adapted to be operated to move said member to bolt retracting position, and means whereby said latch bolts are locked against retracting movement independent of said operating member.

16. A unit lock of the character described, comprising in combination a lock frame, a plurality of spaced bolts carried thereby, a movable operating member guided in said frame and operatively connected to each of said latch bolts to project the same, actuating means located at one side of said frame and in operative connection with said operating member adapted to be operated to move said member to bolt retracting position, and means carried by said frame for engaging and automatically retaining said operating member in bolt retracting position upon the opening of the door and for automatically disengaging said operating member upon the closing of the door.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."