H. REIN & J. R. COMBS.

DOOR LOCK.

APPLICATION FILED MAY 18, 191 .

1,223,110.

Patented Apr. 17, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

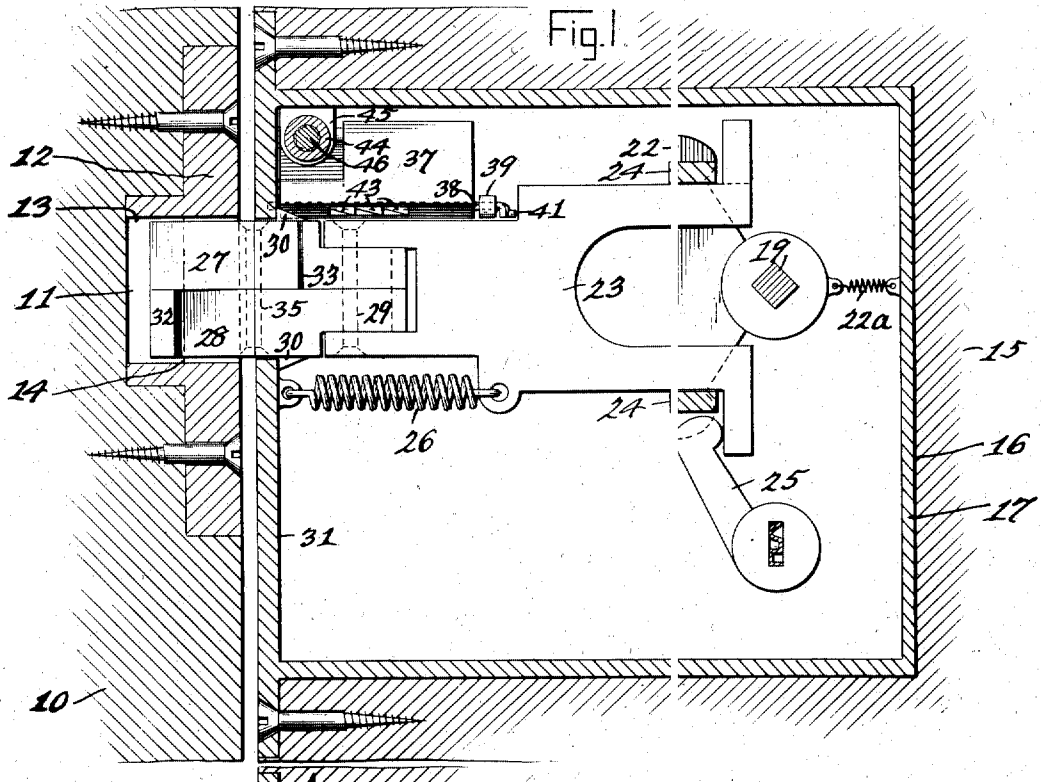
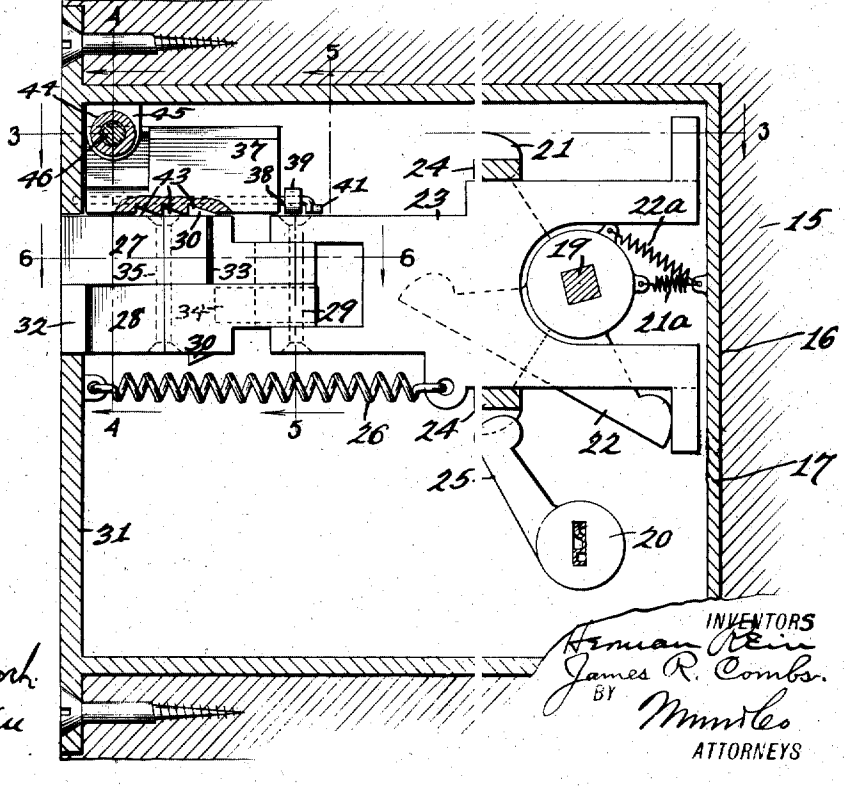


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

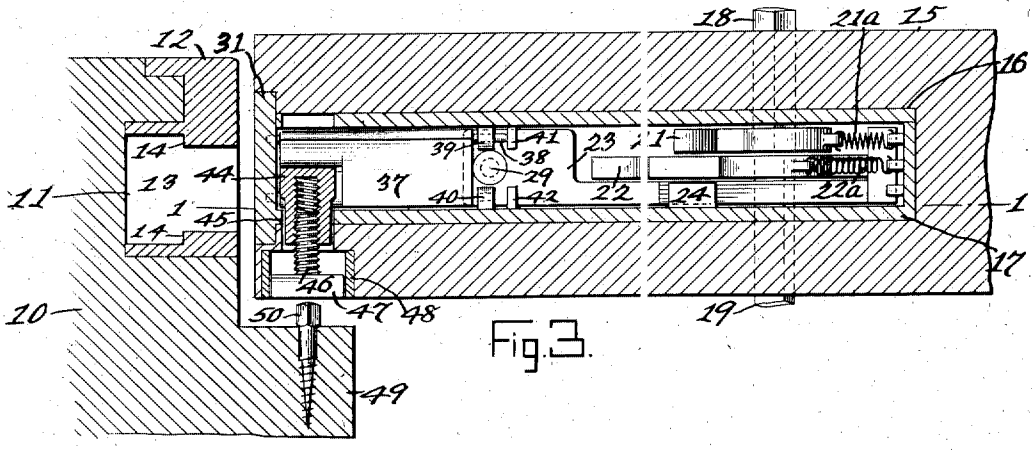


Fig. 3.

Fig. 4.

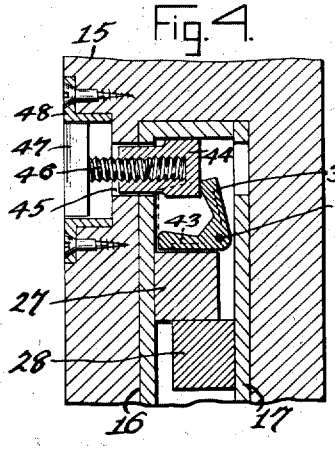


Fig. 5.

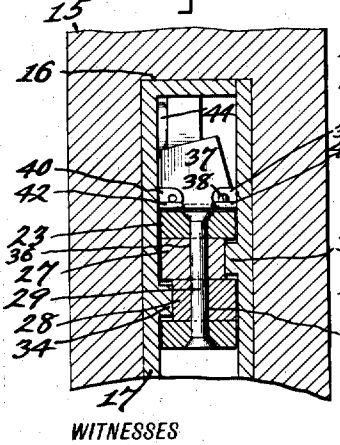


Fig. 6.

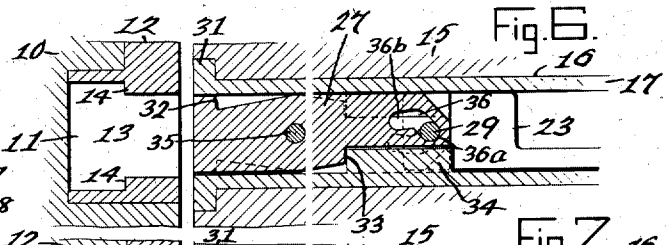


Fig. 7.

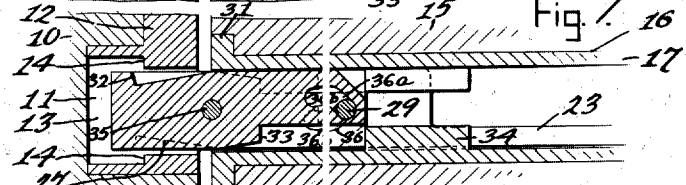


Fig. 8.

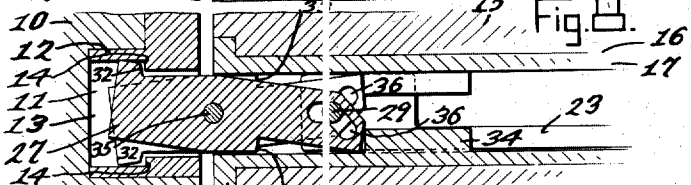
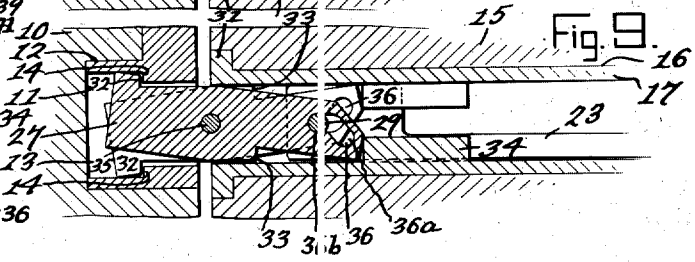


Fig. 9.



WITNESSES

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UNITED STATES PATENT OFFICE.

HERMAN REIN, OF NEW YORK, N. Y., AND JAMES R. COMBS, OF DINSMORE, FLORIDA; SAID COMBS ASSIGNOR TO SAID REIN.

DOOR-LOCK.

1,223,110. Specification of Letters Patent. Patented Apr. 17, 1917.

Application filed May 18, 1916. Serial No. 98,397.

To all whom it may concern:

Be it known that we, HERMAN REIN and JAMES R. COMBS, citizens of the United States, and residents of New York, in the county of New York and State of New York, and of Dinsmore, in the county of Duval and State of Florida, respectively, have invented certain new and useful Improvements in Door-Locks, of which the following is a specification.

This invention relates to door locks and is an improvement over the form shown and described in the application for Letters Patent of the United States filed by Herman Rein on the 7th day of March, 1916, Serial No. 82,599, and some of the main objects are to provide such locks which are positively burglar-proof, which are adapted to use either as mortise or side locks, which are adapted for use on either right or left hand doors, and wherein the several parts are reversible and interchangeable.

Our invention is fully described in the following specification, of which the accompanying drawings form a part, in which like characters refer to like parts in each of the views, and in which:—

Figure 1 is a vertical section taken through a lock constructed in accordance with our invention, as on the line 1—1 of Fig. 3, with the door locked;

Fig. 2 is a similar view with the lock bolt retracted;

Fig. 3 is a section taken on the line 3—3 of Fig. 2;

Fig. 4 is a section taken on the line 4—4 of Fig. 2;

Fig. 5 is a section taken on the line 5—5 of Fig. 2; and Figs. 6 to 9, inclusive, are sections taken on the line 6—6 of Fig. 2 and showing progressive steps in the bolt projection into locking position.

Referring to the drawings 10 represents a door jamb having a recess 11 therein having a striking-plate 12 therein and thereover provided with an angular passage 13 and with a horizontal enlargement forming shoulders 14, Figs. 3 and 6 to 9, inclusive, these shoulders forming an important feature of the lock.

At 15 is shown a door having a mortise 16 for the lock casing 17 within which the operable parts of the invention are located, and said parts may be controlled by either knobs or by a key, knob shanks 18 and 19 being shown, as well as a cylinder lock 20, but no effort has been made to illustrate any means for preventing knob rotation as many forms thereof are now in use and may be adapted to our lock.

Each knob shank carries a roll-back, 21 for the shank 18 and 22 for the shank 19, independently operable upon a sear 23 guided between lugs 24 on the casing back, the cylinder lock 20 also acting on said sear by means of a roll-back 25, against the action of a spring 26 which tends to force said sear forwardly toward the free edge of the door.

The forward end of the sear 23 is bifurcated to span two identical though reversely arranged bolt members 27 and 28 freely movable upon a pivot 29 carried by said sear, the outer ends of said bolt members being vertically thickened to jointly equal the vertical diameter of the sear, and each of said bolt members carries a tooth 30 adapted to bear against the inner side of the edge plate 31 of the lock casing when the bolt is in extreme forward position, Fig. 1.

By reference to Figs. 6 to 9, inclusive, it will be seen that each bolt member is cut away at the front thereof to provide a hook 32 adapted, as shown in Figs. 8 and 9, to engage with the striking-plate shoulders 14, and the inner ends of said bolt members are cut away to form shoulders 33 bearing against a relatively long stationary stop 34 on each inner side of the casing, though in different horizontal planes, in the inner position of the bolt, and said stops also serve as guides for the bolt members as will be later explained.

The bolt members 27 and 28 are joined, forwardly of the pin or pivot 29, by means of a pivot 35 permitting rotary movement of each bolt member and so located as to have its axis in the plane of the free edge of the door when the bolt is in outermost position whereby it will be impossible for a house-breaker to break either the bolt members or the pivot 35 inasmuch as he cannot secure any leverage between the bolt members.

As stated, the bolt members are identical though reversed, and the inner ends thereof are provided with similar though reversely

directed slots 36 having, each, an inclined portion 36^a and a portion 36^b substantially parallel with the sides of the lock casing, the pivot pin 29 being passed through said slots and being at the inner ends of the inclined portions with the bolt in retracted position.

Arranged above the bolt members is a detent 37 of bell-crank form pivoted at 38, the pivot 38 being detachably held in the front edge of the lock casing and in one or the other of two lugs 39 and 40 according to whether the door is left or right hand, and the inner end of said pivot 38 is angularly bent and locked against longitudinal movement by means of one or the other of two stops 41 and 42, Fig. 3.

The detent 37 has two identical arms or leaf members in order to make the same reversible and is preferably gravity operated, the lower arm having a plurality of notches 43 for the reception of the tooth 30 of the uppermost bolt member, Fig. 2, whereby the bolt is held in retracted position when said tooth is in the innermost notch but, when the detent is rocked on its pivot, the tooth 30 is released and the bolt is shot out by means of the spring 26, Fig. 1.

The upper arm of the detent 37 bears against a carrier 44 of circular form in cross section and slidable in a similarly shaped channel 45 in the casing 17 and door 15, said carrier having a screw threaded thereinto, shown at 46 Fig. 4, in turn carrying an angular button 47 on its outer end slidably mounted in a guide 48 detachably secured to the side of the door facing the direction of closing movement, said carrier, screw, and button being normally held in outermost position by means of the detent 37 when the latter is in tooth engaging position, and it will be noted that the button 47 is normally flush with the surface of the door and may be adjusted for doors of varying thicknesses by means of the screw 46.

The door stop 49 of the door jamb is provided with a post 50 in the position of the button 47 when the door is closed whereby the button is forced inwardly of the door to rock the detent 37 and thus release the bolt tooth 30 and thereby permit the spring 26 to force the bolt outwardly of the door and into the jamb, and said bolt may be retracted by the knobs or by the key in the cylinder lock although, as hereinbefore stated, suitable means may be provided to prevent rotation of the outer knob when desired.

The operation of the bolt members is clearly shown in Figs. 6 to 9, inclusive, the first showing the parts in door open positions and, when the post 50 rocks the detent 37 to release the bolt the sear 23 moves forwardly and carries the pivot pin 29 therewith. Inasmuch as the stops 34 will not permit lateral movement of the inner ends of the bolt members, the pivot pin 29 cannot move in the slots 36 and the bolt members are also carried forwardly into the positions shown in Fig. 7 just clearing the stops 34. The inner ends of the bolt members may now move laterally and this movement is produced by the pivot pin 29 sliding along the inclined portions 36^a of the two slots 36 until the two portions 36^b approximately register and this rocking of the bolt members on their pivot 35 forces the outer ends laterally in opposite directions to engage the hooks 32 with the shoulders 14 in the striking-plate, and continued movement of the sear forces the pivot pin 29 into the portions 36^b of the slots and thus prevents any rocking of the bolt members on the pivot 35 and forestalls any attempt to rock the said members by means of an instrument inserted between the door and jamb.

Upon retraction of the sear, by knob or key, the pivot pin 29 first moves out of the registering portions 36^b of the slots 36 and then moves along the inclined portions 36^a, the bolt members being thus rocked on the pivot 35 into the positions shown in Fig. 7, after which the bolt members are carried rearwardly to innermost positions, the inner ends thereof having been cleared from the forward ends of the stops 34, these stops limiting rearward movement of the bolt members, in retracted positions, preventing retracting when in their outermost positions, and preventing lateral movement thereof when in retracted positions, and the uppermost tooth 30 holds the parts in retracted position whereas both teeth 30 limit forward movement of the bolt members.

From the foregoing it will be seen that the bolt is positively immune from any exterior attempt to retract the same by means of any implement introduced between the door and jamb, and the pivot 35 being in the plane of the narrow space between the door and jamb no possibility of rocking the bolt members by external means is presented in an effort to withdraw the same from the jamb.

The knob shanks 18 and 19 are carried back to normal positions, when rotated therefrom, by springs 21^a and 22^a, respectively, but we do not desire to limit ourselves to any specific knob or key structure, but we will preferably make the parts reversible and interchangeable.

Our lock is very simple, presents no bolt when the door is open, and presents a smooth surface in the position of the button 47, and the post 50 is practically buried in the angle of the stop 49 whereby no injury to clothing or to the body of a person can occur by catching on the same, and, as stated, the lock may be adapted to various uses other than that shown.

Having fully described our invention,

what we claim as new, and desire to secure by Letters Patent, is:—

1. A lock, comprising a casing, a bolt slidable therein formed of a plurality of members pivoted together, means for spreading said members apart at their outer ends when in outermost position consisting of inclined slots and a pin engaged therein, a sear carrying said pin, a spring tending to force said sear outwardly, and means for holding said sear in retracted position against the action of said spring.

2. A lock, comprising a casing, a bolt slidable therein formed of a plurality of members pivoted together, means for spreading said members apart at their outer ends when in outermost positions consisting of inclined slots and a pin engaged therein, a spring tending to hold said bolt in outermost position, a detent for holding said bolt in retracted position, means external of said lock for releasing said detent from said bolt to permit outward movement of the latter by said spring.

3. A lock, comprising a casing, a bolt slidable therein formed of a plurality of members pivoted together, means for spreading said members apart at their outer ends when in outermost positions, a spring for holding said bolt outwardly, and means for locking said bolt in innermost position against the action of said spring consisting of an externally released detent provided with a notch, said bolt having a tooth thereon engaged with said notch.

4. The combination with a door and a door jamb, of a lock comprising a casing, a bolt slidable therein formed of a plurality of members pivoted together, means for spreading said members apart at their outer ends when in outermost positions, a spring for moving said bolt outwardly, a detent for locking said bolt in innermost position, a button for releasing said detent from the exterior of said door and normally flush with the surface of said door, and a post on the inner edge of the door stop on said frame for forcing said button inwardly to release said detent to permit said bolt to shoot outwardly into engagement with said door frame.

5. The combination with a door and door jamb, of a lock comprising a bolt formed of a plurality of members in pivotal engagement, a spring for moving said bolt outwardly of said lock, means for normally holding said bolt entirely within said door when said door is open, and means for releasing said bolt holding means when said door is closed to permit said spring to shoot said bolt outwardly into engagement with said jamb.

6. A lock, comprising a casing, a sear, means for moving said sear, a plurality of bolt members, a pivot joining said members, a pin on said sear engaged in the inner ends of said members said members having slots to receive said pin, means for spreading the outer ends of said members apart when in outermost position, and means for preventing retraction of said bolt by external means, said pivot being in the plane of the outer edge of said lock when said bolt members are in outermost positions.

7. A lock, comprising a casing, a bolt therein formed of two members pivoted together and having hooks at their outer ends and slots in their inner ends composed, each, of an inclined portion and a straight portion, a sear, a pin carried thereby engaged in said slots, a spring for moving said sear outwardly, and manually operable means for retracting said bolt.

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