March 24, 1953 H. QUIGLEY 2,632,664

DOOR LOCK

Filed Sept. 2, 1948 2 SHEETS—SHEET 1

FIG. 1.

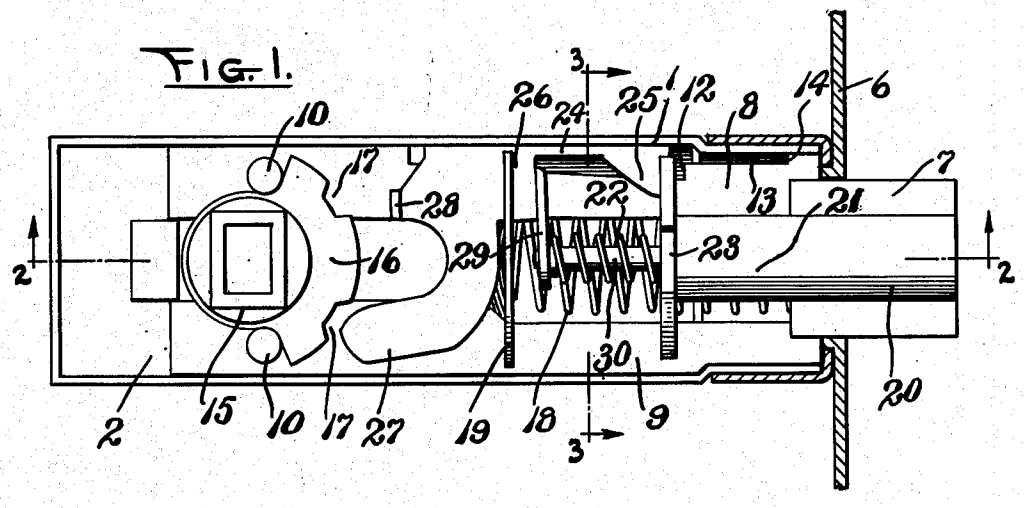
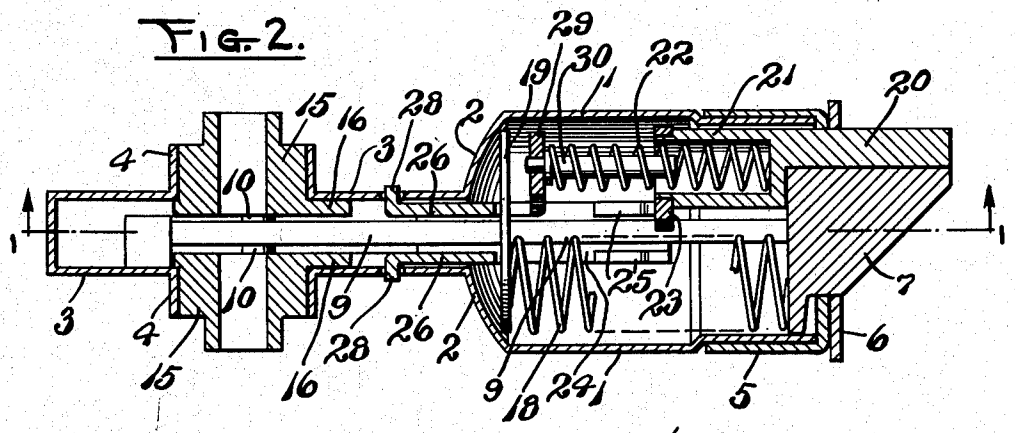


FIG. 2.



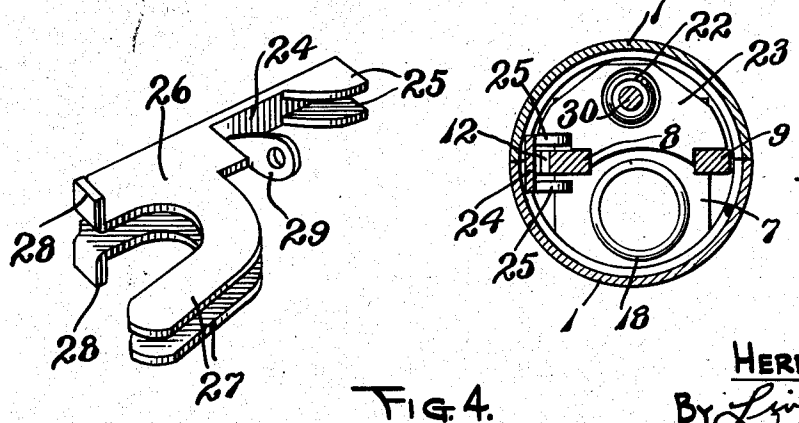


FIG. 3.

FIG. 4.

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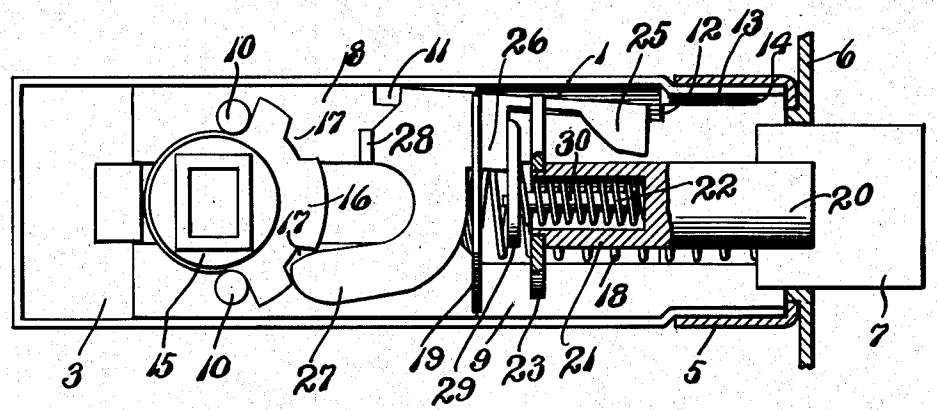


FIG. 5

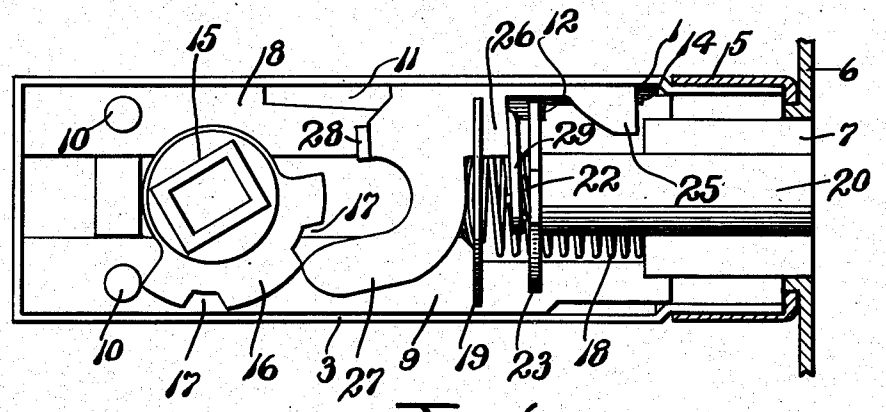


FIG. 6

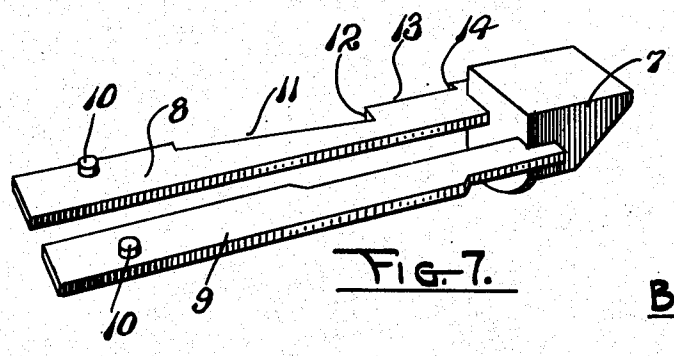


FIG. 7.

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2,632,664

DOOR LOCK

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Application September 2, 1948, Serial No. 47,437

9 Claims. (Cl. 292—169)

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This invention relates to a door lock which may be applied at the free vertical edge portion of a swinging door and automatically lock the door when it is closed, with the bolt of the lock received in a keeper opening or recess on the adjacent door jamb. When the door is closed and the bolt engaged with the keeper, it is impossible to engage the projecting end of the bolt to press or otherwise work it back, to disengage it from the keeper.

With my invention, the retraction of the bolt is by means of roll-backs, two of which are used, each independently operable without affecting the other. The lock of my invention is applicable to doors swinging in either direction, and it is not necessary to have two patterns or a right and a left in connection with said lock for use on swinging doors. In practice there will be a key-operated locking means associated with the spindle, knobs and roll-backs, the key being used at the outer side of the door, but with the lock being readily operated by turning the knob at the inner side of the door. With the invention as disclosed, either roll-back may be actuated to turn it to retract the bolt of the lock. A simplified structure is produced, one which may be economically manufactured and assembled with resultant economy in production. In practice, and as shown in an application for a patent, Serial No. 47,438 of even date herewith, a key-operated means for releasing the lock from the outer side of the door will generally be used.

An understanding of the invention may be had from the following description, taken in connection with the accompanying drawings in which,

Fig. 1 is a vertical section, substantially on the plane of line 1—1 of Fig. 2.

Fig. 2 is a longitudinal horizontal section substantially on the plane of line 2—2 of Fig. 1.

Fig. 3 is a transverse section substantially on the plane of line 3—3 of Fig. 1.

Fig. 4 is a perspective view of a movable locking dog which in operative position holds the lock-bolt from retraction, and when automatically moved to inoperative position, frees the bolt for retraction.

Fig. 5 is a view similar to Fig. 1, showing the position of the parts of the bolt with the door closed.

Fig. 6 is a view similar to Fig. 5 with the lock bolt retracted by operation of either roll-back, and,

Fig. 7 is a perspective view of the lock bolt, and the retractor bars permanently connected therewith.

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Like reference characters refer to like parts in the different figures of the drawings, and the sections are taken looking in the directions indicated by the arrows associated with the section lines.

In the latch structure, a hollow bolt housing of sheet metal is used, formed of two halves, the outer end portions of which are of semi-cylindrical form with inwardly extending shoulders 2 at their inner ends, substantially midway between the ends of the housing. The inner portions 3 of the housing, are of generally channel shape in cross section, and said sections 3, between their ends, have oppositely projecting cylindrical portions 4 which serve as mountings for rotatable roll-backs. The two halves of the housing placed together telescope at their outer ends into a metallic cup 5 which is secured at the rear side of a rectangular metal plate 6. When the lock is installed in a door, an opening of a diameter slightly in excess of the diameter of the cylindrical outer portion of the housing is bored between the sides of the door at the free vertical edge thereof, said opening being long enough for the entrance of the housing to bring the plate 6 against the edge of the door, to which it is secured by screws or other fastenings in the usual manner.

The bolt or bolt head 7 has an inclined outer side which is adapted to ride against the strike plate of a keeper on a door jamb. The bottom of the cup 5 and the plate 6 having openings through them for the bolt 7 to pass. From the inner end of the bolt 7, two spaced apart retractor bars 8 and 9 are permanently secured. The bars 8 and 9 are of flat metal and lie in the same vertical plane and are spaced from each other at adjacent edges. Each toward its inner end has a transverse pin 10 extending therethrough with projecting end portions, one at each side of each bar, which in the assembled latch are engaged by roll-backs, one at each side of the retractor bars. The upper bar 8 at its middle portion and its upper edge is cut away to provide a relatively long recess 11, with a vertical shoulder 12 at the front end of the recess. Ahead of the shoulder 12 and at the same upper edge of the bar 8, a shorter section is machined from the bar, leaving a shorter elongated recess 13, with a vertical shoulder 14 at its front end.

Two roll-backs 15 are rotatably mounted, one in each of the sleeves 4 of the housing described. Each at its inner end has an arcuate flange 16 extending regularly therefrom. Each of said flanges is notched at spaced apart points as

shown at 17. The rotation of either roll-back 15 in either direction serves to engage one of the pins 10 so that the bolt 7 is retracted inwardly. Normally the bolt is moved outwardly to the position shown in Fig. 1 by a coiled compression spring 18 bearing at one end against the back of the bolt, and at its other end against a transverse plate 19 which comes against the inner sides of the housing shoulders 2. The plate 19 has suitable openings through it for the retractor bars 8 and 9, and for other parts of the mechanism where needed.

Along side the bolt 7, a projecting finger 20 at one end of a cylindrical member 21 is located, the finger 20 being substantially semi-circular in cross section, and having a shoulder at its juncture with the member 21. The shoulder is held against the inner end of the bolt 7 by a relatively light coiled spring 22, the front end portion of which is housed in an axial opening in the member 21. At the inner end of said member 21, a plate 23 is permanently secured which rides against a side of the bars 8 and 9 and extends between them (Fig. 3).

A pivotally mounted locking dog is housed within the bolt housing. It is formed from sheet metal and includes an upper bar 24 which, at its outer end and at each side, has downwardly extending cam projections 25 adapted to embrace the upper retractor bar 8. The bar 24 at its inner end portion, has two flanges 26, one at each edge extending downwardly, each continuing in a finger 27 which curves downwardly and inwardly in assembly. The two fingers 27 extend to the arcuate flanges 16 of the two independent roll-backs 15 and said flanges 26 and fingers 27 pass one at each side of the retractor bars 8 and 9. Each of the flanges 26 at its inner end has an outwardly turned lug 28, the two lugs passing through openings in opposite sides of the inner sections 3 of the housing (Fig. 2) to pivotally mount the dog on the housing. From the forward edge of one of the flanges 26, an ear 29 is turned to extend downwardly. It has an opening through it for receiving the inner end of a rod 30 which is in axial alinement with the cylindrical member 21, said rod extending partly through the spring 22.

In the free position of the lock bolt 7 (Fig. 1), the bolt is projected by the spring 18, and the member 20, by the spring 22 to the limit of their outward movement. In such outer position, plate 23 is under one of the cam members 25 and holds the locking dog in upper position so that the shoulder at 12, and the part of the latch bolt below the recess at 13, may pass below the bar 24 of the locking member. Thus the bolt 7 and the member 20 and parts associated therewith are unrestricted in movement, and will move inwardly when the inclined end of the bolt 7 engages with the keeper or striking plate on the door frame. When the bolt 7 is brought into alinement with the opening in the keeper plate, as when the door is fully closed, spring 18 moves the bolt outwardly to its outer limit, but the member 20, at its outer end, having no opening in the keeper plate to receive it, is held at its inner position as shown in Fig. 5. In that position, the plate 23 is moved back so as to be out of engagement with the cam projection 25 with which it was previously engaged. Whereupon the locking dog is moved clockwise under the force of spring 22, to bring the outer end of the bar 24 into the path of inward movement of the shoulder 12 on the retractor bar 8, thereby preventing inward movement of the bolt.

Under such circumstances, the free ends of fingers 27 enter the lowermost recesses 17 in flanges 16, the plate 23 now being back of the cams 25, and the locking dog rotates in a clockwise direction so that the outer end of the locking dog is back of the shoulder 12. The bolt 7 and the retractor bars 8 and 9 thereupon are prevented from inward movement until the locking dog has been moved counter-clockwise to the position shown in Fig. 6, by operation of either one or the other of the rollbacks 15.

On turning a roll-back 15 in either direction, the fingers 27 associated with the flange 16 of the roll-back which is operated, rides out of the recess 17 that it is in and against the edge of the flange 16, thereby pivoting the locking dog and causing its outer end to move out of the path of movement of the shoulder 12. The bolt 7 is retracted, and the door thus opened. Upon releasing of the roll-back which has been turned to withdraw the bolt, the parts are forced outwardly to the position shown in Figs. 1 and 2, and the door can be again closed as has been described.

The structure described is relatively economical to produce, all the parts being manufactured in accordance with large quantity production methods. Both roll-backs are independently operable, and a turning of either one in either direction will result in a retraction of the bolt.

This invention as defined in the appended claims is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In a structure as described, an elongated housing having an opening at its outer end, a latch bolt slidably extending through said opening, retractor means connected to said bolt located within and lengthwise of the housing, two independent roll-backs movably mounted on the housing, one at each side of the retractor means, means for moving said retractor means and bolt inwardly on movement of either roll-back in either direction, yielding means normally projecting said bolt outwardly, a locking element movably mounted on said housing engaging at one end with each of said roll-backs and at the other end movable into and out of engagement with the retractor means to lock the bolt against inward movement when in such engagement, and means on each roll-back for independently moving said locking means to a position out of engagement with said retractor means on moving either roll-back in either direction, a continuation of said roll-back movement retracting the latch bolt.

2. In a structure as defined in claim 1, an auxiliary member located at a side of the bolt and having a shoulder against which said bolt engages at its inner end, and means on said auxiliary member in operative engagement with said locking element to hold said element out of engagement with said retractor means when both said latch bolt and auxiliary member are at outer positions, but engaged when only the bolt is at outer position.

3. In a structure as described, an elongated housing having an opening at its outer end, a latch bolt slidably mounted through said opening, an elongated retractor secured to the latch bolt and extending inwardly therefrom lengthwise of and within the housing, roll-backs rotatably mounted, one at each side of the hous-

ing, said roll-backs being one at each side of the retractor, each roll-back at its inner end having an arcuate flange, each flange having spaced-apart recesses therein, means carried by the retractor in the path of movement of the ends of said flanges for retracting the latch bolt on independent rotative movement of either roll-back, spring means normally moving said bolt and retractor outwardly, a locking member pivotally mounted on and within the housing, said locking member embracing the retractor at both sides thereof, and each side having an inwardly extending finger, one bearing against the outer edge of each of the flanges of said roll-backs, and adapted to enter the recesses therein, the other end of said locking member extending over the retractor, said retractor having a shoulder behind which the other end of said locking member is located when said fingers are both in the recesses of said flanges, the turning of either roll-back moving said other end of the locking member away from said shoulder and out of its path of movement, whereby the retractor and the bolt connected therewith may be retracted inwardly lengthwise of the housing.

4. A structure as defined in claim 3, and an auxiliary member located along one side of said bolt and adapted to extend outwardly and have its outer end substantially flush with the outer end of the bolt, said member having a shoulder between its ends against which the inner end of said bolt engages, and a transverse member secured at the inner end of said auxiliary member operably engaging with the outer end of said locking member for moving it out of the path of movement of the shoulder on said retractor when said auxiliary member is at its outer position and freeing said locking member to move into the path of movement of said shoulder when said auxiliary member is moved and held at an inner position.

5. A structure as defined in claim 4, and spring means between said auxiliary member and said locking member for normally moving said auxiliary member to outer position and turning said locking member to maintain the fingers thereof against the flanges of the roll-backs, and the forward end thereof in the path of inward movement of said shoulder on the retractor.

6. A latch comprising, a housing having an open end, a latch bolt slidable through the open end of the housing, a member alongside the latch bolt independently slidable through the open end of the housing, means for locking the latch bolt against inward slidable movement actuated by said member on positioning said member at inner position, and two independently operable roll-backs for retracting the latch bolt by rotation of either roll-back in either direction, each of said roll-backs engaging said locking means when said locking means is in latch-bolt locking position and adapted to urge said locking means out of locking position when said roll-backs are rotated.

7. A latch comprising an elongated housing having an opening at its outer end, a bolt slidable through said opening movable to retracted or extended positions, spring means normally moving the bolt to extended position, roll-backs rotatively mounted one at each side of the housing, a retractor connected to the bolt located lengthwise of the housing and between said roll-backs, inter-engaging means on the retractor and roll-backs for withdrawing the bolt on rotative movement of either roll-back in either direction, and a pivotally mounted locking means mounted on said housing between its ends, said locking means located between said roll-backs and bolt, said pivotally mounted locking means having two fingers, one engaging each of said roll-backs, and a forwardly extending part located alongside the retractor, said retractor having a stop-shoulder which at the outer position of the bolt is located outwardly from said locking means, a lost motion connection between said forwardly extending part and said locking means for moving the outer end of said locking means into the path of inward movement of said shoulder, and means on the roll-backs for pivotally moving said locking means to move its outer end out of said inward path of movement of said retractor shoulder on rotation of either roll-back in either direction.

8. A latch comprising an elongated housing having an opening at its outer end, a bolt slidably movable through said opening for retraction or extension, resilient means normally moving the bolt to extended position, roll-backs rotatably mounted one on each side of the housing, a retractor connected to the bolt located lengthwise of the housing and between said roll-backs, inter-engaging means on the retractor and roll-backs for withdrawing the bolt on rotative movement of either roll-back in either direction, and a pivotally mounted locking dog mounted on said housing between its ends, said locking dog located between said roll-backs and bolt, said pivotally mounted locking dog having two fingers, one engaging each of said roll-backs, and a forwardly extending part located along side the retractor, said retractor having a stop shoulder which at the outer position of the bolt is located outwardly from said locking dog, a lost motion connection between said forwardly extending part and said locking dog for moving the outer end of said locking dog into the path of inward movement of said shoulder, and a cam on the roll-backs for pivotally urging said locking dog to move its outer end out of said inward path of movement of said retractor shoulder on rotation of either roll-back in either direction.

9. In a latch having a housing, roll-backs and a latch-bolt retractor operated by said roll-backs, the improvement comprising: a pivotally mounted locking dog mounted between it ends to said housing, said locking dog located adjacent said retractor, said pivotally mounted locking dog having two fingers, one engaging each of said roll-backs, and a forwardly extending part located along side said retractor, said retractor having a stop shoulder which at the outer position of the bolt is located outwardly from said locking dog, a lost motion connection between said forwardly extending part and said locking dog for moving the outer end of said locking dog into the path of inward movement of said shoulder, and a cam on the roll-backs for pivotally urging said locking dog to move its outer end out of said inward path of movement of said retractor shoulder on rotation of either roll-back in either direction.

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