

Dec. 29, 1953

R. C. CERF, JR

2,664,306

LATCH RETRACTOR AND HOUSING

Filed Feb. 16, 1952

2 Sheets-Sheet 1

FIG. 1.

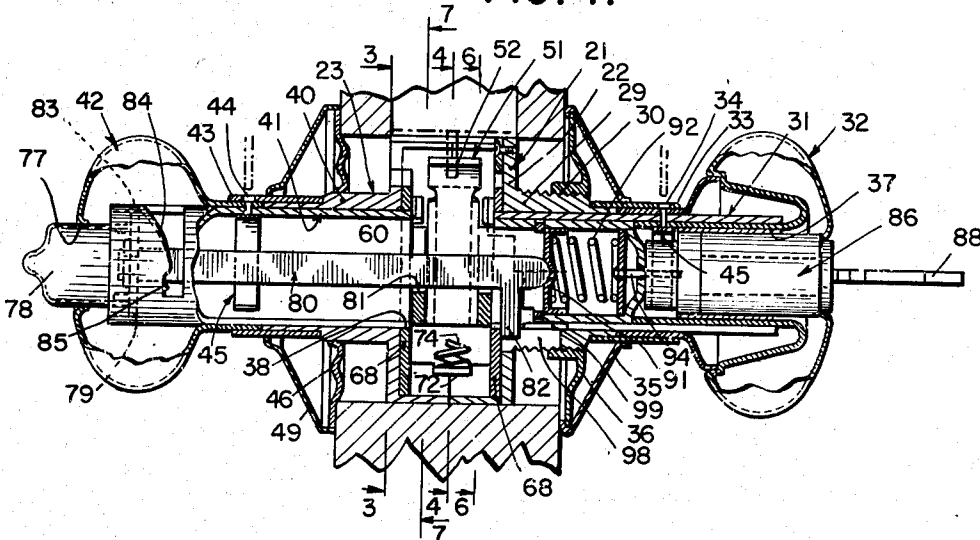


FIG. 2.

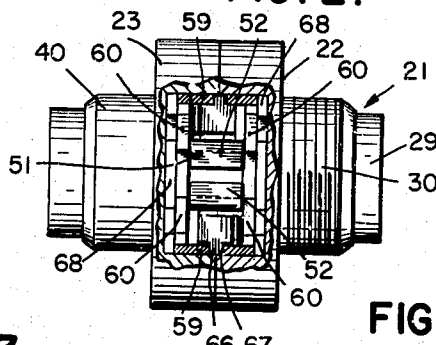


FIG. 4.

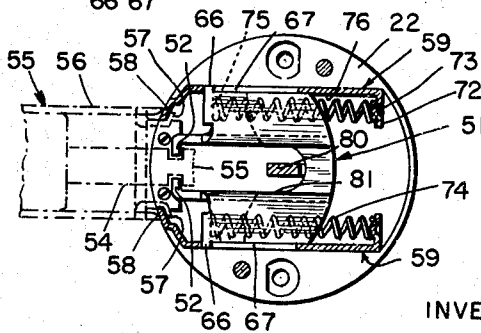


FIG. 3.

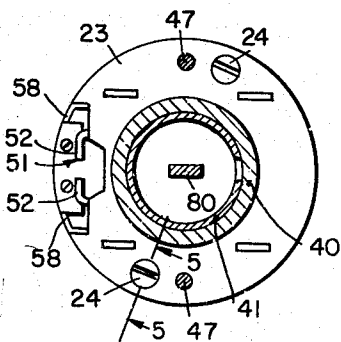
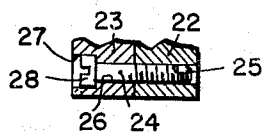


FIG. 5.



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FIG. 6.

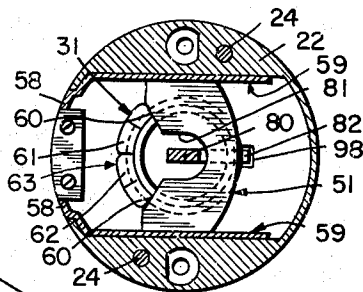


FIG. 7.

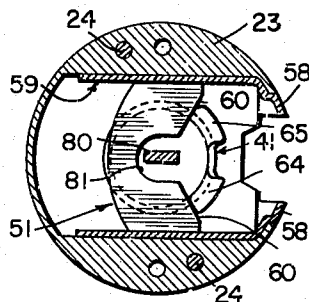


FIG. 8.

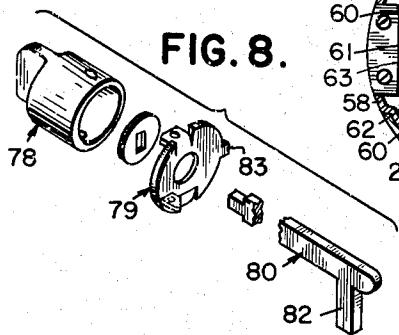


FIG. 9.

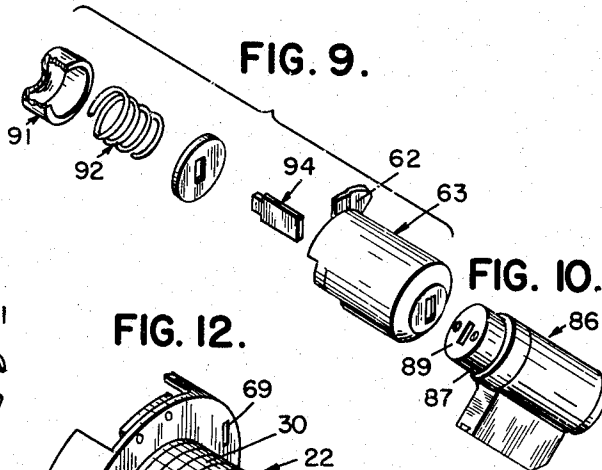


FIG. 11.

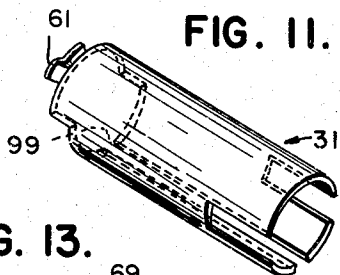


FIG. 12.

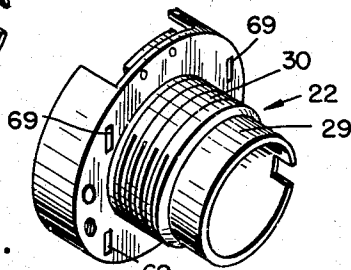


FIG. 10.

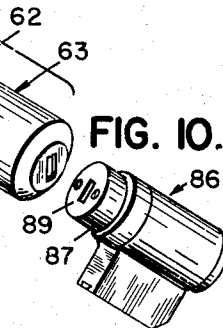


FIG. 13.

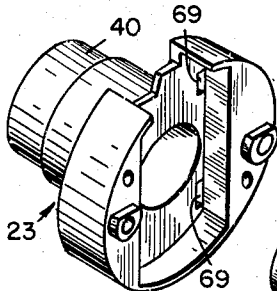


FIG. 15.

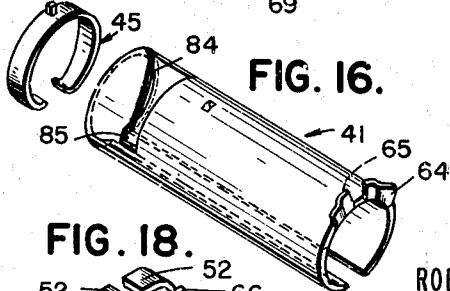


FIG. 16.

FIG. 14.

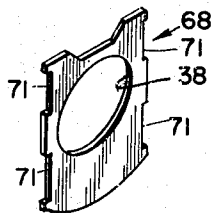


FIG. 17.

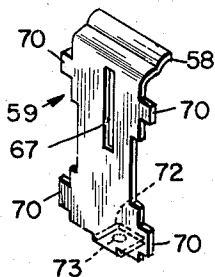
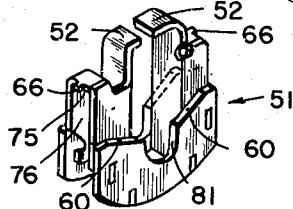


FIG. 18.



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LATCH RETRACTOR AND HOUSING

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Application February 16, 1952, Serial No. 271,946

5 Claims. (Cl. 292—169)

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This invention relates to a latch retractor means for a door knob lock and latch set and in particular to an assembly of a retractor and a retractor housing.

The general object of the invention is to provide in a door knob lock and latch set an easily assembled, strong, and durable latch retractor and housing therefor, the separate parts being made by the most economical forming procedures. Another object is to provide a steel lined retractor housing which resists wear and thereby lengthens the useful life of a latch set. A still further object is to provide a steel lined retractor housing and a guided retractor within said housing to high precision dimensions whereby the retractor operates smoothly and without looseness or excessive friction. A further object is to provide a retractor and housing for use in a high quality lock and latch set at decreased manufacturing and assembly costs. These and other objects are attained by my invention which will be understood from the following description, reference being made to the accompanying drawings which form a part hereof, in which

Fig. 1 is a top plan view partly in section of the lock and latch set installed on a door;

Fig. 2 is a side elevational view with parts broken away to show the interior structure of the assembly of the retractor housing and retractor;

Fig. 3 is a cross-sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 1;

Fig. 5 is a fragmentary cross-sectional view taken on the line 5—5 of Fig. 3;

Fig. 6 is a cross-sectional view taken on the line 6—6 of Fig. 1;

Fig. 7 is a cross-sectional view taken on the line 7—7 of Fig. 1;

Fig. 8 is a disassembly view in perspective of the turn button and locking bar mechanism;

Fig. 9 is a disassembly view in perspective of the key operated roll-back sleeve and the spring-pressuring device associated therewith;

Fig. 10 is a perspective view of a key operated cylinder lock;

Fig. 11 is a perspective view of the outside spindle;

Fig. 12 is a perspective view of the outside portion of the retractor housing;

Fig. 13 is a perspective view of the inside portion of the retractor housing;

Fig. 14 is a perspective view of a steel bearing plate for the retractor housing;

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Fig. 15 is a spring detent member for holding the inside knob to the inside spindle;

Fig. 16 is a perspective view of the inside knob spindle;

Fig. 17 is a perspective view of a steel guide plate of the retractor housing; and

Fig. 18 is a perspective view of the retractor.

The complete door knob lock and latch set of which the present invention is a part, consists of a body 21 which externally is generally cylindrical in shape and is assembled from two die-cast half or part portions which are here designated 22 for the outside portion and 23 for the inside portion, these two portions being assembled to form a body having a generally rectangular cavity by means of assembly screws 24 whose threaded ends engage threaded holes 25 in the outer portion 22, the corresponding unthreaded holes 26 in the inside portion 23 being countersunk at 27 to receive the heads 28 of the assembly screws 24. In the drawings, particularly Fig. 1, the right hand knob containing a key actuated cylinder lock is referred to as "outside" and the left-hand knob containing the push button is referred to as "inside," this relating to the mounting on a door such as a house entrance door. The outside portion 22 of the body is provided with an outwardly extending axial bearing sleeve 29 which is provided with threads 30 on its outside surface. This sleeve is adapted for the mounting therein of the outside tubular spindle 31 upon the end of which the outside knob 32 is fastened by means of a spring catch 45 (see Fig. 15) which fits inside the spindle 31 and keys together the spindle 31 and the collar of the outside knob 32. Beyond the said threads 30, the diameter of the sleeve is reduced and a covering sleeve 33 is attached thereto, said sleeve having an access hole 34 by which the spring catch may be released. An outside rosette 35 attached to the clamping plate 36 is threadedly mounted on the threads 30 of the sleeve 29. The inside portion 23 of the body is also provided with an outwardly extending axial bearing sleeve 40 in which there is mounted for rotation the inside spindle 41, on the end of which spindle is mounted the inside knob 42. A cover sleeve 43 is attached to the bearing sleeve 40 and is provided with access hole 44 for a spring catch 45 (see Fig. 15), holding the inside knob 42 on the inside spindle 41. An inside clamp plate 46 is provided to abut the face of the door at the margin of the mounting hole, screws 47 being provided to fit threaded holes in the inside body 23,

and a rosette 49 being removably attached to said clamp plate by the spring loop 50.

The latch bolt retractor 51 consists of a generally rectangular frame having a pair of opposed fingers 52 which are adapted to engage the end 53 of the latch bar 54 which protrudes from the spring latch 55 whose housing 56 is adapted to be mounted in a hole in the door at right angles to the knob spindles, the tabs 57 of said latch bolt housing 56 engaging the latch connecting ledges 58 of the retractor guide plates 59 (see Fig. 4). On the opposite sides of the retractor 51 there are provided laterally extending ledges 60 which form the four cam thrust surfaces on the retractor against which the roll-back cam 61 at the end of the outside knob spindle 31, the roll-back cam 62 at the end of the key actuated spindle 63, and the roll-back 64 and 65 of the inside end of the inside knob spindle 41 respectively may press to move it against the springs 74 and thereby actuate the spring latch 55. The retractor 51 is also provided at its edges with bosses 66, projecting from each edge, which bosses engage longitudinal slots 67 in the guide plates 59. The retractor 51 is also disposed between steel bearing plates 68 which fit in the bottom of the cavity of each of the two portions 22 and 23 of the body 21, each bearing plate being provided with a circular opening 38 for the outside and inside spindles 31 and 41. Rectangular holes or slots 69 are provided in the bottoms of the cavities of the outside portion 22 and the inside portion 23 of the housing at the edges of said cavities, these holes or slots being adapted to receive tabs 70 on the retractor guide plates 59. Corresponding notches 71 are also provided in the edges of the bearing plates 68 for the tabs 70 thus keying the parts together and anchoring them to the die-cast body portions. Each of the guide plates 59 is provided at one end with a right-angled inwardly projecting tab 72, having a mound 73 which serves to hold one end of each of the coil springs 74 which are disposed on each side of the retractor 51, the other end of each of the coil springs abutting an edge shoulder 75 provided on the retractor, the springs then resting in the channels 76. When assembled, the retractor 51 is thus completely encased in the two guide plates 59 and the two bearing plates 68 which are keyed together by means of the notches and tabs, as described, and also anchored to the die cast portions of the body 21.

The guide plates 59 at the ends opposite the inwardly projecting spring holding tab 72 are bent inwardly to form latch connecting edges 58, these edges being substantially parallel to the opposed faces of the fingers 52 of the retractor. These latch-connecting edges 58 are arranged to engage tabs 57 on the latch bolt housing, as shown particularly in Fig. 4, when the set is installed on a door.

The inside knob 42 is provided with an axial hole 77 in which there is mounted the turn button 78 whose inside end plate 79 is attached to the end of the locking bar 80, the locking bar extending from the turn button through the central opening 81 in the retractor into the spindle 31 for the outside knob 32. The other end of the locking bar 80 is provided with a dogging arm 82 extending at right angles to the bar, this dogging arm being adapted to dog the spindle 31 for the outside knob, as will be described. The end plate 79 of the turn button 78 is provided with a projecting follower tab 83 which is

adapted to engage the bayonet slot 84 in the knob end of the inside spindle 41 so that when the turn button 78 is pressed inwardly and turned, it is held in that position until released by the notch 85 in the bayonet slot, engaging the follower tab 83. When the turn button 78 is in the depressed position, the dogging arm 82 is pressed into the slot 99 in the outside tubular spindle 31, the dogging arm also extending into the longitudinal dogging groove 98 in the outside bearing sleeve 29. When the turn button is released, the locking bar 80 moves back by the spring pressure of the spring 92 in the cap 91 out of the dogging slots and the cut-away segment opposite the rollback 61 permits the rotation of the outside tubular spindle 31.

The outside tubular spindle 31 is provided with the outside knob 32, this knob being provided with an axial opening 37, in which there is mounted a cylinder lock 86, the plug 87 of said lock being operable by the removable key 88, and the rotatable plug 87 being also operatively attached to a slotted connector 89 inside the outside tubular spindle 31. Spring pressure against the locking bar 80 is provided by the coil spring 92 inside the cap 91 which is disposed inside the key-actuated sleeve 63, the spring also abutting a washer 93 attached to a connector bar 94 which protrudes through the closed end of the key-actuated sleeve 63 and makes operative connection with the connector 89 attached to the plug 87 of the cylinder lock 86.

In the operation of my lock, the pressing in and turning of the turn button 78 in the inside knob 42 causes the dogging arm 82 of the locking bar 80 to dog the outside spindle 31 to the dogging groove 98 in the bearing sleeve 29 for the outside spindle 31. The outside knob and spindle remains dogged irrespective of the movement of the retractor by the rollback on the key-actuated spindle 63 and also irrespective of the turning of the inside knob. The dogging is released only by the release of the turn button 78 in the inside knob. The retractor and retractor housing assembly is easily assembled from die-cast body parts forming a cavity in which the steel lining plates comprising the two bearing plates and the two guide plates may be assembled with the retractor enclosed therein, the retractor being prevented from binding or irregular operation or excessive friction by the guide tabs coating with the guide slots in the guide plates. The springs which press the retractor are enclosed in channels which prevent them from buckling and becoming inoperative. The steel lining plates are strongly held together by the tabs and slots, and the holes in the cavity of the die-cast parts so that the whole unit is durable and strong. The retractor is easily operated by the rollbacks attached to the several spindles which act against the retractor ledges to reciprocate the retractor. All of these result in an improved lock and latch structure at lower costs of manufacture and assembly.

I claim:

1. In a door knob lock and latch set of the type described having separate knob spindles, a body having a cavity for a retractor, said body being assembled from two die-cast portions, each of said portions having an integral axial bearing sleeve for a knob spindle extending from the side walls of said cavity, said body having an opening for an operating connection from a retractor to a spring latch means; a pair of steel guide plates having retractor guide slots arranged to line the

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opposite edge walls adjoining said side walls of said cavity; a pair of steel bearing plates arranged to line the side walls of said cavity, each of said bearing plates being provided with a hole adapted to receive a knob spindle; said guide plates and said bearing plates being provided respectively with edge tabs and tab receiving slots adapted to coact with tab receiving slots in said die-cast portions to hold said plates rigidly in place when assembled as a renewable lining in said cavity.

2. In a door knob lock and latch set of the type described having two separate knob spindles, a body having a rectangular cavity for a retractor, said body being assembled from two die-cast portions, each of said portions having an integral axial bearing sleeve for a knob spindle extending from the side walls of said cavity, said body having an opening for an operating connection for a retractor to a spring latch means; a pair of steel guide plates having retractor guide slots arranged to line the opposite edge walls adjoining said side walls of said cavity, the edges of said guide plates disposed adjacent said spring latch opening being bent inwardly and extending through said opening to form a latch housing connection slot; a pair of steel bearing plates arranged to line the side walls of said cavity, each of said bearing plates being provided with a hole adapted to receive a knob spindle; said guide plates and said bearing plates being provided respectively with edge tabs and tab receiving slots adapted to coact with tab receiving slots in said die-cast portions to hold said plates rigidly in place as a renewable lining when assembled in said cavity.

3. In a door knob lock and latch set of the type described having two separate knob spindles, a body having a rectangular cavity for a retractor, said body being assembled from two die-cast portions, each of said portions having an integral axial bearing sleeve for a knob spindle extending from the side walls of said cavity, said body having an opening for an operating connection for a retractor to a spring latch means; a pair of steel guide plates having retractor guide slots arranged to line the opposite edge walls adjoining said side walls of said cavity, the edges of said guide plates disposed adjacent said spring latch opening being bent inwardly and extending through said opening to form a latch housing connection slot; a pair of steel bearing plates arranged to line the side walls of said cavity, each of said bearing plates being provided with a centrally disposed hole adapted to receive a knob spindle; said guide plates and said bearing plates being provided respectively with edge tabs and tab receiving slots adapted to coact with tab receiving slots in said die-cast portions to hold said plates rigidly in place as a renewable lining when assembled in said cavity; and a steel retractor adapted to fit and to be reciprocated within said enclosure formed by said guide plates and said bearing plates.

4. In a door knob lock and latch set of the type described having two separate knob spindles, a body having a rectangular cavity for a retractor, said body being assembled from two die-cast portions, each of said portions having an integral axial bearing sleeve for a knob spindle extending from the side walls of said cavity,

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said body having an opening for an operating connection for a retractor to a spring latch means; a pair of steel guide plates having retractor guide slots arranged to line the opposite edge walls adjoining said side walls of said cavity, the edges of said guide plate disposed adjacent said spring latch opening being bent inwardly and extending through said opening to form a latch housing connection slot; a pair of steel bearing plates arranged to line the side walls of said cavity, each of said bearing plates being provided with a centrally disposed hole adapted to receive a knob spindle; said guide plates and said bearing plates being provided respectively with edge tabs and tab receiving slots adapted to coact with tab receiving slots in said die-cast portions to hold said plates rigidly in place as a renewable lining when assembled in said cavity; and a steel retractor adapted to fit and be reciprocated within the enclosure formed by said guide plates and said bearing plates, said retractor having edge bosses slidably engaging said retractor guide slots.

5. In a door knob lock and latch set of the type described having two separate knob spindles, a body having a rectangular cavity for a retractor, said body being assembled from two die-cast portions, each of said portions having an integral axial bearing sleeve for a knob spindle extending from the side walls of said cavity, said body having an opening for an operating connection for a retractor to a spring latch means; a pair of steel guide plates having retractor guide slots arranged to line the opposite edge walls adjoining said side walls of said cavity, the edges of said guide plates disposed adjacent said spring latch opening being bent inwardly and extending through said opening to form a latch housing connection slot, and having inwardly turned spring supporting tabs opposite said inwardly bent edges; a pair of steel bearing plates arranged to line the side walls of said cavity, each of said bearing plates being provided with a centrally disposed hole adapted to receive a knob spindle; said guide plates and said bearing plates being provided respectively with edge tabs and tab receiving slots adapted to coact with tab receiving slots in said die-cast portions to hold said plates rigidly in place as a renewable lining when assembled in said cavity; and a steel retractor adapted to fit and be reciprocated within the enclosure formed by said guide plates and said bearing plates, said retractor having edge bosses slidably engaging said retractor guide slots, and having attachment means adjacent said spring latch opening adapted to operatively connect said retractor to said spring latch, and said retractor also having laterally extending cam surfaces adapted to coact with roll-backs on the knob spindle ends extending into said lined cavity to reciprocate said retractor.

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