

Nov. 25, 1941.

L. HIRSH

2,264,239

DOOR LOCK

Filed Jan. 31, 1940

2 Sheets-Sheet 1

Fig. 1.

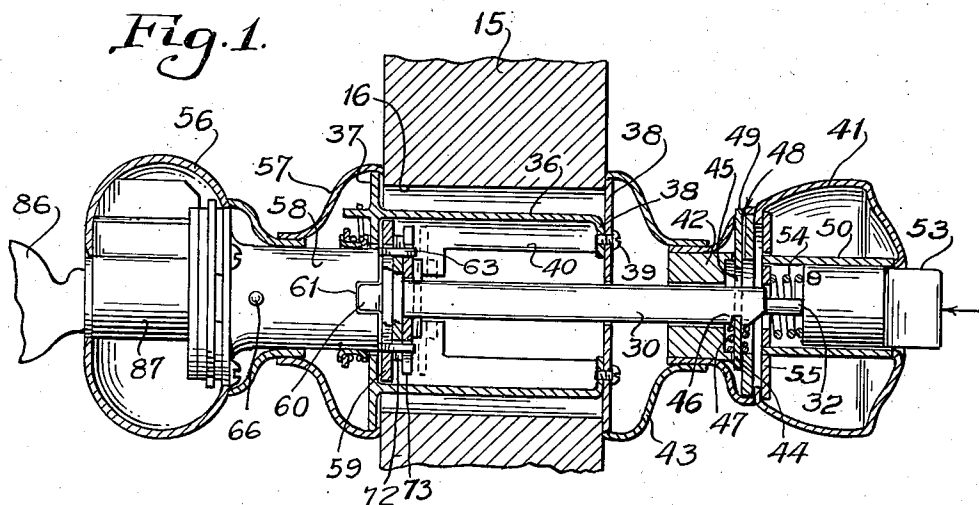


Fig. 2.

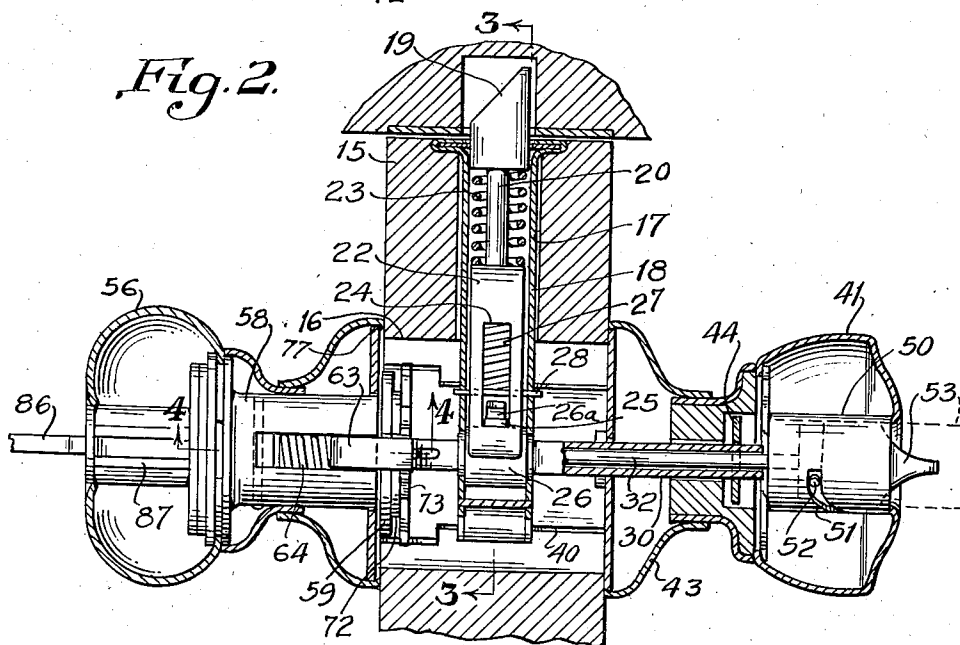
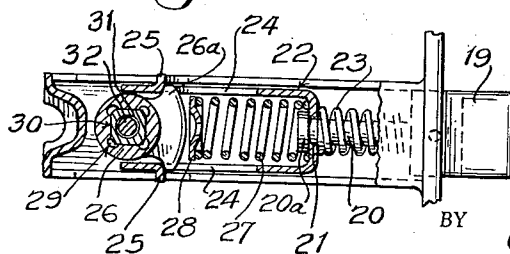


Fig. 3.



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Fig. 5.

Fig. 4.

Fig. 6.

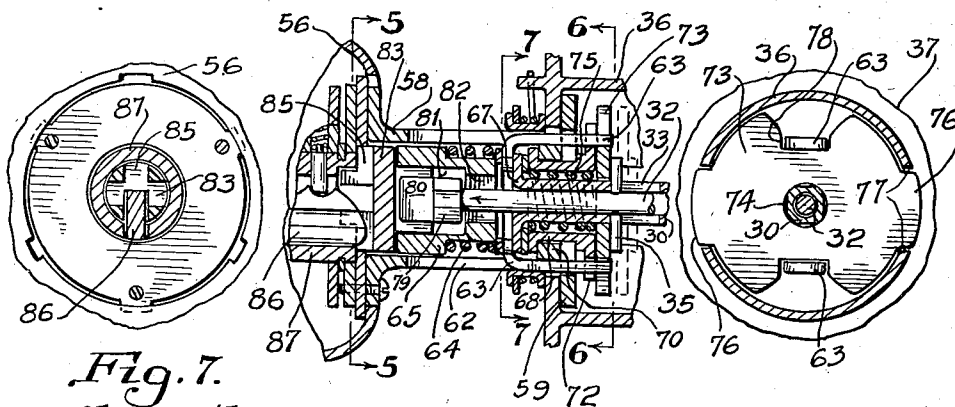


Fig. 7.

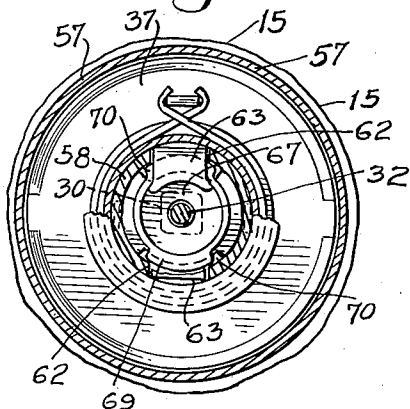


Fig. 8.

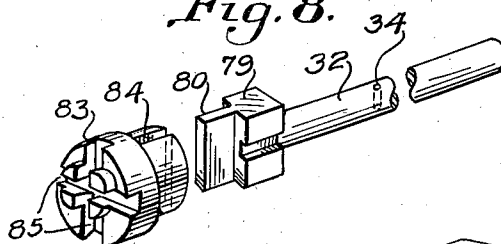


Fig. 9.

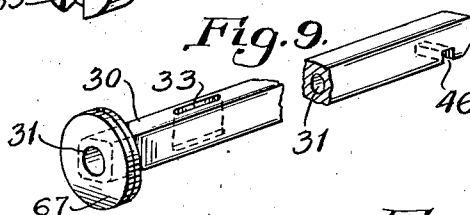


Fig. 10.

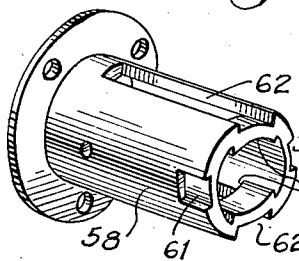
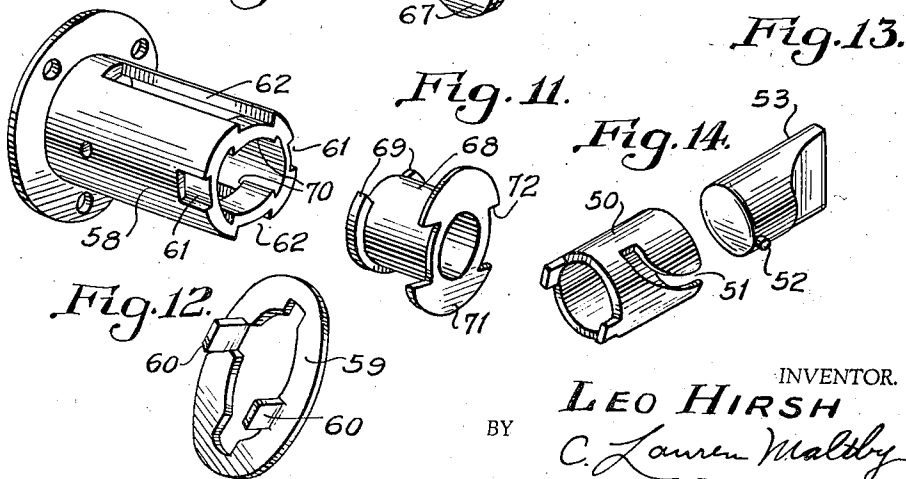


Fig. 13.

Fig. 11.

Fig. 14.

Fig. 12.



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DOOR LOCK

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4 Claims. (Cl. 70—146)

This invention relates to locks and more especially to door locks of the rotary knob type having different inner and outer locking characteristics.

The general object of the invention is to provide an improved locking mechanism of the rotary knob type wherein one of the knobs is provided with a key cylinder and the other knob is provided with means for locking the mechanism and also releasing the same so as to be actuated by the knob having the key cylinder.

A particular object of the invention is to provide a lock mechanism according to the previous object wherein the knob having the key cylinder can be released only by the operation of a manual operator associated with the other knob.

A further object of the invention is to provide a lock mechanism wherein when in locked condition the door may be opened by turning the inner knob or by the use of a key in the outer knob, however, such operations will not change the locked condition of the mechanism.

Other and more specific objects and advantages will appear and be brought out more fully in the following specification, reference being had to the accompanying drawings, wherein:

Fig. 1 is a vertical sectional view of the lock embodying my invention;

Fig. 2 is a horizontal sectional view of the same;

Fig. 3 is a fragmentary sectional view taken along the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary sectional view taken along the line 4—4 of Fig. 2;

Fig. 5 is a sectional view taken along the line 5—5 of Fig. 4;

Fig. 6 is a sectional view taken along the line 6—6 of Fig. 4;

Fig. 7 is a sectional view taken along the line 7—7 of Fig. 4;

Fig. 8 is a perspective view of the spindle member and key operated cylinder;

Fig. 9 is a perspective view of the spindle bearing member;

Fig. 10 is a perspective view of the outer knob hub;

Fig. 11 is a perspective view of the hub bushing;

Fig. 12 is a perspective view of the hub locking plate;

Fig. 13 is a perspective view of a manual operator; and

Fig. 14 is a perspective view of the cam tube for the same.

Referring more particularly to the drawings, I show a door jamb 15 having a lock aperture 16

and an aperture 17 for a bolt housing 18. A bolt 19 therein is secured to a stem 20 which extends through an aperture 21 in a U-shaped member 22, stem 20 having a shouldered head 20a by which it is held to member 22. A spring 23 on stem 20 presses against member 22 and bolt 19 and keeps the latter in extended position with respect to member 22, however the bolt will be retracted upon passing the strike plate of the door frame, stem 20 passing into aperture 21 under these conditions. Member 22 is provided with a pair of slots 24 at the extreme end of each of which is an abutment 25, one of which is engageable with and pushed by the sector portion 25a when rotated by the cylinder 26 of which it is a part, cylinder 26 being rotatably mounted in housing 18. Spring 27 is positioned between member 22 and a plate 28 suitably secured across housing 18 so as to retain members 19, 20 and 22 in extended position as shown in Fig. 3. Cylinder 26 has a square aperture 29 through which extends a square section bearing member 30 having a bore 31 for a spindle 32 adapted to reciprocate therein. Member 30 has a pair of slots 33 on opposite faces thereof and spindle 32 has a cross bore 34 adapted to receive a pin 35 in such manner that the turning of spindle 32 will turn member 30 and vice versa.

A lock retaining shell 36 has a circular flange 37 by which it is held against one face of door jamb 15, and it is secured to the other face by a plate 38 secured as by screws to inturned flanges 39 of shell 36. Shell 36 is prevented from rotation by cut-out portions 40 which extend above and below housing 18. A knob 41 designated the "inner knob" is provided with a hub 42 having a square aperture through which member 30 may pass. An escutcheon 43 is provided for knob 41 and is secured to plate 38 in any suitable manner. A lock piece 44 is secured adjacent hub 42 and is provided with a square aperture 45 for engagement with a notch 46 in the lower side of member 30. A spring 47 retains piece 44 in engagement with notch 46 and an aperture 48 is provided in knob 41 for an extension 49 of piece 44. By this construction knob 41 is held on member 30 and may be released therefrom and removed from the door by pressing downwardly on extension 49 which releases the piece 44 from notch 46. A cam tube 50 is secured to knob 41 and has a cam slot 51 in which moves a pin 52 secured to a manual operator 53, the end portion of which extends out from the center of the knob. A spring 54 presses against operator 53 and against a plate 55 secured to knob 41.

The outer knob 56 is provided with an escutcheon 57 secured to flange 37 and is secured to a hub 58. An apertured holding plate 59 is provided with a pair of flanges 60 adapted to fit in recesses 61 in hub 58, the latter being provided with a pair of slots 62 in which are positioned a pair of L-shaped pieces 63 which are held in position by a spring 64 which bears against the flanged portion of a bushing 65 secured within hub 58 as by pin 66. Member 30 is provided with a flanged end portion 67. A bushing 68 is adapted to interlock with hub 58 and is provided with a pair of flanges 69 which interengage with flanges 70 of the hub, bushing 68 having a flange 71 provided with a pair of notches 72. In the assembly of hub 58 and bushing 68 pieces 63 are pressed against spring 64 by flange 67, bushing 68 holding flange 67 in position and also holding plate 59 which holds the assembly to flange 37.

A shiftable lock plate 73, Fig. 6, having an aperture 74 is held by a spring 75, Fig. 4, against pin 35 and is provided with a pair of extensions 76 which engage edges 77 of shell 36. Plate 73 is provided with a plurality of notches 78 for engagement with the ends of pieces 63 when the plate is shifted by the inward movement of spindle 32 and disengagement therefrom by outward movement of the spindle. Spindle 32 has a square end 79 and a web extension 80 thereon. Bushing 65 has a circular bore 81 in which end 79 is free to rotate and has a square bore 82 adapted to receive end 79 so as to turn therewith. A cylinder 83 is located in hub 58 and has an end slot 84 for engagement with web 80 and has a pair of cross slots 85 adapted for engagement with the end of a key 86, a key guide barrel 87 being provided for key 86 in knob 56.

It should be apparent from the foregoing description that outer knob 56 and hub 58 will be locked against rotation when shiftable lock plate 73 is in the "in" position in which position notches 78 engage pieces 63 and that hub 58 is free to rotate when plate 73 is in the "out" position as at A as shown by the dotted lines in Fig. 4. Plate 73 is shifted between these two positions by spring 75 and pin 35 secured to spindle 32 which is shifted by a manual operator 53 in inner knob 41.

Bolt 19 is retracted by the turning of member 30 either by turning knob 41 which is never locked against turning or by the turning of spindle 32 by cylinder 83 when actuated by a key 86, thus bolt 19 can be retracted at any time in this manner whereas the actuation of operator 53 by turning which carries it inwardly as guided by cam slot 51 pushes spindle 32 inwardly causing the engagement of plate 73 with pieces 63 thus locking the outer knob which remains locked until operator 53 has been retracted. The closing of the door and the retraction of bolt 19 by passing over the strike plate will not release hub 58 for rotation which remains locked as long as operator 53 is in the inner position.

Having described my invention, what I claim is:

1. In a door lock as described having a fixed housing, a rotatable bolt retractor therein, an inner knob having a manual operator therein

and an outer knob having a key cylinder, the combination of an elongated bearing member engaging said retractor and rotatable by said inner knob, a reciprocable spindle extending through said bearing member and rotatable therewith, a hub secured to said outer knob and having members projecting into said housing, and a locking plate slidably positioned on said bearing member adapted to engage said projecting members when said spindle is reciprocated in one direction.

2. In a door lock as described having a fixed housing, a rotatable bolt retractor therein, an inner knob having a manual operator therein and an outer knob having a key cylinder, the combination of an elongated bearing member engaging said retractor and rotatable by said inner knob, a spindle slidably mounted in said bearing member and rotatable therewith, a hub secured to said outer knob having members projecting into said housing and a locking plate slidably mounted on said bearing member adapted to engage said projecting members to lock said outer knob when said spindle is actuated by said operator and adapted to be disengaged from said projecting members to unlock said outer knob when said spindle is actuated by the reverse actuation of said operator.

3. In a door lock as described having a fixed housing, a rotatable bolt retractor therein, an inner knob having a manual operator therein and an outer knob having a key cylinder, the combination of an elongated bearing member adapted to rotate said retractor, a spindle slidably mounted in said bearing member and rotatable therewith, a manual operator in said inner knob adapted to depress said spindle toward said outer knob and hold same in said depressed position, a locking plate slidably mounted on said bearing member, a pin secured to said spindle adapted to engage and remove said locking plate, a spring adapted to hold said plate in engagement with said pin, a hub secured to said outer knob and having means to be engaged by said locking plate, and means to rotate said spindle and bearing member when said locking plate is in engagement with said hub means.

4. In a door lock as described having a fixed housing, a rotatable bolt retractor therein, an inner knob having a manual operator therein and an outer knob having a key cylinder, the combination of an elongated bearing member adapted to rotate said retractor, a spindle slidably mounted in said bearing member and rotatable therewith, said manual operator in said inner knob adapted to depress said spindle toward said outer knob and hold said spindle in said depressed position, a locking plate slidably mounted on said bearing member, a pin secured to said spindle adapted to engage and move said locking plate into knob locking position, a spring adapted to hold said plate in engagement with said pin, a hub secured to said outer knob and having means to engage said locking plate, and means to rotate said spindle and bearing member when said locking plate is in engagement with said hub, said means including key engaging bushing having an engaging relation with said spindle.

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