Jan. 6, 1942. H. G. VOIGHT 2,268,974

DOOR LOCK

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Fig. 1.

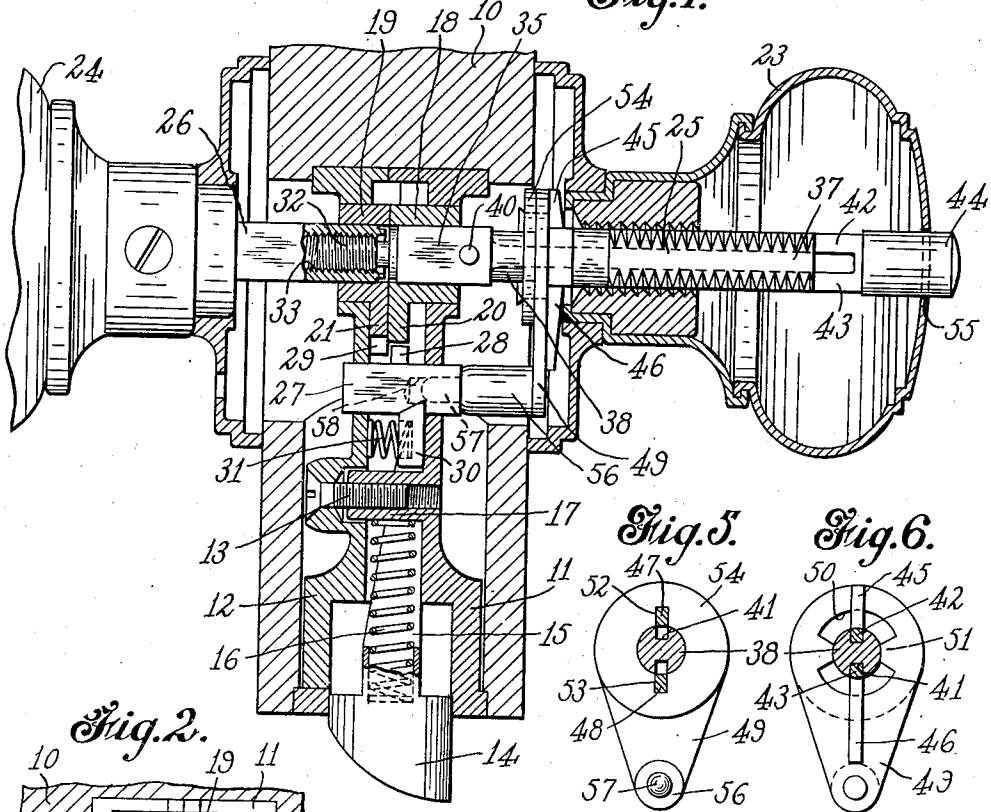


Fig. 5.

Fig. 6.

Fig. 2.

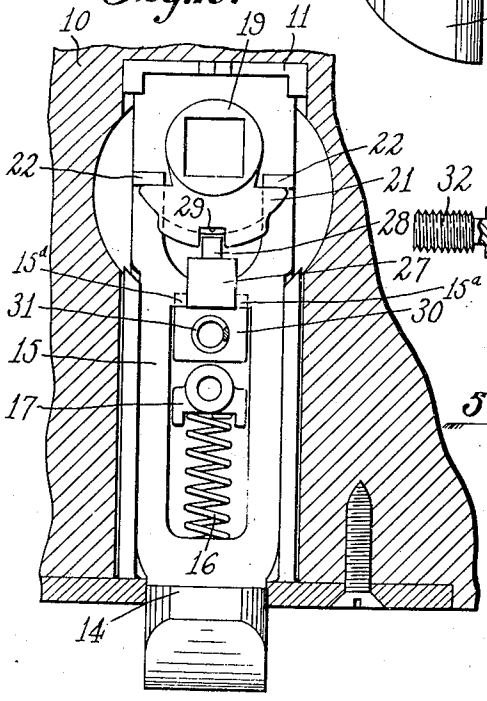
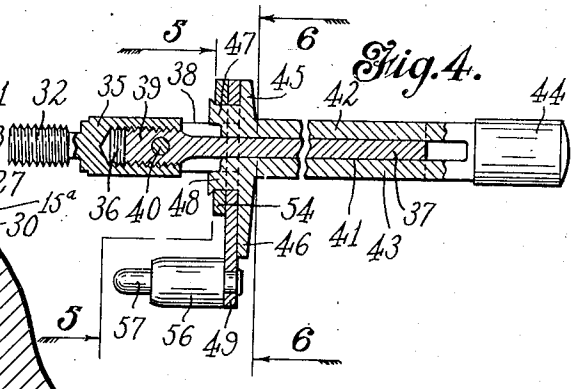


Fig. 4.



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Fig. 3.

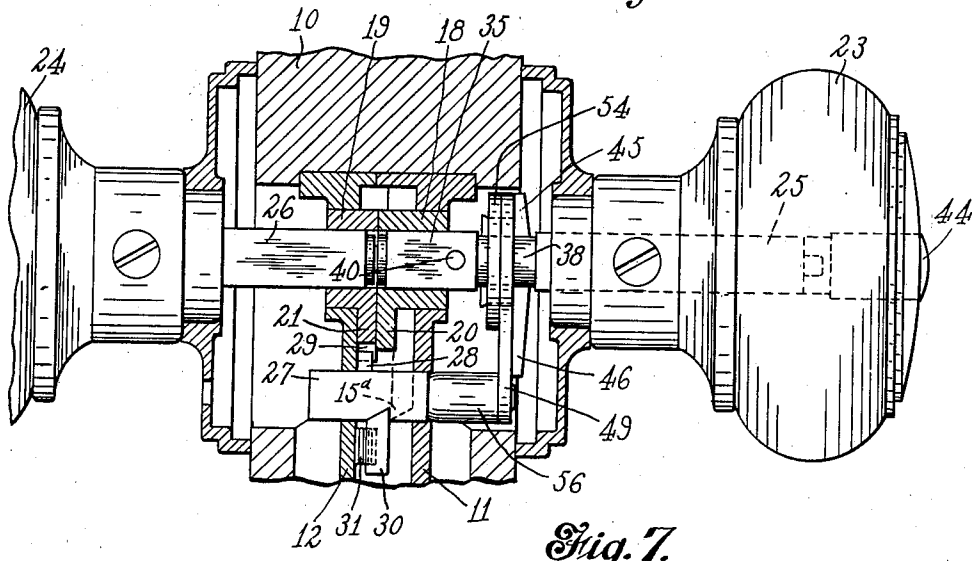


Fig. 7.

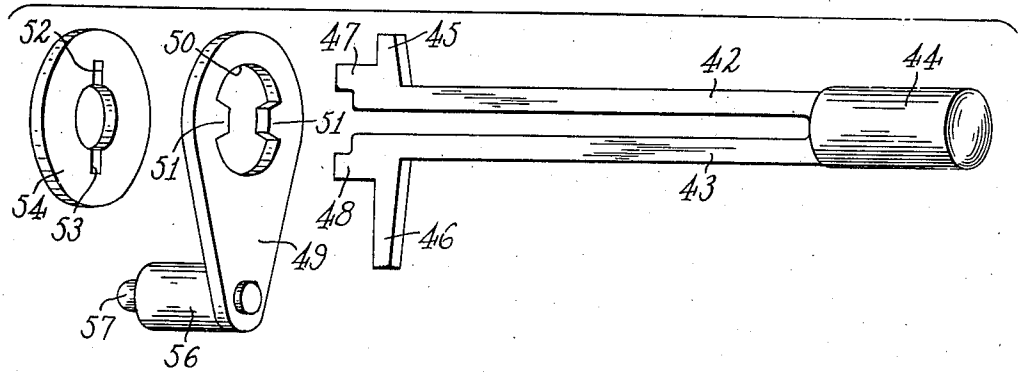
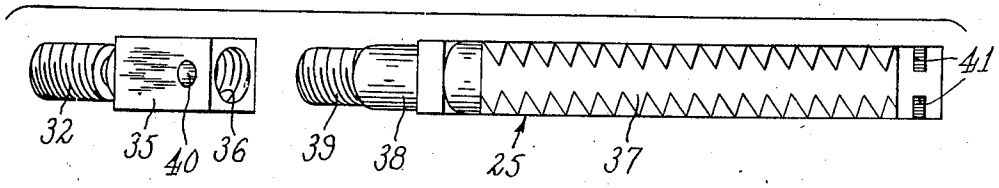


Fig. 8.



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Patented Jan. 6, 1942 2,268,974

UNITED STATES PATENT OFFICE

2,268,974

DOOR LOCK

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Application April 25, 1941, Serial No. 390,317

17 Claims. (Cl. 292—169)

This invention relates to door locks, and more particularly to a so-called tubular lock which may be installed in a door by making cylindrical openings through the edge and face of the door to avoid the more or less tedious mortising operations usually employed, but it will be understood that the improvements may be employed in other types of locks as well. The invention particularly relates to a lock such as that shown in the patent to Henry G. Voight and William S. Edwards, No. 2,220,591, granted November 5, 1940, wherein a dogging element is mounted in a lock case to dog the outer rollback or knob spindle against movement, and provides improved mechanism for actuating or moving this dogging element to its operative position.

In certain instances, due to improper installation of the locks shown in the prior patent referred to, it was found that the dogging element, which was pressed manually to operative position and returned to inoperative position by a spring, would sometimes stick or bind, and thus failed to operate as intended, notwithstanding the fact that the operation was quite satisfactory if properly installed.

However, as locks are installed in many instances by workmen who do not exercise proper care, it is desirable to so construct a lock that it will be practically impossible to install it so as to interfere with its operation.

One object of the present invention is the provision of a door lock having a dogging element for dogging the bolt against retraction, and improved means for actuating or moving the dogging element to operative position.

A further object of the invention is the provision of a door lock having means for dogging the bolt against retraction by the outer knob, the dogging element being mounted in the walls of the lock case, and to provide actuating mechanism for the dogging element including a push button projecting through the knob in alignment with the knob spindle.

A still further object of the invention is the provision of a door lock having a dogging element for preventing the retraction of the bolt by the outer knob, the dogging element being mounted at one side of the axis of the knob spindle, and a member to actuate the dogging element, which member is slidably carried at the surface of one of the knob spindles and actuated by a push button in the knob in alignment with the axis of the spindle.

Still another object of the invention is the provision of a door lock having the usual inner and outer knobs and spindles connected therewith to operate the bolt, and also having a dogging element to prevent operation of the bolt by the outer spindle, which dogging element is mounted at one side of the axis of the spindles, and having an arm slidably and rotatably mounted on the inner knob spindle to engage the dogging element to move it to operative position, and a member guided at the exterior surface of the spindle for actuating the arm, this member carrying a push button projecting through the inner knob in alignment with the spindle.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a sectional view of a door lock embodying my improvement;

Fig. 2 is a view taken at right angles to Fig. 1, with the cover of the lock case removed;

Fig. 3 is a view similar to Fig. 1, showing the dogging element in its operative position;

Fig. 4 is a view partly in section of the inner knob spindle and associated parts;

Fig. 5 is a sectional view on line 5—5 of Fig. 4;

Fig. 6 is a sectional view on line 6—6 of Fig. 4;

Fig. 7 is an exploded view of the parts constituting the actuating mechanism for the dogging element; and

Fig. 8 is a view of the parts of the spindle of the inner knob.

To illustrate a preferred embodiment of my invention I have shown a portion of a door at 10 having mounted therein a door lock comprising the casing parts 11 and 12 secured by a screw 13, it being understood that the casing is of such cross-sectional shape that it may be inserted in a cylindrical bore formed through the edge of the door.

Within the casing is reciprocably mounted a bolt 14 having bifurcated stem portions 15 between which is mounted a spring 16 acting against the post 17 to normally urge the bolt to protracted position. Rotatably mounted toward the rear of the case are inner and outer hubs 18 and 19 carrying rollbacks 20 and 21 which are engaged with laterally turned ends 22 on the stem portions 15 to effect retraction of the bolt by rotation of the inner and outer knobs 23 and 24. These knobs are mounted upon spindles 25 and 26, respectively, it being understood that these spindles are usually square or non-circular in cross section, and fit into corresponding openings in the hubs 18 and 19, so that the rotation

of the spindles by the knobs will serve to rotate the hubs.

Slidably mounted in the walls of the lock case is a dogging plunger 27 having a detent 28 projecting therefrom, which detent is adapted to be received in a notch or recess 29 of the outer rollback 21 to dog the latter against movement so that the bolt may not be retracted by the outer knob. The inoperative position of the dogging element is shown in Fig. 1, while the operative position of this element, wherein the detent 28 is within the slot 29, is shown in Fig. 3.

It will be understood that the member 27 extends between the leg portions 15 of the latch bolt stem, and this element carries a lug 30 against which bears a spring 31 pressing at its other end against a wall of the lock case to normally hold the member 27 in its inoperative position, shown in Fig. 1. As explained in the prior patent above referred to, when the member 27 is pressed inwardly it will be retained in its inward position by engagement of the portions 15a of the legs 15 of the latch bolt with the lug 30, but will be released when the latch bolt is retracted, whereupon it will be returned to inoperative position by its spring. With the exception of the spindle 25 of the inner knob, the parts heretofore described are in all substantial respects similar in construction and operation to those shown in the patent referred to.

It will be understood that the inner knob spindle 25 and outer knob spindle 26 are independently rotatable, the former being provided with a reduced threaded end portion 32 which is threadedly received in a socket 33 in the end of the outer spindle, so that, while the two spindles are held against relative longitudinal movement, they are permitted relative rotational movement to permit the rotation of either of the rollback hubs by the spindle associated therewith independently of the other, the junction between the two spindles being in the same plane as the abutting faces of the rollback hubs.

As shown in Figs. 4 and 8, the inner knob spindle 25 is in itself made in two parts, one of these parts comprising the threaded end portion 32 and a non-circular portion 35 having therein a threaded socket 36. The other section of the spindle comprises a square or non-circular portion 37 which is threaded to receive thereon the knob 23 in the usual manner, and a circular portion 38 provided with a reduced threaded end 39 to be received in the socket 36. After these two sections of the inner rollback and associated parts have been assembled, as will be hereinafter explained, a pin 40 may be inserted through the parts 35 and 39, thus securing the two sections of the spindle together, the pin 40 also serving as a stop to limit the insertion of the non-circular portion 35 of the spindle within the rollback hub 18.

The portions 37 and 38 of the spindle are provided with a pair of oppositely disposed longitudinally extending slots 41, these slots opening through the side edges of the surface of the spindle and also opening through the outer end thereof. In these slots are slidably seated the legs 42 and 43 of an actuating member which terminates at its outer end in a push button 44, so that this member will be slidably mounted in the spindle and guided by the engagement of the legs 42 and 43 in the slots 41, and will rotate with the spindle. Adjacent their inner ends the legs 42 and 43 are provided with laterally projecting arms 45 and 46, and with end portions 47 and 48 beyond these arms, these end portions when the parts are assembled being disposed in the circular portion 38 of the inner spindle.

It will be understood that the outer edges of the portions 47 and 48 project outwardly beyond the periphery of the part 38 of the spindle, and mounted for limited rotation thereon is an arm 49 having an opening 50 within which the members 47 and 48 are received. At opposite edges of the opening, lugs 51 project inwardly between the members 47 and 48 to engage the periphery of the part 38 of the spindle, the rotation of the member 49 on this part of the spindle being limited by the engagement of the lugs 51 with the projecting portions of the members 47 and 48.

The projecting ends of the parts 47 and 48 are inserted through slots 52 and 53 in a washer 54 which surrounds the spindle, and these ends are peened over so that the member 49 will be held upon the actuating element between the washer and the arms 45 and 46. It will be understood that the actuating element, together with the arm 49 and washer 54, are assembled upon the outer section of the inner spindle before the threaded end 39 is engaged in the socket 36. Then the two parts of the spindle are threaded together and secured by the pin 40. The inner knob 23 may then be screwed upon the spindle and secured in the usual manner, the knob being hollow and the push button 44 projecting outwardly through an opening 55 therein for manual engagement.

It will be noted that the arm 49 projects laterally from the spindle, and upon the projecting end is secured a member 56 adapted to abut the outer surface of the dogging element 27, and which member is provided with a pin 57 received in a socket 58 in the dogging element, so as to maintain engagement of these parts.

With the parts assembled in the position shown in Figs. 1 and 3, it will be apparent that the actuating element, together with the arm 49 and washer 54, may be moved longitudinally of the spindle by the push button 44. When the push button is moved from its outer position, shown in Fig. 1, to the inner position shown in Fig. 3, the member 56 upon the arm 49 will effect movement of the dogging plunger 27 to dog the outer rollback 21. As has already been described, the parts will be held in this position by the engagement of the bolt stem with the lug 30. In this position of the parts the inner knob will still be free to turn, and due to the manner in which the arm 49 is mounted upon the spindle of the inner knob, the knob and spindle may have a limited rotation relatively to the arm 49, which is, of course, held against rotation by engagement of the pin 57 with the dogging element 27. This limited rotation permitted the spindle 25, until one of the lugs 51 engages one of the end members 47 or 48 of the actuating element, will be sufficient to effect retraction of the bolt by the rollback operated by the inner knob, and upon the retraction of the bolt the dogging element 27 will be returned to its outer position by the spring 31, carrying with it the arm 49 and actuating element and push button 44, so that the parts will be restored to their original position. It will be observed that with this construction of the parts there will be no danger of the lock being installed so that any of the parts will stick or bind, as the alignment will be determined by the knob spindles themselves, which must always stand at right angles to the plane

of operation of the bolt, and the mounting of the legs 42 and 43 of the actuating element in slots at the outer surface of the inner knob spindle serves to accurately guide these elements and permit free and easy movement thereof from one position to the other.

While I have shown and described a preferred embodiment of my invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the appended claims.

What I claim is:

1. In a door lock, a bolt, mechanism for operating the bolt comprising inner and outer knobs and independently operable spindles, one secured to each of said knobs, and means to dog the bolt against operation by the outer knob including a dogging plunger, a push button in the inner knob, a member operated by said button longitudinally of the inner spindle and guided for longitudinal movement adjacent the outer surface of the spindle, and means operatively connecting said member with said plunger, said means comprising an arm projecting laterally from the spindle and mounted thereon for limited relative rotary movement with respect to the spindle.

2. In a door lock, a bolt, mechanism for operating the bolt comprising inner and outer knobs and independently operable spindles, one secured to each of said knobs, and means to dog the bolt against operation by the outer knob including a dogging plunger, a push button in the inner knob, a member operated by said button longitudinally of the inner spindle and seated in a slot extending longitudinally of, and opening through the outer surface of the spindle, and means operatively connecting said member with said plunger, said means comprising an arm projecting laterally from the spindle and mounted thereon for limited relative rotary movement with respect to the spindle.

3. In a door lock, a bolt, mechanism for operating the bolt comprising inner and outer knobs and independently operable spindles, one secured to each of said knobs, and means to dog the bolt against operation by the outer knob including a dogging plunger, a push button in the inner knob and a member operated by said button longitudinally of the inner spindle, said member having spaced parallel legs seated respectively in longitudinally extending slots opening through the outer surface of the spindle.

4. In a door lock, a casing, a bolt reciprocably mounted therein, a pair of rollbacks rotatably mounted in the case and operatively connected to the bolt, inner and outer knob spindles of non-circular cross section engaged respectively with said rollbacks, knobs on the outer ends of said spindles, an element movably mounted in the casing to dog the rollback of the outer spindle against retraction, means for actuating said element comprising a push button mounted in the inner knob and a member slidably mounted adjacent the outer surface of the inner spindle and moved by said button longitudinally of the spindle, and an arm movably mounted on said member and projecting laterally therefrom to engage said dogging element.

5. In a door lock, a casing, a bolt reciprocably mounted therein, a pair of rollbacks rotatably mounted in the case and operatively connected to the bolt, inner and outer knob spindles of non-circular cross section engaged respectively with said rollbacks, knobs on the outer ends of said spindles, an element movably mounted in the casing to dog the rollback of the outer spindle against retraction, and means for actuating said element comprising a push button mounted in the inner knob and a member slidably mounted adjacent the outer longitudinal surface of the inner spindle and moved by said button, said member lying within the outline of the spindle.

6. In a door lock, a casing, a bolt reciprocably mounted therein, a pair of rollbacks rotatably mounted in the case and operatively connected to the bolt, inner and outer knob spindles of non-circular cross section engaged respectively with said rollbacks, knobs on the outer ends of said spindles, an element movably mounted in the casing to dog the rollback of the outer spindle against retraction, an arm movably mounted on the inner spindle and extending laterally therefrom to be engaged with said element, and a member slidably carried by the inner spindle adjacent its outer longitudinal surface to actuate said arm.

7. In a door lock, a casing, a bolt reciprocably mounted therein, a pair of rollbacks rotatably mounted in the case and operatively connected to the bolt, inner and outer knob spindles of non-circular cross section engaged respectively with said rollbacks, knobs on the outer ends of said spindles, an element movably mounted in the casing to dog the rollback of the outer spindle against retraction, an arm movably mounted on the inner spindle and engaged with said element, and a member slidably carried by the inner spindle adjacent its outer longitudinal surface to actuate said arm, and the mounting of said arm on said spindle permitting relative rotational and longitudinal movements therebetween at all times.

8. In a door lock, a casing, a bolt reciprocably mounted therein, a pair of rollbacks rotatably mounted in the case and operatively connected to the bolt, inner and outer knob spindles of non-circular cross section engaged respectively with said rollbacks, knobs on the outer ends of said spindles, an element movably mounted in the casing to dog the rollback of the outer spindle against retraction, an arm movably mounted on the inner spindle and projecting laterally therefrom to engage said element, and a push button carried by said spindle in alignment with the axis thereof to actuate said arm to move said element to dogging position.

9. In a door lock, a casing, a bolt reciprocably mounted therein, means to operate the bolt comprising inner and outer knobs and independently operable spindles actuated by said knobs, a dogging element mounted within the casing to dog the spindle of the outer knob against movement, means for moving said dogging element to operative position comprising a push button mounted in the inner knob, and an arm slidably surrounding the spindle and operatively connected to the dogging element to move the same.

10. In a door lock, a casing, a bolt reciprocably mounted therein, means to operate the bolt comprising inner and outer knobs and independently operable spindles actuated by said knobs and extending into the casing, a dogging element movably mounted in the walls of the casing to dog the spindle of the outer knob against movement, and means for moving said dogging element to operative position comprising an arm located exteriorly of the casing and movably mounted on the inner knob spindle and protect-

ing laterally therefrom to engage said element, and a push button in the inner knob to effect movement of said arm.

11. In a door lock, a casing, a bolt reciprocably mounted therein, means to operate the bolt comprising inner and outer knobs and independently operable spindles actuated by said knobs and extending into the casing, a dogging element movably mounted in the walls of the casing to dog the spindle of the outer knob against movement, and means for moving said dogging element to operative position comprising an arm located exteriorly of the casing and mounted for relative longitudinal and rotational movements on the inner knob spindle and projecting laterally therefrom to engage said element, and a push button in the inner knob to effect movement of said arm.

12. In a door lock, a casing, a bolt reciprocably mounted therein, means to operate the bolt comprising inner and outer knobs and independently operable spindles actuated by said knobs, a dogging element movably mounted in the walls of the casing to dog the spindle of the outer knob against movement, and means for moving said dogging element to operative position comprising an arm movably mounted on the inner knob spindle and projecting laterally therefrom to engage said element, and a member slidably mounted in a recess opening through the outer surface of the spindle and engaged with said arm, and the end of said member projecting through the inner knob for manual operation.

13. In a door lock, a casing, a bolt reciprocably mounted therein, means to operate the bolt comprising inner and outer knobs and independently operable spindles actuated by said knobs, a dogging element movably mounted in the walls of the casing to dog the spindle of the outer knob against movement, and means for moving said dogging element to operative position comprising an arm movably mounted on the inner knob spindle and projecting laterally therefrom to engage said element, a member slidably mounted in a slot extending longitudinally of, and opening through the outer surface of, the inner spindle and engaged with said arm, and means carried by said member projecting through the inner knob for manual operation.

14. In a door lock, a casing, a bolt reciprocably mounted therein, means to operate the bolt comprising inner and outer knobs and independently operable spindles actuated by said knobs, a dogging element movably mounted in the walls of the casing to dog the spindle of the outer knob against movement, and means for moving said dogging element to operative position comprising an arm movably mounted on the inner knob spindle and projecting laterally therefrom to engage said element, and a member slidably mounted adjacent the outer surface of the spindle to move longitudinally thereof and engaged with said arm, the end of said member projecting through the inner knob for manual operation, and said spindle being provided with means to guide said member in its movement.

15. In a door lock, a casing, a bolt reciprocably mounted therein, means to operate the bolt comprising inner and outer knobs and independently operable spindles actuated by said knobs, a dogging element movably mounted in the walls of the casing to dog the spindle of the outer knob against movement, and means for moving said dogging element to operative position comprising an arm movably mounted on the inner knob spindle and projecting laterally therefrom to engage said element, and a member slidably mounted adjacent the outer surface of the spindle to move longitudinally thereof and engaged with said arm, the end of said member projecting through the inner knob for manual operation, said member being restrained against rotational movement on said spindle.

16. In a door lock, a casing, a bolt reciprocably mounted therein, a pair of rollbacks rotatably mounted in the case and operatively connected to the bolt, inner and outer knob spindles of non-circular cross section engaged respectively with said rollbacks, knobs on the outer ends of said spindles, an element movably mounted in the casing to dog the rollback of the outer spindle against retraction, and means for actuating said element comprising a push button mounted in the inner knob and a member slidably mounted adjacent the outer surface of the inner spindle for movement longitudinally thereof and moved by said button, and means moving said element to inoperative position upon retraction of the bolt.

17. In a door lock, a casing, a bolt reciprocably mounted therein, a pair of rollbacks rotatably mounted in the casing and operatively connected to the bolt, inner and outer knob spindles of non-circular cross section engaged respectively with said rollbacks, knobs on the outer ends of said spindles, an element movably mounted in the casing to dog the rollback of the outer spindle against retraction, an arm mounted for longitudinal and limited rotational movements on the inner spindle and engaged with said element, a member slidably carried by the inner spindle adjacent its outer surface to actuate said arm, said element being held in operative position by said bolt, and spring means to move said element to inoperative position upon retraction of the bolt.

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