Jan. 5, 1932. J. A. KIMBALL 1,840,236

DOOR OPERATING KNOB

Filed Dec. 19, 1930

Fig. 1.

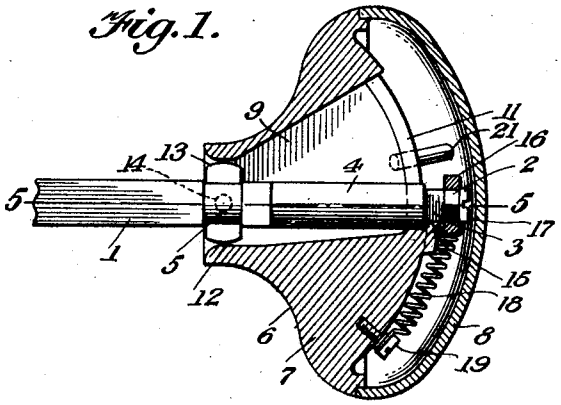


Fig. 2.

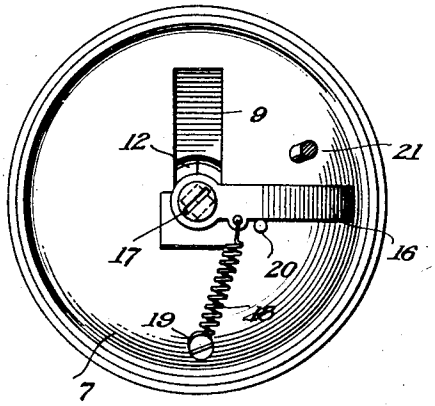


Fig. 3.

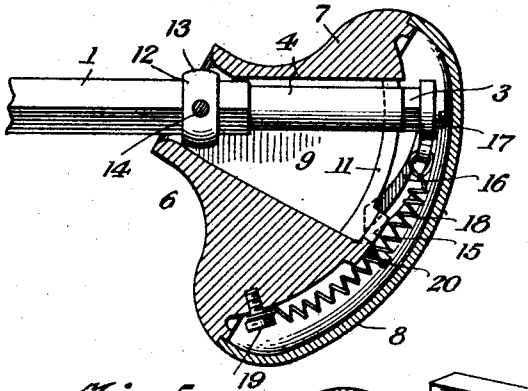


Fig. 4.

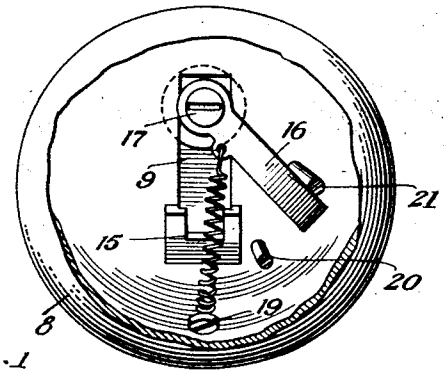


Fig. 5.

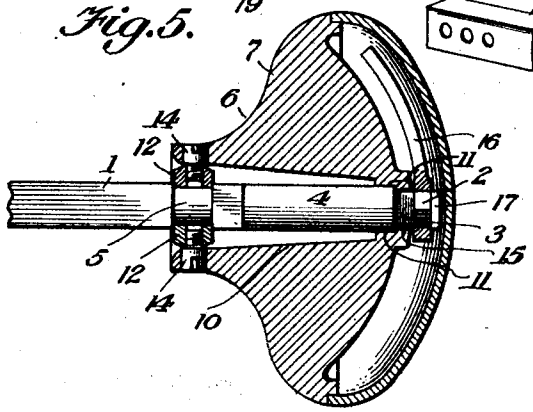


Fig. 6.

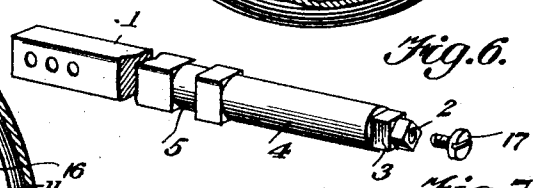
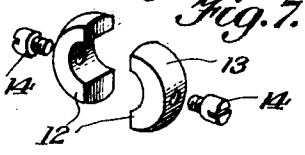


Fig. 7.



John A. Kimball
INVENTOR

BY Victor J. Evans
and A. L. Evans ATTORNEYS

Patented Jan. 5, 1932

1,840,236

UNITED STATES PATENT OFFICE

JOHN A. KIMBALL, OF TAYLORVILLE, ILLINOIS

DOOR OPERATING KNOB

Application filed December 19, 1930. Serial No. 503,589.

An object of this invention is the provision of a knob and spindle for the latch bolts of ordinary door locks, of such construction as to permit of the latch bolt being thrown by the turning of the knob in the ordinary manner, or by a downward pressure being exerted upon the knob, as when a person is ladened to an extent that the knob cannot be successfully gripped.

A further object is the provision of a knob and spindle that may be associated with any ordinary door or like lock, wherein the knob is pivotally supported on the spindle and is provided with means for gripping the spindle so that the same can be turned with the turning of the knob and which is also provided with other means, spring influenced to normally sustain the knob in gripping or locking engagement with the spindle but movable upon the downward depression of the knob to bring such gripping means out of engagement and to cause the turning of the spindle without the turning of the knob.

The invention will be fully and comprehensively understood from a consideration of the following detailed description when read in connection with the accompanying drawings which form part of the application, with the understanding, however, that the improvement is capable of extended application and is not confined to the exact showing of the drawings nor to the precise construction described and, therefore, such changes and modifications may be made therefrom as do not affect the spirit of the invention nor exceed the scope thereof as expressed in the appended claims.

In the drawings:

Figure 1 is a side elevation of the improvement, the knob and other parts being in section.

Figure 2 is a face view of the knob with the outer member or cap removed.

Figure 3 is a view substantially similar to Figure 1 but showing the knob moved downwardly on the spindle to turn the said spindle.

Figure 4 is a view substantially similar to Figure 2 but showing the parts arranged as in Figure 3.

Figure 5 is a sectional view on the line 5—5 of Figure 1.

Figure 6 is a perspective view of the spindle.

Figure 7 is a similar view of the two-part bearing between the knob and spindle.

In general the spindle 1 for operating the latch bolt of the door lock, or the like is of the ordinary construction except for the end or ends thereof attached to the knob or knobs. The spindle 1 has its outer end formed with a reduced cross sectionally squared portion 2, and inward thereof, but in contact therewith, with another and preferably larger squared portion 3. The squared portion 3 is arranged angularly with respect to the outer squared portion 2.

The spindle, for a suitable distance from its squared end portions may be and preferably is round in cross section, as indicated by the numeral 4, and inward of the rounded portion 4 the spindle is grooved to provide a cross sectionally round portion 5 and shoulders at the ends of the said round portion.

The knob is broadly indicated by the numeral 6 and comprises an inner or main portion 7 and an outer removable cap portion 8. The squared portion from its inner and reduced end is formed with an opening 9 that communicates with its outer face. The upper and lower walls provided by the opening 9 are spread away from each other and are, therefore, beveled so that the end of the opening communicating with the face of the knob section 7 is of a materially greater width than the inner portion of the said opening. In a like manner the side walls provided by the opening are tapered from their inner to a point adjacent their outer ends, as indicated by the numeral 10, the tapered walls terminating in ribs 11 that afford bearings for the rounded portion 4 of the spindle that is received between the said ribs.

Received in the depression 5 in the spindle there is a ring bearing, the same comprising two semi-cylindrical sections 12, respectively, and the outer faces of these sections are arched or rounded in cross section, as indicated by the numeral 13. Each of the sections of the bearing 12 is provided with a threaded open-

ing and these openings are arranged in a line and receive therein the shanks of short bolts 14 which are screwed through the opposite sides at the inner end of the handle sections 7. The portion of the opening in which the bearings are received has its wall round, and by the arrangement just described it will be noted that when the knob and spindle are in their normal relative positions the turning of the knob will impart a like turning to the spindle, and also that the knob is permitted to swing downwardly from the pivot bolts 14 on the said spindle. By connecting the knob to the spindle by means of the split collar and screws, and the knob and spindle are in their normal relative positions, turning the knob will release the latch when the socket 15 is in engagement with the squared portion 3, of the spindle.

Except at its periphery the outer face of the knob section 7 is convex, the curvature of which being struck from the axial plane of the pivots 14, which is true with respect to the bearing ribs 11. The outer face of the said section 7 is formed with a socket 15 that comprises a notched member that has its sides extended along the ribs 11 from the lower wall provided by the opening 9, and in this socket the squared portion 3 of the spindle is designed to be received. The outer squared portion 2 of the spindle is received through a squared opening in one end of a lever 16 and the lever is held on the said end of the spindle by a headed bolt 17 which is screwed in the spindle.

The lever 16 is in the nature of flat plate and has on its lower end an ear extension to which is attached one end of a helical spring 18, the second end of the spring being attached to the shank of a short bolt 19 which is screwed in the outer face of the knob section 7. The lever is held from downward swinging through the influence of the spring 18 by a stop pin 20 which may be in the nature of a bolt that attaches the hollow cap or outer knob section 8 to the inner knob section 7. A second stop element, also in the nature of a bolt 21 passes through the cap 8 and enters the knob 7 at a point above and outward of the stop 20, the stop 21 being disposed above the lever 16.

Other means may be provided for securing the cap on the knob, and the edge of the hollow cap is received in the annular peripheral depression in the knob proper, 7.

As the knob is normally held in latched relation with the spindle the turning of the knob will impart a like turning to the spindle. Because of the attachment of the spindle to the spring influenced plungers of the latch bolt in the lock, the knob and spindle are normally retained in the positions disclosed by Figures 1, 2 and 5. Should a person laden with bundles or the like desire to open the door it is merely necessary that a downward pressure be exerted by his forearm or any other part of his anatomy to cause the knob to be first swung downwardly from the pivots 14 on the spindle 1. This initial downward movement of the knob will bring the socket 15 out of the squared portion 3 of the spindle and a further downward swinging of the knob will bring the stop element 21 against the lever 16, turning the said lever to a downward angular position and causing the lever to turn the spindle 1 and thereby release the latch bolt. When pressure upon the knob is relieved the spring 18 will contract, thereby returning the parts to their initial position to cause the latching engagement between the knob and spindle. The return of the spring influenced latch bolt to its initial position will likewise return the spindle 1 to its normal position. The ribs 11 positively guide the knob in its movement over the spindle so that the socket or keeper 15 will be positively in a position to receive the squared end 3 of the spindle therein and, therefore, any liability of the parts not properly returning to their initial or normal positions is entirely overcome. The lever 16, it may be well to state, is arched in plan to correspond with the curvature of the pocket provided between the concaved face of the cap and the convex face of the knob, so that the pin or stop element 21 will properly ride over the upper edge of the lever when the spindle is operated by the downward movement of the knob.

Having described the invention, I claim:

1. A spindle for a latch bolt and a knob for the spindle, latching means between the knob and the spindle to permit the knob and spindle turning in unison and said knob being swingable on the spindle to release the latching means and means operated by such swinging of the knob for turning the spindle.

2. A spindle for a latch bolt and a knob swiveled to the spindle, latching means between the knob and the spindle to permit the knob and spindle turning in unison and said knob being swingable on the spindle to release the latching means, and means operated by such swinging of the knob for turning the spindle, and means for returning the knob to latching engagement with the spindle when pressure on the knob is relieved.

3. A spindle for the latch bolts of door locks and a knob swiveled to the spindle to turn on or swing in one direction from the spindle, a catch on the knob to engage with the spindle to cause the knob and spindle to be turned together, spring influenced means for holding the knob latched to the spindle, and said means operable to turn the spindle when the knob is swung on the spindle without the turning of the knob and likewise to return the knob to latching engagement with the spindle.

4. A spindle for the latch bolts of locks, a

slotted knob through which the spindle passes and in which the spindle is swiveled to permit the knob turning or swinging in one direction on the spindle, a latch on the knob to engage the spindle to permit of the knob and spindle being turned together, a lever fixed on the spindle, a spring connection between the lever and knob, spaced stop elements on the knob at the opposite edges of the lever, one to contact with the lever when the spring influences the knob to latching engagement with the lever and the other to contact with the lever to swing the same to turn the spindle when the knob is swung on the spindle.

5. A spindle for the latch bolts of locks, a slotted knob through which the spindle passes and to which the spindle is swiveled to permit the turning or the swinging of the knob in one direction, a latch on the knob to engage the spindle to permit of the knob and spindle being turned in unison, a lever fixed on the spindle, a spring connection between the lever and knob, spaced stop elements on the knob at the opposite edges of the lever, one to contact with the lever when the spring influences the knob to latching engagement with the lever and the other to contact with the lever to swing the same to turn the spindle when the knob is swung on the spindle, and a hollow cap for the knob held thereon by the stop elements.

6. A spindle for the latch bolt of a door lock and a knob for the spindle, said spindle having its outer end provided with stepped angularly arranged square portions, a rounded part extending therefrom and an annular groove inward of the rounded part, a two part bearing ring received in the groove, the knob having an opening therethrough whose upper and lower walls are gradually spaced away from each other and whose side walls are tapered and whose reduced end wall is round and receives the ring bearing therein and which is pivotally connected to the opposite sides of said bearing, a slotted keeper on the outer face thereof to receive the inner squared portion of the spindle therein, a lever removably fixed on the outer squared end of the spindle, a coiled spring connected with the lever and with the outer face of the knob, a hollow cap for the knob, spaced elements securing the cap on the knob disposed away from each other and to the opposite edges of the lever, for the purpose set forth.

7. A spindle for the latch bolt of a door lock and a knob for the spindle, said knob having an opening therethrough whose top and bottom walls are gradually widened to the outer face of the knob, and whose side walls are tapered to the rear end of the knob and provided, opposite the outer face of the knob with inwardly directed ribs, said spindle received through the opening and bearing against the ribs, a pivoted revoluble connection between the knob and spindle, a socket on the outer face of the knob affording a latch for the spindle to permit of the knob being turned in unison with the spindle, spring influenced means for normally holding the knob in latching engagement with the spindle and said means being operable for turning the spindle when the knob is swung angularly on its pivotal connection with the spindle.

8. A spindle for a latch bolt having a knob journaled thereon and swingable in one direction therefrom, means for normally latching the handle to the spindle, and means operated by the swinging of the handle for turning the spindle.

9. A door operating knob, means in the knob for latching the same to the spindle, means for permitting of the release of the latching means and the swinging of the knob on the spindle and means operated by the swinging of the knob on the spindle for turning the spindle.

10. A door operating knob, means in the knob for latching the same to the spindle, means for permitting of the release of the latching means and the swinging of the knob on the spindle and means operated by the swinging of the knob on the spindle for turning the spindle and means also within the knob for returning the knob to its initial latched position.

11. A door operating knob, and means contained in the knob operable on the non-rotation but movement of the knob in one direction for actuating the latch bolt of the door.

12. A means for operating a turnable member, including a handle having mechanism entirely within the interior thereof for turning the turnable member with the handle and means also entirely within the interior of the handle for turning the member upon a non-rotative movement of the handle.

In testimony whereof I affix my signature.

JOHN A. KIMBALL.