

April 22, 1930.

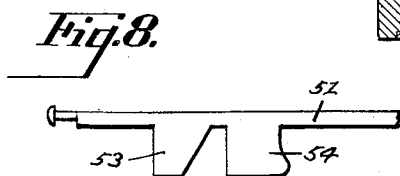
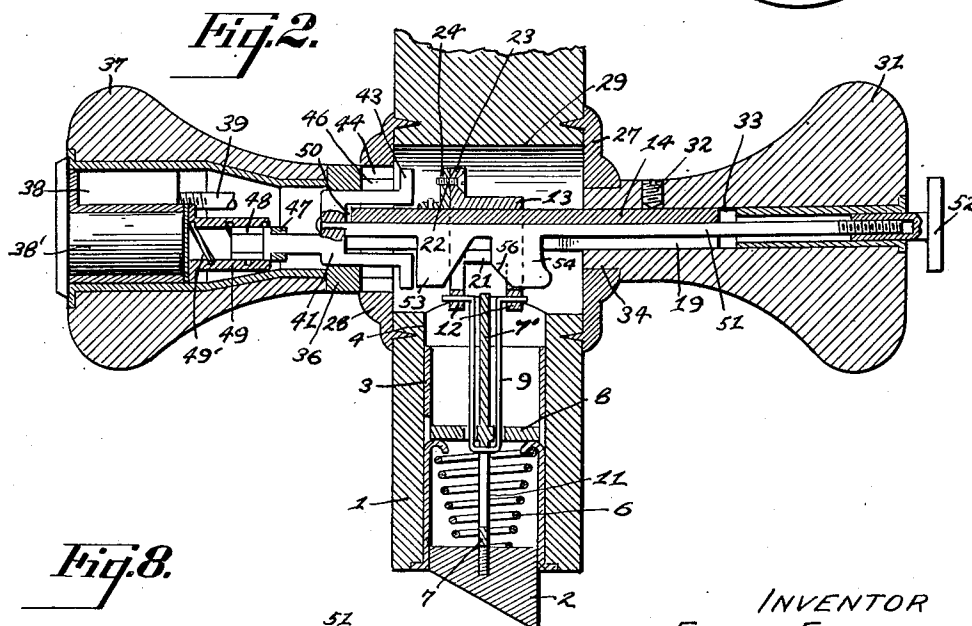
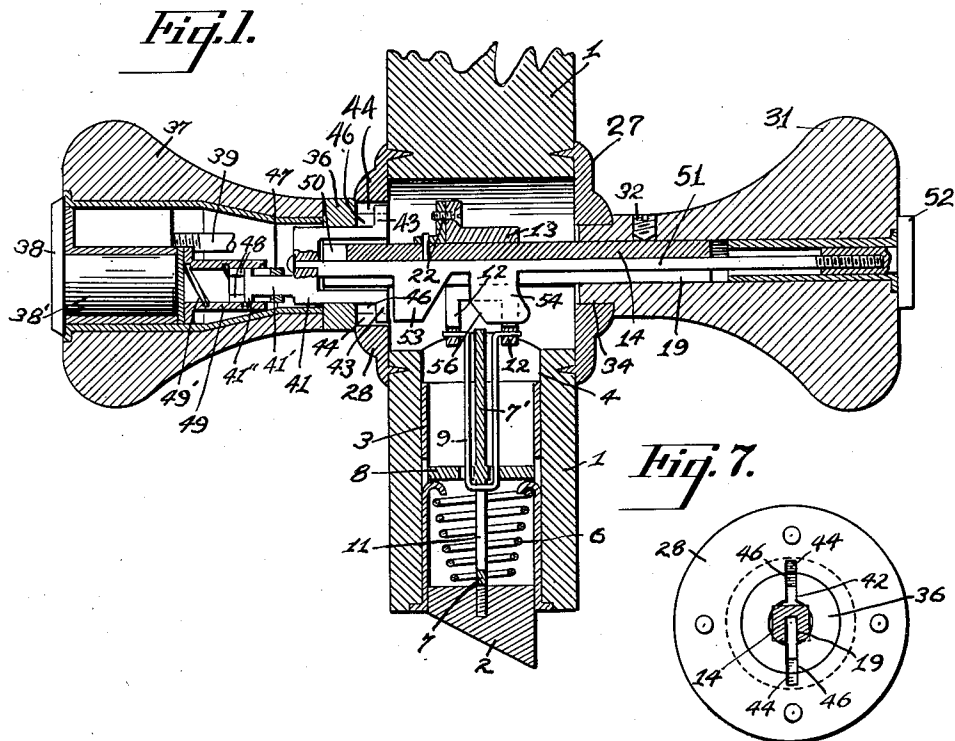
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1,755,434

DOORKNOB LOCKING DEVICE.

Filed April 29, 1929

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3.

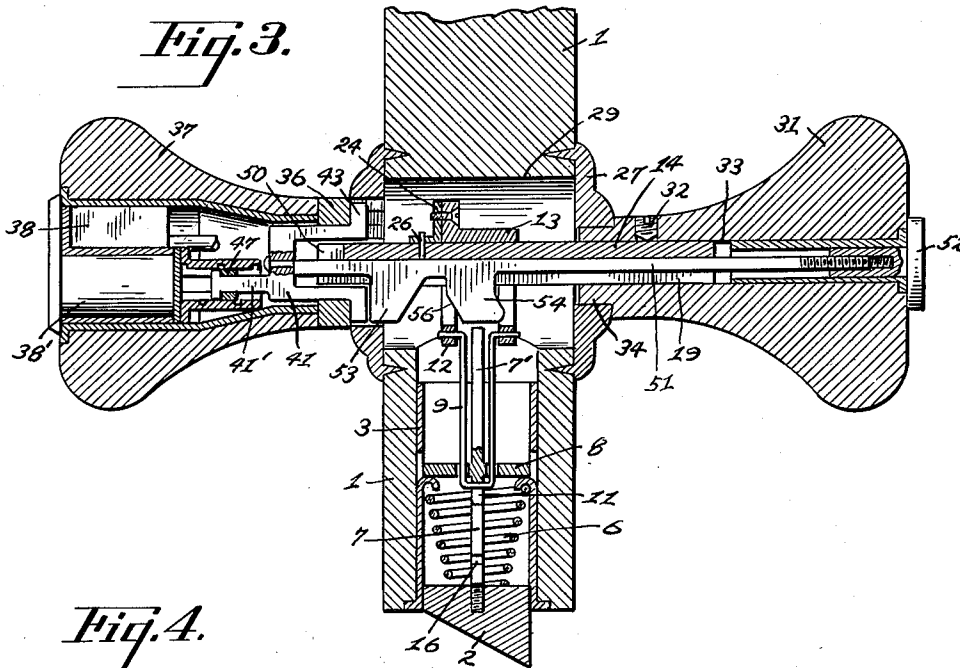


Fig. 4.

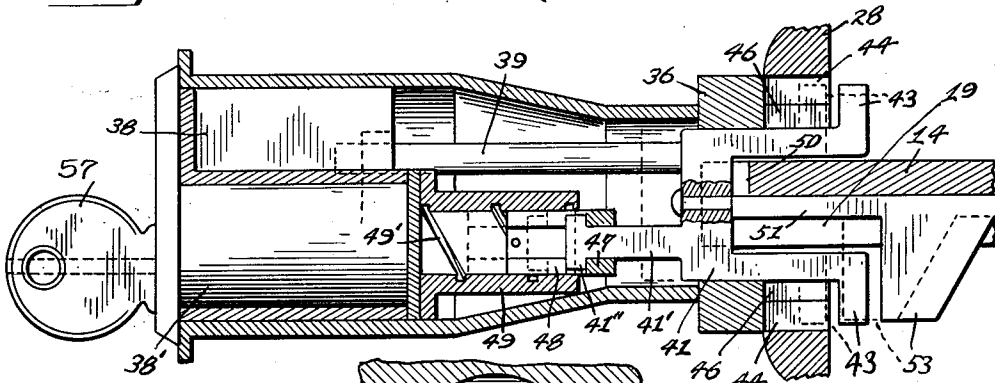


Fig. 5.

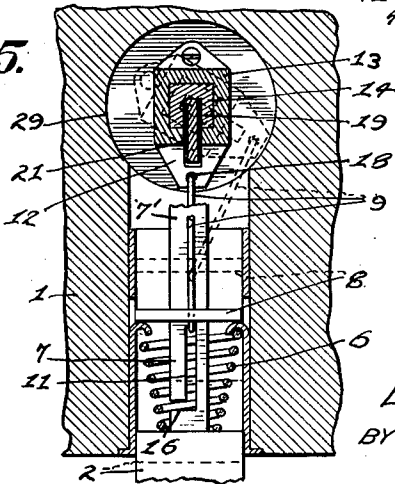
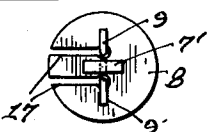


Fig. 6.



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DOORKNOB-LOCKING DEVICE

Application filed April 29, 1929. Serial No. 358,964.

My invention relates to improvements in locking devices wherein a locking member and actuating means therefor are mounted within inner and outer knobs and a stem connected between said knobs and extending through a door for operating a door latch bolt, the locking member being movable from a normal unlocking position to locking positions adapted to prevent operation of the outer knob only or to prevent the operation of either knob or the latch bolt.

The present invention is directed to improvements in the construction and arrangement of locking devices as disclosed in my co-pending applications, Serial No. 344,513, filed March 5, 1929, and Serial No. 355,581, filed April 16, 1929, and consists in improved and simplified details of construction and arrangement affording a more economical and efficient device.

The primary object of the present invention is to provide an improved door knob locking device.

Another object is to provide an improved locking device of simplified construction adapted to facilitate the construction and assembling of the device.

A further object is to provide an improved device of the character described of increased efficiency and adapted to facilitate operation.

Another object is to provide an improved device which is adapted to be normally unlocked and which may be readily operated from either side of a door to prevent unauthorized entry from the outside and which may be locked from the outside to prevent the operation of either knob and to prevent the retracting of the latch bolt of a door by any means other than a proper key applied from the outside of the door.

A still further object is to provide an improved construction and arrangement which will permit of the use of many parts of standard construction and requiring a minimum of special parts and fittings.

I accomplish these and other objects by means of the improved device disclosed in the drawings forming a part of the present application wherein like characters of reference are used to designate similar parts through-

out the specification and drawings and in which—

Fig. 1 is a horizontal section of my improved locking device as installed upon a door, the locking member being shown in semi-locking position;

Fig. 2 is a similar view showing the locking member in releasing position;

Fig. 3 is a similar view showing the locking member in full locking position;

Fig. 4 is a broken sectional view of the outer knob and the locking mechanism, the figure being drawn upon an enlarged scale and showing the manner in which the locking member is moved from releasing to semi-locking position;

Fig. 5 is a broken transverse section taken upon the line 5—5 of Fig. 3 in the direction indicated;

Fig. 6 is an elevation of the inside end of the latch member;

Fig. 7 is an elevation of the inner side of the outside mounting plate and bushing, the knob stem being shown in section; and

Fig. 8 is a broken plan view of a portion of a modified form of the manual lock actuating member.

Referring to the drawings, the numeral 1 is used to designate in general a door having a latch bolt 2 slidably mounted within a sleeve 3 set within an opening 4 formed in the edge of the door. The latch bolt 2 is arranged to be retracted into the sleeve 3 against the normal pressure of a spring 6 by a latch arm 7 extending axially inwardly through the sleeve. The arm 7 is provided with a guide portion 8 slidably mounted within the inner portion of the casing.

The latch bolt 2 is actuated by means of a U shaped link 9 engaging a slot 11 formed in the arm 7 and extending inwardly into engagement with arms 12 formed upon a collar 13 secured upon a knob stem 14 extending transversely through the door 1. The link 9 is inserted into the slot 11 through a lateral opening 16 formed in the side of the arm 7 adjacent the bolt member 2 and the side portions of the link 9 are received within slots 17 formed in the guide portion 8. The ends of the U-link 9 are bent at substan-

tially right angles to pivotally engage openings 18 formed in the ends of the arms 12.

The stem 14 is preferably square in cross section and has a groove 19 formed longitudinally upon one side to extend the full length of the stem. The collar 13 is fitted onto the square stem 14 and provided with a slot 21 matching with the groove 19, said member being secured in an operative position upon the stem 14 preferably by means of a screw 22 engaging an extension 23 of the collar 13 and a bracket 24 secured to the stem by a pin 26 or other suitable securing means.

The ends of the stem 14 extend outwardly through suitable bearing plates 27 and 28 secured upon the inner and outer sides of the door respectively across the ends of an opening 29 formed transversely through the door. An inner knob 31 is secured upon the inner end of the stem 14 by means of a set screw 32 or other suitable securing means, said knob being provided with an axial opening 33 extending therethrough. The knob 31 is provided with a suitable bearing portion 34 seating within the inner bearing plate 27.

A bushing 36 is rotatably mounted within the outer bearing plate 28 and connected to the outer end of the stem 14, preferably by threads cut in the corners of the square stem to secure the bushing to the stem and at the same time permit a limited rotative movement of the stem within the bushing. An outer knob 37 is secured to the bushing 36, said outer knob having a relatively large opening formed axially therein. A cylinder lock 38 of the well known form is mounted within the outer end of the knob 37, said lock being secured within the knob by means of the usual anchor bolts 39 applied through the bushing 36 to clamp the knob between the bushing and the outer flange of the lock.

A locking member 41 is slidably mounted within a slot 42 formed in the bushing 36. The member 41 is substantially Y-shaped and provided with lateral extensions 43 formed upon the ends of the arms of the Y. The extensions 43 are normally positioned within the opening 29 of the door clear of the inner ends of the plate 28 and bushing 36 and are movable into engagement with recesses 44 formed in the bearing plate 28 and with notches 46 communicating between the slot 42 and said recesses 44 as shown in Fig. 1 of the drawings. The stem portion 41' of the member 41 is offset slightly from the axis of the knob 37 and into axial alinement with the cylinder 38' of the lock 38, said stem portion extending into sliding engagement with a follower 47 having longitudinal slots 48 engaging lateral extensions 41'' of the member 41. The follower is mounted within a cylindrical actuating member 49 secured upon the inner end of the lock cylinder 38' and rotatable therewith, said member being provided with a spiral groove 49' adapted

to impart axial movement to the follower when the actuating member is rotated with the cylinder of the lock. The arms of the Y span the end of the stem 14 and the body portion of the member 41 is movable into engagement with a slot 50 formed in the end of the stem 14 as shown in Fig. 2 of the drawings.

A manual actuating member 51 is slidably mounted within the groove 19 of the stem 14, said member being rotatably connected at its inner end to the locking member 41. The member 51 extends axially through the stem and the opening 33 of the inner knob 31, the end of said member being threaded to receive an actuating button 52 adjustably mounted thereon and extending outwardly from the knob to permit manual operation of the member 51 and the locking member 41 from the inner side of the door.

The member 51 is provided with an extension 53 disposed within the plane of the locking member 41 and extending laterally outwardly from the groove 19 parallel to one of the extensions 43 of said locking member, a slight clearance being provided between the adjacent edges of the extensions 43 and 53. A second extension 54 is formed upon the member 51 in spaced relation to the extension 53 to provide a recess between the extensions 53 and 54. The extension 53 is adapted to be moved into engagement with the adjacent recess 44 of the bearing plate and the adjacent notch 46 of the bushing 36 when the members 41 and 51 are moved to their extreme locking positions as shown in Fig. 3 of the drawings. The extension 54 is arranged to be moved into alinement with an inwardly disposed extension 7' of the latch stem 7 when the member 51 is moved to locking position.

The extension 54 is preferably provided with an inclined edge 56 adapted to be moved into alinement with the extension 7' when the member 51 is moved to the semi-locking position as shown in Fig. 1 whereby an inward movement of the latch bolt 2 to door releasing position will cause the extension 7' to engage said inclined edge 56 and move the member 51 to its normal unlocking position. When the member 51 is moved to its full locking position as shown in Fig. 3, the inclined edge 56 is moved past the plane of the extension 7' and an inward movement of the latch bolt will cause the extension 7' to strike the extension 54 and prevent movement of the latch to door releasing position. If desired, the extension 54 may be modified as shown in Fig. 8 by omitting the inclined edge 56 whereby the extension 54 will operate to block the movement of the latch bolt 2 when the member 51 is moved to either semi-locking or full locking positions.

In operation, the members 41 and 51 are assembled within the stem 14 and bushing 36, the knob 37 and the lock 38 are then applied,

the follower 47 being turned into engagement with the member 49 and the entire assembly secured in assembled relation by the anchor bolts 39. The latch 2 with its actuating connections assembled therein is inserted into the opening 4 and the stem 14 and member 51 inserted through the collar 13 from the outer side of the door, the extensions 53 and 54 being movable through a recess 44 of the plate 28 and through the slot 21 of the member 13. The collar 13 is secured in operative position upon the stem 14 by the screw 22 applied through the inner open end of the opening 29. The inner plate 27 is then applied and the knob 31 secured upon the inner end of the stem, and the button 52 screwed onto the end of the member 51 and adjusted to a normal operative position such that the outer flange of the button will seat against the end of the knob 31 when the locking member 41 and the member 51 are moved to the semi-locking position shown in Fig. 1 of the drawings.

When thus assembled upon the door, the locking member 41 may be moved from its normal releasing position as shown in Fig. 2 to its semi-locking position shown in Fig. 1 by pressing the button 52 inwardly manually from the inside of the door, or by turning the cylinder 38' by means of a suitable key 57, from the outside of the door. To operate the lock by the key 57, the key is turned in a counter-clockwise direction, the movement of the cylinder and the member 49 causing the follower to be moved from the position shown in Fig. 2 and in full lines in Fig. 4 to the position shown in dotted lines in Fig. 4, thereby moving the member 41 into locking engagement with the matching recesses of the bushing and bearing plate 28. To remove the key from the lock, it must be turned back to its initial position, and in so turning the cylinder 38' the follower is returned to its starting position, the slots 48 permitting said follower to be thus moved without imparting movement to the locking member. To move the member 41 to releasing position, the key is turned in a clockwise direction.

In this semi-locking position, the outer knob 37 is effectually locked against rotation, and hence the latch bolt 2 cannot be operated by the knob from the outer side of the door. In moving the locking member 41 to the semi-locking position, said member is moved out of engagement with the slot 50 of the stem 14, thereby permitting the stem to be turned independently of the member 41 and the bushing 36 whereby the latch 2 may be freely operated by the inner knob 31. The door is thus locked against entrance from the outside, but may be freely operated from the inside.

The inward movement of the latch 2, whether actuated by the stem 14 or independently of the stem as in closing the door, causes

the extension 7' to engage the inclined edge 56 and move the member 51 and the locking member 41 to normal releasing position. Thus a person leaving a room through a door equipped with my improved lock cannot be inadvertently locked out as the lock 38 must be operated to again lock the door from the outside, or the button 52 pressed to locking position from the inside. When in the unlocking position, the member 41 engages the slot 50 of the stem 14 so that when the outer knob 37 is turned, the stem 14 is actuated to operate the latch.

If it is desired to lock the door against operation from either the inside or outside, the button 52 is adjusted to permit an increased inward movement of the member 51 sufficient to permit a full revolution of the lock cylinder 38' in the counter-clockwise direction. By turning the lock cylinder a full revolution in the counter-clockwise direction, the member 41 is moved to the position shown in Fig. 3, thereby causing the extensions 43 to be moved to the extreme locking position and at the same time causing the extension 53 to be moved into engagement with the plate 28 and bushing 36 whereby the inner knob 31 as well as the outer knob 37 is locked against rotation. At the same time, the inclined edge of the extension 54 is moved past the extension 7' so that if an attempt is made to force the latch bolt 2 inwardly to release the door, the extension 7' will strike the extension 54 and block the movement of said latch. The key 57 may now be removed without altering the positions of the members 41 and 51, and the latch can be operated only by a proper key 57 applied from the outside.

While I have illustrated and described my improved locking device in what I now regard as its preferred construction, the device is subject to modification in various details of construction and arrangement, and I desire to avail myself of all such modifications as may fall within the scope of the appended claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is—

1. A door knob locking device comprising a knob stem extending through a door and having a longitudinal groove formed in one side thereof; inner and outer knobs connected upon the ends of the stem; a latch bolt slidably mounted within the edge of the door; means connecting the bolt and stem for retracting the bolt when the stem is turned; a locking member slidably mounted within the outer knob and movable to engage and disengage the stem, said member being provided with locking portions movable to lock the knob against turning; key actuated means mounted within the outer knob for actuating the locking member; and a manual actuating member slidably mounted within the groove

of the knob stem and extending through the inner knob for operation from the inside of the door, said actuating member having its inner end rotatably secured to the locking member and being provided with an extension extending laterally from the slot and movable to a position locking the stem and inner knob against rotation.

2. A door knob locking device comprising a knob stem extending through a door and having a longitudinal groove formed in one side thereof; inner and outer knobs connected upon the ends of the stem; a latch bolt slidably mounted within the edge of the door; means connecting the bolt and stem for retracting the bolt when the stem is turned; a locking member slidably mounted within the outer knob and movable to engage and disengage the stem, said member being provided with locking portions movable to lock the knob against turning; key actuated means mounted within the outer knob for actuating the locking member; a manual actuating member slidably mounted within the groove of the knob stem and extending through the inner knob for operation from the inside of the door, said actuating member having its inner end rotatably secured to the locking member and being provided with an extension extending laterally from the slot and movable to a position locking the stem and inner knob against rotation; and a second extension carried by the manual actuating member and movable into the path of the latch bolt to prevent inward movement of the latch.

3. A door knob locking device comprising a knob stem extending through a door and having a longitudinal groove formed in one side thereof; inner and outer knobs connected upon the ends of the stem; a latch bolt slidably mounted within the edge of the door; means connecting the latch bolt and stem for retracting the latch bolt when the stem is turned; a locking member slidably mounted within the outer knob and movable from a normal releasing position engaging the end of the stem to locking position disengaging the stem and securing the knob against rotation; key actuated means mounted within the outer knob and connected to the locking member for actuating said member; a manual actuating member slidably mounted within the groove of the stem and extending axially through the inner knob; and an extension formed upon the manual actuating member and movable into the path of the latch bolt, said extension being provided with an inclined edge adapted to be engaged by said latch bolt when in a semi-locking position for normally moving the member to releasing position when the latch is retracted.

4. A door knob locking device comprising a knob stem extending through a door and having a longitudinal groove formed in one side thereof; inner and outer knobs con-

nected upon the ends of the stem; a latch bolt slidably mounted within the edge of the door; means connecting the latch bolt and stem for retracting the latch bolt when the stem is turned; a locking member slidably mounted within the outer knob and movable from a normal releasing position engaging the end of the stem to locking position disengaging the stem and securing the knob against rotation; key actuated means mounted within the outer knob and connected to the locking member for actuating said member; a manual actuating member slidably mounted within the groove of the stem and extending axially through the inner knob; an extension formed upon the manual actuating member and movable into the path of the latch bolt, said extension being provided with an inclined edge adapted to be engaged by said latch bolt when in a semi-locking position for normally moving the member to releasing position when the latch is retracted; said extension also being movable to a full locking position with the inclined edge moved past the path of the latch bolt to prevent movement of said bolt to door releasing position.

5. A door knob locking device comprising a knob stem extending through a door and having a longitudinal groove formed in one side thereof; inner and outer knobs connected upon the ends of the stem; a latch bolt slidably mounted within the edge of the door; means connecting the latch bolt and stem for retracting the latch bolt when the stem is turned; a locking member slidably mounted within the outer knob and movable from a normal releasing position engaging the end of the stem to locking position disengaging the stem and securing the knob against rotation; key actuated means mounted within the outer knob and connected to the locking member for actuating said member; a manual actuating member slidably mounted within the groove of the stem and extending axially through the inner knob; an extension formed upon the manual actuating member and movable into the path of the latch bolt, said extension being provided with an inclined edge adapted to be engaged by said latch bolt when in a semi-locking position for normally moving the member to releasing position when the latch is retracted, said extension also being movable to a full locking position with the inclined edge moved past the path of the latch bolt to prevent movement of said bolt to door releasing position; and adjustable means for limiting the movement of the manual member to semi-locking or full locking positions as desired.

6. A door knob locking device comprising a knob stem extending through a door and having a longitudinal groove formed upon one side thereof; inner and outer knobs connected upon the ends of the stem; a latch bolt slidably mounted within the edge of the door;

means connecting the latch bolt and stem for retracting the latch bolt when the stem is turned; a locking member slidably mounted within the outer knob and movable from a normal releasing position engaging the end of the stem to locking position disengaging the stem and securing said knob against rotation; a key actuated cylinder mounted within the outer knob; an actuating member secured to the cylinder; a follower slidably connected to the locking member and engaging the actuating member and adapted to be moved axially by a rotation of the actuating member with the cylinder to operate the locking member; and manual actuating means slidably movable through the groove of the stem for actuating the locking member independently of the key actuated cylinder.

7. A door knob locking device comprising a knob stem extending through a door and having a longitudinal groove formed upon one side thereof; inner and outer knobs connected upon the ends of the stem; a latch bolt slidably mounted within the edge of the door; means connecting the latch bolt and stem for retracting the latch bolt when the stem is turned; a locking member slidably mounted within the outer knob, said member normally engaging the end of the stem to impart rotation from the outer knob to said stem and being movable out of engagement with said stem and into locking position to secure the knob against rotation; a key actuated cylinder mounted within the outer knob; an actuating member secured to the cylinder and rotatable therewith, said member being provided with spiral feeding means; a follower adapted to be moved axially by the feeding means when the cylinder is rotated, said follower engaging the locking member and being slotted to permit a limited sliding movement of the locking member relative to the follower; and manual actuating means slidably mounted within the groove of the stem and operable through the inner knob for actuating the locking member independently of the key actuated cylinder.

8. In a door knob locking device, a locking member slidably mounted within a door knob and knob bushing and provided with extensions adapted to engage matching recesses formed in said bushing and a bearing plate therefor to prevent rotation of the bushing and knob; a key actuated lock cylinder mounted within the knob; an actuating member secured to the cylinder and rotatable therewith; a follower mounted within the actuating member and adapted to be moved axially therein when the member is rotated with the cylinder, said member engaging the locking member and permitting a limited sliding movement thereof relative to the follower.

9. In a door knob locking device, a knob stem substantially square in cross section and

having a longitudinal slot formed in one side thereof; a locking element mounted adjacent one end of the stem; and an actuating member slidably mounted within the slot and rotatably connected to the locking element, said member being provided with a locking extension disposed within the plane of the locking member and movable to lock the stem against rotation.

10. In a door knob locking device, a knob stem substantially square in cross section and having a longitudinal slot formed in one side thereof; a locking element mounted adjacent one end of the stem; an actuating member slidably mounted within the slot and rotatably connected to the locking element, said member being provided with a locking extension disposed within the plane of the locking member and movable to lock the stem against rotation; and a latch engaging extension formed upon the actuating member and movable into the path of a latch actuated by the knob stem when the locking extension is moved to locking position.

11. In a door knob locking device, a knob stem substantially square in cross section and having a longitudinal slot formed in one side thereof; a locking element mounted adjacent one end of the stem; an actuating member slidably mounted within the slot and rotatably connected to the locking element, said member being provided with a locking extension disposed within the plane of the locking member and movable to lock the stem against rotation; a latch engaging extension formed upon the actuating member and movable into the path of a latch actuated by the knob stem when the locking extension is moved to locking position; and adjustable means mounted upon the actuating member for limiting the movement of said member in the locking direction.

12. In a door locking device, a latch bolt slidably mounted within the side edge of a door and provided with an inwardly extending latch stem; a square knob stem extending transversely through the door and having a longitudinal slot formed upon the side adjacent the latch; a locking member mounted adjacent one end of the stem; key actuated means mounted adjacent the locking member for moving the same to locking position; manual actuating means connected to the locking member and extending through the slot in the stem to be actuated from the opposite end of said stem; a collar secured upon the stem and provided with latch actuating arms, said collar being slotted to permit sliding movement of the manual actuating means therethrough; an actuating link connected between the latch actuating arms and the latch stem; an extension carried by the latch stem and movable to engage the manual actuating means when the latch is moved inwardly; and an extension formed

upon the manual actuating member and movable to a full locking position to prevent inward movement of the latch, said extension having an inclined edge adapted to be engaged when in a semi-locking position whereby inward movement of the latch will move the member to a releasing position.

In witness whereof, I hereunto set my signature.

ELLING ELLINGSON.

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