

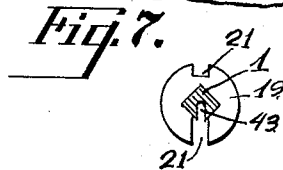
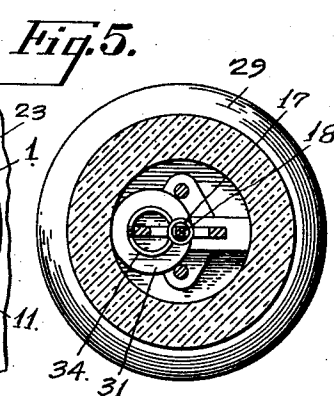
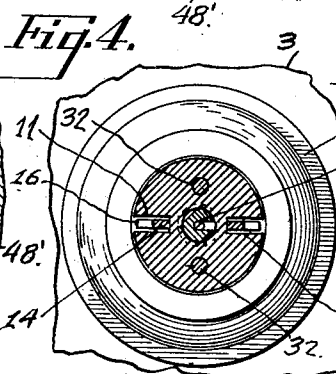
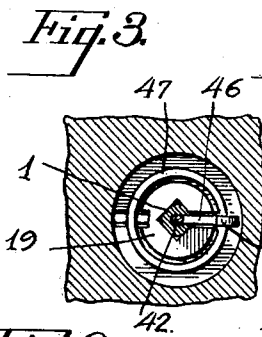
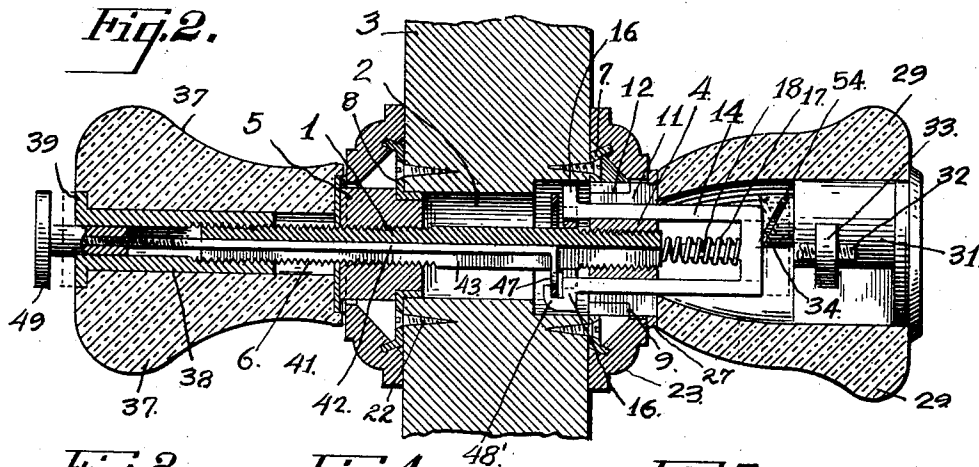
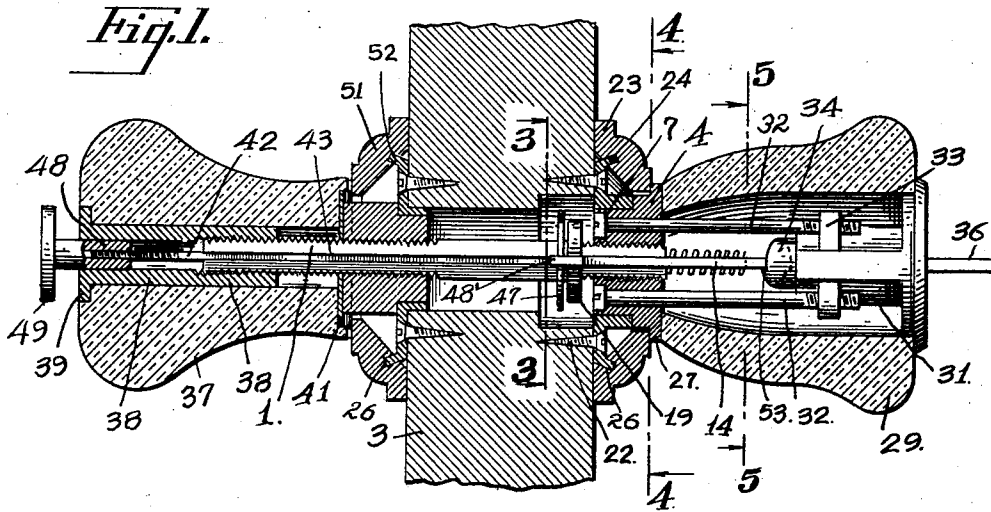
June 23, 1931.

E. ELLINGSON

1,810,909

DOORKNOB LOCKING DEVICE

Filed March 5, 1929



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UNITED STATES PATENT OFFICE

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DOORKNOB LOCKING DEVICE

Application filed March 5, 1929. Serial No. 344,513.

My invention relates to improvements in locking devices for door knobs and the like wherein an outer door knob operates in conjunction with key actuated mechanism for connecting or disconnecting said outer knob to or with the inner knob whereby the locking mechanism of a door may at all times be actuated by manual operation of the inner knob and by the outer knob when said key actuated mechanism is actuated to connect said outer knob with said inner knob through the medium of the usual stem.

The present invention is an improvement upon the knob lock disclosed in my co-pending application, Serial No. 336,475, filed January 31, 1929.

The primary object of my present invention is to provide an improved locking device for door knobs and the like.

Another object is to provide an improved knob locking device wherein a locking member is normally held in locking position to prevent operation of a door latch by an outer knob, said locking member being movable to unlatching position from either side of the door.

A further object is to provide an improved device of the character described which is provided with key actuated means for unlocking the knob from the outside of a door and provided with manually operable means for moving the locking member to an unlatching position from the inside of the door independently of the key actuated means.

Another object is to provide an improved device wherein the outer knob is normally locked to prevent opening of the door from the outside without interfering with the free operation of the inner knob to open the door from the inside, and in which the knob locking means may be released from the inside of the door.

A further object is to provide an improved device wherein a locking member normally operating to lock the outer knob of a door may be moved and held in unlatching position independently of key actuated means provided for actuating said locking member from the outside of a door.

A further object is to provide improved

features of construction whereby the operation of the locking member may be facilitated and rendered more positive and efficient, and by which the utility of the device is extended.

A still further object is to provide an improved construction which is simple in construction and operation and which may be easily manufactured and assembled upon a door.

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 throughout the specification and drawings, and in which—

Fig. 1 is a sectional view of my invention as applied upon a door;

Fig. 2 is a sectional view taken at right angles to the view shown in Fig. 1;

Fig. 3 is a section taken upon the line 3—3 of Fig. 1 in the direction indicated;

Fig. 4 is a section taken upon the line 4—4 of Fig. 1 in the direction indicated;

Fig. 5 is a sectional view taken upon the line 5—5 of Fig. 1 in the direction indicated;

Fig. 6 is a side elevation of the cam member, detached from the cylinder lock; and

Fig. 7 is an end elevation of the knob stem disclosing the actuating collar thereon.

Referring to the drawings, the numeral 1 is used to designate in general a knob stem extending through an opening 2 formed in a door 3, and having bushings 4 and 5 mounted upon the outer and inner ends of the stem 1, preferably by means of threads 6. The outer bushing 4 is supported within a bearing plate 7 secured upon the outer side of the door, and the inner bushing 5 is supported by a bearing plate 8 secured upon the inner side of the door.

The outer bushing 4 is shouldered as at 9 to seat upon the bearing portion of the bearing plate 7 and grooves 11 are formed upon diametrically opposite sides thereof and arranged to register with corresponding grooves 12 formed in the bearing surface of the bearing plate 7.

A U shaped locking member or bolt 14 is

slidably mounted within the grooves 11 of the bushing 4, said member being provided with outwardly disposed extensions 16 movable into the matching grooves 11 and 12 to lock the bushing 4 against turning movement within the bearing plate 7. A spring 17 is mounted upon a guide 18 carried by the closed end of the member 14 and compressed between said member and the end of the stem 1 to normally move the member 14 into locking position. A collar 19 is carried by the stem 1 in slightly spaced relation to the end of the bushing 4, said collar 19 having notches 21 formed in the edges thereof to receive the ends of the member 14 when in unlocking position.

The bearing plate 7 is secured to the door by suitable screws 22 or other suitable securing means; and is covered by means of a rosette 23 engaged and held against turning by means of spring lugs 24 formed upon the plate 7 and engaging openings 26 formed in the back of the rosette. An annular flange 27 is formed upon the outer end of the bushing 4 to retain the rosette in operative position.

A hollow knob 29 is secured upon the outer end of the bushing 4. A cylinder lock 31 of any ordinary form and construction is mounted within the outer end of the knob 29, said lock being secured in an operative position within the knob and said knob being secured to the bushing 4 by means of securing members 32 applied through the bushing 4 and threaded into anchor lugs 33 formed upon the lock 31 to clamp the lock in engagement with the knob and at the same time clamp the knob against the bushing.

A cam 34 is secured upon the inner end of the cylinder of the lock 31, said cam preferably being of hollow cylindrical form and secured in co-axial relation to the cylinder. The end of the cam is inclined and arranged to be engaged by the end of the U shaped member 14 whereby a rotative movement of the cam with the cylinder of the lock will cause the member 14 to be moved between its locking and unlocking positions as indicated in Fig. 2 of the drawings. The cam 34 is so positioned that the end of the member 14 may extend into the hollow cam when engaged by the low portion of the inclined end, and said low portion will be presented to the member 14 when the lock is in normal position to receive or permit the withdrawal of a proper key 36. The spring 17 holds the member 14 in engagement with the cam 34, and as the high portion of the cam is turned into engagement with the member 14, said member is moved inwardly against the pressure of said spring 17 to its unlocking position.

A knob 37 is mounted upon the end of the stem 1 extending through the inner side of the door. The knob 37 is preferably pro-

vided with a sleeve 38 extending axially into the knob from the outer end thereof, said sleeve having a flange 39 engaging the outer end of the knob and being internally threaded at its inner end to engage the threads of the stem 1. A ridged washer 41 is fitted onto the stem 1, preferably by a square aperture adapted to prevent rotation of said washer relative to the stem, the ridges of the washer being engaged between corresponding ridges and grooves formed upon the bushing 5 and the knob 37 as illustrated in my co-pending application, Serial No. 252,898, filed February 8, 1928, said washer operating to prevent rotation of either the bushing or knob relative to the stem.

A bolt actuating stem 42 is mounted within a groove 43 formed longitudinally along the knob stem 1. An extension is carried upon the inner end of the stem 42, said extension consisting of an outwardly extending arm 46 protruding from the groove 43 and having a curved portion 47 concentric with the stem 1 and engaging a hook-like extension 48' carried by one of the arms of the U shaped locking member 14, as shown in Figs. 1, 2, and 3 of the drawings. The curved portion 47 is preferably made a complete annulus extending around the knob stem 1 whereby said knob stem and the stem 42 with its extension may be rotated by the inner knob 37 independently of the locking member 14 and outer knob 29, and without disengaging said locking member. The portion 47 is formed upon a radius such that the said portion may be moved past the collar 19.

A sleeve 48 is slidably mounted within the outer end of the knob sleeve 38 and threaded onto the outer end of the actuating stem 42. A knurled flange 49 is formed upon the outer end of the sleeve 48 whereby the sleeve may be rotated to move the stem 42 longitudinally within the groove 43 of the stem 1.

A rosette 51 is mounted around the end of the bushing 5 and covering the bearing plate 8, said rosette engaging lugs 52 formed upon said plate 8 and being retained in an operative position by the washer 41.

In operation, my improved knob locking device is assembled upon a door in the following manner. The locking member 14, with the spring 17 mounted upon the guide 18, is inserted to operative position upon the bushing 4 with the arms of the U shaped member 14 received within the grooves 11. The knob 29 and lock 31 are then secured to the bushing, and the bushing moved into engagement with the bearing plate 7, said plate 7 having been secured to the door and the rosette 23 positioned thereon previously. The extensions 16 are moved through the grooves 12 to admit the bushing 4 to operative position relative to the mounting plate

7. The stem 1 is then inserted through the opening 2 from the inner side of the door and threaded into the bushing 4. The spring 17 is compressed between the stem 1 and the closed end of the member 14, and the collar 19 is moved to a position slightly spaced from the inner end of the bushing 4.

The actuating stem 42 is inserted into operative position upon the knob stem 1 engaging the hook portion 48' of the member 14, said stem 1 is screwed into the bushing 4. The bushing 5 is then threaded onto the inner end of the knob stem 1 and advanced into operative relation to the bearing plate 8. The rosette 51 is next applied and the washer 41 fitted onto the stem 1 and the knob 37 secured upon the extreme outer end of the stem by screwing the sleeve 38 onto the stem 1 until the ridged washer 41 is clamped between the knob and the bushing 5. The sleeve 48 is then inserted into the outer end of the sleeve 38 and turned onto the threads of the actuating stem 42. The sleeve 48 is normally adjusted to a position such that the outer flange 49 seats against the end of the sleeve 38 when the stem 42 is moved inwardly with the locking member 14 to its normal locking position as indicated in dotted lines in Fig. 2 of the drawings.

With the device assembled upon the door as above described, the locking member 14 is normally held in locking position by the spring 17, the extensions 16 being received within the matching grooves 11 and 12 to lock the outer knob 29 and bushing 4 against rotation. The stem 1, being threaded into the bushing 4, may be turned within said bushing, thus permitting the opposite knob 37 and the stem 1 to be turned from the inside of the door, independently of the locking of the outer knob. The stem 1 is adapted to be connected to any suitable latch mechanism, such as commonly installed in doors, but as such latch mechanism forms no part of the present invention, and the specific form and construction of said mechanism may be of practically any standard construction, no disclosure of said latch mechanism has been included herein. Thus, by locking the outer knob against rotation, the operation of the stem 1 by the outer knob to release the latch mechanism is prevented, and the door will be effectually locked against opening from the outside. At the same time, the stem 1 is freely operable by the inner knob to permit the opening of the door from the inside at will.

To open the door from the outside, a proper key 36 is inserted into the lock 31 and a half turn imparted to the cylinder of the lock in the well known manner. As the cylinder is thus turned, the cam 34 will be moved to force the locking member 14 inwardly against the pressure of the spring

17, the amount of movement being designed to cause the extensions 16 to be moved out of engagement with the grooves 11 and 12, thereby permitting free rotation of the knob and bushing 4 within the bearing plate 7. At the same time, the ends of the member 14 are moved into the notches 21 of the collar 19 carried by the knob stem 1, whereby a rotation of the knob and bushing will cause the member 14 to also rotate the collar 19 and stem 1, thereby actuating said stem 1 to operate the latch mechanism. The movement of the cam 34 and the cylinder of the lock is limited by shoulders 53 and 54 formed adjacent the high and low portions of the inclined end of the cam, said shoulders being adapted to engage the sides of the member 14 and limit the rotation of the cam and cylinder to a half revolution. The cylinder must be turned to allow the locking member to be returned to its locking position before the key 36 can be withdrawn, thus insuring that the outer knob will be normally locked.

When the locking member 14 is moved by the key 36 as above described, the stem 42 will be moved outwardly through the inner knob 37 to the position indicated in full lines in Figs. 1 and 2 of the drawings. If it is desired to secure the locking member 14 in an unlocking position, the sleeve 48 is turned to advance along the threaded end of the stem 42 to the position indicated in dotted lines, thereby holding said stem and the locking member against movement to the normal locking position when the cam is moved to release the same, thus permitting either knob to be freely turned to operate the latch mechanism. In case the locking member 14 is in locking position and it is desired to move it to unlocking position from the inside of the door, the sleeve 48 is rotated to move the stem 42 into said sleeve, the flange 49 being seated against the sleeve 38 and the threaded portion of the stem 42 being advanced into the sleeve 48 as said sleeve is rotated, and thereby moving the locking member 14 to its unlocking position.

While I have illustrated and described only the preferred embodiment of my invention, the specific details of construction and arrangement are subject to modification in numerous ways without departing from the spirit of my invention. I therefore desire to avail myself of all modifications which 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 locking device comprising a knob stem extending through a door and adapted to be partially rotated to actuate latch mechanism mounted within the door; a bearing

plate secured upon one side of the door; a bushing rotatably mounted within the bearing plate and engaging one end of the knob stem; a locking member slidably mounted in connection with the bushing and movable into locking engagement with the bushing and bearing plate to lock said bushing against rotation when said member is in a locking position, said locking member being disengaged from the stem when in a locking position and being movable into actuating engagement with the stem when said member is moved to an unlocking position; means mounted in connection with the locking member for normally moving the same to a locking position; a knob secured to the bushing; and key actuated means mounted within the outer end of the knob for moving the locking member to unlocking position.

2. A locking device comprising a knob stem extending through a door and adapted to be partially rotated to actuate latch mechanism mounted within the door; a bearing plate secured upon one side of the door; a bushing rotatably mounted within the bearing plate and engaging one end of the knob stem; a locking member slidably mounted in connection with the bushing and movable into locking engagement with the bushing and bearing plate to lock said bushing against rotation when said member is in a locking position, said locking member being disengaged from the stem when in locking position and being movable into actuating engagement with the stem when said member is moved to an unlocking position; means mounted in connection with the locking member for normally moving the same to a locking position; a knob secured to the bushing; key actuated means mounted within the outer end of the knob for moving the locking member to unlocking position; and means operable from the opposite end of the stem for moving the locking member to unlocking position.

3. A locking device comprising a knob stem extending through a door and adapted to be partially rotated to actuate latch mechanism mounted within the door; a bearing plate secured upon one side of the door; a bushing rotatably mounted within the bearing plate and engaging one end of the knob stem; a locking member slidably mounted in connection with the bushing and movable into locking engagement with the bushing and bearing plate to lock said bushing against rotation when said member is in a locking position, said locking member being disengaged from the stem when in locking position and being movable into actuating engagement with the stem when said member is moved to an unlocking position; means mounted in connection with the locking member for normally moving the same to a

locking position; a knob secured to the bushing; key actuated means mounted within the outer end of the knob for moving the locking member to unlocking position; and means mounted within the stem and manually operable from the opposite end thereof for moving the locking member to an unlocking position.

4. A locking device comprising a knob stem extending through a door and adapted to be partially rotated to actuate latch mechanism mounted within the door; a bearing plate secured upon one side of the door; a bushing rotatably mounted within the bearing plate and engaging one end of the knob stem; a locking member slidably mounted in connection with the bushing and movable into locking engagement with the bushing and bearing plate to lock said bushing against rotation when said member is in a locking position, said locking member being disengaged from the stem when in locking position and being movable into actuating engagement with the stem when said member is moved to an unlocking position; means mounted in connection with the locking member for normally moving the same to a locking position; a knob secured to the bushing; key actuated means mounted within the outer end of the knob for moving the locking member to unlocking position; an actuating stem slidably mounted within the knob stem and extending outwardly from the opposite end thereof, said actuating stem having its inner end engaging the locking member; and means engaging the outer end of the actuating stem and manually operable for moving said stem and the locking member to unlocking position.

5. A locking device comprising a knob stem extending through a door and adapted to be partially rotated to actuate latch mechanism mounted within the door; a bearing plate secured upon one side of the door; a bushing rotatably mounted within the bearing plate and engaging one end of the knob stem; a locking member slidably mounted in connection with the bushing and movable into locking engagement with the bushing and bearing plate to lock said bushing against rotation when said member is in a locking position, said locking member also being movable into actuating engagement with the stem when said member is moved to an unlocking position; means mounted in connection with the locking member for normally moving the same to a locking position; a knob secured to the bushing; key actuated means mounted within the outer end of the knob for moving the locking member to unlocking position; an actuating stem slidably mounted within the knob stem and extending outwardly from the opposite end thereof, said actuating stem having its inner end engaging the locking member; and

a sleeve threaded onto the outer end of said actuating stem for moving said stem and the locking member to unlocking position.

6. A locking device comprising a knob
5 stem extending through a door and adapted to be partially rotated to actuate latch mechanism mounted within the door; a bearing plate secured upon one side of the door; a bushing rotatably mounted within the bearing
10 plate and engaging one end of the knob stem; a locking member slidably mounted in connection with the bushing and movable into locking engagement with the bushing and bearing plate to lock said bushing
15 against rotation when said member is in a locking position, said locking member also being movable into actuating engagement with the stem when said member is moved to an unlocking position; means mounted in
20 connection with the locking member for normally moving the same to a locking position; a knob secured to the bushing; key actuated means mounted within the outer end of the knob for moving the locking mem-
25 ber to unlocking position; a knob mounted upon the opposite end of the knob stem, said knob being provided with an axial sleeve engaging said knob stem; an actuating stem slidably mounted within the knob
30 stem and engaging the locking member; and an actuating sleeve threaded onto the outer end of the actuating stem and slidably engaging the outer end of the knob sleeve for moving said stem and the locking member
35 to unlocking position, said actuating sleeve and stem being slidably movable with the locking member when moved by the key actuated means.

7. A locking device comprising a knob
40 stem extending through a door and adapted to be partially rotated to actuate latch mechanism mounted within the door, said stem being provided with a collar; a bearing plate secured upon one side of the door;
45 a bushing rotatably mounted within the bearing plate and engaging one end of the knob stem, said bushing having longitudinally disposed grooves adapted to register with corresponding grooves formed within
50 the bearing plate; a locking member slidably mounted within the grooves of the bushing and provided with extensions movable to engage the grooves of the bearing plate to lock the bushing against rotation
55 when the locking member is in a locking position, said extensions also being movable into actuating engagement with the collar carried by the stem for rotating said stem when the locking member is moved to un-
60 locking position; means for normally moving the locking member to locking position; a knob secured to the bushing; a key actuated cylinder lock mounted within the outer end of the knob; and a cam mounted in
65 connection with the cylinder lock and mov-

able therewith to displace the locking member from normal locking position to unlocking position.

8. A locking device comprising a knob
70 stem extending through a door and adapted to be partially rotated to actuate latch mechanism mounted within the door, said stem being provided with a collar; a bearing plate secured upon one side of the door;
75 a bushing rotatably mounted within the bearing plate and engaging one end of the knob stem, said bushing having longitudinally disposed grooves adapted to register with corresponding grooves formed within the bearing plate; a locking member slid-
80 ably mounted within the grooves of the bushing and provided with extensions movable to engage the grooves of the bearing plate to lock the bushing against rotation when the locking member is in a locking
85 position, said extensions also being movable into actuating engagement with the collar carried by the stem for rotating said stem when the locking member is moved to
90 unlocking position; means for normally moving the locking member to locking position; a knob secured to the bushing; a key actuated cylinder lock mounted within the outer end of the knob; a cam mounted in
95 connection with the cylinder lock and movable therewith to displace the locking member from normal locking position to unlocking position; and means formed upon the cam for limiting the rotation of the cylinder lock and the cam.
100

9. A locking device comprising a knob
stem extending through a door and adapted to be partially rotated to actuate latch
105 mechanism mounted within the door, said stem being provided with a collar; a bearing plate secured upon one side of the door; a bushing rotatably mounted within the bearing plate and engaging one end of the knob stem, said bushing having longitudi-
110 nally disposed grooves adapted to register with corresponding grooves formed with the bearing plate; a locking member slidably mounted within the grooves of the bushing and provided with extensions movable to
115 engage the grooves of the bearing plate to lock the bushing against rotation when the locking member is in a locking position, said extensions also being movable into actuating engagement with the collar carried by the stem for rotating said stem
120 when the locking member is moved to unlocking position; means for normally moving the locking member to locking position; a knob secured to the bushing; a key actuated cylinder lock mounted within the
125 outer end of the knob; and a hollow cylindrical cam secured upon the cylinder of the lock and rotatable therewith, the end of said cam being inclined and engaging the adjacent end of the locking member for
130

moving said member from normal locking position to unlocking position.

10. A locking device comprising a knob stem extending through a door and adapted to be partially rotated to actuate latch mechanism mounted within the door, said stem being provided with a collar; a bearing plate secured upon one side of the door; a bushing rotatably mounted within the bearing plate and engaging one end of the knob stem, said bushing having longitudinally disposed grooves adapted to register with corresponding grooves formed within the bearing plate; a locking member slidably mounted within the grooves of the bushing and provided with extensions movable to engage the grooves of the bearing plate to lock the bushing against rotation when the locking member is in a locking position, said extensions also being movable into actuating engagement with the collar carried by the stem for rotating said stem when the locking member is moved to unlocking position; means for normally moving the locking member to locking position; a knob secured to the bushing; a key actuated cylinder lock mounted within the outer end of the knob; a hollow cylindrical cam secured upon the cylinder of the lock and rotatable therewith, the end of said cam being inclined and engaging the adjacent end of the locking member for moving said member from normal locking position to unlocking position; and shoulders formed upon the inclined end of the cam adjacent the extreme high and low points thereof to engage the sides of the locking member and thereby limit the rotative movement of the cam and the cylinder lock.

11. A locking device comprising a knob stem extending through a door and adapted to be partially rotated to actuate latching mechanism mounted within the door, said stem being provided with a collar and having a groove extending longitudinally thereof; bearing plates secured upon opposite sides of the door; bushings engaging the stem and rotatably supported within the bearing plates, the bushing upon the outer side of the door having longitudinally disposed grooves adapted to register with corresponding grooves formed in the adjacent bearing plate; a U shaped locking member slidably mounted in the bushing grooves and provided with extensions movable to engage the grooves of the bearing plate when in a locking position and also movable into actuating engagement with the collar carried by the stem when said locking member is moved to an unlocking position; means for normally moving the locking member to locking position; knobs secured to the bushings; key actuated means mounted within the outer knob and engaging the locking member for moving said member from nor-

mal position to unlocking position; an actuating stem slidably mounted within the groove of the knob stem and engaging the locking member, said actuating stem extending into the inner knob; and means mounted within the end of the knob and engaging the actuating stem for moving said stem and the locking member to unlocking position.

12. In a knob locking device, the combination with a knob stem extending through a door and adapted to operate latching mechanism by a rotative movement of said stem, of a locking member slidably mounted adjacent the outer end of the stem, said member being normally held in a locking position to prevent rotation of the stem from outside the door; key actuated means operable from outside the door for moving the locking member to unlocking position; an actuating stem slidably mounted within the knob stem; an extension formed upon the inner end of the stem and engaging the locking member; and manually operable means engaging the other end of said stem for moving said stem and the locking member to unlocking position independently of the key actuated means.

13. In a knob locking device, the combination with a knob stem extending through a door and adapted to operate latching mechanism by a rotative movement of said stem, of a locking member slidably mounted adjacent the outer end of the stem, said member being normally held in a locking position to prevent rotation of the stem from outside the door; key actuated means operable from outside the door for moving the locking member to unlocking position; an actuating stem slidably mounted within a groove longitudinally disposed along the knob stem; an extension formed upon the inner end of the stem and engaging the locking member, said extension being adapted to permit rotation of the knob stem independently of the locking member when said stem is turned from the inner side of the door; and manually operable means for moving the actuating stem longitudinally within the knob stem to move the locking member to unlocking position independently of the key actuated means.

14. In a knob locking device, the combination with a bearing plate and a bushing rotatably mounted within said plate and having grooves registering with grooves formed in the plate, of a locking member slidably mounted within the bushing and movable to engage the registering grooves to prevent rotation of the bushing; means normally moving the locking member to a locking position; and a key actuated cam engaging the locking member and operable to move said locking member to an unlocking position, said cam comprising a hollow

5 cylindrical extension secured to the cylinder of a cylinder lock and having an inclined end engaging the end of the locking member, a portion of the end of said locking member being received within the tubular
10 body of the cam when said member is engaged by a low point of the inclined cam surface.

15 15. In a knob locking device, the combination with a bearing plate and a bushing rotatably mounted within said plate and having grooves registering with grooves formed in the plate, of a locking member
20 slidably mounted within the bushing and movable to engage the registering grooves to prevent rotation of the bushing; means normally moving the locking member to a locking position; a key actuated cam engaging the locking member and operable to
25 move said locking member to an unlocking position, said cam comprising a hollow cylindrical extension secured to the cylinder of a cylinder lock and having an inclined end engaging the end of the locking member, the end of said locking member being
30 received within the tubular body of the cam when said member is engaged by a low point of the inclined cam surface; and shoulders formed adjacent the high and low points of the inclined cam surface to engage the locking member and limit the movement of the cam.

In witness whereof, I hereunto set my signature.

ELLING ELLINGSON.