Feb. 16, 1932. E. ELLINGSON 1,845,963

DOOR KNOB LOCKING DEVICE

Filed Jan. 31, 1929

Fig. 1.

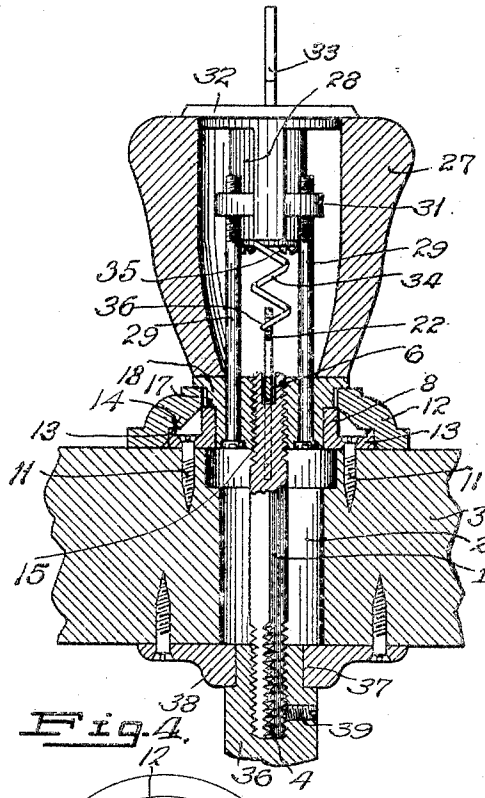


Fig. 2.

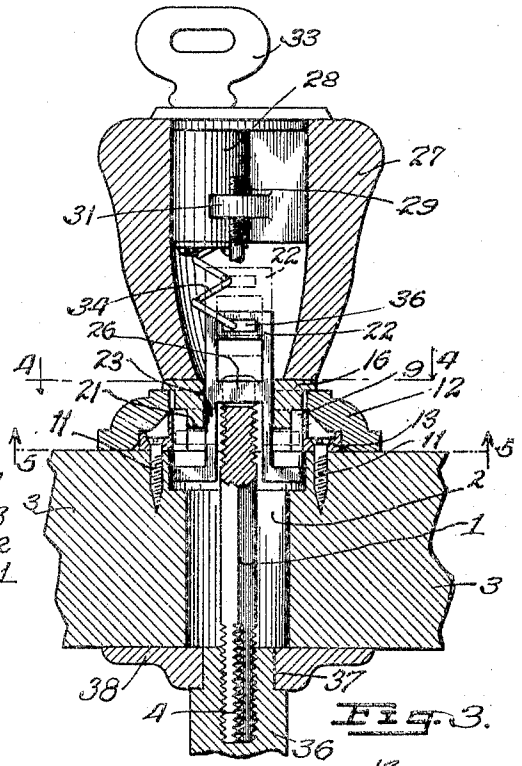


Fig. 4.

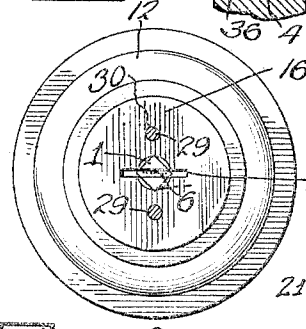


Fig. 5.

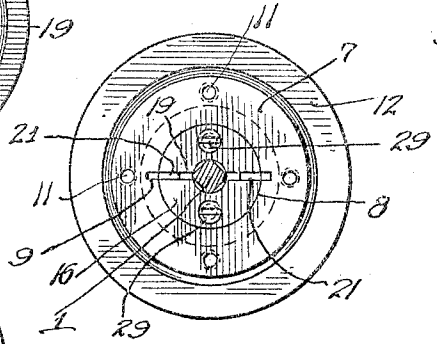


Fig. 3.

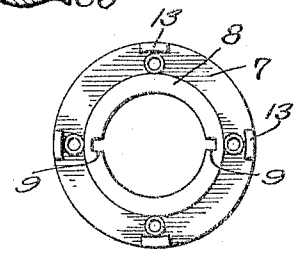
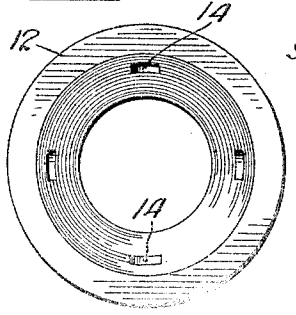


Fig. 6.



INVENTOR.

Elling Ellingson

Patented Feb. 16, 1932 1,845,963

UNITED STATES PATENT OFFICE

ELLING ELLINGSON, OF SAN FRANCISCO, CALIFORNIA

DOOR KNOB LOCKING DEVICE

Application filed January 31, 1929. Serial No. 336,475.

My invention relates to improvements in a door knob lock wherein a bolt and key actuated operating means therefor are enclosed within a door knob, said bolt being movable to a locking position to lock the knob against turning and being movable to an unlocking position and into actuating engagement with a knob stem to permit operation of the ordinary door latching mechanism by said knob.

The primary object of my invention is to provide an improved door knob lock.

Another object is to provide an improved locking means wherein the locking mechanism with its actuating mechanism is entirely enclosed within a door knob assembly.

A further object is to provide an improved locking means which may be readily installed and operated in connection with the knob stem of door latching mechanism of substantially any ordinary form.

Another object is to provide an improved knob locking device wherein a cylinder lock of any ordinary construction may be installed for operating the knob locking mechanism.

A further object is to provide an improved device of the character described wherein the knob and latch mechanism may be effectively locked against operation from one side of a door without interfering with the free operation of the same from the opposite side of the door.

A further object is to provide an improved device of the character described which is neat and compact and which is attractive in appearance and efficient in operation.

A still further object is to provide an improved door knob lock which is simple in construction and operation and which may be economically manufactured and installed.

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 broken longitudinal section of my improved door knob lock as installed in connection with the knob stem of a door latch;

Fig. 2 is a broken longitudinal section taken at right angles to the section shown in Fig. 1;

Fig. 3 is an elevation of the outer end of a bearing plate;

Fig. 4 is a view taken upon the line 4—4 of Fig. 2 in the direction indicated, the bolt member being omitted;

Fig. 5 is a sectional view taken upon the line 5—5 of Fig. 2 in the direction indicated; and

Fig. 6 is a view of the inner end of a rosette.

Referring to the drawings, the numeral 1 is used to designate in general a door knob stem of any suitable construction, preferably of the ordinary square cross section. The stem 1 extends through an opening 2 formed through a door 3 and is adapted to operate any suitable latch mechanism mounted within the door in the usual manner. As the latch mechanism itself forms no part of the present invention, and my improved device is operable in connection with any ordinary door latching mechanism, such mechanism is omitted from the drawings.

The ends of the stem 1 are threaded as at 4, the threads being cut into the corners only of a square stem such as illustrated, and the end of the stem upon the outer side of the door has a slot 6 formed therein.

A bearing plate 7 is secured upon the outer side of the door in registering relation with the opening 2, said plate being provided with an outwardly extending bearing portion 8 having diametrically opposite grooves 9 formed upon the inner bearing surface of the bearing portion. The plate 7 is secured to the door by means of screws 11 or other suitable securing members and is covered by means of a rosette 12 fitted thereon. Lugs 13 formed upon the edges of the plate 7 extend outwardly into engagement with recesses 14 formed upon the inner surface of the rosette to secure said rosette against rotation.

A bushing 16 is threaded, as at 15, onto the end of the stem 1 and arranged to rotatably engage the bearing portion 8 of the bearing

plate. The bushing is preferably shouldered as at 17 to seat against the outer end of the bearing portion 8 and is provided with an annular flange 18 arranged to engage and retain the rosette 12 in an operative position. An axial slot 19 is formed through the center of the bushing 16 and notches 21 are formed in the inner end of the bushing in the plane of said slot and opening thereinto, said notches being adapted to register with the grooves 9 of the bearing plate and to form recesses extending between said grooves and the slot 19.

A bolt member 22 is slidably mounted within the bushing slot 19. The inner end of the bolt 22 is made yoke shaped and is arranged to span the end of the stem 1, the ends of the arm portions 23 of said yoke being outwardly turned in the form of lugs 24 movable into engagement with the notches 21 and the grooves 9 to prevent rotation of the bushing 16 within the bearing plate 7 when the bolt is moved to a locking position as indicated in dotted lines in Fig. 2 of the drawings.

A transverse bar portion 26 is formed between the arms 23 of the bolt member and arranged to be moved into engagement with the slot 6 in the end of the stem 1 when the bolt member 22 is moved to an unlocking position as indicated in full lines in Fig. 2 of the drawings. The bar portion 26 clears the outer end of the stem 1 and entirely disengages the stem when the bolt member is in locking position, thereby permitting the stem to be rotated within the bushing 16.

A knob 27 is secured in connection with the outer end of the bushing 16. The knob is made hollow and the outer end shaped to receive a cylinder lock 28 of any ordinary construction. The lock 28 is secured to the bushing 16 by means of securing members 29 extending through apertures 30 formed in the bushing and threaded into anchor lugs 31 formed upon the body of the lock 28 in the ordinary manner, said securing members operating to clamp the face plate 32 of the lock against the outer end of the knob 27 and thereby bind said knob in an operative engagement with the bushing 16.

The lock 28 may be of any standard construction provided with a rotatable cylinder adapted to be actuated by means of a proper key 33 in the well known manner. A bolt actuating member 34 is secured upon the inner end of the cylinder of the lock in any suitable manner, as by screws 35, said member preferably consisting of a rigid spiral cam having a free inner end adapted to thread through an opening 36 formed in the end of the bolt member 22 whereby a rotation of the member 34 will move the bolt member longitudinally along the spiral to locking or unlocking positions as desired.

For most purposes, the outer knob only of a door requires the provision of locking means, and it is usually desired to have the inner knob freely operable to unlatch the door. I have illustrated this arrangement in the drawings, the inner end of the stem 1 being provided with a knob having a shank 36 threaded onto the end of the stem and supported in a bearing 37 formed by a rosette 38. A set screw 39 is tapped into the shank to secure the knob against rotation upon the threads of the stem.

My improved door knob locking means is installed and assembled in connection with the ordinary door latch in the following manner:—The bolt member 22 is inserted into the slot 19 of the bushing member 16 from the inner end thereof and the lock 28 inserted into the outer end of the knob 27 and manipulated to cause the free end of the spiral member 34 to enter the opening 36 of the bolt. The securing members are then applied through the bushing to secure the lock within the knob and to secure the knob seated upon the bushing. The bushing is inserted into operative position upon the bearing plate 7, said plate having been previously secured upon the door and the rosette 12 applied to cover the same. The stem 1 is then threaded into the bushing 16 from the opposite side of the door, the bolt being first moved to its locking position as indicated in dotted lines in Fig. 2. The stem is advanced into the bushing 16 until the end of said stem is substantially flush with the end of the bushing and the slot 6 of said stem matching with the slot 19 of the bushing. The knob shank 36 upon the opposite side of the door is then screwed onto the opposite end of the stem 1 and secured by the set screw 39 to hold the entire assembly in operative relation.

The pitch of the spiral actuating member 34 is such that a full turn of the lock cylinder by means of the proper key 33 will operate to move the bolt from the locking position as indicated in dotted lines in Fig. 2 of the drawings to the unlocking position indicated in full lines in said figure, thereby permitting the key to be withdrawn to leave the bolt in either its locking or unlocking position as desired. When the bolt member 22 is in its unlocking position as indicated in full lines, the transverse bar portion 26 is moved into the slot 6 of the stem. When now the knob 27 is turned the bushing 16 and the bolt 22 are of course turned with it, and the turning movement is imparted by the bar portion 26 to the stem, thereby operating said stem to actuate the latch mechanism in the usual manner, and a movement of the inner knob will operate through the stem 1 and bar portion 26 to turn the outer bushing and knob.

When the bolt member 22 is moved to locking position as indicated in dotted lines in Fig. 2, the lugs 24 are moved into engagement with the notches 19 and the grooves 9, there-

by preventing rotation of the bushing within the bearing plate 7 and thereby preventing the outer knob from being turned to operate the latch mechanism. At the same time, the bar portion 26 of the bolt member is moved out of engagement with the slot 6 in the end of the stem 1, thereby permitting said stem to be turned within the threaded bushing 16 whereby the inner knob may be operated to actuate the latch mechanism independently of the locking of the outer knob. The stem 1 is automatically turned back to normal position in the ordinary manner after being moved by the inner knob, thereby being normally held with the slot 6 alined with the slot 19 to receive the bar portion 26 when the bolt is again moved to unlocking position.

While I have illustrated and described what I now regard as the preferred embodiment of my improved knob locking mechanism, the device is of course subject to modification in numerous details without departing from the spirit of my invention. I therefore do not wish to restrict myself to the precise details of construction and arrangement disclosed, but 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 door knob lock comprising a knob stem extending through a door and adapted 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 rotatably engaging the knob stem; a bolt slidably mounted within an axial slot formed in the bushing; locking lugs formed upon the inner end of the bolt and movable into matching recesses formed in the bushing and bearing plate to prevent rotation of the bushing when the bolt is in locking position; a transverse bar carried by the bolt and movable into actuating engagement with the end of the stem when the bolt is moved to unlocking position; a knob secured to the bushing; and key actuated means mounted within the outer end of the knob and connected to the bolt for moving the same to locking and unlocking positions.

2. A door knob lock comprising a knob stem extending through a door and adapted 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 rotatably engaging the knob stem, said bushing having an axial slot therethrough and notches formed upon the inner end thereof to provide recesses matching with the slot and with recesses formed in the bearing plate; a bolt slidably mounted within the bushing slot, said bolt being provided with means movable to engage the matching recesses of the bushing and bearing plate to prevent rotation of said bushing when the bolt is in a locking position; means carried by the bolt and movable therewith into actuating engagement with the stem when the bolt is moved to an unlocking position; a knob secured upon the bushing; and key actuated means mounted within the outer end of the knob and connected to the bolt for moving the same to locking and unlocking positions.

3. A door knob lock comprising a knob stem extending through a door and adapted 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 rotatably engaging the knob stem; a bolt slidably mounted in connection with the bushing and provided with lugs movable to engage matching recesses formed in the bushing and bearing plate to prevent rotation of said bushing when the bolt is in a locking position, said bolt also being provided with stem engaging means movable into actuating engagement with the stem when the bolt is moved to an unlocking position; a knob secured upon the outer end of the bushing; and means mounted within the outer end of the knob for moving the bolt to locking and unlocking position.

4. A door knob lock comprising a knob stem extending through a door and adapted 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 rotatably engaging the knob stem; a bolt slidably mounted in connection with the bushing and provided with locking means to engage and disengage the bushing and bearing plate and movable into locking engagement with the bushing and bearing plate to prevent rotation of said bushing relative to the bearing plate when the bolt is in a locking position, said bolt also being provided with stem engaging means movable into actuating engagement with the stem independently of the bushing when the bolt is moved to an unlocking position; a knob secured upon the outer end of the bushing; and means mounted within the outer end of the knob for moving the bolt to locking and unlocking positions.

5. A door knob lock comprising a knob stem extending through a door and adapted to actuate latch mechanism mounted within the door, said stem having a slot cut in one end thereof; a bearing plate secured upon one side of the door and provided with a bearing portion having grooves formed upon the inner surface thereof; a bushing rotatably mounted within the bearing portion and rotatably engaging the slotted end of the

stem, said bushing having an axial slot and notches formed in the inner end of the bushing to register with the slot and the grooves of the bearing portion; a bolt slidably mounted within the bushing slot and provided with lugs formed upon the inner end to engage the notches and grooves to prevent rotation of the bushing when the bolt is in a locking position; a stem engaging portion formed upon the outer end of the bolt, said portion being movable to engage the slot in the end of the knob stem when the bolt is moved to an unlocking position, and to disengage said slot when the bolt is moved to locking position; a knob secured upon the outer end of the bushing; a cylinder lock mounted within the outer end of the knob; and bolt actuating means secured to the cylinder of the lock and movable thereby for moving the bolt to locking and unlocking positions.

6. A door knob lock comprising a knob stem extending through a door and adapted to actuate a 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 rotatably engaging the adjacent end of the stem; a bolt slidably mounted upon the bushing and extending therethrough; means carried by the bolt to engage and disengage the bearing plate and bushing simultaneously, the bushing being locked against rotation relative to the bearing plate when said means is in engaging position and said bushing being rotatable within the bearing plate when said means is in disengaging position; means carried by the bolt to engage and disengage the stem independently of the bushing, said means engaging the stem when the plate and bushing engaging means is moved to disengaging position and said means disengaging said stem when said plate and bushing engaging means is moved to engaging position, whereby the stem may be turned to actuate the lock from the end remote from the bolt when the bolt is in either position; and a member secured to the bushing for turning said bushing and stem when the bolt is in bushing disengaging position, said member being provided with key actuated means for moving the bolt to its engaging and disengaging positions.

In witness whereof, I hereunto set my signature.

ELLING ELLINGSON.