

March 14, 1944.

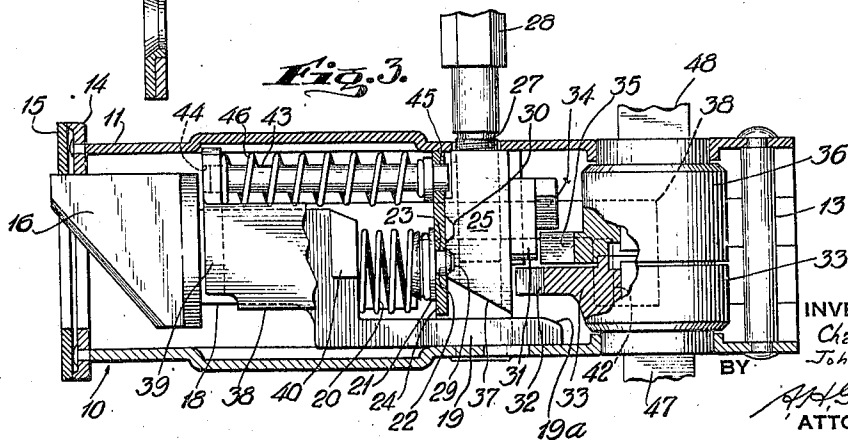
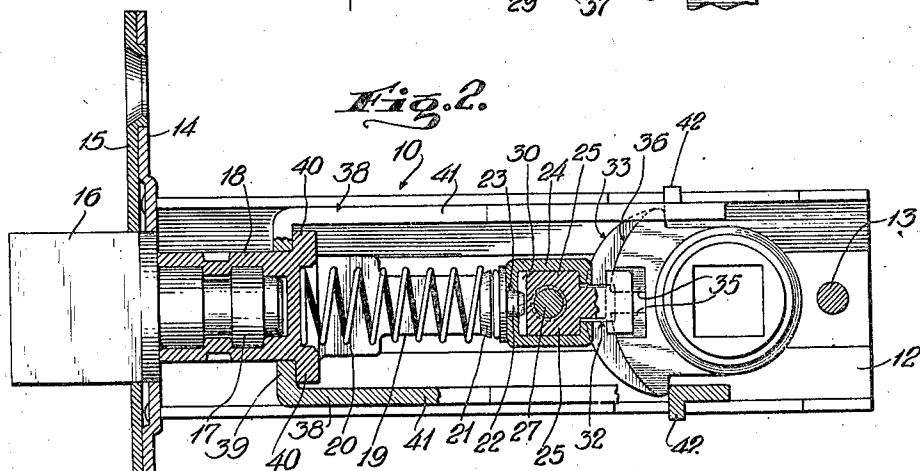
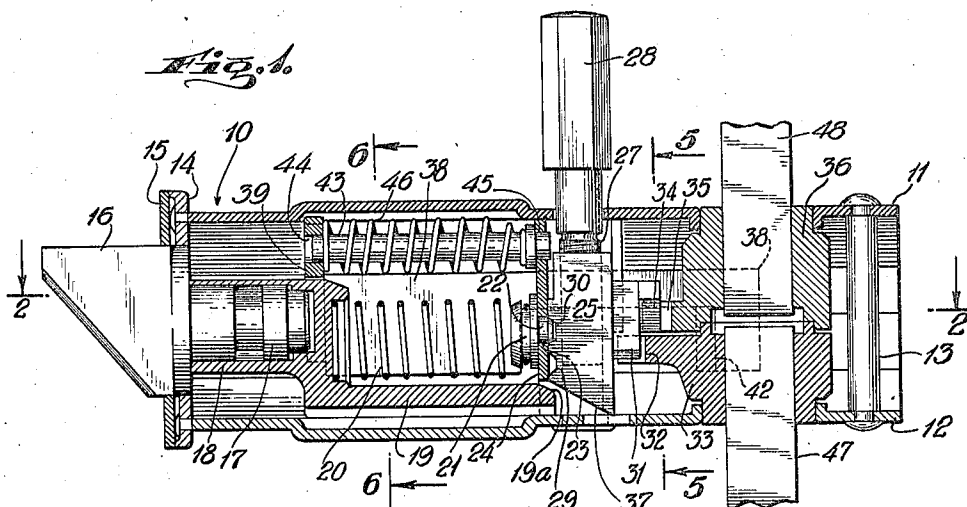
C. LEDIN ET AL

2,344,484

TUBULAR LOCK

Filed March 29, 1941

2 Sheets-Sheet 1



INVENTOR
Charles Ledin
John P. Andrew
BY
A. H. Golden
ATTORNEY

March 14, 1944.

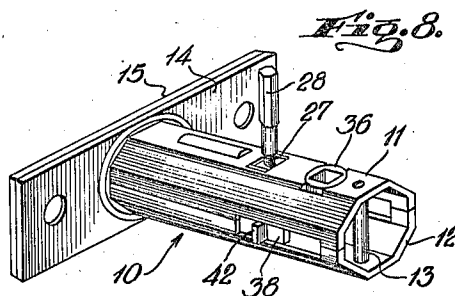
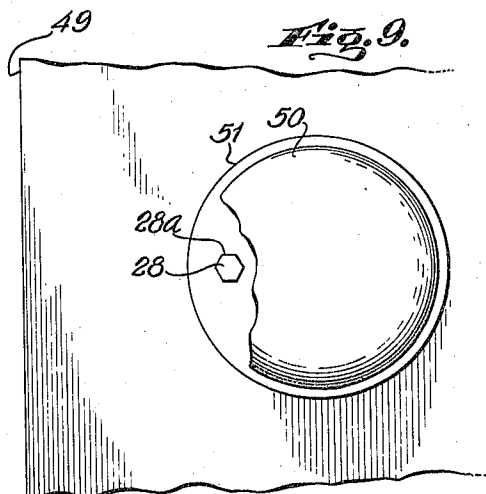
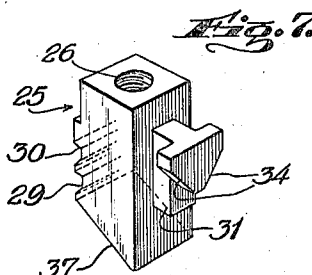
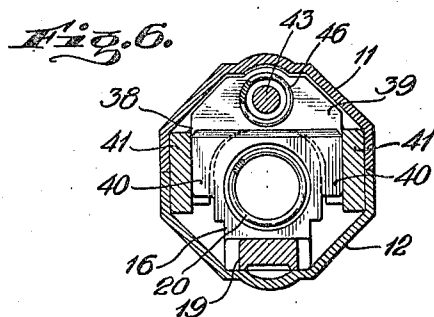
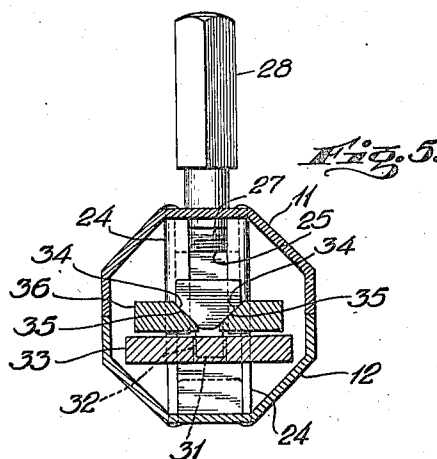
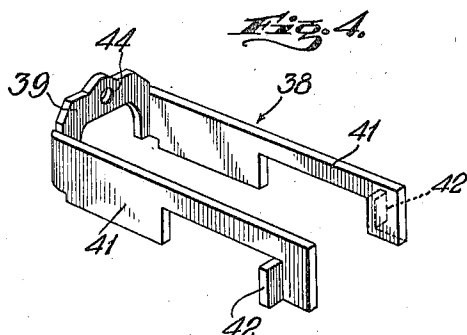
C. LEDIN ET AL

2,344,484

TUBULAR LOCK

Filed March 29, 1941

2 Sheets-Sheet 2



INVENTORS
Charles Ledin
John P. Andrew
BY *H. Golden*
ATTORNEY

UNITED STATES PATENT OFFICE

2,344,484

TUBULAR LOCK

Charles Ledin, Stamford, Conn., and John P. Andrew, New Rochelle, N. Y., assignors to The Yale & Towne Manufacturing Company, Stamford, Conn., a corporation of Connecticut

Application March 29, 1941, Serial No. 385,824

13 Claims. (Cl. 292-169)

This invention relates to locks, and more especially to tubular locks of the type in which a latch bolt is retracted by inside and outside rollbacks, with the feature that the outside rollback may be locked by a push piece to prevent its operation. While locks of this general type are old and well known in the art, our invention is directed to a particular construction whereby we obtain, in a single tube lock, a functioning and operation of the parts which is extremely desirable.

As an important feature of our invention, we are able to obtain, in a single tube tubular lock, an "easy action" latch bolt in combination with an automatic throw-off push piece. By an "easy action" latch bolt, we mean a latch bolt which is projected by an extremely light spring, so that it may be easily latched back when it hits the strike to allow for facilitated closing of the door, while at the same time, the knob retraction of the latch bolt is opposed by a relatively heavier spring resistance, all as will be appreciated by those skilled in the art.

As a further feature of our invention, the push piece which locks the outside rollback is retained yieldingly in its locking position by a spring, which is preferably the spring which projects the latch bolt. In this way, the movement of the push piece is only lightly opposed, and yet the push piece may be effectively retained in locking position. As still a further feature of the invention, the push piece is adapted for automatic throw-off to release position, upon retraction of the latch bolt by the inside knob, or by the strike when the door to which the lock is applied is moved to closed position.

Before proceeding with a detailed description of our invention, we should like to emphasize that the contribution of an easy action latch bolt and an automatic push piece throw-off or release in a simple tubular lock casing of commercial size, is an extremely valuable one, and one which has been long sought. While a preferred form of the means which we have devised is shown in the accompanying drawings and will be described in this specification, it should be understood that we consider our invention to be a relatively broad one, and that we expect to obtain claims which will prevent the utilization of our contribution to the art in physical forms other than that herein shown and described.

Referring now to the drawings, Fig. 1 is a horizontal section through our tubular lock casing showing the various operating parts. Fig. 2 is a section of Fig. 1 taken along lines 2-2. Fig.

3 shows the parts of Fig. 1 in a different operating position. Fig. 4 is a perspective view of a latch retracting yoke utilized in our lock. Figs. 5 and 6 are sections taken respectively along lines 5-5 and 6-6 of Fig. 1. Fig. 7 is a perspective view of the push piece used for locking the outside rollback. Fig. 8 is a perspective view of the tubular lock assembly. Fig. 9 is a view showing a portion of a door to which the lock is applied.

Referring now more particularly to the drawings, and especially Fig. 8, we show there a single tube tubular lock housing designated generally by reference numeral 10, and formed of two parts 11 and 12 which are held together at one end by a pin 13, and at the other end by a face plate 14, which in turn is secured to a decorative face plate 15. The parts 11 and 12 are so formed that the resulting housing 10 is octangular, as is shown, with the internal surfaces thereof acting as guides for the various parts to be described presently.

Referring now more particularly to Figs. 1, 2 and 3, our lock comprises a latch bolt assembly including a bolt head 16 having a rearwardly extending shaft portion 17 adapted to enter a sleeve-like portion 18 of the tail piece 19. A spring 20 presses at one end against the tail piece 19 of the latch bolt assembly, and at its other end is secured in pressure relation to a plug 21 having a pin portion 22 extending through an opening 23 in what we term a push piece guide casing 24. The cross sectional shape of the push piece guide casing 24 is best illustrated in Fig. 2. It is formed preferably of sheet metal bent to the section shown, and secured at its lower end to the housing portion 12, as best shown in Fig. 5, and at its upper end to the housing portion 11.

Slidably mounted within the guide casing 24 is a push piece 25 (Fig. 7) internally threaded at 26 for threaded engagement with the threaded end 27 of a push button 28, as best illustrated in Fig. 8. The push piece has detent portions 29 and 30 formed thereon, with which is cooperable the pin 22 of the plug 21 for yieldingly retaining the push piece in its position of Fig. 1 or in its position of Fig. 3.

As will be noted, the push piece 25 has a locking lug 31 which is adapted to enter a slot 32 formed in an outside operated rollback 33, which is rotatably mounted in the casing in a conventional manner well understood by those skilled in the art. It is obvious that when the push piece 25 is in its position of Fig. 1, the locking lug 31 will be within the slot 32 of the outside rollback, and will effectively lock the rollback against rotation. At the same time, a pair of cam sur-

faces 34 which are integral with the push piece 25 and are located above the locking lug 31, are cooperable with camming surfaces 35 formed on an inside rollback 36, also mounted within the casing in a conventional manner well understood by those skilled in the art (Fig. 5).

With the push piece in its locking position of Figs. 1 and 5, the outside rollback 33 cannot be rotated. The inside rollback 36 may however be rotated, and one of its camming surfaces 35 will cooperate with one of the cam surfaces 34 to move the push piece from its position of Fig. 1 to the position of Fig. 3. This movement will of course be against the yielding pressure of the pin 22 of the plug 21 as effected by the pressure of spring 20.

Should the push piece 25 be moved to its locking position of Fig. 1 and the door slammed shut, it is obvious that the bolt head 16 will be moved rearwardly as it contacts its strike, all in the usual manner. The rearward movement of the latch bolt is illustrated in Fig. 3, and it will be noticed that the end surface 19a of the tail piece 19, formed in the manner of a cam, will cooperate with the angular surface 37 of the push piece 25 for camming the push piece upwardly to the position of Fig. 3, all as is quite apparent. Reviewing what has already been described, it is quite clear that the push piece 25 locks the outside rollback 33 when it is depressed into its position of Fig. 1. It is also clear that the push piece 25 may be moved back to its unlocked position by rotation of the inside rollback 36, or by retraction of the latch bolt as it impinges against its strike.

For retracting the latch bolt by the inside and outside rollbacks, we use what we choose to term a yoke 38, one form of which is shown best in perspective in Fig. 4. This yoke is preferably U-shaped, and has its closed end 39 fitting over shoulders 40 formed on the sleeve portion 18 of the latch bolt assembly. The parallel legs 41 of the yoke 38 extend rearwardly at each side of the casing 10, as best illustrated in Fig. 2, to a point beyond the push piece housing 24, and have bent out portions 42 cooperable with portions of the outside rollback 33 and the inside rollback 36.

A spring guide pin 43 fits at one end within an opening 44 in the closed end 39 of the yoke, and at 45 in an opening of the push piece guide casing 24. A spring 46 surrounds the guide pin 43 and serves to project the yoke 38 into its position of Fig. 1. It will now be readily appreciated that rotation of either the inside or the outside rollback will retract the yoke 38 against the pressure of the spring 46, and that the yoke will act to retract the latch bolt through its cooperation with the shouldered portion 40 of the latch bolt assembly. This retraction of the latch bolt will take place against the additional pressure of the spring 20. Therefore, it is quite clear that the retraction of the latch bolt by the rollbacks will take place against the combined pressure of springs 20 and 46, yielding a type of action which is very desirable for knob operation, for which the present latch is particularly intended.

It will be noted that spindle portions of the type well known in the art and designated by reference numerals 47 and 48, cooperate respectively with the outside and inside rollbacks. It will be noted also that the latch bolt itself may be retracted by the endwise pressure of a strike against the resistance of the relatively light

spring 20, to yield what is termed an "easy action" latch bolt, all as has been more particularly set forth above.

In Fig. 9, we show our lock applied to a door 49, and with an inside knob 50 rotating relatively to an inside rose 51 through which projects the push button 28, which is threaded into the push piece 25, as has already been described. It is obvious that the hexagon shape of the push button 28 cooperates with the opening 28a in the rose 51 to prevent rotation of the push button once it has been rotated to a particular adjusted relation to the push piece 25 through the cooperation of its threaded portion 27 with the threaded opening 26 of the push piece. This particular construction is not, however, novel with us, and is merely described here to present a more complete description of the method of mounting the lock in a door.

We now claim:

1. In a lock of the class described, a substantially tubular housing, a latch bolt slidable in said housing, a push piece guide secured in said housing and transversely thereof, a spring extending between said latch bolt and said push piece guide for projecting said latch bolt, a latch bolt retracting yoke having a portion impinging against a portion of said latch bolt and a leg portion extending towards and beyond said push piece guide, whereby said yoke will retract said latch bolt while said latch bolt may be retracted independently of said yoke, a spring between said push piece guide and the yoke for projecting said yoke, inside and outside rollbacks mounted in said housing for cooperation with said leg portion for retracting said yoke and latch bolt, and a push piece in said push piece guide for locking one of said rollbacks when pushed into a predetermined position.

2. In a lock of the class described, a substantially tubular housing, a latch bolt slidable in said housing, a push piece guide secured in said housing and transversely thereof, a spring for projecting said latch bolt, a yoke fitting over a portion of said latch bolt and having a portion extending towards and beyond said push piece guide, whereby said yoke will retract said latch bolt while said latch bolt may be retracted independently of said yoke, a spring for projecting said yoke, inside and outside rollbacks mounted in said housing for cooperation with said yoke for retracting said yoke and latch bolt, a push piece for locking one of said rollbacks when pushed into a predetermined position, and means whereby one of said springs maintains said push piece yieldingly in said predetermined position.

3. In a lock of the class described, a substantially tubular housing, a latch bolt slidable in said housing, a push piece guide secured in said housing and transversely thereof, a spring extending between said latch bolt and said push piece guide for projecting said latch bolt, a yoke fitting over a portion of said latch bolt and extending towards and beyond said push piece guide, whereby said yoke will retract said latch bolt while said latch bolt may be retracted independently of said yoke, a spring between said push piece guide and said yoke for projecting said yoke, inside and outside rollbacks mounted in said housing for retracting said yoke and latch bolt, a push piece in said push piece guide for locking one of said rollbacks when pushed into a predetermined position, and means whereby one of said springs maintains said push piece yieldingly in said predetermined position.

4. In a lock of the class described, a substantially tubular housing, a latch bolt slidable in said housing, a push piece guide secured in said housing and transversely thereof, a spring extending between said latch bolt and said push piece guide for projecting said latch bolt, a U-shaped yoke having its closed end fitting over a portion of said latch bolt and with its parallel leg portions extending towards and beyond said push piece guide in straddling relation thereto, whereby said yoke will retract said latch bolt while said latch bolt may be retracted independently of said yoke, a spring between said push piece guide and the closed end of said U-shaped yoke for projecting said yoke, inside and outside rollbacks mounted in said housing for cooperation with said parallel legs for retracting said yoke and latch bolt, a push piece in said push piece guide for locking one of said rollbacks when pushed into a predetermined position, and means whereby one of said springs maintains said push piece yieldingly in said predetermined position.

5. In a lock of the class described, a housing, a beveled strike engaging latch bolt slidable in said housing, a rollback for retracting said latch bolt to withdraw it from locking engagement with said strike, a push piece for locking said rollback against rotation while leaving said latch bolt free for retraction independently of said rollback, a spring in said housing having one end pressing directly against a surface of said latch bolt projecting said latch bolt outwardly relatively to said housing, and a plug against which the other end of said spring presses in all positions of said latch bolt whereby to maintain a portion of said plug yieldingly in position relatively to a cooperating portion of said push piece for yieldingly resisting the movement of said push piece.

6. In a lock of the class described, a housing, a latch bolt slidable in said housing, a rollback for retracting said latch bolt, a push piece for locking said rollback against rotation, a guide plate in said housing for said push piece and having an opening, a spring in said housing having one end projecting said latch bolt outwardly relatively to said housing, a plug against which the other end of said spring presses, said plug having a portion extending through said guide plate opening and cooperable with a portion of said push piece whereby to retain said push piece yieldingly in a particular position.

7. In a lock of the class described, a housing, a latch bolt slidable in said housing, a rollback for retracting said latch bolt, a push piece for locking said rollback against rotation, a guide casing positioned transversely in said housing for guiding said push piece, a spring in said housing having one end projecting said latch bolt outwardly relatively to said housing, a plug pressed by the other end of said spring against said guide casing and with a portion thereof extending through an opening in the guide casing, said plug portion cooperating with spaced detent surfaces on said push piece for yieldingly retaining said push piece in particular spaced positions to which it is moved.

8. In a lock of the class described, a housing, a latch bolt slidable in said housing, a rollback for retracting said latch bolt, a push piece for locking said rollback against rotation, a guide casing positioned transversely in said housing for guiding said push piece, a spring in said housing having one end projecting said latch bolt outwardly relatively to said housing, a plug pressed

by the other end of said spring against said guide casing and with a portion thereof extending through an opening in the guide casing, said plug portion cooperating with spaced detent surfaces on said push piece for yieldingly retaining said push piece in particular spaced positions to which it is moved, a cam surface formed on said push piece, and a portion of said latch bolt adapted to impinge against said cam surface to move said push piece from one position in which it is yieldingly retained by said plug, to a second position.

9. In a lock of the class described, a substantially tubular housing, a latch bolt slidable in said housing, a push piece guide secured in said housing and transversely thereof, a spring extending between said latch bolt and said push piece guide for projecting said latch bolt, a U-shaped yoke having its closed end fitting over a portion of said latch bolt and with its parallel leg portions extending towards and beyond said push piece guide, whereby said yoke will retract said latch bolt while said latch bolt may be retracted independently of said yoke, a spring between said push piece guide and the closed end of said U-shaped yoke for projecting said yoke, inside and outside rollbacks mounted in said housing for cooperation with said parallel legs for retracting said yoke and latch bolt, a push piece in said push piece guide for locking one of said rollbacks when pushed into a predetermined position, means whereby one of said springs maintains said push piece yieldingly in said predetermined position, and means on said latch bolt when it is retracted for pushing said push piece away from said position in which it is retained by said spring.

10. In a lock of the class described, a substantially tubular housing, a latch bolt slidable in said housing, a push piece guide secured in said housing and transversely thereof, a spring extending between said latch bolt and said push piece guide for projecting said latch bolt, a U-shaped yoke having its closed end fitting over a portion of said latch bolt and with its parallel leg portions extending towards and beyond said push piece guide in straddling relation thereto, whereby said yoke will retract said latch bolt while said latch bolt may be retracted independently of said yoke, a spring between said push piece guide and the closed end of said U-shaped yoke for projecting said yoke, inside and outside rollbacks mounted in said housing for cooperation with said parallel legs for retracting said yoke and latch bolt, a push piece in said push piece guide for locking one of said rollbacks when pushed into a predetermined position, means whereby one of said springs maintains said push piece yieldingly in said predetermined position, and means on the inside rollback for moving said push piece away from a particular position in which it is retained by said spring as said rollback is rotated to retract said latch bolt.

11. In a lock of the class described, a tubular housing, a latch bolt slidable in said housing, independently rotatable inside and outside rollbacks in said housing for retracting said latch bolt, a push piece mounted for axial movement transversely of said housing and adapted for manual movement from the inside of said lock into locking position, means on said push piece movable into a slot in said outside rollback for locking said outside roll back when said push piece is so moved into locking position while leaving said inside roll back free to retract said

latch bolt, means on said latch bolt for contacting said push piece when said latch bolt is retracted whereby to move said push piece out of its locking position and into a release position, and spring means yieldingly retaining said push piece in said locking position and in its release position and yieldingly resisting the movement of said push piece from one position to the other.

12. In a lock of the class described, a housing, a beveled strike engaging latch bolt slidable in said housing, a rollback for retracting said latch bolt to withdraw it from locking engagement with said strike, a push piece mounted for movement in said housing into a release position and into a locking position for locking said rollback against rotation, while leaving said latch bolt free for retraction independently of said rollback, a spring in said housing having one end pressing directly against a surface of said latch bolt effecting the projection of said latch bolt outwardly relatively to said housing, means whereby the other end of said spring coacts with said push piece in all positions of said latch bolt for yieldingly resisting the movement of said push piece

from said release and locking positions, and means whereby said latch bolt moves said push piece out of locking position and into release position when said latch bolt is retracted while said push piece is in locking position.

13. In a lock of the class described, a housing, a beveled strike engaging latch bolt slidable in said housing, a rollback for retracting said latch bolt to withdraw it from locking engagement with said strike, a push piece mounted for movement in said housing into a release position and into a locking position for locking said rollback against rotation while leaving said latch bolt free for retraction independently of said rollback, a spring in said housing having one end pressing directly against a surface of said latch bolt effecting the projection of said latch bolt outwardly relatively to said housing, means whereby the other end of said spring coacts with said push piece in all positions of said latch bolt for yieldingly resisting the movement of said push piece from either of said positions to the other position.

CHARLES LEDIN.
JOHN P. ANDREW.