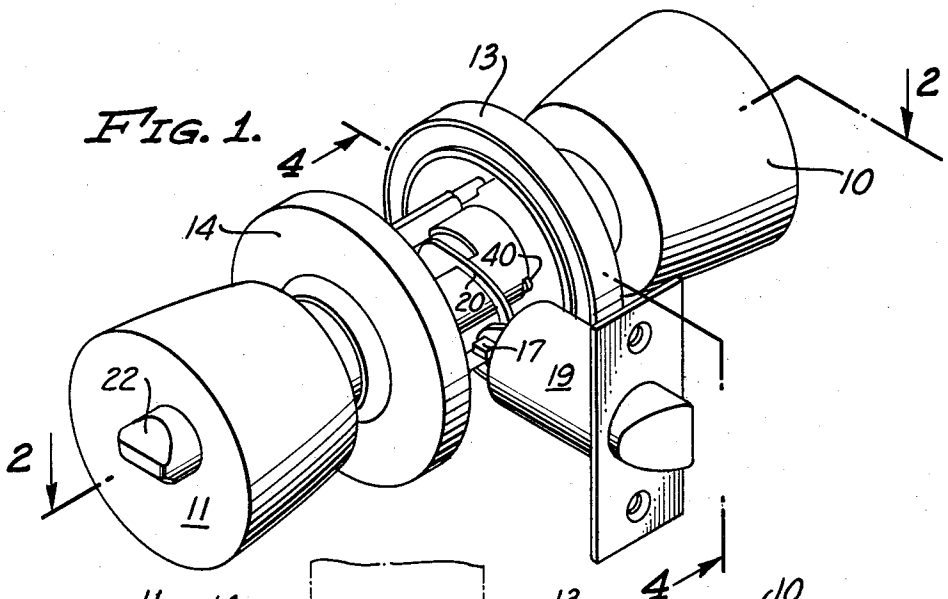
Oct. 1, 1963 W. J. DUVALL 3,105,712

PRIVACY SET

Filed Feb. 10, 1961 2 Sheets-Sheet 1

FIG. 1.



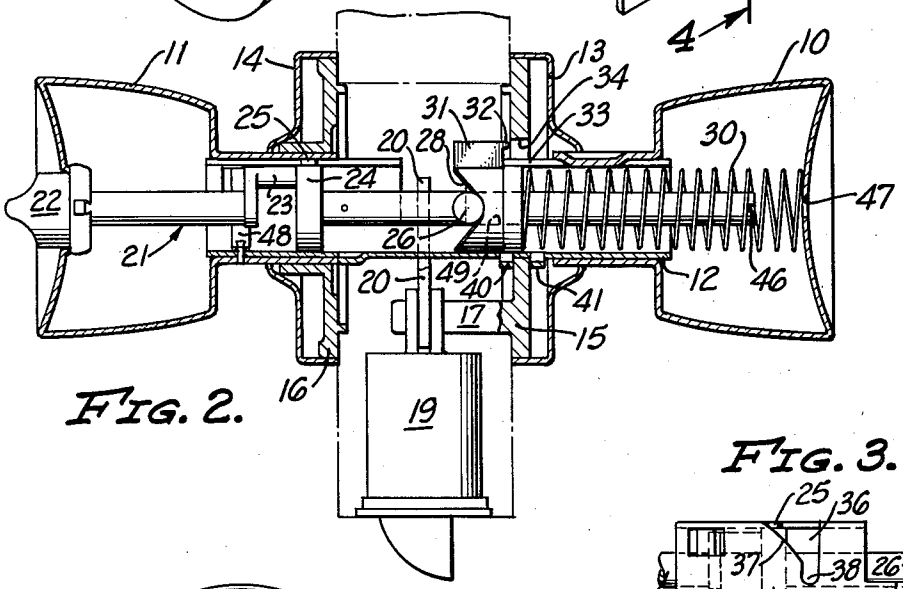
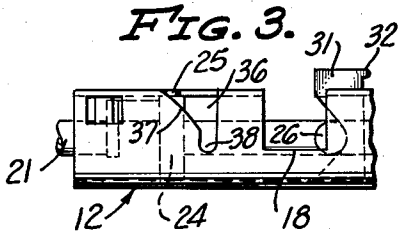


FIG. 2.

FIG. 3.



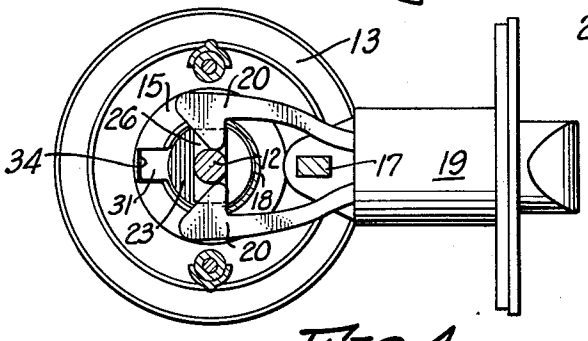


FIG. 4.

INVENTOR.
WALTER J. DUVALL
BY Robert C. Comstock
ATTORNEY

Oct. 1, 1963 W. J. DUVALL 3,105,712

PRIVACY SET

Filed Feb. 10, 1961 2 Sheets-Sheet 2

FIG. 5.

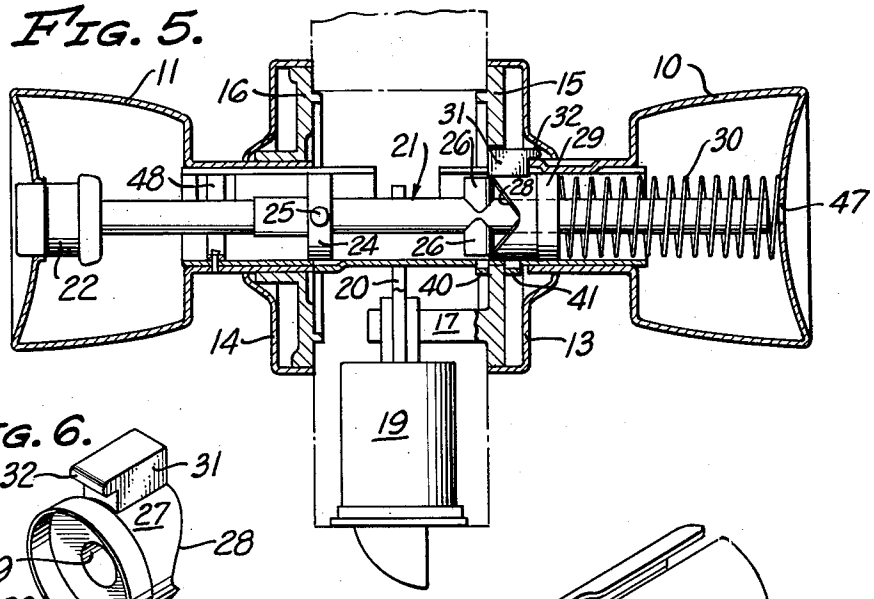


FIG. 6.

FIG. 7.

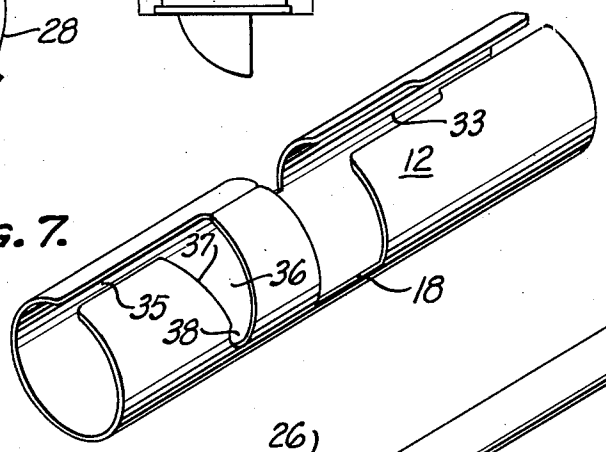


FIG. 8.

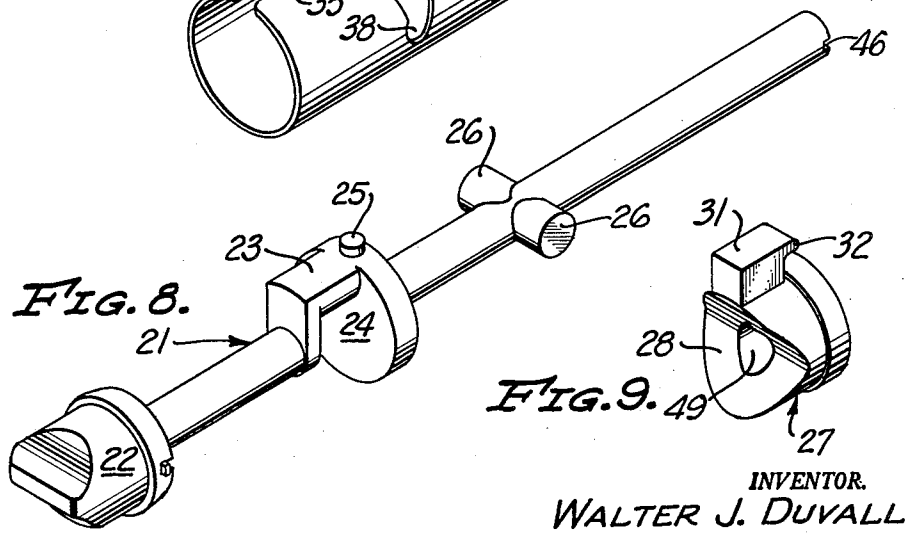


FIG. 9.

INVENTOR.
WALTER J. DUVALL
BY Robert C. Comstock
ATTORNEY

United States Patent Office

3,105,712

Patented Oct. 1, 1963

3,105,712

PRIVACY SET

Walter J. Duvall, P.O. Box 866, Chula Vista, Calif.

Filed Feb. 10, 1961, Ser. No. 88,413
9 Claims. (Cl. 292—169)

This invention relates to a privacy set of the cylindrical type which is particularly adapted for residential use.

It is an object of my invention to provide a privacy set which is simple in its construction and operation. It is a more particular object of my invention to provide a privacy set which utilizes only a single spindle instead of a pair of spindles.

A further object of my invention is to provide a privacy set in which the required amount of movement of the thumb piece is held to a minimum, so that the thumb piece does not protrude too far from the knob.

Another object of my invention is to provide a privacy set which can be used on doors of either 1⅜" or 1¾" thickness without any change or adjustment whatsoever being required in the construction or operation of the set. It is more particularly an object of my invention to provide a privacy set in which both the positioning and the amount of longitudinal movement of the thumb piece are unchanged by the thickness of the door on which the set is used.

In a conventional privacy set, the thumb piece is used to move the locking member to locked position. The thumb piece is customarily moved inwardly and then rotated in order to lock it in its inward position. With my invention, this customary rotational movement of the thumb piece is made to serve a dual rather than a single purpose. This rotation is utilized not only to lock the thumb piece in its inward position, but also to provide additional longitudinal movement of the locking member toward locked position. This is achieved through a cam, whereby the rotation of the thumb piece to its locked position imparts added longitudinal movement to the locking member. Thus, the direct inward movement of the thumb piece provides part of the longitudinal movement of the locking member and the rotation of the thumb piece provides the remaining necessary longitudinal movement of the locking member. With my invention, it is accordingly possible to construct a privacy set with a single spindle and without requiring any added longitudinal movement of the thumb piece.

It is accordingly an object of my invention to provide a privacy set having all of the advantages and benefits of the structure described above and hereinafter in this specification.

It is a further object of my invention to provide a privacy set which is more economical to manufacture and assemble and which is more foolproof in operation.

My invention also comprises such other objects, advantages and capabilities as will later more fully appear and which are inherently possessed by my invention.

While I have shown in the accompanying drawings a preferred embodiment of my invention, it should be understood that the same is susceptible of modification and change without departing from the spirit of my invention.

Referring to the drawings,

FIG. 1 is an isometric view of my privacy set assembled in unlocked position;

FIG. 2 is a longitudinal sectional view of the same, taken on lines 2—2 of FIG. 1;

FIG. 3 is a side elevational view of the center of the spindle and related locking portions;

FIG. 4 is a sectional view taken on line 4—4 of FIG. 1;

FIG. 5 is a sectional view similar to FIG. 2, showing the set in locked position;

FIG. 6 is an enlarged rear isometric view of the cam lock;

FIG. 7 is an enlarged isometric view of the spindle;

FIG. 8 is an enlarged isometric view of the thumb piece and slide;

FIG. 9 is an enlarged front isometric view of the cam lock.

A preferred embodiment which has been selected to illustrate my invention comprises a pair of manually rotatable knobs 10 and 11, which are mounted on the opposite ends of an elongated hollow cylindrical spindle 12. One knob 10 is permanently mounted on one end of the spindle 12, while the other knob 11 is removably mounted on the opposite end of the spindle 12 by a semi-circular leaf spring 48. A pair of escutcheon plates 13 and 14 are disposed inwardly from the knobs 10 and 11. The escutcheon plates 13 and 14 fit over a pair of mounting plates 15 and 16. A rectangular post 17 extends inwardly from the mounting plate 15. The midportion of the spindle 12 is cut away to leave an arcuate portion 18 of less than 180°. A bolt assembly 19 is removably mounted on the post 17, the bolt being retracted by movement of a pair of fingers 20 which fit around the arcuate portion 18 of the spindle 12.

Complete details regarding the construction and operation of the conventional portions of the lock set are shown and described in my co-pending application Serial No. 27,625, filed May 9, 1960, now Patent No. 3,042,437, issued July 3, 1962. The adjustment of the set for doors of different thicknesses is also fully described in that application. Briefly stated, the spindle 12 is provided along its lower edge with a pair of outwardly directed projections 40 and 41, which are spaced longitudinally from each other along the spindle 12. These projections normally limit the longitudinal movement of the mounting plate 15 along the spindle 12.

The mounting plate 15 is provided with an opening 34, which is disposed diametrically opposite from the post 17. The mounting plate 15 may be rotated to bring the opening 34 into alignment with the projections 40 and 41. For a door of 1⅜" thickness, the mounting plate 15 is moved past the outermost projection 41 and into engagement with the innermost projection 40. It is then rotated back to its normal position.

While the opening 34 is also utilized as a part of the present invention, the subject matter of the present application may be used equally well with any type of adjustment for door thickness. It may also, of course, be utilized with a nonadjustable set.

The locking and unlocking of my privacy set are controlled by an elongated rod-like slide 21, which is mounted for longitudinal movement within the spindle 12. A thumb piece 22 is mounted on one end of the spindle 12 and protrudes through an opening in the center of the knob 11. The base of the thumb piece 22 engages the portion of the knob 11 surrounding the opening to limit the outward movement of the thumb piece 22.

The slide 21 is provided with a dog-leg 23, which is designed to permit the easy insertion and removal of the semi-circular spring 48 which holds the knob 11 on the spindle 12. Directly adjacent to the dog-leg 23 is a circular portion 24, which carries an outwardly projecting pin 25. The outer diameter of the circular portion 24 is slightly less than the inner diameter of the spindle 12, so that the pin 25 projects from the spindle 12 when the slide 21 is mounted therein.

Beyond the circular portion 24, the slide 21 is provided with a pair of radially directed arms 26 of circular cross section. The length of the arms 26 is slightly less than the inner diameter of the spindle 12, so that they are free to rotate therein. The end of the slide 21 remote from the thumb piece 22 is provided with a transverse slot 46.

The knob 10 is provided with a central opening 47 to permit the insertion of a screw driver or other keying device into the slot 46 for emergency release of the lock.

A cam lock 27 is mounted on the slide 21 directly adjacent to the arms 26. The side of the cam lock 27 which engages the arms 26 is provided with an inwardly curved cam surface 28. The arms 26 normally fit within and extend across the innermost portion of the cam surface 28.

The opposite side of the cam lock 27 is provided with a circular spring mounting cup 29, which removably receives one end of an elongated coil spring 30. The coil spring 30 surrounds one end of the slide 21, extending from the cam lock 27 to the inside of the knob 10, surrounding the opening 47.

The top of the cam lock 27 is provided with a locking lug 31, having an overhanging lip 32. The spindle 12 is provided at the top thereof with a wide slot 33, through which the lug 31 projects. The previously mentioned opening 34 in the mounting plate 15, which may be used for adjusting the set for doors of different thicknesses, is substantially aligned with the slot 33 in the spindle 12. Upon the longitudinal movement of the cam lock 27, the lug 31 moves along the slot 33 into the opening 34 to lock the spindle 12 and knobs 10 and 11 against rotation with respect to the fixed mounting plate 15 and thus lock the bolt against retraction.

The end of the spindle 12 which is disposed toward the knob 11 is provided with an elongated longitudinal slot 35, which permits movement of the pin 25 as the slide 21 is inserted into the spindle 12. The slot 35 connects at its inner end with a larger transversely directed slot 36, which has an angularly directed cam surface 37 along which the pin 25 is adapted to travel upon rotation of the slide 21. The end of the slot 36 is provided with a slightly reversed notch 38 into which the pin 25 is moved by the spring 30 upon the termination of its inward and rotational movement.

When my privacy set is in unlocked condition, the thumb piece 22 is disposed in outward position, projecting slightly outwardly from the center of the knob 11. The pin 25 is disposed at the upper end of the cam surface 37 of the slot 36. The arms 26 of the slide 21 extend horizontally and are disposed within the cam surface 28 of the cam lock 27. The lug 31 is disposed within the slot 33, but is outside of the opening 34. Upon the rotation of either of the knobs 10 or 11, the spindle 12 is rotated to move the fingers 20 and retract the bolt.

To lock the set, the thumb piece 22 is moved inwardly and rotated clockwise 90°, rotating the slide 21 within the spindle 12. The inward movement and rotation of the slide 21 can be achieved in the order named or simultaneously. Upon this movement of the slide 21, the circular member 24 is rotated to move the pin 25 along the cam surface 37 until it reaches the notch 38. The inward movement of the slide 21 is achieved against the urging of the coil spring 30. Upon release of the thumb piece 22 at the end of the movement, the coil spring 30 urges the pin 25 outwardly so that it is held within the notch 38 to hold the slide 21 in locked position and prevent its reverse rotation to unlocked position.

The inward movement of the slide 21 moves the cam lock 27 toward the mounting plate 15. The rotation of the slide 21 causes the arms 26 to rotate. As they rotate from a horizontal to a vertical position, the arms 26 travel along the cam surface 28 of the cam lock 27 until they are in a vertical position engaging the inner edge of the cam lock 27 as shown in FIG. 5 of the drawings. It will be noted that the cam lock 27 has thus been moved longitudinally to a greater degree than the slide 21. This movement is sufficient to move the lug 31 into the opening 34 of the mounting plate 15, with its overhanging lip 32 fitting over the shank of the knob 10.

The lug 31 effectively locks the spindle 12 to the fixed mounting plate 15 and prevents rotation of the spindle 12 to prevent retraction of the bolt. The set is then in locked condition.

The set is normally unlocked by rotation of the thumb piece 22 in a counter-clockwise direction, which moves the pin 25 out of the notch 38. The spring 30 then urges the slide 21 outwardly with respect to the spindle 12. As the slide 21 moves outwardly, the pin 25 engages the cam surface 37 to rotate the slide 21 back to its normal position. The cam surface 28 of the cam lock 27 also engages the arms 26 to urge the reverse rotation of the slide 21. In an emergency, the slide 21 can be rotated from its opposite end through use of the slot 46.

It will be noted that the cam lock 27 is provided with a central circular opening 49, which is dimensioned to fit loosely around the slide 21 to permit the necessary longitudinal movement of the cam lock 27 with respect to the slide 21 as the slide 21 is rotated.

It may also be noted that the leaf spring 48 serves a dual purpose. Its primary purpose is to hold the knob 11 on the spindle 12. It also acts to hold the working assembly of the lock set within the spindle 12, since the slide 21, cam lock 27 and spring 30 cannot be removed from the spindle 12 while the leaf spring 48 is in place. This facilitates handling of the set during assembly operations.

While I have shown and described my invention in use in a privacy set, it should be understood that it is also capable of being used in other types of lock sets, such as entry sets, as well.

I claim:

1. In a lock set having an elongated cylindrical spindle, a pair of knobs mounted on opposite ends of said spindle and adapted to rotate said spindle, a bolt connected to said spindle for operation upon the rotation of said spindle, a stationary mounting plate disposed adjacent one end of said spindle, an elongated slide mounted for longitudinal and rotational movement within said spindle, and a thumb piece carried by one end of said slide, a pair of transversely directed arms carried by said slide remote from said thumb piece, a cam lock mounted for longitudinal movement on said slide and within said spindle directly adjacent to said arms, said cam lock having on one side thereof an inwardly curved cam surface, said arms normally engaging the inner portion of said cam surface, the opposite side of said cam lock having a spring cup directed toward the adjacent knob, a coil spring having one end thereof disposed within said spring cup and the other end engaging the inside of said adjacent knob, said spring urging said slide outwardly with respect to said spindle, a lug carried by said cam lock, said spindle having a longitudinal slot disposed adjacent to said cam lock, said lug being mounted for longitudinal movement within said longitudinal slot, said stationary mounting plate having an opening therein adjacent to said spindle, said opening being aligned with said longitudinal slot, said spindle having a transverse slot, said transverse slot having an angularly directed cam surface, a pin carried by said slide and engageable with said cam surface, a notch disposed at one end of said transverse slot, said pin moving along the cam surface of said transverse slot into said notch and being held therein by said spring upon the rotation of said slide, said arms moving along the cam surface of said cam lock from the inner portion thereof to an outer portion thereof to move said lug into the opening in said mounting plate to lock said spindle against rotation, said spring urging said slide and cam lock back to normal position upon the release of said pin from said notch by reverse rotation of said slide.

2. In a lock set having an elongated cylindrical spindle, a pair of knobs mounted on opposite ends of said spindle, a bolt connected to said spindle for operation upon the rotation of said spindle, a stationary mounting plate disposed adjacent one end of said spindle, an elongated slide mounted for longitudinal movement

within said spindle, and a thumb piece carried by one end of said slide, a pair of transversely directed arms carried by said slide remote from said thumb piece, a cam lock mounted for longitudinal movement on said slide and within said spindle directly adjacent to said arms, said cam lock having on one side thereof an inwardly curved cam surface, said arms engaging said cam surface, a coil spring disposed between said cam lock and the adjacent knob, said spring urging said slide outwardly with respect to said spindle, a lug carried by said cam lock, said spindle having a longitudinal slot disposed adjacent to said cam lock, said lug being mounted for longitudinal movement within said longitudinal slot, said stationary mounting plate having an opening therein adjacent to said spindle, said opening being aligned with said longitudinal slot, said spindle having an angularly directed cam surface, a pin carried by said slide and adapted to move along said cam surface upon the rotation of said slide, said arms moving along the cam surface of said cam lock to an outer portion thereof to move said lug into the opening in said mounting plate to lock said spindle against rotation, said spring urging said slide and cam lock back to normal position upon the release of said pin from said notch by reverse rotation of said slide.

3. In a lock set having an elongated cylindrical spindle, a bolt connected to said spindle for operation upon the rotation of said spindle, a stationary mounting plate disposed adjacent one end of said spindle, an elongated slide mounted for longitudinal movement within said spindle, a pair of transversely directed arms carried by said slide, a cam lock mounted for longitudinal movement on said slide directly adjacent to said arms, said cam lock having a cam surface, said arms engaging said cam surface, spring means urging said slide outwardly with respect to said spindle, a lug carried by said cam lock, said spindle having a slot adjacent to said cam lock, said lug being mounted for movement within said slot, said stationary mounting plate having an opening therein, said opening being aligned with said slot, said slide being movable inwardly within said spindle against the urging of said spring, said slide being rotatable within said spindle to move said arms along the cam surface of said cam lock to move said cam lock longitudinally and move said lug into the opening in said mounting plate to lock said spindle against rotation.

4. In a lock set having an elongated cylindrical spindle, a bolt connected to said spindle for operation upon the rotation of said spindle and a stationary mounting plate disposed adjacent one end of said spindle, an elongated slide mounted within said spindle, a cam lock mounted for longitudinal movement on said slide, said cam lock having a cam surface, means on said slide engaging said cam surface, said spindle and stationary mounting plate having aligned openings therein, means carried by said cam lock for entering both of said openings to lock said spindle against rotation, said slide being movable longitudinally inwardly and rotatably within said spindle to move said cam lock so that said means on said cam lock enters said openings to lock said spindle against rotation.

5. The structure described in claim 4, and spring means normally urging said slide outwardly with respect to said spindle, and means engageable between said slide and spindle to hold said slide in its longitudinally inward and rotated position against the urging of said coil spring.

6. In a lock set having an elongated cylindrical spindle, a bolt connected to said spindle for operation upon the rotation of said spindle, and a stationary mounting plate disposed adjacent said spindle, an elongated slide mounted within said spindle, a cam lock mounted for longitudinal movement on said slide, cam means engageable between said cam lock and slide, said spindle and stationary mounting plate having aligned openings therein, means carried by said cam lock for entering both of said openings to lock said spindle against rotation, said slide being movable longitudinally inwardly and rotatably within said spindle to move siad means into said openings to lock said spindle against rotation.

7. In a lock set having an elongated cylindrical spindle, a bolt connected to said spindle for operation upon the rotation of said spindle and a stationary mounting plate, an elongated slide mounted within said spindle, a cam lock mounted adjacent said fixed mounting plate, a coil spring normally urging said slide outwardly with respect to said spindle, said slide being movable longitudinally inwardly within said spindle to move said cam lock toward said fixed mounting plate, said slide being rotatable within said spindle, cam means engageable between said slide and cam lock whereby the rotational movement of said slide provides additional longitudinal movement of said cam lock to move said cam lock longitudinally to a locking position wherein it provides locking engagement between said spindle and fixed mounting plate to prevent the operation of said bolt, and means engageable between said slide and spindle to hold said slide in its longitudinal inward and rotated position against the urging of said coil spring.

8. In a lock set having an elongated spindle, a bolt connected to said spindle for operation upon the rotation of said spindle and a stationary mounting plate, an elongated slide mounted within said spindle, a cam lock mounted adjacent said fixed mounting plate, said slide being movable longitudinally within said spindle to move said cam lock toward said fixed mounting plate, said slide being rotatable within said spindle, cam means engageable between said slide and cam lock whereby the rotational movement of said slide provides added longitudinal movement of said cam lock to a locking position wherein it provides locking engagement between said spindle and fixed mounting plate to prevent the operation of said bolt.

9. In a lock set having an elongated spindle, a bolt connected to said spindle for operation upon the rotation of said spindle and a stationary member, an elongated slide mounted within said spindle, a cam lock, said slide being slidable and rotatable within said spindle, cam means engageable between said slide and cam lock whereby the sliding and rotational movement of said slide move said cam lock to a locking position wherein it provides locking engagement between said spindle and stationary member to prevent the retraction of said bolt.

References Cited in the file of this patent

UNITED STATES PATENTS

1,489,675	Schlage	Apr. 8, 1924
2,759,352	Fisler	Aug. 21, 1956
2,841,432	Ahlquist et al.	July 1, 1958