May 4, 1954 G. HAGSTROM 2,677,266

CYLINDER LOCK

Original Filed Dec. 1, 1950 2 Sheets-Sheet 1

FIG. 1.

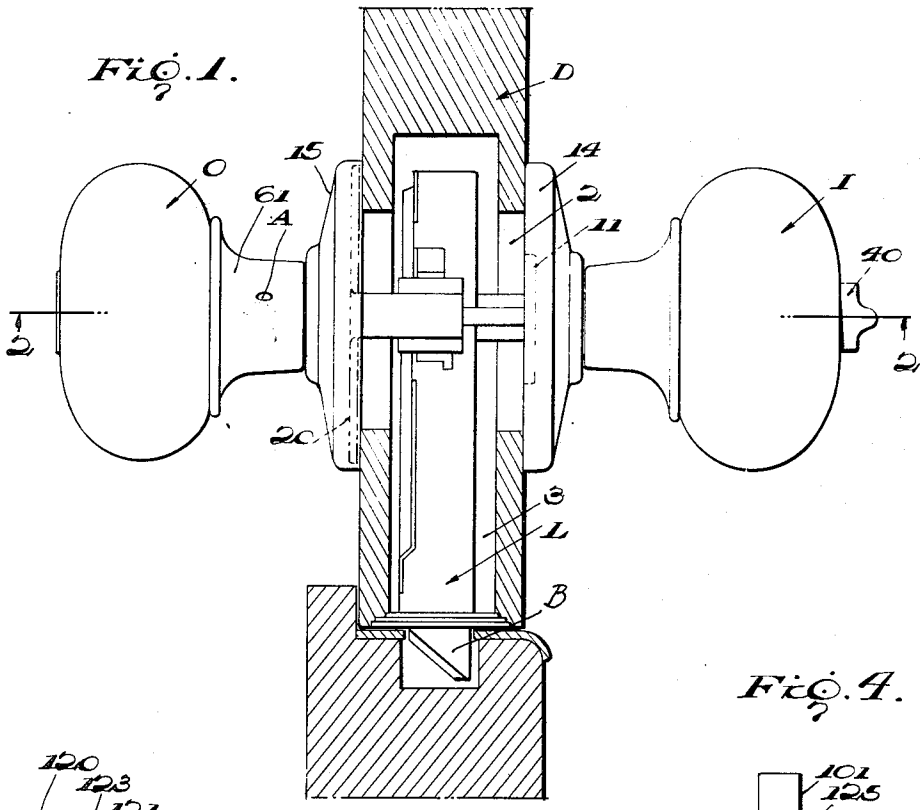


FIG. 4.

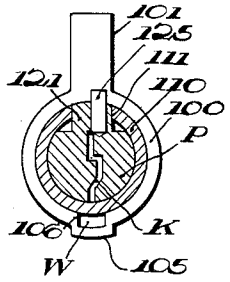


FIG. 3.

FIG. 5.

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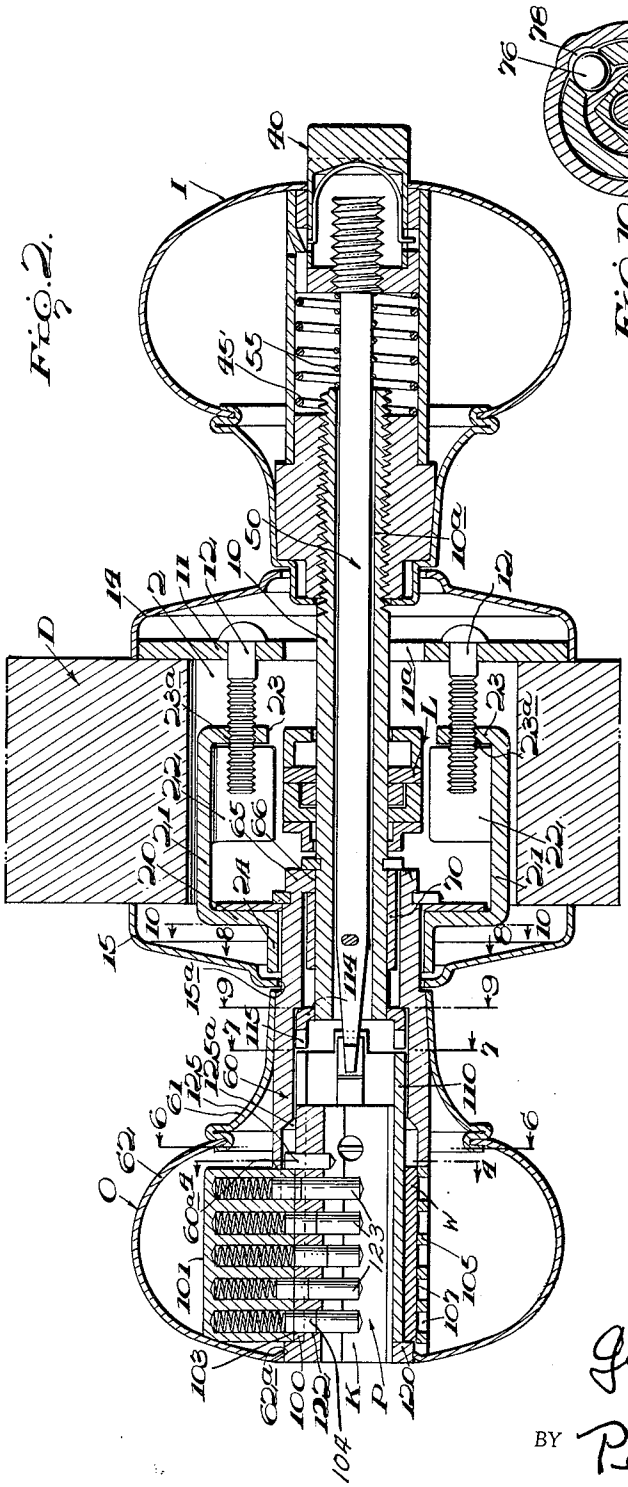


Fig. 2.

Fig. 10.

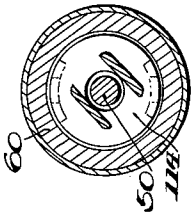


Fig. 9.

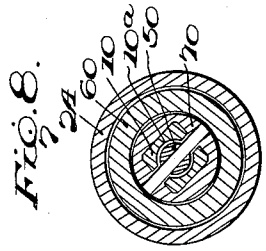


Fig. 8.

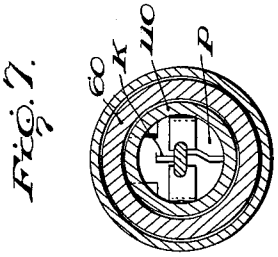


Fig. 7.

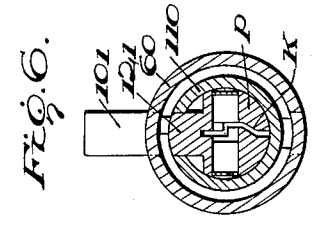


Fig. 6.

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UNITED STATES PATENT OFFICE

2,677,266

CYLINDER LOCK

Gotthard Hagstrom, Greenwich, Conn., assignor to The Safe Padlock and Hardware Company, Lancaster, Pa., a corporation of Pennsylvania

Original application December 1, 1950, Serial No. 198,557, now Patent No. 2,662,387, dated December 15, 1953. Divided and this application December 3, 1951, Serial No. 259,565

14 Claims. (Cl. 70—369)

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This invention relates to certain improvements in cylinder lock; and the nature and objects of the invention will be readily recognized and understood by those skilled in the art in the light of the following explanation and detailed description of the accompanying drawings illustrating what I at present believe to be the preferred embodiments or mechanical expressions of the invention from among various other embodiments, modifications, variations, combinations and constructions of which the invention is capable within the broad spirit and scope thereof as defined by the claims hereto appended.

This application is filed as a division of my copending application Serial No. 198,557, filed December 1, 1950, now Patent Number 2,662,387 granted December 15, 1953, for Door Locks.

More particularly my invention is directed to those general types of cylinder locks characterized by a key or cylinder plug rotatably confined and mounted in a casing or cylinder body with an arrangement of pin tumblers adapted upon insertion of a suitable key in the cylinder plug to be actuated from positions locking the plug against rotation to positions unlocking the plug for rotation in the cylinder body by the key inserted in the plug.

A general object of the invention is to provide a design and construction of such a type of cylinder lock which is extremely simple structurally and mechanically, with a minimum of parts designed for low cost manufacture, yet which will maintain precision of operation over a long life under all of the conditions of use to which such types of locks are normally subjected.

Another object is to provide such a cylinder lock in which the cylinder plug of the lock may be readily removed without the use of special keys or other implements, merely by a simple manual manipulation of the cylinder plug and associated mechanism.

Another object is to so provide for such cylinder plug removal that inadvertent displacement of the tumbler and driver pins from the lock body and from the plug will be prevented without requiring the use of a so-called "following" or the like tool such as commonly used by locksmiths in changing the keying of a cylinder lock.

A further object is to provide a design of cylinder lock and removable cylinder plug, in which the plug may be conditioned for withdrawal and removal from the lock merely by rotating the plug from normal position to position with a fixed pin on the plug lined up with a groove disposed longitudinally of the lock body.

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Another object is to provide such a lock and its removable plug in which when in assembled position in operative connection with the mechanism to be actuated thereby, the plug will be constrained against rotation to plug removal position but will be released for rotation to removal position upon disconnection from the mechanism actuated thereby.

And another object is to provide such a cylinder lock adapted for use with various types of lock actuated and controlled mechanisms.

With the foregoing and various other objects, features and results in view which will be readily apparent from the following detailed description, my invention consists in certain novel features in design and construction, and in combinations and sub-combinations of parts and elements, all as will be more fully referred to and specified hereinafter.

Referring to the accompanying drawings in which similar reference characters refer to corresponding parts and elements throughout the several figures thereof;

Fig. 1 is a view in horizontal section through a portion of a door with a knob operated door lock and latch mechanism installed thereon and having a form of cylinder lock of my invention mounted in the outer knob thereof.

Fig. 2 is a view in vertical section taken as on the line 2—2 of Fig. 1, and showing the construction and mounting of the cylinder lock in the outer knob and its connection with the latch operating spindle.

Fig. 3 is a perspective view of the cylinder lock of the form of Fig. 2, showing the parts thereof disassembled but in the relative positions to be assumed on assembly.

Fig. 4 is a transverse sectional view taken as on the line 4—4 of Fig. 2.

Fig. 5 is a view similar to Fig. 4 but showing the cylinder plug rotated to position for withdrawal.

Fig. 6 is a transverse sectional view taken as on the line 6—6 of Fig. 2.

Fig. 7 is a transverse sectional view taken as on the line 7—7 of Fig. 2.

Fig. 8 is a transverse sectional view taken as on the line 8—8 of Fig. 2.

Fig. 9 is a transverse sectional view taken as on the line 9—9 of Fig. 2.

Fig. 10 is a transverse sectional view taken as on the line 10—10 of Fig. 2.

In my Patent No. 2,662,387, of which this application is a division, a form of cylinder lock of my invention adapted to mounting in the outer knob of a door latch and lock set of the so-called

key-in-the-knob type is disclosed by way of an example. While such form and adaptation is also disclosed in this present application it is presented primarily for purposes of explanation and not in all respects by way of limitation to such form and particular adaptation thereof, as the various features and basic combinations embodied in this example are capable of and intended for embodiment in various other forms thereof for use wherever a cylinder type lock, or lock employing a cylinder, may be utilized.

In the example adaptation as applied to the key-in-the-knob door lock unit or set which embodies various inventions claimed in my above identified copending application, the cylinder lock unit is mounted in the outer knob of the door set for operating the door latch actuating spindle thereof. Referring to Fig. 1, such a door lock set is shown as mounted and installed on a door D in operative association with a tubular latch bolt unit L. The door lock set includes the spindle 10 of square or angular section mounted in position extended through a transverse bore or passage 2 formed through the door D with an inner knob unit I mounted on the spindle end at the inner side of door D and an outer knob unit O mounted on the spindle end at the outer side of the door. The tubular latch bolt unit L is mounted in the door D in a suitable bored or mortised opening 3 formed therein and opening through the outer edge of the door D, with the unit L being disposed in position with its longitudinal axis perpendicular to the longitudinal axis of the spindle and with the spindle being extended transversely through unit L in operative connection therewith for retracting the latch bolt B of unit L upon rotation of the spindle by either knob unit, in the manner generally familiar in this art.

The door lock unit or set is mounted on the door D by a mounting structure which includes a back plate 11 located on the inner side of the door across spindle receiving bore 2, and a lock plate 20 located at the outer side of the door across the outer end of spindle receiving bore 2. The back plate 11 is provided with a bore 11*a* for receiving therethrough the spindle 10. The lock plate 20 is formed with a hub or angular flange 24 extended from the outer side thereof providing a bore therethrough and through the plate for receiving the outer end length of the spindle 10.

The lock plate 20 includes the spaced parallel arms 21 extended from the inner side thereof at opposite sides of the spindle receiving bore through the plate, with these arms being extended into the bore 2 in the door D. The arms 21 are provided at their inner ends with the inwardly facing positioning flanges 22 between which the latch bolt unit L is received and mounted. The inner ends of arms 21 are provided with the lugs 23 bent inwardly therefrom. Each of the lugs 23 is provided with a tapped bore 23*a* therethrough. The back plate 11 and the lock plate 20 in mounted position are connected and drawn tightly together against the outer and inner sides of door D, over and across the adjacent end openings of the bore 2 by the threaded and headed bolts or screws 12 which are extended inwardly through smooth wall bores formed in the back plate 11 with the threaded inner ends of the screws being threaded into the tapped bores 23*a* of lugs 23 of the lock plate 20. An inner rose 14 is provided at the inner side of the door over back plate 11 and an outer rose 15 is provided at the outer side of the door over and surrounding lock plate 20.

The inner knob unit I is threaded onto the externally threaded inner end of spindle 10 and is suitably secured thereto so that rotation of this knob in either direction will correspondingly rotate spindle 10 to retract latch bolt B of the unit L. This inner knob unit I mounts the spring loaded button member 40. Button member 40 is connected with the end of a push rod 50 which is located in the knob unit and which is reciprocally mounted in and extended through an axial bore 10*a* in the spindle 10. The button member 40 with push rod 50 connected thereto is continuously biased outwardly to the projected position of the button member and the retracted position of the push rod 50 by the biasing springs 45' and 55.

The outer knob unit O includes an insert sleeve 60 on which the annular shank 61 of the knob unit is secured with the sleeve member extended outwardly a distance beyond this shank. Shank 61 is radially outwardly flared and has secured to the outer annular edge flange thereof the knob cap 62. Cap 62 is provided with an axial, circular opening 62*a* therethrough in axial alignment with the inner end of the insert sleeve 60. This sleeve 60 terminates at its outer end within cap 62 spaced a distance inwardly from the inner side of the outer end wall of the cap. The outer rose 15 has the axial opening 15*a* therethrough and the outwardly projected length of sleeve 60 is extended through the rose opening and lock plate 20 with the sleeve rotatably received in and extended through the hub forming flange 24 of the lock plate 20. In this mounted position, the spindle 10 extends a distance into sleeve 60, such sleeve having an internal diameter greater than the maximum external diameter of the spindle 10. The open inner end of sleeve 60 is provided with an inturned flange portion 65 which provides at its opposite ends the clutch teeth forming shoulders 66. The radial depth of flange 65 is such that the flange is spaced from the spindle 10 so that the spindle and the knob unit O are rotatable relative to each other in the absence of connecting means therebetween.

A clutching mechanism adapted to be actuated by push rod 50 under the control of button member 40, is provided for releasably connecting the sleeve 60 of the outer knob unit O with the spindle 10, so that rotation of knob O will effect rotation of spindle 10 to retract latch bolt B of unit L. This clutch mechanism includes a clutch sleeve 70 slidably mounted on and over spindle 10 and suitably connected with push rod 50 so that when the push rod and button member 40 are in projected position sleeve 70 is in clutching engagement with clutch teeth 66 of sleeve 60 to thereby engage the outer knob unit O with the spindle. When button 40 is depressed to project push rod 50 outwardly the sleeve 70 is moved to position declutching outer knob unit O from the spindle 10. In such position of sleeve 70 the spindle may then be rotated independently of the outer knob unit O.

A suitable clutching means is provided for actuation by outward projection of push rod 50 to effect clutching engagement between the outer knob insert sleeve 60 and the flange 24 of lock plate 20 to thereby lock the outer knob unit O to the lock plate against rotation when such knob unit is declutched from the spindle 10. In this instance such clutching or locking means takes the form of ball members 76 which are cammed

by inward projection of push rod 50 into the locking recesses 78 provided in the hub forming flange 24 of the lock plate 20. The details of this clutching or locking mechanism are disclosed and claimed in my Patent No. 2,662,387, hereinbefore identified.

The outer knob unit O mounts therein a key operated cylinder lock of the pin tumbler type embodying and in accordance with the inventive features of my present invention. Such cylinder lock following the teachings of the invention comprises basically a cylinder body 100 having a driver pin case 101 extended longitudinally therealong and radially outwardly from one side thereof, and a cylinder plug P which is rotatably mounted in the body 100 and is provided with the usual key way or slot K opening through one side or end of the plug for receiving therein an operating key.

The cylinder body 100 is of tubular form providing a circular bore or opening 102 extending axially therethrough and opening through the opposite ends of the body. This cylinder body is provided with a series of spaced bores 103 therethrough along the under or inner side of an opening in the driver case 101 for reciprocal projection therethrough of the usual spring loaded driver pins 104 which are reciprocally mounted in the driver case. Diametrically opposite the driver case the cylinder body 100 is provided with a rib formation 105 which extends longitudinally therealong and which is projected outwardly therefrom to form at the inner side thereof a groove 106 which opens at its opposite ends through the ends of the cylinder body. This rib 105 is provided with spaced bores 107 through the outer side wall thereof which are located therein in axial alignment with the bores 103 at the driver case side of the cylinder body. Groove 106 is open at the inner side thereof throughout its length into the bore 102 of the cylinder body.

The cylinder body 100 is mounted in assembled position within the outer knob unit O by securing the inner end of the body to the outer end of the hub insert sleeve 60. This sleeve 60 is formed with diametrically opposite recesses or slots 60a therethrough which receive therein the inner end portions of the driver case 101 and of the rib 105, respectively, of the cylinder body 100. The forward portion of insert sleeve 60 is formed with an internal diameter to receive therein the rear, externally cylindrical end portion of the cylinder body 100. Cylinder body 100 is thus rigidly held against independent axial movement in relation to sleeve 60 in position in knob unit O with the forward end of the body being located adjacent the inner side and axially aligned with the opening 62a in knob cap 62.

In accordance with a feature of the invention the cylinder plug P is assembled with and is adapted to rotate an actuator sleeve 110 by which rotation of the cylinder plug by a key inserted therein will effect rotation of a mechanism or member with which the sleeve may be connected, such for instance as the spindle 10 for actuating the latch bolt unit of the example door lock and latch set.

In this instance the actuator sleeve 110 is formed as a cylindrical, tubular member having a longitudinal slot 111 through one side thereof which extends to and opens through opposite ends of the sleeve. The actuator sleeve 111 has an external diameter to be rotatably received and journaled in bore 102 of cylinder body 100.

In the mounted position of the actuator sleeve 110 in the cylinder body 100 the sleeve extends completely through bore 102 with its forward end at the forward or outer end of the cylinder body but with its inner end portion projected a distance inwardly into the insert sleeve 60. At its inner end the actuator sleeve 110 is provided with a pair of rearwardly extended teeth 112 positioned at opposite sides of slot 111 in diametrically opposite locations on the sleeve. The spindle 10 of the example mechanism with which the actuator sleeve 110 is in operative association, is provided at the outer end thereof with a head 114 which is suitably fixed thereto and which is provided with a pair of forwardly extended teeth 115 located at diametrically opposite positions on the head. The actuator sleeve 110 extends inwardly into the insert sleeve 60 a distance to locate the teeth 112 thereof in positions for engaging upon rotation of the sleeve the forwardly extended teeth 115 located at diametrically opposite positions on the head 114. In normal position the pairs of teeth 112 and 115 are approximately 90° apart so that upon rotation of the actuator sleeve 110 through the required number of degrees the teeth 112 of the sleeve will engage the teeth 115 of the spindle head 114 and upon further rotation of sleeve 110 in the same direction the spindle 10 will be rotated thereby to effect actuation of the latch bolt B of the latch bolt unit.

The cylinder plug P is formed at the forward end thereof with a radially extended flange 120 therearound for engagement against the forward end edge of the actuator sleeve 110 and the forward end of the cylinder body 100 when the plug P is mounted in assembled position in the sleeve. The key slot K opens through the forward flanged end of plug P in the usual manner familiar in this art. Along one side of the plug P and disposed longitudinally thereof from the end flange 120 to the inner end of the plug there is formed a rib portion 121 having a width to be received and slidably fit in the longitudinal slot 111 of the actuator sleeve 110. The outer face or surface 121a of rib portion 121 is formed on a radius transversely thereof such that the surface 121a with the plug mounted in the actuator sleeve 110 lies in the plane and forms a continuation of the cylindrical outer surface of the sleeve. A series of spaced bores 122 are formed in and along the rib portion 121. These bores open at their outer ends through the outer surface of the rib portion 121 and at their inner ends open into and along the key slot K. Bores 122 are so located and spaced as to be axially aligned with the bores 103 which open through body 100 from the driver case 101. Pin tumblers 123 are reciprocally mounted in the bores 122 in the generally conventional manner for tumbler pin locks.

The opposite longitudinal sides 121b of rib 121 are adapted to engage the longitudinal side edges of the slot 111 in the actuator sleeve 110 to thereby form and provide the operative connection between the plug and the sleeve for rotation of the sleeve by key rotation of the plug. The cylinder plug P has a length greater than the length of the cylinder body 100, and in mounted, assembled position of the actuator sleeve with the plug P therein the plug extends a distance inwardly through the sleeve beyond the inner end of the cylinder body but terminating a distance spaced inwardly from the inner end of the sleeve. A fixed pin or lug 125 is formed from, or as a separate member secured in, the rib portion 121 of plug P and extends radially outwardly from

such rib portion in a position to be slidably engaged against the inner end edge of the cylinder body 100 in the assembled position of the actuator sleeve and plug P in the cylinder body. The outer end of the insert sleeve 60 is formed of an enlarged internal diameter to provide an annular space 125a for receiving therein the pin 125. In this manner the plug P is secured against outward displacement in or removal from the actuator sleeve 110 while being freely rotatable as a unit with that sleeve in the cylinder body 100.

One of the important features of the invention resides in the design, construction and arrangement of the cylinder lock unit and its cylinder plug P and actuator sleeve 110 to permit of the efficient removal and replacement of the cylinder plug.

With the adaptation of the cylinder lock of my invention to the door lock set or unit of the illustrated example, when the cylinder lock is in mounted and assembled position in the outer knob cap O, the cylinder plug P is constrained or restricted to a maximum range of rotation of approximately 140°. Thus, the cylinder plug is limited to a maximum range of rotation of substantially less than 180°, and the plug cannot be rotated through a complete half turn of 180° to a position with pin 125 aligned with the inner end of the longitudinal slot 106 in the rib portion 105 of the cylinder body 100. In this particular adaptation and combination the foregoing limitation of the range through which cylinder plug P may be rotated is effected by the engagement of the teeth 112 of the actuator sleeve 110 with the teeth 115 of the spindle head 114 and by the connection of the spindle 10 in the latch bolt unit L with the limited reciprocation provided for the latch bolt B by such latch unit.

The cylinder plug P is, however, readily and efficiently removable from the cylinder body 100 and the outer knob unit O, without the use of special keys or implements and in such a manner that neither the pin tumblers 123 in the plug nor the driver pins 104 in the driver case 101 will be displaced inadvertently from their receiving bores.

In order to remove the cylinder plug P from the cylinder body 100 and from the outer door knob unit O, the inner knob I is first removed by unscrewing it completely from the spindle 10. The plate securing screws 12 are then unthreaded from the lugs 23 on arms 21 of locking plate 20 so as to detach back plate 11 and the lock plate 20. The outside knob unit O is then drawn outwardly from the door D to remove therewith as a unit the spindle 10, lock plate 20 and associated mechanism. The outside knob unit O with its attached mechanism is then held in an upside-down position with the marker A which is provided on shank 61 as shown in Fig. 1, in visible position at the upper side of the shank The locking plate 20 is then lined up so that the ball receiving recesses 78 thereof will be in positions in a plane midway between the vertical and the horizontal to thereby permit of the locking balls 76 entering the recesses.

With the outer knob unit O held in the foregoing position the push rod 50 is then depressed by pressing upon the outer free end thereof. While the push rod is thus depressed the spindle 10 is twisted or rotated in either direction to thereby release the clutch sleeve 70 with resulting release of this sleeve for rotation. A normal key for the lock may then be inserted into normal position in the key slot K of plug P to set the pin tumblers 123 and driver pins 104 in the usual manner to unlock and release the cylinder plug for rotation of the plug in the cylinder body.

The key thus inserted into position in the key slot is then turned to rotate cylinder plug P and its actuator sleeve 110 through 180° until the plug pin 125 is lined up with the slot 106 in cylinder body 100 at the inner end of that slot. During such rotation it is of importance to note that the actuator sleeve 110 is rotated to position the closed side wall thereof over and across the driver pin bores 103 which open into the passage 102 of the cylinder body. The actuator sleeve 110 thus functions as a guard or retainer to prevent displacement of these spring loaded driver pins from their bores in the driver case. During the rotation of the cylinder plug P the pin tumblers 123 in the rib portion 121 of the plug which is received in slot 111 of actuator sleeve 110, are closed against pin tumbler displacement by the side wall of the body 100. In order to prevent displacement of the pin tumblers 123 from their bores in the groove 106 of cylinder body 100 when the cylinder plug P is rotated through its half turn with rib portion 121 lined up with and along slot 105, I have provided a removable wedge strip W within the slot 105 to completely occupy that slot from end to end thereof with the inner surface defining a portion of the inner surface surrounding bore 102 at opposite sides of the slot 106. Thus when the cylinder plug P has been rotated through the half turn from normal position to a position with the pin 125 lined up with the groove 106, the pin tumblers 123 are retained against displacement by the wedge strip W. From this position the cylinder plug P may then be drawn outwardly with pin 125 received in and sliding through the groove 106, the wedge strip W being of course located on the upper side of the plug and being withdrawn therewith and being adapted to be held by the fingers in position over the pin tumbler bores until the plug is completely removed.

In order to insure against the inadvertent withdrawal of the sleeve 110 from the cylinder body 100 when the cylinder plug P is withdrawn, I have provided the sleeve with a small projection 110a for engagement against the rear or inner edge portion of the cylinder body which surrounds the bore therethrough. This projection 110a is located on the sleeve intermediate the inner end of the sleeve and the inner end of the cylinder body when the sleeve is in assembled, cylinder plug receiving position in the cylinder body. In such assembled position the projection 110a is located at the under side of the sleeve spaced a distance inwardly from the inner or rear end of the cylinder body. When the cylinder plug P and the sleeve 110 are rotated to a position with the pin 125 in line with groove 106 the sleeve projection 110a is rotated to position to engage the inner edge portion of the cylinder body in the event that the sleeve should be withdrawn with the plug to thereby insure against complete withdrawal of the sleeve from the cylinder body.

After the cylinder plug P has been removed and has been reloaded with the desired combination of pin tumblers, the reloaded plug may be readily replaced in the cylinder body 100 by placing a wedge strip W over the pin tumbler bores and then inserting the plug with the wedge thereon into the cylinder body with the wedge and pin 125 in position for sliding in and along groove 106 of the cylinder body. After the plug

is in fully inserted position it may be then rotated through 180° to its normal position of assembly with pin 125 engaged against the inner edge portion of the cylinder body 100. The key may then be removed from the cylinder plug P and the spindle 10 thereafter turned in the proper direction to engage the clutch sleeve 70 with the spindle. The spindle 10 is then inserted through door opening 2 and through the latch bolt unit L in the usual manner of assembly. The fastening screws 12 may then be inserted to position and rotated to clamp plates 11 and 20 in position against the door. The inner knob I is then screwed onto the inner end of the spindle 10 to complete the reassembly and remounting of the lock unit in the door.

While I have in the illustrated example selected an adaptation and application of a cylinder lock of the invention to mounting in the knob of a particular door lock set, it is to be understood that I do not intend to thereby limit the invention to this specific adaptation, combination and mounting. The invention is capable of adaptations and mountings with various other forms of lock controlled organizations, such for example as padlocks, where it is desired to actuate a member from the cylinder plug and its actuated member or sleeve.

It will further be evident that various modifications, changes, eliminations and substitutions may be resorted to without departing from the spirit and scope of my invention, and hence I do not desire to limit my invention in all respects to the exact and specific disclosures hereof, except as may be required by specific intended limitations thereto in any of the claims hereto appended.

What I claim is:

1. In a cylinder lock in combination; a cylinder body; an actuator sleeve member rotatably mounted in said body; said actuator sleeve being formed with a slot through and disposed longitudinally of the side wall thereof; a cylinder plug slidably mounted in said sleeve member for removal and replacement from and to mounted position therein; said cylinder plug being constrained by said sleeve against rotation relative thereto for rotation of said sleeve and plug as a unit within said cylinder body; means constraining said cylinder plug against removal through a limited range of rotation of the plug and sleeve; said cylinder body being formed to release said constraining means for removal of said plug when said sleeve and plug are rotated to a predetermined position outside the limited range of rotation; and means adapted to releasably engage said actuator sleeve to restrict rotation thereof with said cylinder plug to the said limited range.

2. In a cylinder lock, in combination; a cylinder body; an actuator sleeve rotatably mounted in said body; a cylinder plug slidably mounted in said sleeve for removal and replacement of said plug; said cylinder body having pin bores through one side thereof; said cylinder plug having pin bores in one side thereof for alignment with said cylinder body bores in one position of said sleeve and plug in said body; said sleeve being formed along one side thereof to expose said plug bores therethrough and to constrain said plug against rotation relative to the sleeve in position with said plug bores exposed; a groove disposed longitudinally through said cylinder body in position opposite said body pin bores; and said cylinder plug being provided with

a fixed pin adapted to slidably engage said cylinder body to constrain said plug against removal from said sleeve through a range of rotation of said plug in either direction from a position with said plug pin aligned with said body groove.

3. In a cylinder lock, in combination; a cylinder body; a sleeve member rotatably mounted in and being extended through said body; said cylinder body having pin bores therethrough along one side thereof; a cylinder plug slidably mounted in said sleeve for removal and replacement in said member; said cylinder plug having pin bores along one side thereof for alignment with said body pin bores in one position of said plug and sleeve member in said body; said sleeve formed with a slot along one side thereof to expose said plug pin bores therethrough; means adapted to constrain said cylinder plug against rotation relative to said sleeve member when in position with said plug pin bores exposed through said slot; a groove disposed through said cylinder body longitudinally thereof in position thereof opposite said body pin bores and having its opposite ends opening through the opposite ends of the body; said cylinder plug being projected at one end thereof outwardly beyond the cylinder body and being provided with a pin projected radially therefrom for slidable engagement with the adjacent end of the body to constrain the cylinder plug against withdrawal from said sleeve member through a range of rotation of said plug in either direction from a position of the plug with said pin aligned with said body slot; and means adapted to be releasably engaged with said sleeve member limiting the range of rotation of the sleeve member to prevent alignment of said plug pin with said body groove.

4. In a cylinder lock, in combination; a cylinder body providing a cylindrical bore therethrough and having pin bores positioned in a straight line spaced apart longitudinally of said body opening through the side wall thereof into said body bore; a sleeve member rotatably mounted in and being extended through said body bore; said sleeve member being formed with a slot through the side wall thereof disposed longitudinally thereof and being open through the opposite ends of said sleeve member; and a cylinder plug having tumbler pin bores located in a straight line spaced apart longitudinally of said plug and opening through the side wall thereof; and said cylinder plug being slidably mounted in said sleeve for removal and replacement but being constrained against rotation therein in position with said tumbler pin bores exposed through said sleeve member slot.

5. In a cylinder lock, in combination; a cylinder body having a circular bore disposed longitudinally and opening through the opposite ends thereof; said cylinder body being provided with pin bores spaced apart longitudinally thereof and opening into said body bore; said cylinder body being formed with a longitudinally disposed groove therein located diametrically opposite said series of pin bores and opening into said body bore and through the opposite ends of the body; a sleeve member rotatably mounted in and being extended through said body bore; said sleeve member being formed through one side thereof with a slot disposed longitudinally and opening through the opposite ends of the sleeve; a cylinder plug provided with tumbler pin bores therein opening through the outer side thereof and being disposed in a straight line spaced apart longitudinally along said cylinder plug; said cylinder

plug being slidably mounted and received in said sleeve for removal and replacement through one end of the sleeve; said cylinder plug being constrained by said sleeve in position in said sleeve against rotation relative thereto with said tumbler pin bores exposed through said sleeve member slot for alignment with said body pin bores, respectively; a fixed pin on said cylinder plug in position projected radially outwardly therefrom in line with said tumbler pin bores between one end of said plug and said bores and being adapted to engage the adjacent end of said cylinder body; and said cylinder plug and sleeve member in one position thereof in said cylinder body locating said tumbler pin bores at and aligned with said body pin bores and being rotatable from such position to position with said cylinder plug pin aligned with said body groove for withdrawal of said cylinder plug from said sleeve member and cylinder body.

6. In a cylinder lock, in combination; a tubular cylinder body having a series of pin bores therethrough disposed in a straight line spaced apart longitudinally thereof; said cylinder body being formed to provide a longitudinally disposed groove opening thereinto and being located in said body opposite said series of pin bores; a sleeve member rotatably mounted in and being extended through said body; said sleeve member being formed through one side thereof with a slot through one side thereof disposed longitudinally and opening through the opposite ends of the sleeve; a cylinder plug formed with a longitudinally disposed rib portion along one side thereof having a series of tumbler pin bores therein opening through the outer side thereof disposed in a straight line spaced apart longitudinally of said cylinder plug, said cylinder plug adapted to be slidably mounted in said sleeve member with the rib portion of said plug slidably received in said sleeve member slot with said tumbler pin bores being exposed through the slot; said cylinder plug being constrained against rotation relative to said sleeve member by engagement of the opposite sides of said rib portion with the adjacent edge portions of said sleeve member along said slot; a fixed pin on said cylinder plug in position projected radially outwardly therefrom in line with said tumbler pin bores between one end of said rib portion and said bores and being adapted to slidably engage the adjacent end of said body; and said cylinder plug and sleeve member being adapted to be rotated as a unit within said cylinder body between a position locating said cylinder plug tumbler bores aligned with said body pin bores, respectively, and a position with said cylinder plug pin aligned with said body groove for withdrawal and replacement of said cylinder plug from and to position in said sleeve member and cylinder body.

7. In combination as defined in claim 5, a wedge strip adapted to be slidably mounted in said cylinder body groove for removal therefrom by passage of said cylinder plug pin through said groove upon withdrawal of said cylinder plug.

8. In a cylinder lock, in combination; a cylinder body having a circular bore extending longitudinally therethrough and driver pin bores through the side wall of said body and opening into said bore; a sleeve member rotatably mounted in said body bore; said sleeve member being formed with a slot through the side wall thereof disposed longitudinally of and opening through the opposite ends of the sleeve member; a cylinder plug slidably mounted in said sleeve member for removal and replacement through one end thereof; said cylinder plug being engaged with said sleeve member for rotation therewith as a unit; said cylinder plug being formed with a series of tumbler pin bores through the side wall thereof adapted to be exposed through said sleeve member slot for axial alignment with said cylinder body pin bores, respectively; said cylinder plug being provided at one end thereof with a pin projected radially therefrom in position for slidable engagement against the adjacent end edge portion of said cylinder body for constraining said cylinder plug against removal from said sleeve member and cylinder body; and said cylinder body being formed with a passage opening through that end edge portion of said cylinder body engaged by said pin adapted to receive said pin for removal of said cylinder plug when the latter is rotated to position with said pin aligned with said passage.

9. In a cylinder lock, in combination, a cylinder body; a sleeve member rotatably mounted in said body; said sleeve member being formed with a slot through the side wall thereof; a cylinder plug slidably mounted in said sleeve member for removal and replacement through an end thereof from and to mounted position therein; said cylinder plug being adapted to be constrained by said sleeve member against rotation therein for rotation as a unit of said plug and sleeve member; means for constraining said cylinder plug against removal from said sleeve member through a predetermined limited range of rotation of said plug and sleeve member as a unit and for releasing said plug for removal when said sleeve member and plug are rotated to position beyond said range; and means adapted to releasably constrain rotation of said sleeve member and cylinder plug to the said limited range of rotation in said cylinder body.

10. In a cylinder lock, in combination, a cylinder body; a sleeve member rotatably mounted in said cylinder body; a cylinder plug slidably mounted in said sleeve member for removal and replacement through an end of said sleeve member from and to mounted position therein; said sleeve member and cylinder plug being formed to constrain said plug against rotation in said sleeve member for rotation of said plug and sleeve member as a unit in said cylinder body; a constraining member adapted to constrain said cylinder plug against removal from said sleeve member through a predetermined limited range of rotation of said plug and sleeve member unit and to release said plug for removal from said sleeve member when said plug and sleeve member unit is rotated to a position beyond said limited range; a spindle member mounted for releasable engagement with said plug and sleeve member unit for rotation of said spindle member by rotation of said unit; and means adapted to be engaged by said spindle member to limit rotation thereof to the said limited range of rotation of said plug and cylinder sleeve unit.

11. In a cylinder lock, in combination, a cylinder body providing a bore therein and having driver pin bores opening through the side wall thereof into said body bore; a sleeve member rotatably mounted in said body bore; said sleeve member having a slot through the side wall thereof; a cylinder plug having pin tumbler bores therein opening outwardly through the side wall thereof; said cylinder plug being slidably mounted in said sleeve member for removal and

replacement through an end of the sleeve member; said cylinder plug being adapted to be positioned in said sleeve member with said pin tumbler bores exposed through said sleeve member slot; means for constraining said cylinder plug in the aforesaid position against rotation relative to said sleeve member; and said sleeve member and cylinder plug being rotatable as a unit in said cylinder body between position aligning said tumbler pin bores and driver pin bores, respectively, through said sleeve member slot and a position for removal of the cylinder plug from said sleeve member with the side wall of the sleeve member adapted to extend over and block the adjacent ends of said drive pin bores in said cylinder body.

12. In a cylinder lock, in combination; a cylinder body providing a bore therein and having driver pin bores opening through the side wall thereof into said body bore; said cylinder body being provided with a wedge member disposed longitudinally and forming a portion of the wall defining said cylinder body bore; said wedge member being positioned spaced a distance around said bore from said driver pin bores and being slidably mounted in said body for removal and replacement through an end of said body bore; a sleeve member rotatably mounted in said body bore; said sleeve member having a slot through the side wall thereof; a cylinder plug having pin tumbler bores therein opening outwardly through the side wall thereof; said cylinder plug being slidably mounted in said sleeve member for removal and replacement through an end of the sleeve member; said cylinder plug being positioned in said sleeve member with said pin tumbler bores exposed through said sleeve member slot and being adapted to be constrained in such position against rotation relative to the sleeve member; and said cylinder plug and sleeve member being rotatable as a unit in said cylinder body between a position with said tumbler pin bores and said driver pin bores aligned through said sleeve member slot and a position with said pin tumbler bores at and closed by said wedge member for removal of said cylinder plug and wedge member as a unit from said cylinder body and sleeve member.

13. In combination, a cylinder lock including a cylinder body having a circular bore extending longitudinally therethrough and pin bores through the side wall of said body spaced apart longitudinally therealong and opening into said body bore; a sleeve member rotatably mounted in said body bore and being extended outwardly beyond said body at one end thereof; said sleeve member being formed with a slot through the side wall thereof disposed longitudinally of said sleeve member and opening through the opposite ends thereof; a cylinder plug slidably mounted in said sleeve member for removal and replacement through one end thereof; said cylinder plug and said sleeve member being constructed to constrain said plug against rotation relative to the sleeve for rotation of said plug and sleeve in said body bore as a unit; said cylinder plug being formed with a series of pin bores through and spaced apart longitudinally of the side wall of said cylinder plug; said cylinder plug being provided at one end thereof with a fixed pin in position projecting radially outwardly therefrom for slidable engagement against and around the adjacent end edge portion of said cylinder body to constrain said cylinder plug against removal from said sleeve member and said cylinder body; said cylinder body being formed with a groove in the side wall thereof opposite said pin bores with said groove being open into said body bore and at its opposite ends being open through the ends of said body; said cylinder plug being adapted to be rotated in said cylinder body to position said pin aligned with said groove for removal of said cylinder plug from said sleeve member and cylinder body; a spindle member adapted to be assembled in position axially aligned with the projected end of said sleeve member for engagement by said sleeve member for rotation of said spindle member; and said spindle member being adapted to be mounted for limited rotation thereof to prevent rotation of said sleeve member and cylinder plug to a position with said pin on said cylinder plug aligned with said cylinder body groove.

14. In the combination as defined in claim 13, said sleeve member being provided with spaced teeth on the extended end thereof; and said spindle member being provided with spaced teeth thereon adapted to be engaged by said sleeve member teeth.

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