Dec. 3, 1940. E. N. JACOBI 2,223,615

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Fig. 1.

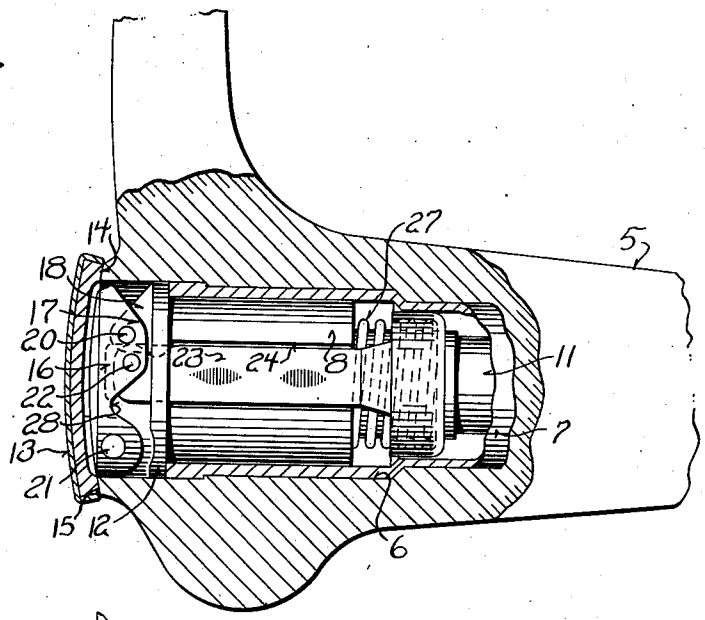
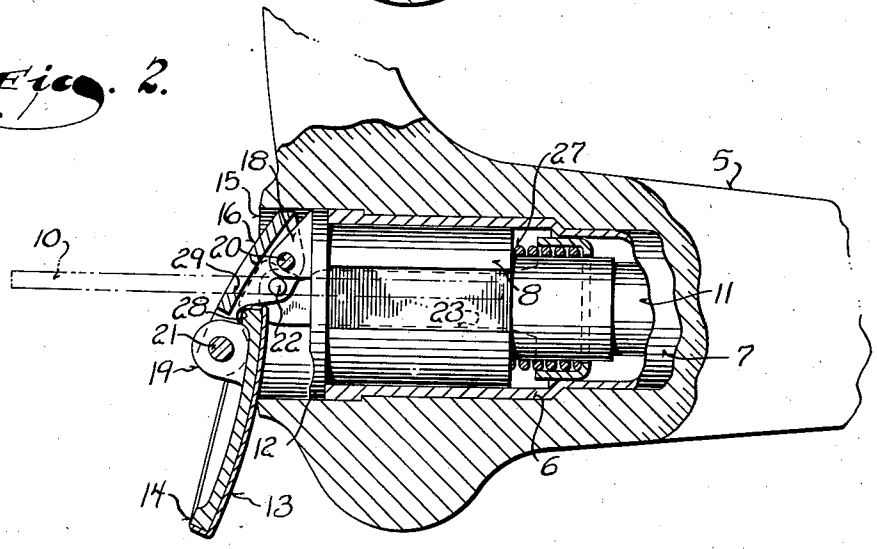


Fig. 2.



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Dec. 3, 1940. E. N. JACOBI 2,223,615

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Fig. 3.

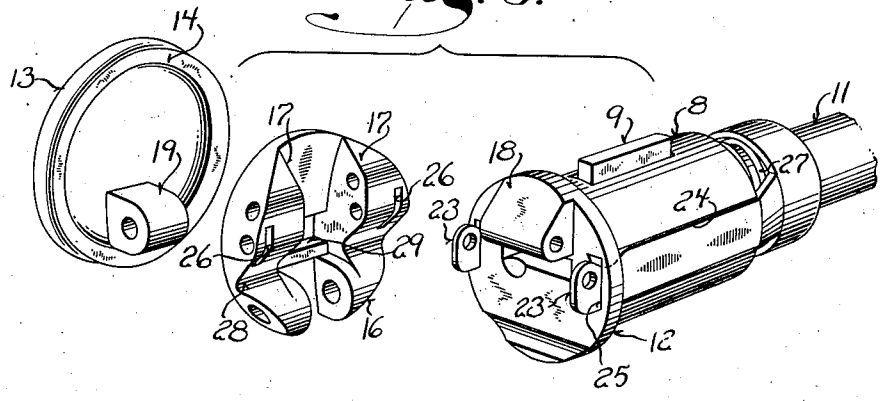


Fig. 4.

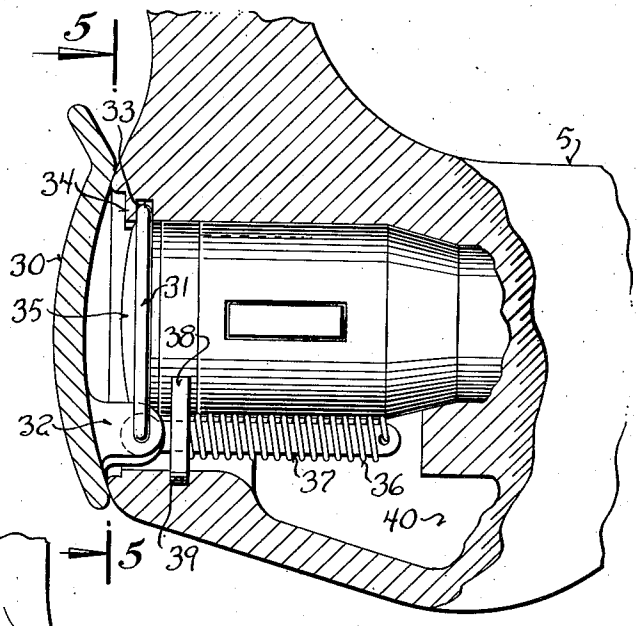
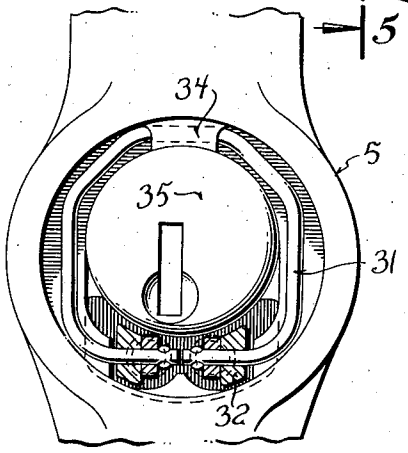


Fig. 5.



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Dec. 3, 1940. E. N. JACOBI 2,223,615

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Fig. 6.

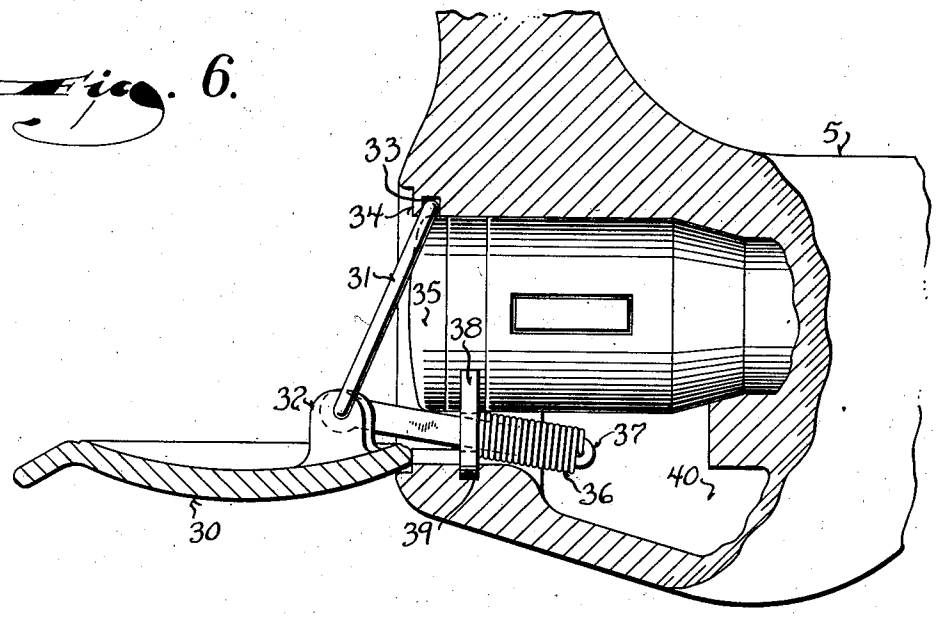
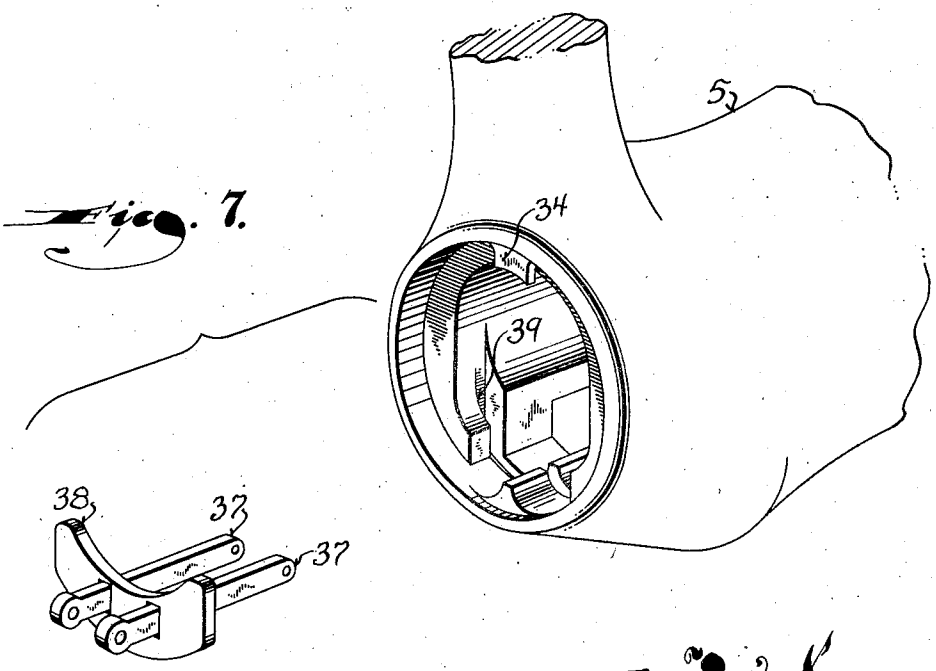


Fig. 7.



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Dec. 3, 1940. E. N. JACOBI 2,223,615

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Fig. 8.

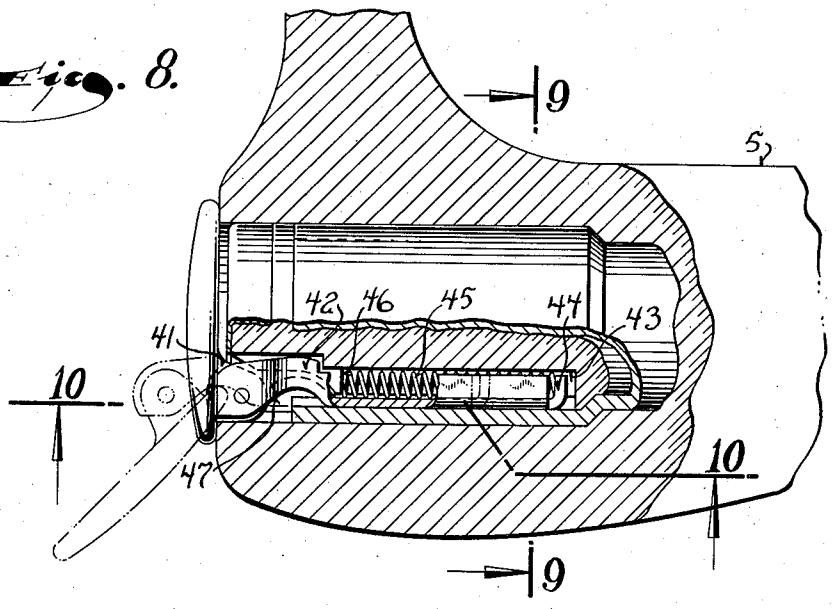
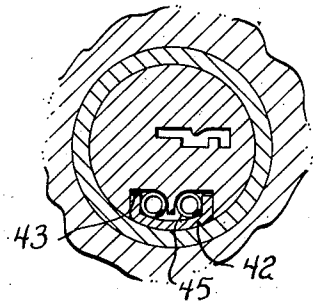


Fig. 9.



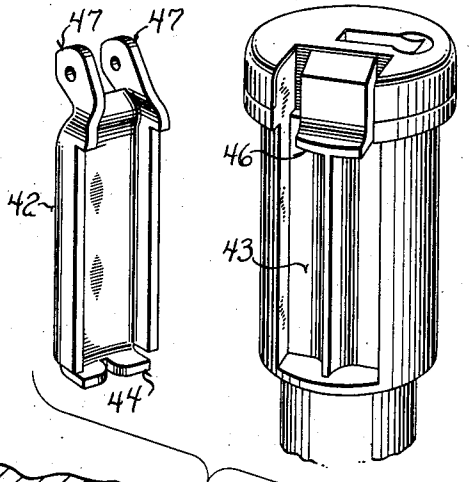


Fig. 10.

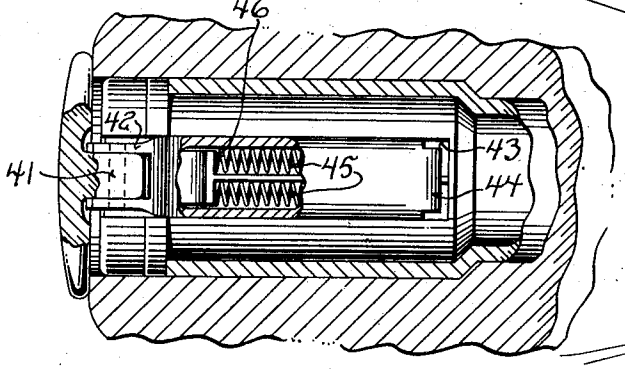


Fig. 11.

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Patented Dec. 3, 1940 2,223,615

UNITED STATES PATENT OFFICE

2,223,615

LOCK

Edward N. Jacobi, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis., a corporation of Delaware

Application November 9, 1939, Serial No. 303,515

19 Claims. (Cl. 70—455)

This invention relates to locks, and refers particularly to key operated cylinder locks of the type used on automobiles in door handles and other exposed locations.

It is of course desirable in locks of this type to cover the entrance to the keyhole, and while so-called "dust covers" have been provided in the past for this purpose, they were generally mounted to swing edgewise to and from operative position, and, as a consequence, they did not seal tightly against their seat. Also, these past covers generally protected only the entrance to the keyway and did not guard against admission of dirt and water into the joint between the lock cylinder and its casing.

The present invention therefore has as one of its objects to provide a cover for locks of the character described which not only closes the entrance to the keyway, but also covers the joint between the cylinder and its casing.

To be effective against a strong jet of water as projected from a hose during washing of the automobile, such covers must seal tightly all around the edge and the mounting for the cover must not break the continuity of the seat at any point.

This invention achieves this objective through the provision of novel means for mounting the cover, all parts of which lie inside an outer peripheral edge portion which engages a seat on the lock housing or casing.

Another object of this invention resides in the provision of improved means for holding the cover closed with a strong spring tension acting on the lock to pull the same down to closed position.

A further object of this invention is to provide a cover for locks of the character described which is so designed that it may be yieldingly held in either closed or open position.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate several complete examples of the physical embodiment of the invention constructed in accordance with the best modes so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a sectional view through an automobile door handle showing a lock equipped with the cover of this invention, mounted therein;

Figure 2 is a view similar to Figure 1, but with the cover in its open position;

Figure 3 is a perspective view of the cover, the lock cylinder, and the link by which the cover is connected to the lock cylinder;

Figure 4 is a view similar to Figure 1, showing a modified embodiment of the invention;

Figure 5 is a sectional view taken through Figure 4 on the plane of the line 5—5;

Figure 6 is a view similar to Figure 4, but showing the cover in its open position;

Figure 7 is a perspective view showing part of the door handle and part of the cover mounting means of that form of the invention shown in Figures 4, 5 and 6;

Figure 8 is a view similar to Figure 1, illustrating another modified embodiment of the invention;

Figure 9 is a cross sectional view through Figure 8 on the plane of the line 9—9;

Figure 10 is a sectional view through Figure 8 on the plane of the line 10—10; and

Figure 11 is a perspective view of the cylinder and part of the cover supporting structure employed in that form of the invention shown in Figures 8, 9 and 10.

Referring now particularly to the accompanying drawings in which like numerals indicate like parts throughout the several views, the numeral 5 designates the supporting member or housing in which the lock of this invention is mounted. In the present instance, this supporting member is in the form of a door handle having a bore 6 to receive the casing 7 of the lock. The casing is secured in the handle in any suitable manner and is bored to receive the rotatable lock cylinder 8.

The cylinder 8 is of the type illustrated in Patent No. 1,965,336 issued to John W. FitzGerald July 3, 1934, in which a locking bar 9 is projected to an operative position engaging in a groove formed in the casing, by key operable tumblers (not shown). The tumblers are retractible upon the insertion of a proper key 10 to a position at which the locking bar 9 is drawn into the confines of the cylinder to free the same for rotation in the customary manner. Rotation of the cylinder is transmitted through a stem 11 extending rearwardly therefrom to the door latching mechanism (not shown).

In the embodiment of the invention illustrated in Figures 1 to 3, inclusive, the casing terminates

a distance inwardly of the mouth of the bore 6 and the cylinder has an enlarged head 12 received in the bore 6 outwardly of the casing. The space between the front of the head 12 and the mouth of the bore accommodates the mechanism by which a cover 13 is mounted.

The cover 13 in this instance is an unbroken disc having a peripheral edge portion 14 which engages a seat 15 at the rim of the bore 6. As clearly shown in Figures 1 and 2, this seat and the contacting edge portion of the cover slant downwardly and outwardly away from the peripheral edge or rim of the bore to direct liquid or foreign matter away from the mouth of the bore. Ordinarily though, the contact between the cover and its seat is sufficiently tight to preclude the passage of water or foreign matter into the bore, so that it is only when some particle of dirt gets under the cover to hold the same from seating properly that the slant of the contacting surfaces on the cover and supporting member is important.

The cover is hingedly mounted on the rotatable lock cylinder by means of a lever or link 16, preferably in the form of a die casting best shown in Figure 3. This link or lever has two spaced parallel arms 17 between which a lug 18 on the head of the cylinder and a lug 19 on the inner face of the cover are received. These lugs are opposite one another across the center line with relation to the link or lever member 16 and are pivotally joined to the arms 17 by pins 20 and 21, respectively.

Between the pivotal connections provided by the pins 20 and 21, the link or lever member 16 is pivotally attached, as at 22, to the arms 23 of a yoke member which slides on the stem 11 of the cylinder. These arms 23 slide in grooves 24 and project through openings 25 in the cylinder head to extend into recesses 26 in the inner faces of the arms 17 on the lever member.

A coil spring 27 confined between the inner or rear end of the lock cylinder and the closed medial portion of the yoke member yieldingly urges the yoke member rearwardly to draw the lever member, and consequently the cover, toward the cylinder. In this way, a strong spring tension is applied to the cover to hold the same firmly engaged with its seat.

In opening the cover to expose the mouth of the keyway, an outward force applied on its edge opposite the hinge pin 21 causes the cover edge to ride over the rim of the bore 6, swinging the lever member 16 outwardly. After a predetermined motion of the cover in this manner, its edge portion adjacent to its lug 19 swings beyond dead center to its position shown in Figure 2, the arms of the lever member 16 being cut away as at 28 to accommodate this edge portion of the cover.

When the parts are moved to this position, the spring 27 acts to yieldingly hold the cover open, and in this position, an opening 29 through the lever member affords access to the keyway to permit the insertion of the key. In reclosing the cover, it is only necessary to flip the same beyond its dead center, whereupon the spring acts to return the same firmly to its closed position.

In that modification of the invention shown in Figures 4 to 7, inclusive, the cover does not turn with the cylinder, but is mounted from the supporting member or door handle. In this instance, the cover 30 is hingedly mounted from the handle by a link 31 pivotally connected to a lug 32 on the inner face of the cover and pivotally connected with the handle by having a portion thereof confined in the bottom of a counterbore 33 by a lug 34 and the head 35 of the cylinder.

Two coil springs 36 are used to draw the cover to its closed position. These springs encircle pins 37 pivotally connected to the cover at their hinged connection with the link 31 and slidably projecting through a fixed plate 38 which serves as a spring abutment. This plate is held in position by being set in a notch 39 in the mouth of the bore of the handle where it is held by the lock casing.

The springs 36, as stated, are coiled about the pins 37 and have one end bearing against the inner face of the plate 38 and their opposite ends connected to the rear ends of the pins. Consequently, the springs are maintained in compression and to accommodate the same, the handle is provided with a cavity 40 in which the springs and their mounting pins operate as the cover is moved to and from its open position.

That form of the invention illustrated in Figures 8 to 11, inclusive, has the cover mounted to turn with the cylinder, and as in the other two embodiments described, the cover is large enough to extend out over the joint between the cylinder and its casing.

As before, the inner face of the cover has a lug 41. This lug is pivotally connected to a slide member 42 slidable in a longitudinal groove 43 formed in the side of the lock cylinder. This slide member 42 is box-like and has a rear wall 44 to engage the rear ends of two compression springs 45, the front ends of which abut a wall 46 partially closing the front of the groove 43. In this manner, the compression of the springs 45 draws the slide member longitudinally rearwardly to maintain the cover in its closed position.

As the cover is opened, it fulcrums about its peripheral edge portion adjacent to the hinged connection with the slide member, which is formed with a curved neck 47 to accommodate the edge of the cover and permit the same to swing beyond dead center to a position where the tension of the springs holds the same in its open position.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent that this invention provides a substantial improvement in covers of key operable lock cylinders in that it not only covers the entrance to the keyway but also precludes the admission of water and dirt to the joint between the cylinder and its casing.

What I claim as my invention is:

1. In a lock of the character described: a supporting member having a bore; a lock cylinder mounted therein; a cover for the outer end of the cylinder, said cover being large enough to extend out beyond the junction between the cylinder and the supporting member and engaging the supporting member all around the mouth of its bore when in closed position; means hingedly mounting said cover to swing flatwise toward and from the outer end of the cylinder with the cover fulcruming about the contact of its rim with the front face of the supporting member; and means for yieldingly drawing the cover down onto the supporting member.

2. In combination with a lock cylinder and its bored housing: a cover for the front of the lock cylinder; a seat for the cover on the housing encircling the bore; means lying wholly within the confines of said seat for hingedly mounting the cover to swing flatwise toward and from the

front of the lock cylinder with the cover fulcruming about the contact of its rim with the front face of the bored housing; and means yieldingly urging the cover into firm engagement with the seat.

3. In combination: a supporting member having a bore; a lock cylinder mounted in the bore; a cover for the front of the lock cylinder larger than the mouth of the bore and engageable with the front of the supporting member; a hinged connection between the cover and the cylinder; and means yieldingly drawing the cover into firm engagement with the front of the supporting member.

4. In combination: a supporting member having a bore; a lock cylinder mounted therein; a cover for the front end of the cylinder; a cover seat on the supporting member encircling the mouth of the bore and with which said cover is engageable with an uninterrupted contact to guard against admission of extraneous matter and water to the joint between the cylinder and the supporting member; a hinged connection between the cover and the lock cylinder; and spring means acting on said cover through the hinged connection to draw the cover down onto its seat.

5. In a lock of the character described: a supporting member having a bore; a lock cylinder mounted therein; a cover for the front end of the cylinder of a size large enough to extend beyond the rim of the bore; a hinged mounting for the cover including a member slidable longitudinally with respect to the cylinder and hingedly connected with the cover inwardly of its peripheral edge portion whereby in opening the cover, the cover fulcrums about the contact of its rim with the front face of the supporting member and the rim of the bore therein; a compression spring arranged with its axis substantially parallel with the axis of the cylinder and inwardly of the outer end of the cylinder; and a connection between the spring and the cover whereby said spring at all times yieldingly draws the cover toward the supporting member.

6. In a lock of the character described: a supporting member having a bore; a lock cylinder mounted therein; a cover for the front end of the cylinder large enough to extend beyond the rim of the bore so as to cover the junction between the cylinder and the supporting member; means hingedly mounting the cover for flat-wise swinging movement from a closed position outwardly away from the supporting member to an open position; a spring; and means connecting the cover with the spring in such a manner that the spring yieldingly holds the cover either in its closed or open position.

7. In a lock of the character described: a supporting member having a bore; a lock cylinder in the bore; a cover for the front end of the lock cylinder large enough to extend beyond the periphery of the cylinder to cover the joint between it and the supporting member; a lug on the inner face of the cover extending into the mouth of the bore, said lug being spaced from the marginal edge portion of the cover so as to leave said marginal edge portion unobstructed for uninterrupted engagement with the supporting member; means connected with the lug for hingedly mounting the cover; and means acting on said cover through the lug for yieldingly holding the cover in its closed position.

8. In a lock of the character described: a supporting member having a bore; a lock cylinder mounted therein; a cover for the front of the lock cylinder large enough to extend beyond the periphery of the cylinder and cover the joint between it and the supporting member; a cover seat encircling the mouth of the bore; a lever pivotally connected with the cover inside its portion which engages the seat; means inwardly of the mouth of the bore for pivotally mounting said lever at a distance from its connection with the cover; and spring means acting on the cover and tending to hold the same in its closed position.

9. In a lock of the character described: a supporting member having a bore; a lock cylinder mounted therein; a cover for the front of the lock cylinder; a cover seat on the supporting member encircling the mouth of the bore and with which the cover is engageable with uninterrupted contact; a lever pivotally connected with the cover to one side of the longitudinal axis of the lock and pivotally connected with the lock cylinder at the opposite side of said axis, said lever and its pivotal connections enabling the cover to be swung to and from its closed position; and spring means connected with the lever between its pivotal connections with the cover and cylinder yieldingly urging the lever toward the cylinder to draw the cover into firm engagement with its seat.

10. In a lock of the character described: a member having a bore; a lock cylinder mounted therein; a cover for the front end of the cylinder; a cover seat on said member encircling the mouth of the bore and with which the cover is engageable with an uninterrupted contact; a lever having a pivotal connection with the cover to one side of the cover center but inwardly of its portion which engages the seat and having a pivotal connection with the cylinder at the opposite side of the center of the lock when the cover is closed; a yoke engaged over an inner end portion of the cylinder and having arms projecting forwardly; a connection between said arms and the lever; and a spring yieldingly urging the yoke inwardly to hold the cover yieldingly down on its seat.

11. In a lock of the character described: a supporting member having a bore; a cylinder mounted therein; a cover for the front of the cylinder large enough to extend beyond the junction of the cylinder and its supporting member; a lever of a size to fit into the mouth of the bore; a pivotal connection between the lever and the cover; a pivotal connection between the lever and the cylinder; said lever and the location of its connections with the cylinder and cover enabling the cover to be swung from a closed position at which the inner face of the cover engages the supporting member, to an open position at which the opposite front face of the cover engages the supporting member; and a spring connected with the lever medially of its pivoted connections with the cylinder and cover and acting inwardly thereon to yieldingly hold the cover in either of its positions.

12. In a lock of the character described: a cylinder having a keyway and having an open longitudinal groove in one side thereof; a cover for the front of the cylinder; a spring for yieldingly urging the cover to its closed position; and means slidable in the longitudinal groove and connected with the spring and the cover through which means the spring tension is applied to the cover.

13. In a lock of the character described: a lock cylinder having a keyway; a cover for the

front of the cylinder to close the keyway; a stem on the inner end of the cylinder; a yoke slidable on said stem and having arms extending forwardly beyond the front end of the cylinder; means connecting the arms with the cover; and a spring confined between the yoke and the inner end of the cylinder for yieldingly drawing the cover to its closed position.

14. In a lock of the character described: a rotatable cylinder having longitudinal grooves at diametrically opposite points in its side wall and having a keyway; a cover for the front end of the cylinder movable to and from a closed position disposed over the keyway; a stem extending from the rear end of the cylinder; a yoke slidable on the stem and having arms slidable in said longitudinal grooves; means connecting said arms with the cover; and a spring confined between the rear end of the cylinder and the yoke for yieldingly drawing the cover to its closed position.

15. In a lock of the character described: a supporting member having a bore; a cylinder mounted therein; a cover having its peripheral edge portion engageable with the supporting member around the rim of the bore; a lug on the inner face of the cover projecting into the bore; a lug on the front face of the cylinder; a lever member having pivotal connections with said lugs; a stem projecting from the rear end of the cylinder; a yoke slidable on the stem with its arms projecting forwardly beyond the front face of the cylinder; means pivotally connecting said lever member with the arms of the yoke; and a spring confined between the rear end of the cylinder and said yoke tending to at all times draw the lever member and consequently the cover toward the cylinder.

16. In a lock of the character described: a supporting member having a bore; a lock cylinder mounted therein; a cover engageable with the supporting member around the rim of the bore; a lug on the inner face of the cover inwardly of its edge portion which engages said rim; a link pivotally connected with the lug and embracing the front end of the cylinder; a pivotal connection between said link and the supporting member diametrically opposite the connection of the link with the cover; and spring means anchored with relation to the supporting member and connected with the cover for yieldingly drawing the cover against the supporting member.

17. In a lock of the character described: a lock cylinder having a keyway; a cover for the front end of the cylinder to close the keyway; said cylinder also having an open groove in its side; an abutment in the bottom of the groove near the front end of the cylinder; a member slidable in said groove and having an abutment spaced from the abutment in the groove; a spring confined between said abutments to yieldingly draw said member longitudinally toward the rear end of the cylinder; and a pivotal connection between the cover and said member.

18. In a lock of the character described: a supporting member having a bore; a lock cylinder mounted therein and having an open longitudinal groove in its side wall; a cover to close the mouth of the bore and engage the rim of the bore with an uninterrupted contact; a member slidable longitudinally in said groove; abutments in the groove, one fixed with relation to the cylinder and the other with relation to the slidable member; a spring confined between said abutments to yieldingly urge the slidable member inwardly; and a pivotal connection between said slidable member and the cover.

19. In a lock of the character described: a supporting member having a bore; a lock cylinder rotatable therein; a cover for the cylinder of a size large enough to extend beyond the rim of the bore and contact the front of the supporting member; common means for hingedly mounting the cover from the cylinder and yieldingly drawing the cover down onto the supporting member, said means including a member slidable longitudinally with respect to the cylinder and hingedly connected with the cover inwardly of its peripheral edge portion whereby in opening the cover, the cover fulcrums about the contact of its rim with the front face of the supporting member and the rim of the bore therein, and said slidable member being formed to enable the cover to swing past dead center to a position at which the spring tension holds the cover open.

EDWARD N. JACOBI.