Nov. 3, 1936. S. F. BRIGGS 2,059,678

LOCK

Filed May 14, 1930

Fig. 1.

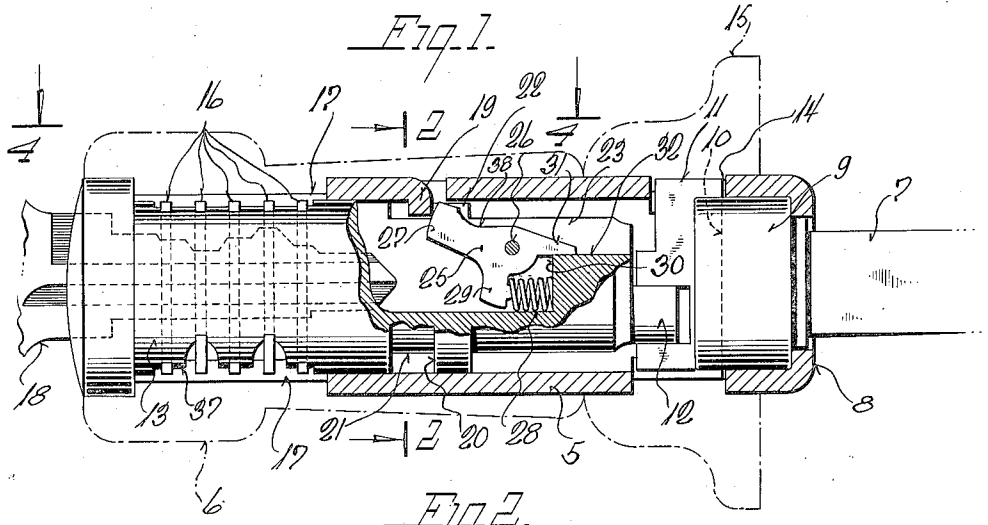


Fig. 2.

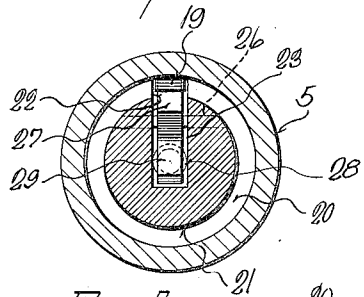


Fig. 3.

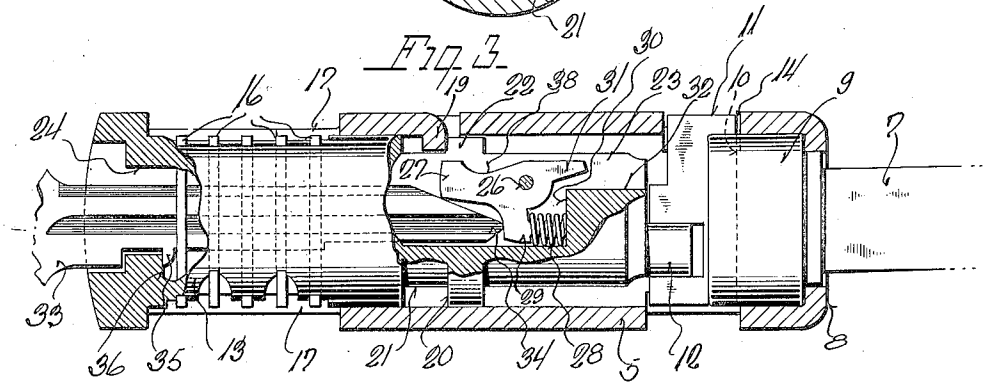
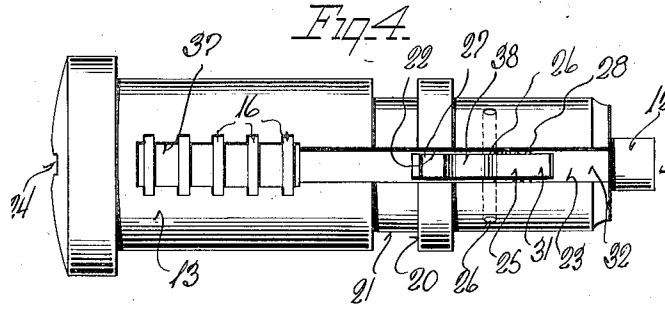


Fig. 4.



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2,059,678

LOCK

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37 Claims. (Cl. 70—46)

This invention relates to certain new and useful improvements in locks and has as a broad object to provide an improved and simplified means for removably securing a lock cylinder assembled with its casing or mounting member.

Another object of this invention resides in the provision of means for removably securing a lock cylinder in its mounting member, which means may be easily disabled by the insertion of a tool into the key receiving opening of the cylinder after the cylinder has been key operated.

A more specific object of this invention resides in the provision of an annular barrier carried by the lock cylinder and into which a casing carried abutment extends to normally hold the cylinder against detachment, the annular barrier having an outlet gate which is normally closed by a member movable to inactive position by the insertion of a tool into the lock cylinder.

With the above and other objects in view which will appear as the description proceeds, my 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 herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawing, I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view, partly in section and partly in elevation, illustrating a conventional vehicle door handle construction equipped with my improved lock device;

Figure 2 is a cross sectional view taken through Figure 1 on the plane of the line 2—2;

Figure 3 is a view similar to Figure 1 illustrating the manner of removing the lock cylinder; and

Figure 4 is a view of the lock cylinder per se taken on the plane of the line 4—4 of Figure 1.

Referring now more particularly to the accompanying drawing, in which like numerals designate like parts, the numeral 5 represents the casing or mounting member of a lock device which may form part of the stem of a vehicle door handle 6 which has been illustrated in light dot and dash lines, as it forms no part of this invention.

The casing or mounting member 5 has a shaft 7 extended from its inner closed end 8, through which the turning movement of the handle is imparted to the door latching mechanism, not shown. The shaft 7 has an enlarged head 9 which substantially fills the inner end of the casing or mounting member and has a transverse groove 10 in which a locking bolt 11 is slidably mounted.

The bolt 11 has a cooperating engagement with a cam 12 extended eccentrically from the inner end of a lock cylinder 13 mounted within the casing or mounting member 5, to be moved longitudinally in its groove 10 upon rotation of the cylinder. With the lock cylinder in its unlocked position, as illustrated in Figures 1 and 3, the bolt 11 extends into an opening 14 formed in the wall of the casing or mounting member 5 so that the shaft 7 and the handle are non-rotatably connected; and when the cylinder is turned to its locked position, which in the present instance is 180 degrees from its unlocked position, the locking bolt 11 is extended outwardly from the mounting member and into a suitable recess, not shown, formed in a conventional escutcheon plate 15 to secure the handle assembly against rotation.

The lock cylinder 13 is provided with a plurality of conventional locking tumblers 16 which are yieldably urged to project into one of a pair of tumbler receiving grooves 17 formed in the mounting member or casing 5 to hold the cylinder against rotation in either its locked or unlocked position, the tumblers being retractible within the peripheral surface of the cylinder upon the insertion of a proper key 18 to free the cylinder for rotation by the key.

Longitudinal movement of the lock cylinder with respect to its mounting member is prevented by the engagement of an inwardly directed stop or abutment 19 with an annular abutment or barrier 20 which forms one side of an annular groove 21 in the medial portion of the cylinder.

At one point of its circumference, the annular barrier 20 is cut away to provide a gate or opening 22 of a width sufficient to permit the stop or abutment 19 to pass into and out of the annular channel 21. The outlet gate or opening 22 preferably is part of an extension 23 of the lock cylinder key slot 24 and is normally closed by a novel stop member 25 mounted within the slot extension 23.

The stop member 25 is pivotally mounted by a pin 26 whose ends are anchored in the lock cylinder, and has an extended arm 27 which, when the locking member is in its normal position, forms substantially a continuation of the

annular barrier 20 to prevent movement of the abutment 19 through the outlet gate or passage 22. An expansive spring 28 confined between an arm 29 and a wall 30 which forms part of the slot extension 23, yieldably maintains the stop member in its normal operative position, the movement of the locking member by the spring being limited by the engagement of a tail piece 31 extended from the locking member with an abutment 32 at the extreme end of the slot extension 23.

The circumferential location of the stop or abutment 19 is preferably in a plane coinciding with the longitudinal axes of the locking tumblers when the lock cylinder is in either extreme position and aligns with the passage or outlet gate 22 when the lock cylinder is in its unlocked position. Unauthorized removal of the lock cylinder is therefore prevented as the possession of the proper key is necessary to turn the lock cylinder to its unlocked position when it is desired to remove the same from the mounting member.

After the cylinder has been turned to its unlocked position, the key 18 is removed and a special tool 33 having a cross section similar to that of the key to permit its insertion into the lock cylinder, is projected into the key slot 24. The tool 33 is longer than the regular key 18 and its nose 34 abuts the arm 29 of the locking member and moves the same about its pivotal mounting in a counterclockwise direction to retract its end 27 out of the path of the stop or abutment 19 as clearly illustrated in Figure 3. The passageway 22 is thus unobstructed so that the stop or abutment 19 may pass therethrough and the cylinder be withdrawn.

A hook 35 formed on the tool 33 engages with the outermost end 36 of the usual transverse slot 37 in which the various tumblers are mounted and which forms an enlargement of the key slot 24, to enable outward longitudinal stress to be applied to the cylinder.

Insertion of the cylinder may be effected without the use of the special tool or the key, for the stop member is in effect a spring pressed pawl. Hence, it is only necessary to align the passage 22 with the stop or abutment 19 and push the cylinder into the mounting member, the locking member end 27 having its leading edge 38 inclined to cam itself past the stop as it is engaged therewith, so that the cylinder is virtually snapped into position.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent to those skilled in the art to which an invention of the character described appertains, that I provide a novel and extremely simple means for removably securing a lock cylinder in its mounting member which necessitates the turning of the cylinder from locked position and the use of a special tool to effect removal.

What I claim as my invention is:

1. In a lock device of the character described, a mounting member, a mounting member carried abutment, a lock cylinder movable in the mounting member in the performance of its normal locking functions, a lock cylinder carried abutment engageable with the mounting member abutment to removably secure the lock cylinder in the mounting member, a movable element forming a part of the lock cylinder abutment and past which the mounting member abutment is adapted to move during insertion and removal of the lock cylinder from the mounting member, and means for securing said movable element against movement by force imparted thereto through the mounting member abutment to prevent unauthorized removal of the lock cylinder from the mounting member.

2. In a lock device of the character described, a mounting member, a mounting member carried abutment, a lock cylinder movable in the mounting member in the performance of its normal locking functions, a lock cylinder carried abutment engageable with the mounting member abutment to removably secure the lock cylinder in the mounting member, a movable element forming a part of one of the abutments and past which the other abutment is adapted to move during insertion and removal of the lock cylinder from the mounting member, and means normally maintaining said movable element in its operative position to prevent unauthorized removal of the lock cylinder from the mounting member.

3. In a lock device of the character described, a mounting member, an abutment carried by the mounting member, a lock cylinder movable in the mounting member in the performance of its normal locking functions, a barrier engageable with the mounting member abutment—throughout the movement of the lock cylinder in the performance of its locking functions—to removably secure the lock cylinder in the mounting member, said barrier having an outlet passage to permit the mounting member abutment to be disengaged from the lock cylinder barrier to release the lock cylinder for removal, and means normally closing said passage, said means being adapted to be disabled by means insertable into the lock cylinder.

4. In a lock device, a mounting member, a lock cylinder in the mounting member having key operable tumblers engageable with the mounting member, said lock cylinder being movable in the mounting member in the performance of its normal locking functions upon retraction of its tumblers, cooperating means carried by the mounting member and the lock cylinder for removably securing the lock cylinder in the mounting member, a movable element forming part of one of said cooperating means, and means whereby said movable element may be moved to enable the cooperating means to be disengaged and release the lock cylinder for removal by engagement with a tool insertable into the lock cylinder.

5. In a lock device of the character described, a mounting member having an abutment, a lock cylinder movable in the mounting member in the performance of its normal locking functions, a barrier engageable with the mounting member abutment to removably secure the lock cylinder in the mounting member, a movable member forming a portion of the barrier, and means whereby the movable member may be moved to an inactive position to release the lock cylinder for removal by means insertable into the lock cylinder.

6. In a lock device of the character described, a mounting member having an abutment, a lock cylinder movable in the mounting member in the performance of its normal locking functions, a barrier engageable with the mounting member abutment to removably secure the lock cylinder in the mounting member, and a movable member forming a portion of the barrier and adapted to align with the mounting member abutment when the lock cylinder is in a predetermined position relative to the mounting member, said movable member being movable to release the lock cylin-

der for removal by a tool insertable into an opening in the lock cylinder.

7. In a lock device of the character described, a mounting member having an abutment, a lock cylinder movable in the mounting member in the performance of its normal locking functions, a barrier engageable with the mounting member abutment to removably secure the lock cylinder in the mounting member, said barrier being cut away for a distance to provide an outlet passage through which the mounting member abutment is adapted to pass during insertion and removal of the lock cylinder from the mounting member, means yieldably urged to a position forming substantially a continuation of the barrier and closing the outlet passage to prevent unauthorized removal of the lock cylinder, and said yieldable means being movable out of said position forming a continuation of the barrier to release the cylinder for removal by means insertable into the lock cylinder.

8. In a lock device of the character described, a mounting member having an abutment, a lock cylinder movable in the mounting member in the performance of its normal locking function, said lock cylinder having a key slot, a barrier engageable with the mounting member abutment to removably secure the lock cylinder in the mounting member, said barrier having an outlet passage to permit the mounting member abutment to be disengaged from the barrier to release the lock cylinder for removal, means yieldably maintained in a position closing said passage and having a part adapted to be engaged by a tool inserted into the lock cylinder key slot to be moved thereby to inactive position.

9. In a lock device of the character described, a mounting member having an abutment, a lock cylinder within the mounting member and having an annular channel in which the mounting member abutment is normally engaged to removably secure the lock cylinder in the mounting member, said annular channel having an outlet passage communicating therewith through which the mounting member abutment may be passed during insertion and removal of the lock cylinder from the mounting member, and means carried by the lock cylinder to normally close said passage and prevent unauthorized removal of the cylinder.

10. In a lock device of the character described, a mounting member having an abutment, a lock cylinder mounted within the mounting member and having an annular channel with which the mounting member abutment is engageable to secure the lock cylinder in the mounting member, said annular channel having a passage communicating therewith through which the mounting member abutment is adapted to pass during insertion and removal of the lock cylinder from the mounting member, a movable member normally forming substantially a continuation of one wall of the annular channel to close said passage and prevent unauthorized removal of the lock cylinder, and means whereby said movable member may be moved to inactive position to release the lock cylinder for removal.

11. In a lock device of the character described, a mounting member, an abutment carried by the mounting member, a lock cylinder insertable into the mounting member, an abutment carried by the lock cylinder, a movable member forming part of said lock cylinder carried abutment, said movable member snapping past the mounting member abutment during insertion of the lock cylinder into the mounting member to permit the mounting member abutment to be engaged with the lock cylinder abutment, and means whereby the movable member may be disabled to release the lock cylinder for withdrawal from the mounting member.

12. In a lock device of the character described, a mounting member, an abutment carried by the mounting member, a lock cylinder insertable into the mounting member, a movable member adapted to snap past the mounting member abutment during insertion of the lock cylinder into the mounting member, said movable element securing the lock cylinder against withdrawal after the same has been moved past the mounting member abutment, an abutment carried by the lock cylinder which with the movable member cooperates with the mounting member carried abutment to releasably secure the lock cylinder in position, and means whereby said movable member may be disabled to release the lock cylinder for withdrawal.

13. In a lock device of the character described, a mounting member having an abutment, a lock cylinder movable in the mounting member in the performance of its normal locking functions, a barrier engageable with the mounting member abutment to removably secure the lock cylinder in the mounting member, and a movable member normally forming a portion of the barrier and movable by means inserted into the lock cylinder to inactive position to release the lock cylinder for removal.

14. In a lock device of the character described, a mounting member, a lock cylinder member, cooperating means carried by the said members for removably securing the same assembled, said means permitting the assembly and disassembly of the members when in predetermined relative positions of rotation, and means carried by one of the members and engageable with the said means on the other member for preventing disassembly of the members after said members are completely assembled.

15. In a lock device of the character described, a mounting member, a lock cylinder member insertable into the mounting member, cooperating means carried by said members for removably securing the lock cylinder member in the mounting member, said means permitting insertion and removal of the lock cylinder member when the members are in predetermined relative positions of rotation, and means carried by one of said members and engageable with the said means of the other member as the lock cylinder member is inserted in the mounting member to prevent unauthorized removal of the lock cylinder member.

16. In a lock device of the character described, a mounting member, a lock cylinder member insertable into the mounting member, cooperating means carried by said members for securing the lock cylinder member in the mounting member in all positions of rotation except one, and movable means carried by one of said members and engageable with the means of the other member to normally prevent removal of the lock cylinder member from the mounting member when the members are in said one position of relative rotation.

17. In a lock device of the character described, a mounting member, a lock cylinder member insertable into the mounting member, cooperating means carried by said members necessitating predetermined relative positions of rotation of

said members during insertion and removal of the lock cylinder member from the mounting member, and means carried by one of said members and engageable with the said means of the other member after the lock cylinder member is inserted into the mounting member to prevent unauthorized removal of the lock cylinder member from the mounting member.

18. In a lock device of the character described, a mounting member, a lock cylinder member insertable into the mounting member, cooperating means carried by said members for preventing removal and insertion of the lock cylinder member in all positions of relative rotation of said members except one, and a movable pawl carried by one of said members and engageable with the said means of the other member as the lock cylinder member is inserted to cooperate with said cooperating means and releasably secure the lock cylinder member in the mounting member.

19. In a lock device of the character described, a mounting member having an abutment, a lock cylinder insertable into the mounting member, a pawl movable by the mounting member abutment during insertion of the lock cylinder into the mounting member and operable after complete insertion to prevent removal of a lock cylinder from the mounting member, an abutment on the lock cylinder forming a circumferential continuation of the pawl, and means for disabling the pawl to enable removal of the lock cylinder.

20. In a lock device of the character described, a mounting member having an abutment, a lock cylinder insertable into the mounting member and having a key-way and a transverse groove with an entrance leading thereto through which the mounting member abutment is passable during insertion of the lock cylinder into the mounting member to engage the mounting member abutment in the transverse groove, a yieldable element for closing the entrance to the groove and adapted to snap past the mounting member abutment during insertion of the lock cylinder into the mounting member, and means carried by said yieldable element accessible from the lock cylinder key-way to enable the yieldable element to be moved to inoperative position by a tool inserted into the key-way.

21. In a lock device of the character described, a bored mounting member, an abutment carried by the mounting member and projecting into the bore, a lock cylinder insertable into the bore and having a groove adjacent its inner end portion and an entrance slot leading to the groove and through which the mounting member abutment is passable for entrance into the groove upon insertion of the lock cylinder into the mounting member bore, alignment of the mounting member abutment with the entrance slot necessitating predetermined relative positions of rotation of the lock cylinder and mounting member, an element carried by the lock cylinder for closing said entrance to the groove, means yieldably urging said element to its operative position to close the entrance, said element being movable to inoperative position upon forced engagement thereof with the mounting member abutment during insertion of the lock cylinder so that said element snaps past the mounting member abutment during insertion, and means carried by said element and accessible from the front end of the lock cylinder through an opening in the lock cylinder to afford means for moving said element to inoperative position.

22. In a lock, the combination of a casing having a bore extending longitudinally therethrough, a cylindrical plug insertable endwise into and rotatable in the bore of the casing and embodying a key slot at the outer end thereof, key-operable tumblers mounted in and movable transversely of the plug and adapted to lock the plug against rotation in the casing, said casing having a longitudinal groove along the bore for receiving the ends of the tumblers when the plug is in its locked position, and a second longitudinal groove along the bore for receiving the ends of the tumblers when the plug is in its unlocked position, and a device releasable when the plug is in its unlocked position for holding the plug against axial displacement in the casing, one end of said second groove being open so as to permit the plug, when it is in its unlocked position and the holding device is released, to be withdrawn from the casing without the use of the tumbler key.

23. In a lock, the combination of a casing having a bore extending longitudinally therethrough, a cylindrical plug insertable endwise into and rotatable in the bore of the casing, key-operable tumblers mounted in and movable transversely of the plug and adapted to lock the plug against rotation in the casing, said casing having a longitudinal groove along the bore for receiving the ends of the tumblers when the plug is in its locked position, and a second longitudinal groove along the bore for receiving the ends of the tumblers when the plug is in its unlocked position, and a device for holding the plug against axial displacement in the casing, mounted in the inner end of the plug and releasable when the plug is in its unlocked position, the front end of said second groove being open and arranged so as to permit the plug, when it is in its unlocked position and the holding device is released, to be withdrawn from the front of the casing without the use of the tumbler key.

24. In a lock, the combination of a casing having a bore extending longitudinally therethrough, a cylindrical plug insertable endwise into and rotatable in the bore of the casing and embodying a key slot at the outer end thereof, key-operable tumblers mounted in and movable transversely of the plug and adapted to lock the plug against rotation in the casing, said casing having a longitudinal groove along the bore for receiving the ends of the tumblers when the plug is in its locked position, and a second longitudinal groove along the bore for receiving the ends of the tumblers when the plug is in its unlocked position, and a special tumbler for holding the plug against axial displacement in the casing, mounted in the plug and adapted to be rendered inoperative when the plug is in its unlocked position by means of a key other than the key for the locking tumblers, the front end of said second groove being open so as to permit the plug, when in its unlocked position, to be removed from the casing by the key for the special tumbler and without the use of the tumbler key.

25. In a lock, the combination of a casing having a bore extending longitudinally therethrough, a cylindrical plug rotatable in and removable axially from the bore of the casing and having formed therein a longitudinal slot for a key, a series of transversely extending key-operable tumblers mounted movably in the plug and operative to lock the plug against rotation in the casing, and a special transversely extending tumbler for holding the plug against removal from the bore, said special tumbler being mounted movably

in the plug and adapted, after unlocking of the lock by the regular key, to be shifted positively into an inoperative position for plug removing purposes in response to insertion through said key slot of a special key unsuitable for unlocking the lock.

26. In a lock, the combination of a casing having a bore extending longitudinally therethrough, a cylindrical plug rotatable in and removable axially from the bore of the casing and having a longitudinal slot for a key extending through the front end thereof, a series of transversely extending key-operable tumblers mounted movably in the central portion of the plug and operative to lock the plug against rotation in the casing, and a special transversely extending spring pressed tumbler for holding the plug against removal from the bore, said special tumbler being disposed in the rear end of the plug and having means whereby it is positively shifted into an inoperative position for plug removal purposes upon insertion through said key slot of a special key having a different end formation than the regular key for the lock.

27. In a locking device, a housing, a cylinder mounted in the housing and provided with a key slot, change tumblers and a pick tumbler mounted in the cylinder, said housing having a recess into which the pick tumbler extends, said pick tumbler remaining inoperative during the ordinary operation of the locking device but having a portion extending into the key slot to be engaged by a key to permit the withdrawal of the cylinder from the housing.

28. In a lock device of the character described, a mounting member, an abutment carried by the mounting member, a lock cylinder movable in the mounting member in the performance of its normal locking function, a barrier engageable with the mounting member abutment to removably secure the lock cylinder in the mounting member, said barrier having an outlet passage through which the mounting member abutment is adapted to pass during insertion and removal of the lock cylinder from the mounting member, and spring-pressed means normally cooperating between said cylinder and mounting member for preventing the removal of the cylinder when said outlet passage is opposite said abutment member, said means being retractable through the keyway of said lock cylinder.

29. In a lock device of the character described, a mounting member having an abutment, a lock cylinder movable in the mounting member in the performance of its normal locking functions, a barrier engageable with the mounting member abutment to removably secure the lock cylinder in the mounting member, and a movable member normally forming a portion of the barrier and movable to an inactive position to release the lock cylinder for removal.

30. In a lock device of the character described, a mounting member having an abutment, a lock cylinder movable in the mounting member in the performance of its normal locking function, a barrier on the lock cylinder engageable with the mounting member abutment to removably secure the lock cylinder and the mounting member, said barrier having an outlet passage to permit the mounting member abutment to pass to and from engagement with the barrier, and a movable member carried by said lock cylinder and cooperable with the mounting member to prevent accidental removal of the lock cylinder when said outlet passage is opposite said barrier.

31. A lock device, comprising a mounting member, a lock cylinder member movable therein in the performance of its locking functions, an abutment carried by one of said members, the other of said members having a groove in which the abutment is engageable to prevent separation of said members, without interference with the movement of the cylinder member in the performance of its locking functions, the groove having an outlet whereby the abutment may be disengaged therefrom when the members are in a predetermined relative position, and means normally blocking said outlet to prevent accidental disengagement of the abutment from the groove when the members are in said predetermined relative position.

32. A lock device, comprising a mounting member, a lock cylinder member movable therein in the performance of its locking functions, an abutment carried by one of said members, the other of said members having a groove in which the abutment is engageable to prevent separation of said members, without interference with the movement of the cylinder member in the performance of its locking functions, the groove having an outlet whereby the abutment may be disengaged therefrom when the members are in a predetermined relative position, and yieldable means normally blocking said outlet to prevent accidental disengagement of the abutment from the groove when the members are in said predetermined relative position.

33. In a lock device of the character described, a mounting member, a lock cylinder member movable in the mounting member, an abutment carried by one of said members, the other member having a bayonet slot engageable with the abutment when the lock cylinder member is in a predetermined position relative to the mounting member to releasably secure the members against separation, and yieldable means normally closing the entrance to the bayonet slot to prevent accidental withdrawal of the lock cylinder member.

34. In a lock device of the character described, a mounting member, an abutment carried by the mounting member, a lock cylinder movable in the mounting member in the performance of its normal locking functions, a barrier engageable with the mounting member abutment to removably secure the lock cylinder in the mounting member, said barrier having an outlet passage through which the mounting member abutment is adapted to pass during insertion and removal of the lock cylinder from the mounting member, and means normally closing said passage.

35. In a lock device of the character described, a mounting member, an abutment carried by the mounting member, a lock cylinder rotatable in the mounting member in the performance of its normal locking functions, a barrier engageable with the mounting member abutment throughout the movement of the lock cylinder in the performance of its locking functions to removably secure the lock cylinder in the mounting member, said barrier having an outlet passage to permit the mounting member abutment to be disengaged from the lock cylinder barrier to release the lock cylinder for removal, and means normally closing said passage.

36. In a lock device of the character described, a mounting member having an abutment, a lock cylinder movable in the mounting member in the performance of its normal locking functions, a barrier engageable with the mounting member

abutment to removably secure the lock cylinder in the mounting member, said barrier having an outlet passage to permit the mounting member abutment to pass to and from engagement with the barrier, and a movable member normally forming a continuation of the barrier and closing said passage to prevent unauthorized removal of the lock cylinder.

37. In a lock device of the character described, a mounting member having an abutment, a lock cylinder movable in the mounting member in the performance of its normal locking functions, a barrier engageable with the mounting member abutment to removably secure the lock cylinder in the mounting member, said barrier being cut away for a distance to provide an outlet passage through which the mounting member abutment is adapted to pass during insertion and removal of the lock cylinder from the mounting member, and means yieldably urged to a position forming substantially a continuation of the barrier and closing said outlet passage to prevent unauthorized removal of the lock cylinder.

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