July 7, 1936. E. N. JACOBI 2,046,630

COMPARTMENT LOCK

Filed Aug. 9, 1935 3 Sheets-Sheet 1

Fig. 1.

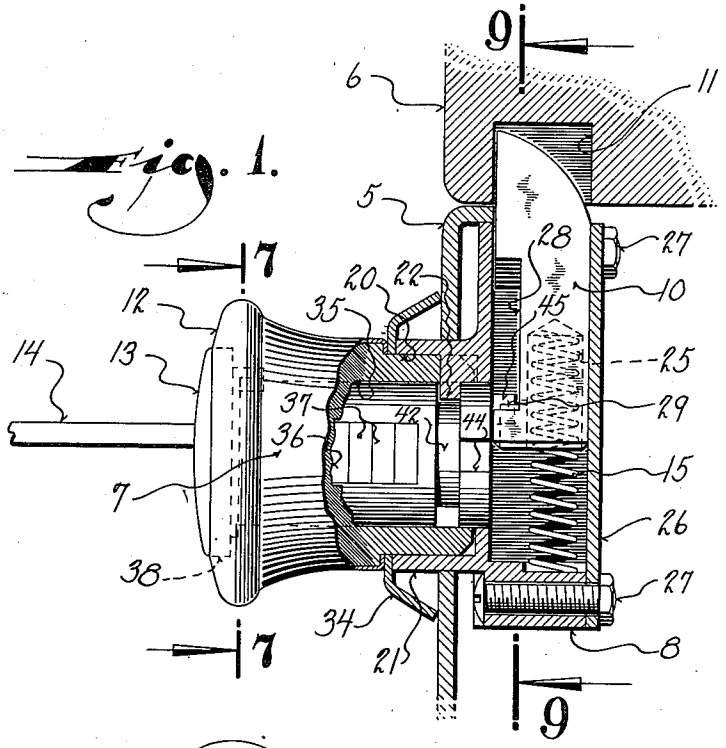
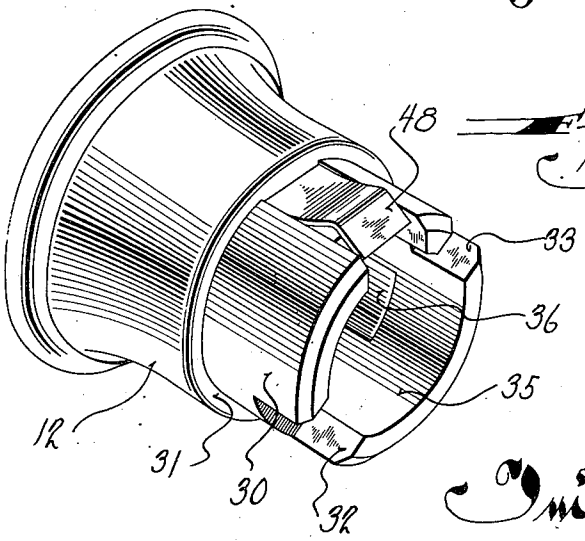


Fig. 2.



Inventor:

Edward N. Jacobi

By Dewitt Jones.

Attorneys

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Fig. 4.

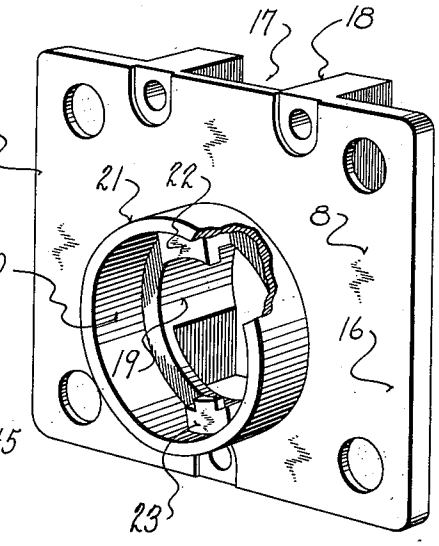
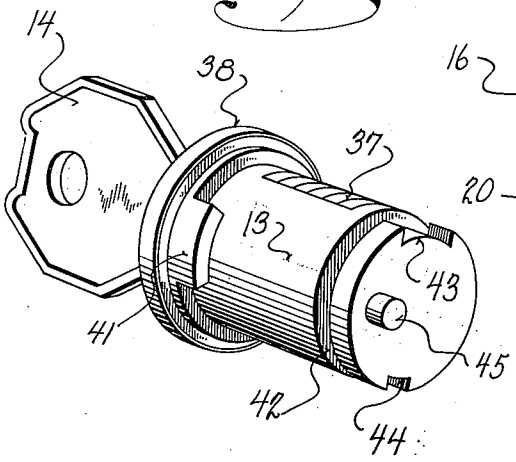


Fig. 3.



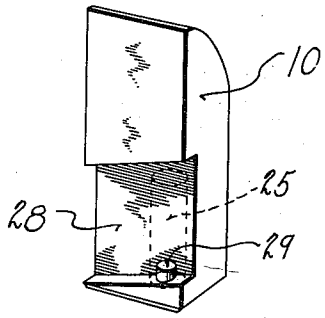
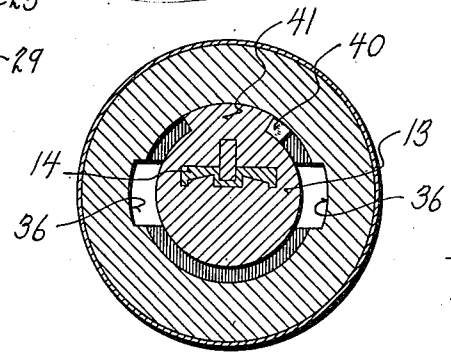


Fig. 5.

Fig. 7.



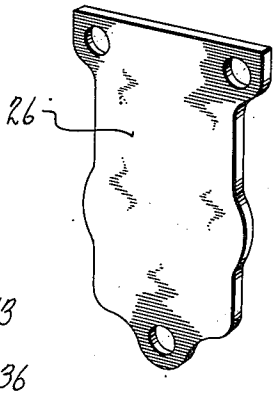
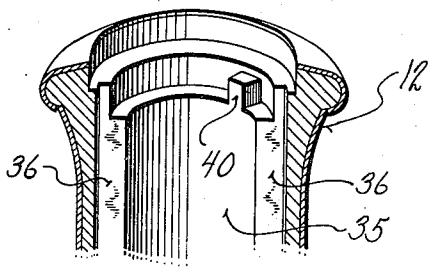


Fig. 6.

Fig. 8.



Inventor

Edward N. Jacobi

By Dorsett & Jones

Attorneys

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COMPARTMENT LOCK

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Fig. 9.

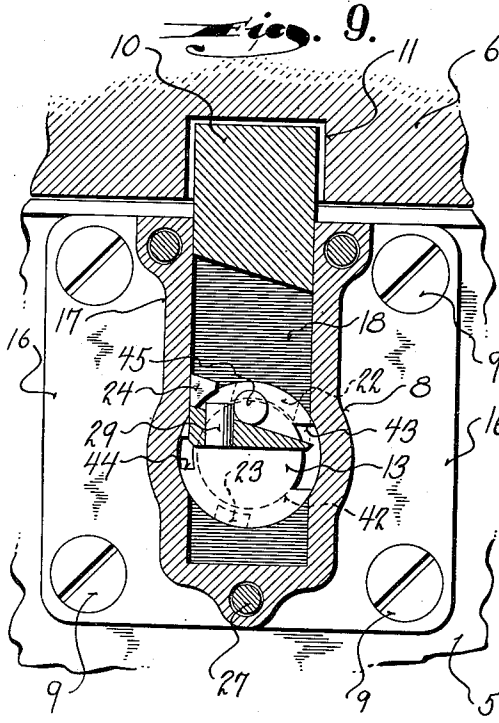


Fig. 10.

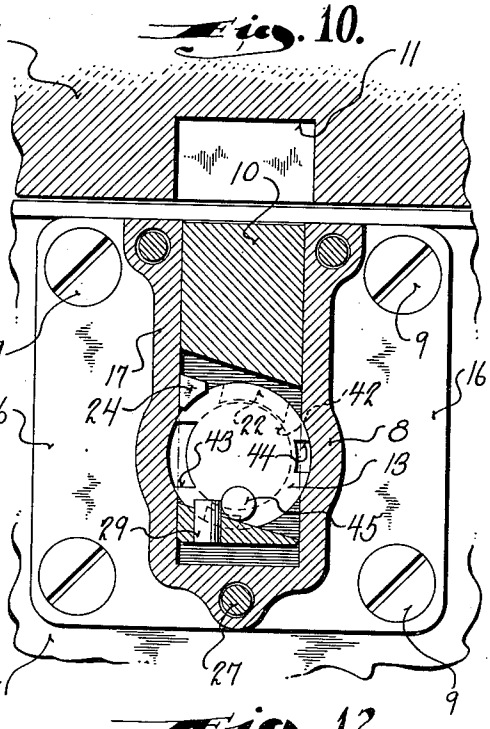


Fig. 11.

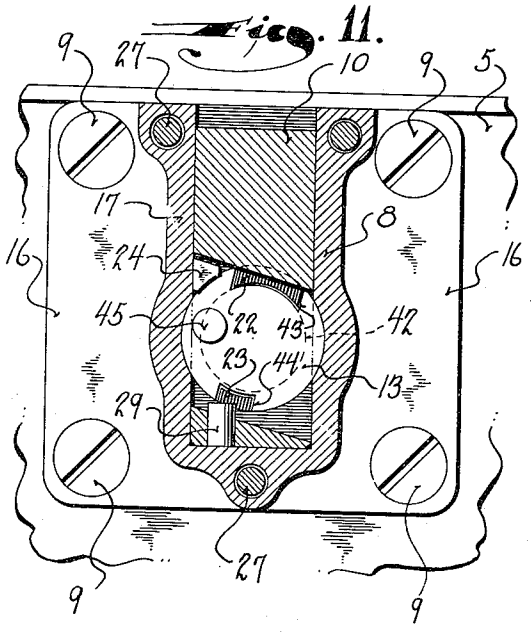
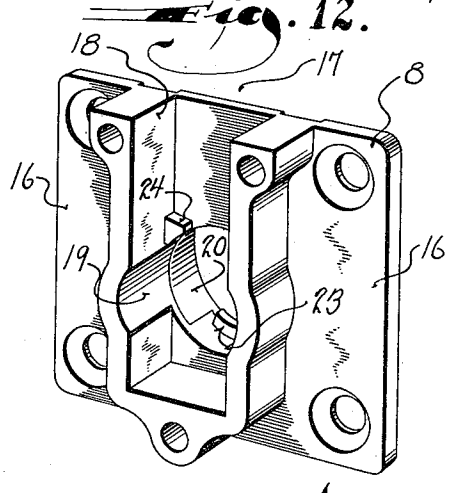


Fig. 12.



Inventor:
Edward N. Jacobi
By Ira Milton Jones
Attorney

Patented July 7, 1936

2,046,630

UNITED STATES PATENT OFFICE

2,046,630

COMPARTMENT LOCK

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

Application August 9, 1935, Serial No. 35,488

19 Claims. (Cl. 70—91)

This invention relates to locks and refers more particularly to compartment door locks such as shown in the copending application of Edward N. Jacobi, Serial No. 756,621, filed December 8th, 1934, patented July 2, 1935, No. 2,006,922.

It is an object of this invention to provide a lock of this character composed of readily separable parts detachably held together by releasably securing the lock cylinder in its casing.

Another object of this invention is to provide simplified means for maintaining the lock cylinder detachably secured in its casing.

Another object of this invention is to provide a lock of the character described which may be readily assembled and disassembled without the use of tools.

Another object of this invention is to provide a lock of the character described which is composed of a few simple ruggedly constructed parts.

A further object of this invention is to generally improve the construction of compartment door locks.

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 one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view partly in longitudinal section and partly in side elevation through a compartment door lock embodying this invention;

Figure 2 is a perspective view of a combined knob and cylinder casing;

Figure 3 is a perspective view of the lock cylinder;

Figure 4 is a perspective view of the supporting housing;

Figure 5 is a perspective view of the locking bolt;

Figure 6 is a perspective view of the back plate of the supporting housing;

Figure 7 is a cross section view taken through Figure 1 on the plane of the line 7—7;

Figure 8 is a perspective view in longitudinal section through the combined cylinder casing and knob;

Figure 9 is a section view taken through Figure 1 on the plane of the line 9—9;

Figure 10 is a view similar to Figure 9, but showing the locking bolt retracted;

Figure 11 is a view similar to Figures 9 and 10 showing the locking bolt and cylinder in their positions permitting withdrawal of the cylinder; and

Figure 12 is a perspective view of the rear of the lock housing.

Referring now more particularly to the accompanying drawings in which like numerals indicate like parts throughout the several views, the numeral 5 designates a compartment door adapted to swing to and from a closed position, or any other movable member which it is desired to lock in a predetermined position with respect to a fixed wall 6. Mounted on the door or movable member 5 is the lock device of this invention, indicated generally by the numeral 7.

This lock device includes a housing or mounting unit 8 secured to the movable element or door 5 by screws 9. A locking bolt 10 is movable in the housing to and from a locked position projecting its outer end into a keeper recess 11 in the fixed wall 6. On the front of the movable door element 5 is a knob 12 which also provides the casing for the lock cylinder 13 adapted to be controlled by a key 14.

Through rotation of the lock cylinder imparted thereto by the key 14, the locking bolt 10 is retractible out of the keeper recess 11 against the action of the bolt spring 15. The normal range of rotation of the cylinder is one hundred and eighty degrees during which the locking bolt is moved from its fully projected locked position to a completely retracted unlocked position.

Throughout its normal range of rotation, the cylinder is held against withdrawal, but upon being turned a predetermined distance beyond its unlocked position of rotation, the cylinder may be withdrawn as will be hereinafter described.

The lock housing is preferably in the form of a die casting and has attaching flanges 16 extending outwardly from opposite sides of a central body portion indicated generally by the numeral 17. This central body portion, as best shown in Figures 4 and 12, has a vertical rectangularly shaped chamber 18 formed therein open at its top and back. Communicating with this chamber 18, which forms a slideway for the locking bolt 10, is a horizontal hole 19 of substantially the diameter of the lock cylinder 13. This hole 19 is counterbored at its forward end to provide a larger bore 20 formed primarily in a for-

wardly extending flange 21. At diametrically opposite points radial lugs 22 and 23 extend inwardly from the wall of the bore 20. These lugs which are of different widths are engageable with the inner end of the lock cylinder to normally hold the same assembled with the housing, as will be hereinafter more fully described.

Projecting into the rectangularly shaped chamber or slideway from one side wall thereof and near the top of the hole 19 is a stop lug 24 which serves to limit the outward projection of the locking bolt by its spring 15, the spring being confined between the bottom wall of the chamber or slideway and the bottom of a well 25 drilled up into the locking bolt and into which the entire spring is movable upon complete retraction of the locking bolt.

The locking bolt is held in the chamber or slideway 18 by a back plate 26 closing the open back of the chamber and held in place by bolts 27. In its front face, the bolt has a transverse recess 28, the top and bottom edges of which are inclined as best shown in Figure 5. Projecting up from the ledge formed by the bottom edge of the recess 28 is a stop pin 29. With the bolt properly disposed in its slideway 18, the stop lug 24 is engageable with the bottom edge of the recess 28 to limit the outward projection of the bolt, as noted hereinbefore.

Inserted into the bore 20 is the inner end of the combined cylinder casing and knob 12. To fit the bore 20, the inner end of the combined cylinder casing and knob is cut down in diameter as at 30 which results in a shoulder 31. The proper relative rotational disposition of the combined casing and knob 12 in the bore 20 is secured by the engagement of the lugs 22 and 23 in diametrically opposite notches 32 and 33, respectively.

For the sake of appearance, a bezel 34 is confined between the shoulder 31 and the outer end of the annular flange 21.

The combined casing and knob 12 has a bore 35 to receive the lock cylinder 13 and communicating with this bore are diametrically opposite tumbler grooves 36 into which the tumblers 37 are yieldingly projected to secure the cylinder against rotation, the tumblers being retractible upon the insertion of the key 14 to free the cylinder for rotation. The outer end of the cylinder has an enlarged flange 38 which is nested in a counterbore at the outer end of the combined casing and knob, and to provide fixed limits of rotation for the cylinder, a stop lug 40 projects into the counterbore to be engageable by a lug 41 on the cylinder.

The inner end of the cylinder has an annular groove 42 so located as to have the lugs 22 and 23 disposed therein when the cylinder and its casing are properly assembled with the housing. Insertion and removal of the lugs 22 and 23 into and from the annular groove 42 is made possible by gateways 43 and 44. These gateways being of widths corresponding respectively to the lugs 22 and 23, assembly and disassembly of the parts can be effected only when the cylinder is in one position of rotation.

Normally when the lock is fully assembled, the cylinder is prevented from being turned to this position by the limiting effect of the engagement of a driving cam 45 projecting from the inner end of the cylinder into the recess 28 of the locking bolt with the stop pin 29.

The eccentrically disposed driving lug 45 is so positioned on the lock cylinder that during the one hundred and eighty degrees of normal rotation of the cylinder, it moves to and from positions lying in a plane parallel to the direction of movement of the locking bolt. Throughout the entire normal range of movement of the cylinder, the locking bolt spring holds the lower edge of the recess 28 in engagement with the lug 45 and at each limit of rotation of the cylinder, the lug 45 engages the stop lug 29.

With the cylinder turned to its unlocked position of rotation at which the bolt is retracted, as shown in Figure 10, the gateways 43 and 44 are still slightly more than ninety degrees away from alignment with their respective lugs 22 and 23. To permit rotation of the cylinder to a point at which the gateways align with the lugs, it is only necessary to press the bolt 10 inwardly against the action of its spring past its normal retracted position so as to move the stop lug 29 out of the path of the eccentric driving lug 45 whereupon the cylinder may be turned the required distance to effect alignment between the gateways and the lugs 22 and 23.

When the gateways are so aligned with the lugs 22 and 23, rotation of the cylinder is positively limited by the engagement of the cylinder carried lug 41 with the stop lug 40.

Hence, it will be seen that disassembly of the component parts of the lock structure may be easily and quickly effected entirely without the use of tools.

When the component parts of the lock are properly assembled, any play which might exist between the cylinder casing and the housing is taken up and rattling is effectively prevented by a spring blade 48 carried by the cylinder casing and arranged to press against the wall of the bore 20. The spring 48 also serves to maintain the bezel 34 assembled with the combined casing and knob when the component parts of the lock are disassembled.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent to those skilled in the art to which this invention appertains that this invention provides a lock structure which is particularly applicable to compartment doors and that all of the various units of the structure are of simple rugged design, and that the entire lock may be quickly and easily assembled and disassembled.

What I claim as my invention is:

1. In a lock of the character described, a supporting housing having a bolt passage formed directly therein, a locking bolt slidable directly in said bolt passage, a cylinder casing detachably engaged with the housing and projecting therefrom, a lock cylinder disposed in the casing with a part engaging the bolt to operate and hold the same in the bolt passage, and means providing a detachable connection between the cylinder and the housing whereby said connection holds all of said parts assembled.

2. In a lock device of the character described, a housing, a locking bolt mounted in the housing, a cylinder casing separate from the housing, a connection between the housing and the cylinder casing, a cylinder in the cylinder casing, a connection directly between the cylinder and the housing maintaining the cylinder casing and housing assembled, and a driving connection between the cylinder and the locking bolt.

3. In a lock device of the character described, a housing having a bolt passage formed directly therein, a locking bolt slidable directly in the

passage, a cylinder casing separate from the housing, a connection between the housing and the cylinder casing, a cylinder in the cylinder casing, a direct connection between the cylinder and the housing maintaining the cylinder casing and housing assembled, and a connection between the cylinder and the locking bolt for transmitting motion from the cylinder to the locking bolt and for preventing detachment of the connection between the cylinder and the housing.

4. In a lock device of the character described, a housing having a part forming a guideway and having a bore in communication with the guideway, a locking bolt slidable in the guideway, a cylinder casing having a part inserted into said bore, a lock cylinder in the cylinder casing having a connection with the bolt for operating the bolt, and a direct connection between the lock cylinder and the housing for preventing disassembly of the cylinder casing from the housing.

5. In a lock device of the character described, a housing having a part providing a guideway and having a bore opening to said guideway, a locking bolt slidable in the guideway, a cylinder casing having a part received in the bore of the housing, a lock cylinder inserted through the casing with its outer end seated in a counterbore in the casing and its inner end projecting into the guideway, a connection between the inner end of the cylinder and the locking bolt, said connection providing for the actuation of the locking bolt upon rotation of the cylinder and also determining the unlocked position of rotation of the cylinder, and a direct connection between the cylinder and the housing inseparable as long as the cylinder remains within its normal range of rotation between locked and unlocked positions, said connection between the cylinder and housing holding the cylinder against endwise withdrawal and maintaining the lock casing assembled with the housing.

6. In a lock device of the character described, a housing, a lock casing connected with the housing, a lock cylinder inserted through the casing and into the housing, and a direct connection between the lock cylinder and housing for holding the lock cylinder against withdrawal from the housing and thereby securing the lock casing assembled with the housing.

7. In a lock device of the character described, a housing, a lock casing connected with the housing, a lock cylinder inserted through the casing and into the housing, a direct connection between the lock cylinder and housing for holding the lock cylinder against withdrawal from the housing and thereby securing the lock casing assembled with the housing, said connection being breakable in one position of rotation of the cylinder, and means for normally preventing rotation of the cylinder to said predetermined position.

8. In a lock device of the character described, a housing, a lock casing connected with the housing, a lock cylinder inserted through the casing and into the housing, a direct connection between the lock cylinder and housing for holding the lock cylinder against withdrawal from the housing and thereby securing the lock casing assembled with the housing, said connection being breakable in one position of rotation of the cylinder, a locking bolt mounted in the housing, and a connection between the cylinder and locking bolt through which actuation of the locking bolt is effected by rotation of the cylinder and whereby the lock cylinder is normally prevented from turning to said predetermined position.

9. In a lock device of the character described, a housing having a bore, a cylinder casing having a part detachably received in said bore, a lock cylinder inserted through the cylinder casing, and means on the housing engageable with the cylinder casing to hold the same against turning and directly engageable with the lock cylinder for holding the lock cylinder against endwise withdrawal and thereby maintaining the cylinder casing and cylinder assembled with the housing.

10. In a lock device of the character described, a housing having a bore, a cylinder casing having a part fitted into said bore, a lock cylinder rotatable in the cylinder casing and having an annular groove positioned within that portion of the casing fitted in the housing bore, and a lug projecting inwardly from the wall of the housing bore through a notch in the inner end of the cylinder casing and into the annular groove in the cylinder for holding the cylinder casing against turning and the cylinder and its casing against endwise movement with respect to the housing.

11. In a lock device of the character described, a housing having a bore, a cylinder casing having a part fitted into said bore, a lock cylinder rotatable in the cylinder casing, said cylinder having an enlarged outer end preventing relative endwise movement between the cylinder and its casing in one direction and having a bayonet slot at its inner end, and a lug projecting inwardly from the wall of the housing bore through a notch in the inner end of the cylinder casing for engagement with the bayonet slot of the cylinder for holding the cylinder casing against rotation and the cylinder and its casing against endwise movement away from the housing.

12. In a lock device of the character described, a housing having a bore, a cylinder casing having a part fitted into said bore, a lock cylinder rotatable in the cylinder casing, said cylinder having an enlarged outer end preventing relative endwise movement between the cylinder and its casing in one direction and having a bayonet slot at its inner end, a lug projecting inwardly from the wall of the housing bore through a notch in the inner end of the cylinder casing for engagement with the bayonet slot of the cylinder for holding the cylinder casing against rotation and the cylinder and its casing against endwise movement away from the housing, said bayonet slot being engageable and disengageable from the lug in one position of rotation of the cylinder, and means for normally preventing rotation of the cylinder to said position.

13. In a lock device of the character described, a housing having a bore, a cylinder casing having a part fitted into said bore, a lock cylinder rotatable in the cylinder casing, said cylinder having an enlarged outer end preventing relative endwise movement between the cylinder and its casing in one direction and having a bayonet slot at its inner end, a lug projecting inwardly from the wall of the housing bore through a notch in the inner end of the cylinder casing for engagement with the bayonet slot of the cylinder for holding the cylinder casing against rotation and the cylinder and its casing against endwise movement away from the housing, said bayonet slot being disengageable from the lug in one position of rotation of the cylinder, a locking bolt mounted in the housing, and a connection between the cylinder and the locking bolt through which the locking bolt is actuated by rotation of the cylinder and through which the cylinder is normally pre-

vented from being turned to said predetermined position of rotation.

14. In a lock device of the character described, a housing adapted to be secured to a movable element to be locked in a fixed position, a locking bolt slidably mounted in the housing and adapted to engage a fixed part associated with the movable element for securing the movable element in a fixed position, a knob for moving the movable element detachably connected with the housing, and means mounted in the knob and connected with the housing for holding the knob attached to the housing and connected with the locking bolt for retracting the same to an inactive position.

15. In a lock device for securing a movable element in a fixed position with respect to a stationary part, a housing adapted to be attached to the movable element, a spring pressed locking bolt carried by the housing for engaging in a keeper recess in the stationary part, a knob for moving the movable element, said knob being detachably mounted on the housing, and key controlled means mounted in the knob and having a connection with the housing for preventing detachment of the knob from the housing and having a connection with the locking bolt for retracting the same out of the keeper recess of the stationary part to free the movable element.

16. In a lock device of the character described, a slidable locking bolt, a rotatable actuator for the locking bolt, a driving connection between the locking bolt and its driver whereby rotation of the driver imparts sliding movement to the bolt in one direction, and means associated with said connection for defining one limit of rotation for the driver, said means being disabled to prevent continued rotation of the driver in said one direction upon endwise movement of the locking bolt independently of the driver.

17. In a lock device of the character described, a sliding locking bolt, a spring urging the bolt in one direction, a rotatable driver for retracting the bolt against the action of its spring, a connection between the driver and the bolt including an eccentric cam on the driver engageable with a transverse ledge on the bolt, and an abutment on said ledge of the bolt engageable with the eccentric cam for normally limiting rotation of the driver in one direction, said limiting effect of the abutment being disruptable by movement of the bolt against the action of its spring beyond the point of retraction to which the bolt is movable by the driver.

18. In a lock device of the character described, a spring pressed locking bolt having a transverse slot in one face thereof providing a transverse ledge, a rotatable driver for the bolt, a connection between the driver and bolt including said ledge and an eccentric cam on the driver engaging said ledge, and an abutment projecting up from the ledge and engageable with the driver for limiting rotation of the driver in one direction, the limiting effect of said abutment engaging the eccentric cam being disruptable by continued movement of the bolt past the point to which it is movable by the driver.

19. In a lock device of the character described, a housing having a slideway, a locking bolt slidable therein, a spring yieldingly urging the bolt in one direction, a transverse ledge on the bolt, a lock cylinder, means for mounting the lock cylinder from the housing in a position with its axis intersecting the axis of movement of the locking bolt and with its inner end adjacent the locking bolt, an eccentric cam on the cylinder engaging the transverse ledge of the bolt so that rotation of the cylinder retracts the bolt against the action of its spring means, and an abutment projecting from the ledge to be engageable by said eccentric cam for normally limiting rotation of the cylinder in one direction, said rotation limiting effect of the lug being disruptable by movement of the locking bolt against its spring past the point to which it is retractible by the cylinder in moving to said normal limit of rotation.

EDWARD N. JACOBI.