Sept. 27, 1932. F. LEEB 1,879,350

LOCK

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FIG. 1.

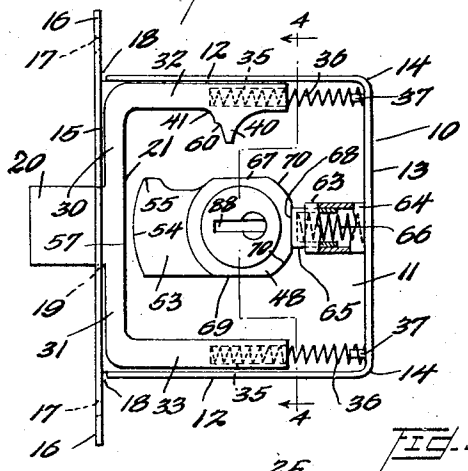


FIG. 2.

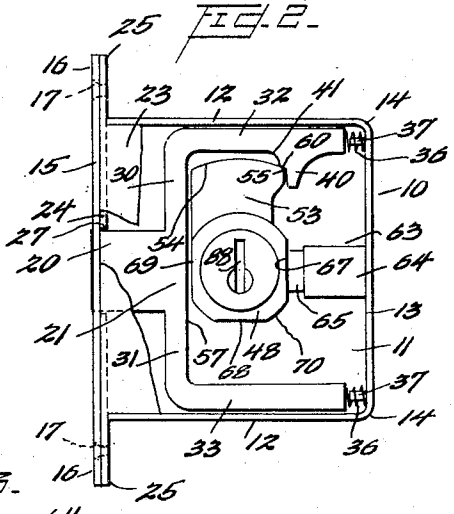


FIG. 3.

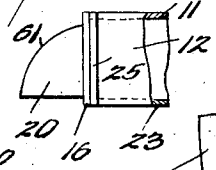


FIG. 4.

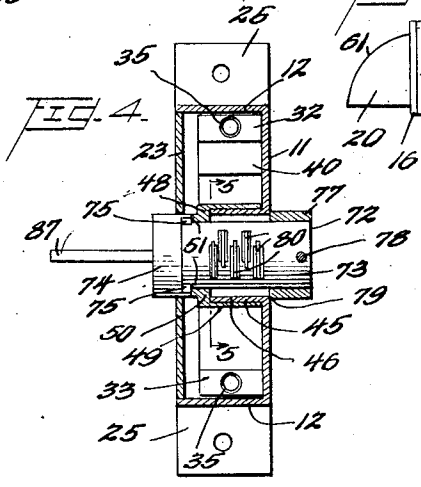


FIG. 5.

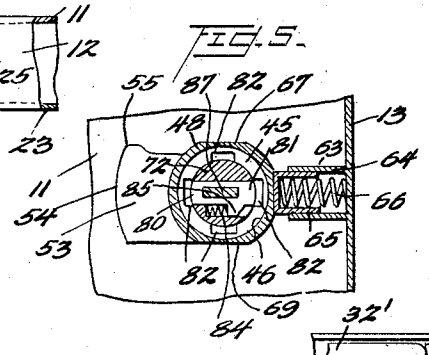


FIG. 6.

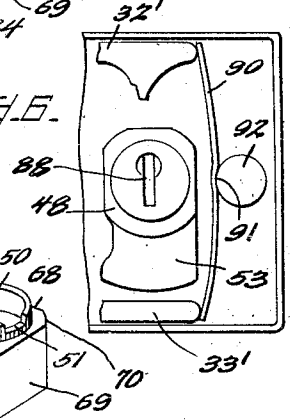


FIG. 7.

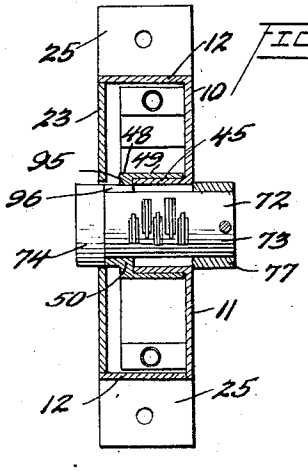
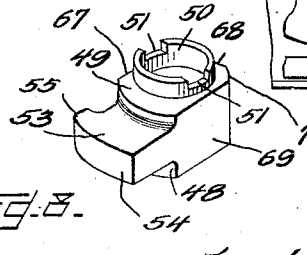


FIG. 8.



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FIG. 9.

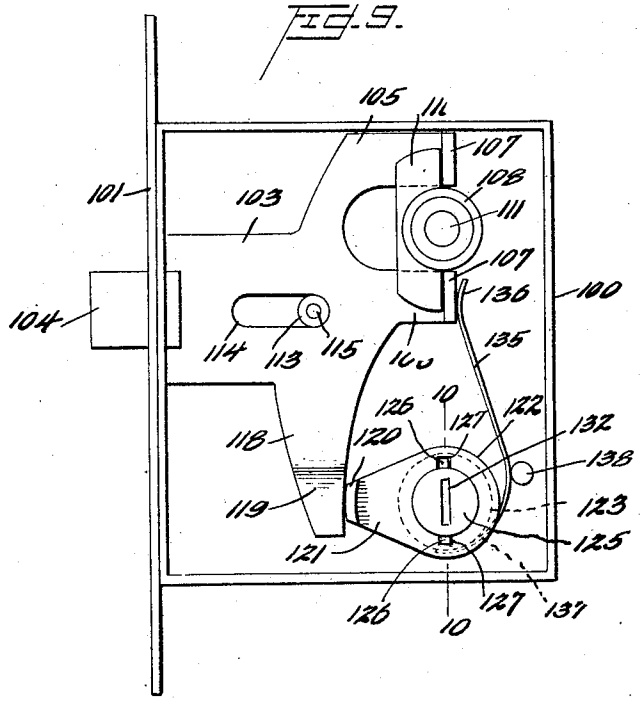
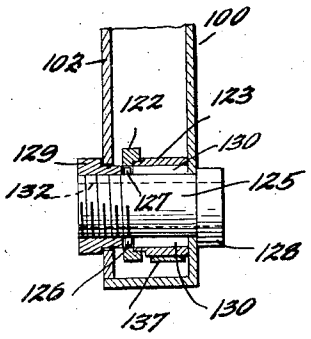


FIG. 10.



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UNITED STATES PATENT OFFICE

FRANK LEEB, OF CULVER CITY, CALIFORNIA

LOCK

Application filed August 6, 1931. Serial No. 555,569.

This invention relates to locks and has for its general object the provision of a simple and inexpensive lock, which may be easily manufactured and installed, and which is particularly adapted for, although not limited to, use in connection with closures such as screen doors, vehicle doors and deck closures, cupboards, desk or cabinet drawers, or the like.

Another object of invention is the provision, in a lock of this type, of a novel combination of bolt and actuating mechanism whereby these elements may be quickly and easily disposed and retained in dead-locked, spring locked, and retracted positions at will.

In the attainment of these objects, my invention in its preferred embodiment contemplates the provision of a spring pressed bolt adapted to be controlled by a cam carrying actuating nut or rollback which is in turn operated by a lock cylinder which is adapted to be released and rotated by means of a key, thus dispensing with the usual knob and spindle.

In another embodiment, there is provided a locking device which is adapted to function in connection with a closure fastener in which a knob is employed, and, in any of the devices described, there may be used a tumbler cylinder which is operable from either side of the closure by means of a symmetrically notched key.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawings, in which certain embodiments of my invention are illustrated by way of example.

In the drawings:

Figure 1 is a plan view of a lock embodying the principles of the invention with the cover plate removed and certain portions shown in cross section, the bolt being in dead-locked position;

Figure 2 is a similar view showing the elements in retracted positions, a portion of the cover plate being illustrated in the forward end of the lock;

Figure 3 is a fragmentary elevational view of the forward end of the lock showing a portion of the bolt in extended position;

Figure 4 is a view in vertical cross section taken substantially on line 4—4 of Figure 1 and also showing the cover plate;

Figure 5 is a cross sectional view taken on line 5—5 of Figure 4;

Figure 6 is a fragmentary plan view showing a modified form of the bolt controlling spring mechanism;

Figure 7 is a view similar to Figure 4 illustrating a modified means for keying the lock cylinder to the bolt actuating nut;

Figure 8 is a perspective view of the actuating nut employed in the embodiment illustrated in Figures 1–6 inclusive.

Figure 9 is a plan view similar to Figure 1 of another embodiment of my invention; and

Figure 10 is a vertical cross sectional view taken on line 10—10 of Figure 9.

Referring to the drawings, it will be seen that my improved lock comprises a casing consisting of the member 10 formed of a base plate 11 provided with marginal side flanges 12 and end flanges 13 adapted to extend preferably at right angles from the base plate 11 and to be integrally united in any suitable manner at the corners 14. A similar flange 15 is turned upwardly from the base plate 11 at the forward edge thereof, to form a face plate adapted to be set in the edge of the door or other closure to which the lock is applied. It will be noted that the face plate 15 is adapted to extend for a short distance on either side of the body portion of the lock and these extended portions 16 may be provided with countersunk openings 17 to receive screws or other elements for attaching the lock to the closure. The forward ends of the side flanges 12 are spaced from the face plate 15 so as to provide slots 18 for a purpose later to be described. The face plate 15 is, of course, provided with a suitable opening 19 through which the nose portion 20 of the bolt 21 is adapted to project. The lock casing further comprises a cover member 23 which is provided with a forward flange 24 which is adapted to fit closely behind the face plate 15 as shown in Figure 2 of the drawings, and is adapted to extend

through the slots 18 provided between the ends of the side flanges 12 and the face plate 15. Extensions 25 may be provided on the flange 24 having openings registering with the openings 17 of the face plate for the reception of fastening screws. Flange 24 is provided with a slot 27 which is adapted to substantially register with the opening 19 of the face plate to accommodate the nose of the bolt.

Interiorly of the casing, the bolt 21 is provided with a pair of arms which comprise the oppositely directed portions 30 and 31 and the spaced parallel rearward extensions 32 and 33. These extensions 32 and 33 are provided with the recesses 35 in the ends thereof which are adapted to receive the forward ends of the coil springs 36, the opposite ends of which are adapted to abut the rear wall 13 of the casing and to be retained as by means of the pins 37. These springs are for the purpose of exerting equal pressures upon the ends of the bolt arms so as to continuously urge the bolt toward the engaged position shown in Figure 1. In Figure 2 the bolt is shown retracted against the tension of the springs 36. A projection 40 is formed on the inner side of the rearward extension 32 of one of the arms and is provided with the cam engaging surface 41.

For the purpose of providing a pivot for the actuating mechanism of the lock, a cylindrical boss 45 is rigidly secured to and adapted to project upwardly from the base plate 11 of the casing. The boss 45 is provided with the cylindrical opening or bore 46 which may pass entirely through the boss and also through the base plate 11. An actuating nut or rollback 48 is provided with a hollow hub or body portion 49 which is adapted to fit rotatably around the boss 45. In the embodiment shown in Figures 4 and 8 of the drawings, the rollback 48 is provided with the sleeve 50 which is of smaller diameter than the hub portion 49 and which is adapted to overlie the upper rim of the boss 45. This narrowed or shouldered portion 50 is provided with the notches 51 in the upper margin thereof which are adapted to receive portions of the operating means hereinafter described.

The rollback 48 is provided with a single lobe cam 53 which is provided with the curved end surface 54 and the nose 55. As illustrated in Figure 1, in which the parts are in dead-locked positions, that is, the position in which the bolt cannot be retracted so as to permit the closure to be opened, the curved surface 54 is disposed in close proximity to the rearwardly facing surface 57 of the bolt 21. In order to move the bolt rearwardly to the retracted position shown in Figure 2 of the drawings, the rollback 48 is rotated through an angle of 90° in a clockwise direction so that the nose 55 of the cam 53 moves along the cam engaging surface 41 of the projection 40 carried by the arm portion 32 until the various elements assume the positions shown in Figure 2, in which the nose 55 of the cam has passed over the slight shoulder 60 formed in the surface 41 and by its engagement behind this shoulder is adapted to retain the bolt in the retracted position shown. If it is desired to permit the bolt to be disposed in so-called spring locked position, wherein it may be retracted by the contact of the curved surface 61 of the nose 20 thereof with the keeper secured to the jamb of the door (not shown), the rollback 48 is rotated through an angle of 90° counterclockwise from the dead-locked position to the position shown in Figure 6 of the drawings wherein the cam will not obstruct the rearward movement of the bolt. As will be readily understood, in this position, the bolt will automatically latch with the keeper upon the mere closing of the door or other closure.

If desired, means may be provided for resiliently retaining the rollback in any of its rotated operative positions such as those shown in Figures 1, 2 and 5 respectively. In the illustrated embodiment of the invention, this means takes the form of the telescoping abutment 63 comprising the portion 64 which is secured to the rear wall 13 of the casing, and the plunger or cap 65 which is adapted to be received therein and to be urged outwardly therefrom by means of the relatively heavy coil spring 66. Flattened surfaces 67, 68 and 69 are formed on the exterior surface of the hub 49 of the rollback 48 and are adapted to be engaged by the plunger 65 when the rollback 48 is in retracted, dead-locked and spring locked positions, respectively. Flattened surfaces 67, 68, and 69 are joined by the rounded portions 70 of the rollback which contact with the plunger 65 in changing from one position to another.

The preferred means for operating the rollback 48 comprises the lock cylinder 72 which includes the cylindrical barrel portion 73 and the outer enlarged portion 74. The cylinder 72, in the embodiment illustrated in Figures 4 and 8 of the drawings, is provided with the projections 75 which are adapted to interlock with the notches 51 of the rollback so that the cylinder and rollback are connected for movement as a unit. The barrel portion 73 of the lock cylinder is retained within the boss 45 by any suitable means, the preferred form of which comprises the collar 77 which is secured to the end of the barrel 73 which is adapted to project through the lock casing, by means of a cotter pin or other suitable fastening element 78. The sleeve 77 is adapted to abut the rear wall 11 of the casing as at 79 so as to hold the lock cylinder securely in engagement

with the rollback 48 and boss 45. The lock cylinder 72 may be provided with suitable means for retaining it in adjusted position with respect to the casing, such as the tumblers 80, the ends 81 of which are adapted to enter one of the slots 82 formed in the inner wall of the boss 45. The tumblers are adapted to be urged outwardly into engagement with these slots as by means of the small coil springs 84 which are adapted to exert pressure upon the projections 85 of the tumblers. A key 87 is adapted to be inserted in the key hole 88 provided in the lock cylinder for the purpose of releasing the tumblers from engagement with the slots and also for the purpose of rotating the cylinder and its associated rollback 48 for operating the lock bolt. When the rollback 48 and the lock cylinder 72 are rotated to any of the three operative positions described, removal of the key from the key hole 88 of the lock cylinder permits the ends 81 of the tumblers 80 to enter that one of the slots 82 which corresponds to the position chosen. It will be noted that four of these slots 82 are provided for the purpose of receiving the tumbler projections 81 in either of the two possible positions of application of the cylinder to the rollback 48 as permitted by the alternative opposite engagements of the projections 75 in the slots 51.

In Figure 6 of the drawings, there is illustrated a modification of the spring means for urging the bolt toward engaged position. In this embodiment, instead of employing the coil springs 36, a single leaf spring 90 is used, the ends of which are adapted to engage behind the ends of the arms 32′ and 33′ of the bolt and the central portion of which is adapted to fulcrum against the front surface 91 of the abutment 92.

An alternative means for connecting the lock cylinder 72 with the rollback 48 is shown in Figure 7 of the drawings. In this embodiment, the projections 75 and slots or notches 51 are omitted and the interior of the sleeve 50 of the rollback 48 is provided with a key-way 95 into which the key 96 formed on the barrel 73 of the locking cylinder 72 is adapted to be inserted.

In the modification illustrated in Figures 9 and 10 of the drawings, the lock casing is indicated by the numeral 100 and is provided with a face plate 101 and a cover plate 102. The bolt 103 is provided with a beveled nose 104 similar to that in the previously described embodiments, but the rear portion of the bolt is of a different construction. Upon the upper portion of the rear part of the bolt there is provided the pair of rearwardly extending arms 105 and 106, each of which is provided with an upstanding lug 107. The arms 105 and 106 are adapted to straddle the hub 108 of the rollback which is provided with the double cam 110. The rollback is adapted to be rotated by means of knobs disposed upon either side of the lock and carried by the shaft 111. It will be readily understood how a rotation of the knob will cause the rollback cam 110 to abut the lugs 107 and move the bolt 103 rearwardly to unlatch the bolt.

An upstanding hollow projection or boss 113 provides means for guiding the movement of the bolt 103 by cooperation with the slot 114 formed therein, and also, the internally threaded central portion 115 thereof provides means for receiving a screw for fastening the cover plate on the lock casing.

The bolt 103 is provided with the laterally extending arm 118 which is provided with the offset portion 119 behind which the nose 120 of the locking dog 121 is adapted to be positioned in order to deadlock the bolt. The dog 121 is carried by the circular sleeve 122 which is adapted to freely rotatably surround the upper end of the boss 123, which is secured by any suitable means to the bottom of the casing 100 as in the previously described embodiments. A tumbler locking cylinder 125 is adapted to extend through the hollow boss 123 and is provided with the projections 126 which are adapted to enter notches or keyways 127 suitably formed in the sleeve 122 whereby the cylinder and dog 121 are adapted to move in unison. In this case the cylinder is adapted to extend all the way through the lock casing and is provided with an enlarged portion 128 at one end and a similarly formed sleeve 129 is secured to the other end of the cylinder in order to retain it in operative position.

In the position illustrated in Figure 9, the dog 121 is in dead-locked position but may be rotated through a quarter turn in a clockwise direction so as to permit rearward movement of the bolt 103. It is obvious that if the casing 100 were made wider, provision could be made for the rotation of the dog 121 in a counterclockwise direction also in order to release the bolt. Just as in the embodiments previously described, the boss 123 is internally provided with slots 130, preferably at intervals of 90° around its periphery, for the engagement of the tumblers of the cylinders in order to retain the cylinder and its associated locking nut in any one of its positions when the key is withdrawn.

One feature of this modification, which, of course, may be embodied in any of the locks previously described, is the provision of means to enable the lock to be operated from either side of the closure with the same key. The key slot is indicated at 132 and the tumblers therein are arranged symmetrically on each side of the mid-point of the cylinder. Similarly, the notches in the key are symmetrically arranged from the center of the operative portion of the key toward either end thereof. This feature is already

well known in the art and does not form a part of the present invention, except as modified by the arrangement of the other elements of the device as claimed.

In order to constantly urge the bolt toward extended position, a leaf spring 135 is provided, the end 136 of which is adapted to bear against the rear surface of one of the lugs 107. The curved lower end 137 of the spring 135 is adapted to lie against a portion of the boss 123 and an intermediate portion of the spring is adapted to fulcrum against a pin 138.

It will be understood that various changes and modifications may be made in the embodiment illustrated and described herein without departing from the scope of the invention as defined by the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a lock of the class described, in combination, a spring pressed bolt provided with two spaced parallel rearwardly extending arms, a rollback rotatably mounted between said arms, a projection on said rollback, means associated with one of said arms adapted to cooperate with said projection to retain the bolt in retracted position, an intermediate portion of said bolt connecting said arms and adapted to cooperate with said projection to retain said bolt in dead-locked position, said rollback adapted to be rotated so that said projection is directed toward the other of said arms to free said bolt for spring-latch operation.

2. In a lock of the class described, in combination, a spring pressed bolt provided with two spaced parallel rearwardly extending arms, a rollback rotatably mounted to operate between said arms, a single cam on said rollback, an inwardly curved surface on the side of one of said arms against which said cam is adapted to move to retract said bolt, a relative slight shoulder formed on said curved surface, a nose formed on said cam and adapted to releasably engage said shoulder to retain said bolt in retracted position, a rearwardly facing surface on said bolt between said arms adapted to abut said cam when said cam is directed forwardly, whereby said bolt is held in dead-locked position, said cam adapted to be turned toward the other of said arms to free the bolt for spring latch operation.

3. In a lock of the class described, in combination, a casing, a spring pressed bolt provided with a pair of spaced, parallel, rearwardly extending arms, a rollback rotatably mounted in said casing between said arms, and adapted to be rotated to a plurality of positions with respect to said bolt and said arms for the purposes of dead-locking, retracting and releasing the bolt, a plurality of flat surfaces on said rollback each corresponding to one of said positions a plunger adapted to engage said surfaces to retain the rollback in said rotated positions, and a coiled spring for urging said plunger toward said rollback.

4. In a lock of the class described, in combination, a casing, a bolt provided with a pair of spaced, parallel, rearwardly extending arms, recesses in the rear ends of said arms, coil springs seated in said recesses and adapted to abut a wall of said casing to urge said bolt toward engaged position, a rollback rotatably mounted in said casing between said arms, and adapted to be rotated to a plurality of positions with respect to said bolt and said arms for the purposes of dead-locking, retracting and releasing the bolt, a plurality of flat surfaces on said rollback each corresponding to one of said positions, a plunger adapted to engage said surfaces to retain the rollback in said rotated positions, and a coiled spring for urging said plunger toward said nut.

5. In a lock of the class described, in combination, a casing, a spring pressed bolt associated with said casing and provided with a pair of spaced, parallel rearwardly extending arms, a cylindrical boss within said casing projecting from one wall thereof and disposed substantially centrally of said casing so as to lie between the arms of said bolt, a rollback rotatably mounted on said boss, a single lobe cam on said rollback adapted to contact with one of said arms to retract said bolt, to contact with a portion of said bolt between said arms to hold said bolt in dead-locked position, and to be directed toward the other of said arms to release said bolt for spring latch operation, said boss being provided with a central bore in the walls of which are formed tumbler receiving slots at intervals spaced according to the relative spacing of the three cam positions described, a lock cylinder disposed in said bore and having a portion thereof keyed to said actuating nut, key retracted tumblers provided in said lock cylinder and adapted to be projected into the slot corresponding to the operative position to which said rollback is turned, whereby said cylinder and consequently said rollback may be locked in said rotated positions.

6. In a lock of the class described, in combination, a casing, a bolt, a boss projecting within said casing from one wall thereof, a locking dog carried by and freely rotatable with respect to said boss, a cam on said nut adapted to be moved to dead-locked position with respect to said bolt, a central bore formed in said boss, the wall of which is provided with symmetrically spaced keyways, a lock cylinder operatively connected with said dog and provided with tumblers adapted to selectively engage in said keyways to lock said cylinder and consequently

said dog in rotated positions for dead-locking and releasing said bolt, said tumblers being symmetrically arranged from the center of said cylinder outwardly toward each end thereof, whereby a similar correspondingly shaped key may be employed to actuate said lock from either side of the closure.

In testimony whereof I hereunto affix my signature.

FRANK LEEB.