July 6, 1926. 1,591,010

F. E. BEST

LOCK

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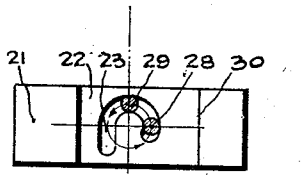


FIG - 11

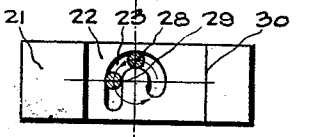


FIG - 12

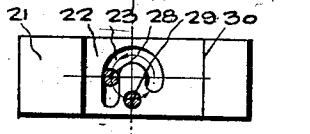


FIG - 13

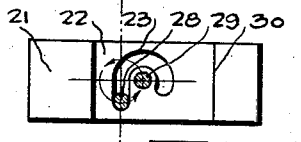


FIG - 14

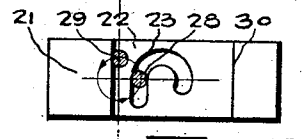


FIG - 15

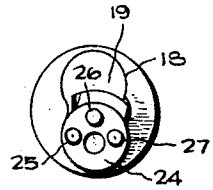


FIG - 3

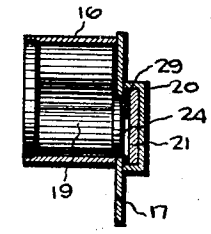


FIG 10

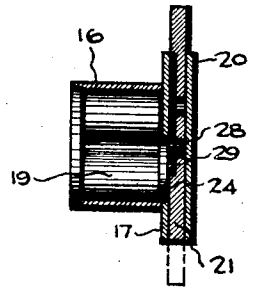


FIG - 2

FIG - 9

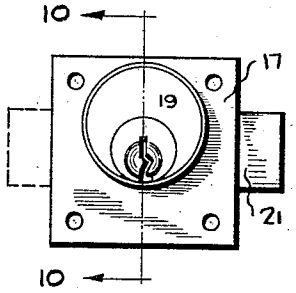
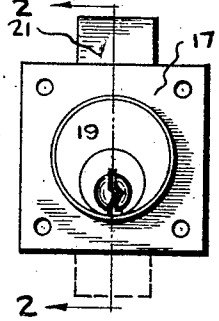


FIG - 1



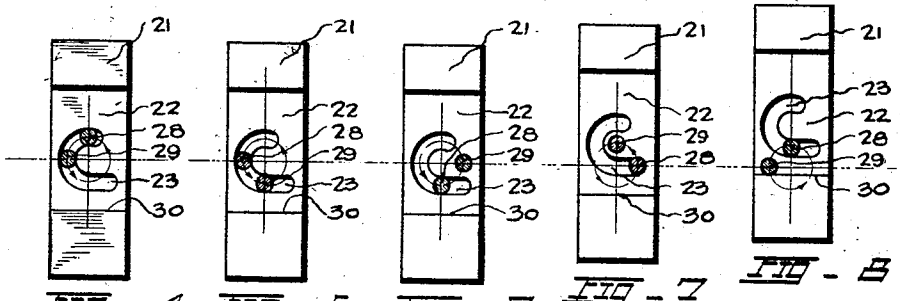


FIG - 4 FIG - 5 FIG - 6 FIG - 7 FIG - 8

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Patented July 6, 1926. 1,591,010

UNITED STATES PATENT OFFICE.

FRANK ELLISON BEST, OF SEATTLE, WASHINGTON, ASSIGNOR TO FRANK E. BEST, INC., OF SEATTLE, WASHINGTON, A CORPORATION OF WASHINGTON.

LOCK.

Application filed July 10, 1923. Serial No. 650,635.

My invention relates to improvements in lock mechanism and is a continuation in part of my prior application for locks, Serial No. 642,566, filed May 31, 1923. The object of my invention is to provide novel and efficient devices for throwing the bolt of a lock and for locking said bolt in two different positions.

Another object is to provide a lock of this nature in which the bolt is arranged to be moved into either of two opposite locked positions thereby making it possible to use the same lock interchangeably in connection with drawers to obtain an upward or a downward throw of the bolt to lock the drawers or in connection with swinging doors, as on lockers, to obtain a throw of the bolt either to right or left for locking said doors.

Another object is to provide a lock having a bolt formed with a slot of substantially J shape adapted for the reception of a bolt operating pin that revolves in a circular path, said J shaped slot being dimensioned and arranged so that it will permit the bolt operating pin to turn in one direction through an angle of three hundred sixty degrees and to then turn in a reverse direction through the same angle, the bolt being locked in one position at the end of the travel of the pin in one direction and in a different position at the end of the travel of the pin in the opposite direction, the shorter arm of the J shaped slot forming a stop that arrests movement of the pin in one direction and other stop means being provided for arresting movement of the pin in the opposite direction.

Other and more specific objects will be apparent from the following description taken in connection with the accompanying drawings.

In locks of this nature it may in some instances, be desired to apply the lock so that the bolt will protrude upwardly when locked while in other instances it may be desired to apply the lock so that the bolt will protrude downwardly when locked, or in a similar manner it may be desired to have the bolt protrude either to the right or to the left when locked. The present invention makes it possible to use the same lock without reversal either to secure an upward or a downward throw of the bolt into a locking position or to use the same lock without reversal to secure a throw of the bolt either to the right or left into a locked position, thereby obviating the reversal of the parts in which the key is inserted.

In the accompanying drawings Figure 1 is a view in elevation of a lock constructed in accordance with my invention having a vertically movable bolt, one position of the bolt being shown by full lines and the other position of the bolt being shown by broken lines.

Fig. 2 is a sectional view of the device on broken line 2—2 of Fig. 1, parts being shown in elevation.

Fig. 3 is a detached view in end elevation of the lock core.

Figs. 4 to 8 inclusive are a series of somewhat diagrammatic views illustrating the operation of the bolt and bolt operating mechanism, parts being shown in cross section.

Fig. 9 is a view in elevation of a lock of this nature in which the bolt is arranged for horizontal movement one position being shown by full lines and the opposite position being shown by broken lines.

Fig. 10 is a sectional view on broken line 10—10 of Fig. 9.

Figs. 11 to 15 inclusive are a series of somewhat diagrammatic views illustrating the operation of the lock shown in Figs. 9 and 10 parts being shown in elevation and parts being shown in cross section.

Like reference numerals designate like parts throughout the several views.

In the drawings I have shown, in Figs. 1 to 8 inclusive, a type of lock commonly called a drawer lock in which the bolt is arranged for vertical movement, and in Figs. 9 to 15 inclusive I have shown the same lock with certain parts assembled in a slightly different manner to form a type of lock commonly called a locker lock in which the bolt is arranged to move horizontally either to right or left.

Referring to the drawings, the numeral 16 designates a cylindrical lock housing, secured at one end to a plate 17 and provided with an internal recess 18 of figure 8 cross sectional shape wherein is removably disposed, a lock core 19, preferably of the pin tumbler type. Secured to the plate 17 on the opposite side thereof from the lock housing 16 is a guide member 20 wherein a relatively flat bolt or locking tumbler 21 is reciprocably disposed. That portion of the

bolt 21 directly in front of the lock housing 16 is recessed or cut away as at 22 to afford working clearance space for parts hereinafter described. The cut away portion 22 of the bolt is provided with a slot 23, hereinafter termed a J shaped slot, said slot comprising a semicircular portion terminating in two tangential arms one of which is longer than the other so that said slot presents substantially the appearance of a letter J with the longer arm thereof shortened.

The lock core 19 is internally provided with key controlled mechanism embodying a rotatable key plug, not shown, to the end of which is secured a disc-like throw member 24 that is arranged to be rotated by rotation of the key plug. In accordance with a standard construction which I have adopted, the disc 24 is provided at three different points or locations designated in Fig. 3 as locations 25, 26 and 27, with perforations arranged substantially at intervals of ninety degrees and in which longer pins 28 and shorter pins 29 may be inserted to suit the requirements of a given lock, only two of such pins ordinarily being used in one lock as hereinafter explained. A shoulder 30 at one end of the cut away portion 22 of the bolt is arranged to engage with the shorter pin and serves as a stop as hereinafter explained.

In the drawer lock shown in Figs. 1 to 8 inclusive the pin at location 27 is omitted, a long pin 28 Fig. 2, is inserted at location 26 and allowed to project into the slot 23 and a short pin 29, which is short enough so that it will clear the surface of the cut away portion 22 of the bolt but will under certain conditions hereinafter explained strike against the shoulder 30 is inserted at location 25. In the locker lock, Figs. 9 to 15 inclusive, the pin at location 25 is removed, a long pin 28 is inserted at location 27 and a short pin 29 is inserted at location 26.

In the operation of the drawer lock shown in Figs. 1 to 8 when the bolt 21 is at the limit of its movement in one direction, as for instance in the lowermost position shown by dotted lines in Fig. 1 the longer pin 28 at location 26 on disc 24 will be in the shorter arm of the slot 23 as shown in Fig. 4 and will lock such bolt in the lowermost position. In throwing the bolt 21 to the opposite position, the disc 24 is rotated in a contra-clockwise direction one complete revolution, as seen in Figs. 4 to 8 inclusive, moving the pins 28 and 29 through the successive positions shown in Figs. 5, 6 and 7 into the position shown in Fig. 8 in which latter position the longer pin 28 is in the longer arm of the slot 23 and further rotation of the disc 24 is prevented by engagement of the shorter pin 29 with the shoulder 30.

The lock being of the pin tumbler type will be arranged so that the tumbler pins therein register and are correctly aligned with the barrels in which they operate only when the several parts are at the limit of their rotary movement, that is, either in the position shown in Fig. 4, or Fig. 8, said tumbler pins operating, when the key is withdrawn, to lock the disc 24 in either of the above described positions. In moving contra-clockwise from the position shown in Fig. 4 the longer pin 28 will move idly in the slot 23 through the first 180° to the position shown in Fig. 6, and during the last 180° movement said pin will throw the bolt from one operative position to another. In moving in a reverse or clockwise direction from the position shown in Fig. 8 the pin 28 will throw the bolt 21 during the first 180° movement and will then move idly through the last 180° into the shorter arm of the slot to the position shown in Fig. 4. It will be noted that the pin 28 is not in engagement with the end of the slot 23 in the position shown in Fig. 4 but that a clearance is provided which will permit the disc 24 to be rotated in a clockwise direction through an angle of substantially 15° this clearance being provided to facilitate the unlocking and removal of the core 19 from the housing 16. The provision of the clearance above described does not prevent the shorter end of the slot 23 from functioning as a stop to prevent rotation of the disc 24 in a clockwise direction for the purpose of throwing the bolt 22, the pin 28 striking against the end of the slot 23 when it is moved beyond the position shown in Fig. 4 and the pin tumbler locking mechanism functioning in the usual well known manner to prevent removal of the key except when the pins are properly aligned in the barrels of the lock as will occur when the parts are in the position shown in Fig. 4.

The longer arm of the J slot 23 is of just sufficient length to permit the pin 28 to pass through a position of extreme movement to one side of the center as shown in Fig. 7 while the shorter arm of said slot will not permit said pin to pass through this extreme position. The disc 24 being locked in either the position shown in Fig. 4 or Fig. 8 will lock the bolt 21 in either the upper or lower position.

In the lock shown in Figs. 9 to 15 inclusive the plate 17 and bolt 21 are turned into a horizontal position, the housing 16 and core 19 are secured to the plate 17 at an angle of 90° with respect to the position in which they are mounted in the previously described lock, to retain the key slot in a vertical position, a longer pin 28 is inserted at location 27 and a shorter pin 26 is inserted at location 26. In this form of lock when the bolt 21 is thrown to the left as shown by broken lines in Fig. 9 the longer

pin 28 will be in the locked position shown in Fig. 11 near the shorter end of the J shaped slot 23. Rotation of the disc 24 contra-clockwise from this position through one complete revolution will move the bolt 21 through the successive position shown in Figs. 12, 13 and 14 into the position shown in Fig. 15. From the position shown in Fig. 15 rotation of the disc 24 in a clockwise direction through one complete revolution will move the bolt from right to left through successive positions shown in Figs. 14, 13 and 12 into position shown in Fig. 11.

By operating in the manner above described, the J-shaped slot 23 in the bolt 21 makes it possible to utilize a rotary movement of 360° of the disc 24 to throw and lock the bolt 21 thus affording a construction that is particularly advantageous in this form of a lock and that meets the requirements of the pin tumbler locking mechanism. The pin 18 fits the slot closely enough so that there is very little lost motion between the pin and the bolt in any position.

Obviously this bolt action will operate in exactly the same manner to lock the bolt at the limit of its movement in either direction regardless of whether both ends or only one end of the bolt are adapted to protrude from the lock housing.

The foregoing description and accompanying drawings clearly disclose what I now consider to be a preferred embodiment of my invention but it will be understood that this disclosure is merely illustrative and that such changes in the same may be resorted to as are within the scope and spirit of the following claims.

I claim:

1. In a lock of the class described, a plate, a guide on one side of said plate, a bolt movable in said guide and arranged to be operated to selectively cause either end to project beyond said plate, said bolt having a J-shaped slot extending crosswise thereof, a lock housing, a lock core in said lock housing, a key plug in said lock core, a crank pin on the end of said key plug and operable in said J-shaped slot to throw and lock said bolt and stop means for limiting the rotary movement of said key plug to one complete revolution in each direction.

2. In a lock of the class described, a plate, a guide on one side of said plate, a bolt movable in said guide and arranged to be operated to selectively cause either end to project beyond said plate, said bolt having a J-shaped slot extending crosswise thereof, a shoulder forming a stop member on said bolt, a lock housing, a lock core in said lock housing a key plug in said lock core arranged to be rotated clockwise and contra-clockwise through an angle of three hundred and sixty degrees, a crank pin on the end of said key plug operable in said J-shaped slot to throw and lock said bolt the shorter arm of said slot serving as a stop for limiting the movement of said key plug in one direction, and means on said key plug for engaging the stop member on said bolt and limiting the movement of said key plug in the opposite direction.

3. In lock of the class described a bolt having a cut away central portion of less thickness than the ends of said bolt forming a stop shoulder adjacent one end and having a J-shaped cam slot formed therein, a lock having a key operated throw member arranged to be rotated through an angle of 360° and arranged to have longer and shorter pins secured thereto in predetermined selected locations, a longer pin being arranged to enter said slot to throw said bolt when said throw member is rotated and a shorter pin being arranged to engage said stop shoulder to limit movement of said throw member and said bolt.

FRANK ELLISON BEST.