Dec. 14, 1954 D. N. JEWETT ET AL 2,696,728

CASE FOR CLOSURE LOCKS

Original Filed Sept. 7, 1949 2 Sheets-Sheet 1

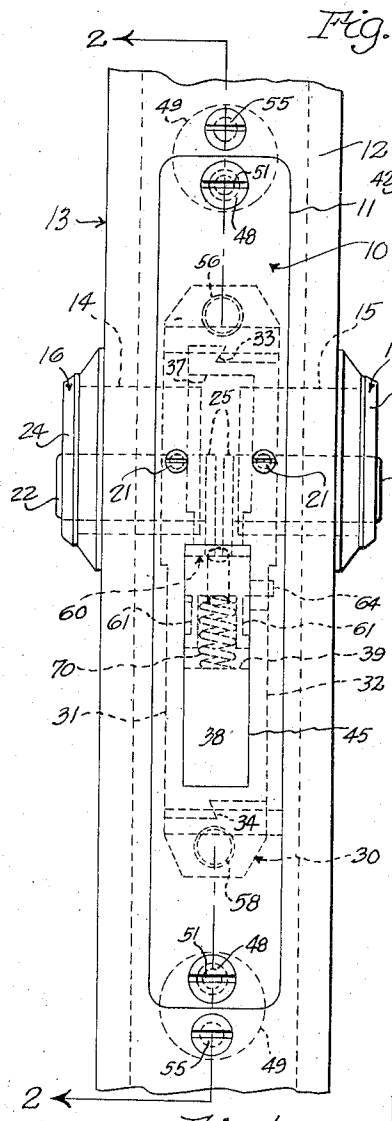


Fig. 1.

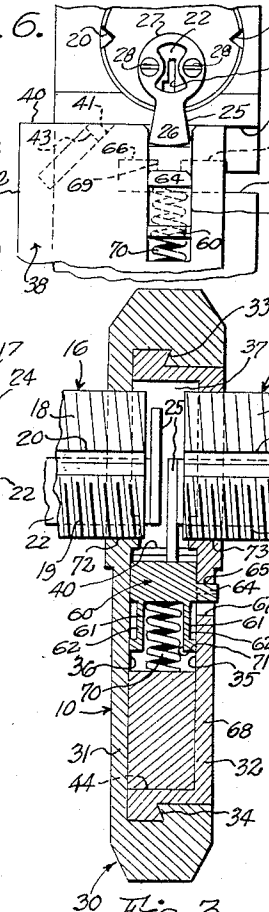


Fig. 3.

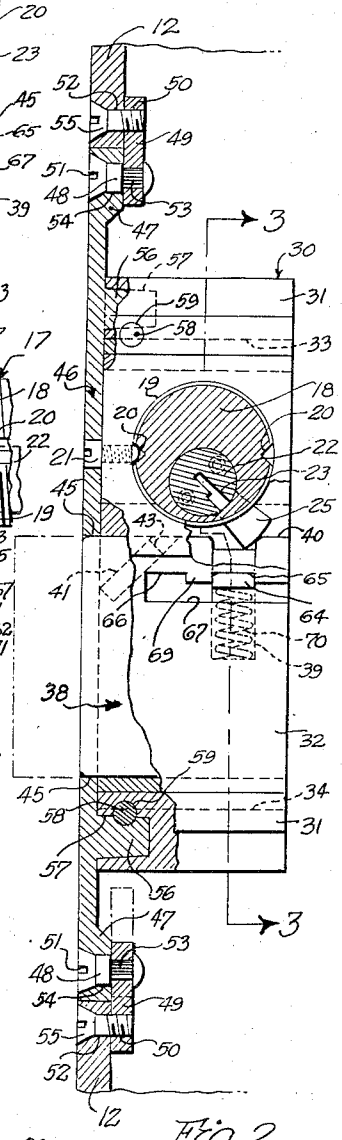


Fig. 2.

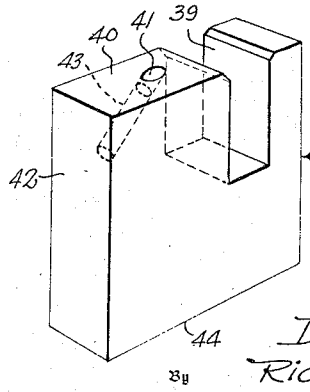


Fig. 5.

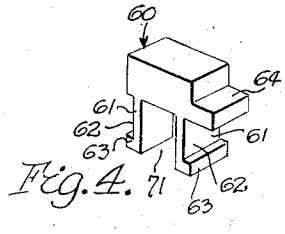


Fig. 4.

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CASE FOR CLOSURE LOCKS

Original Filed Sept. 7, 1949 2 Sheets-Sheet 2

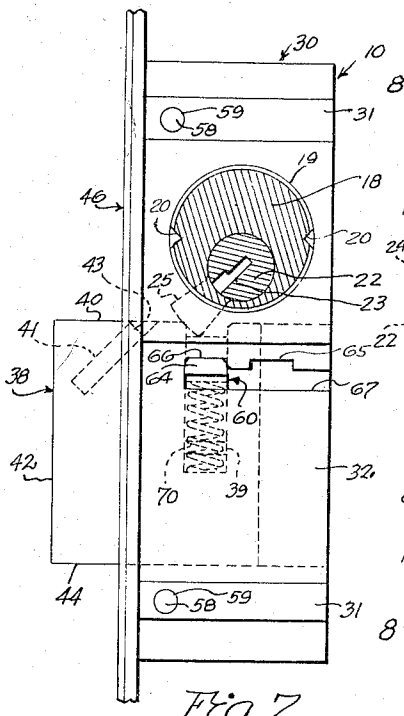


Fig. 7.

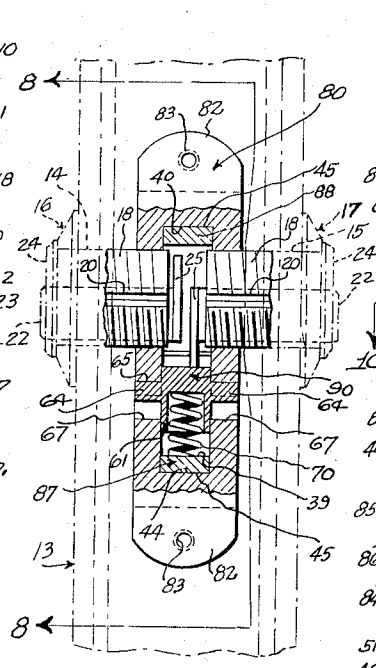


Fig. 9.

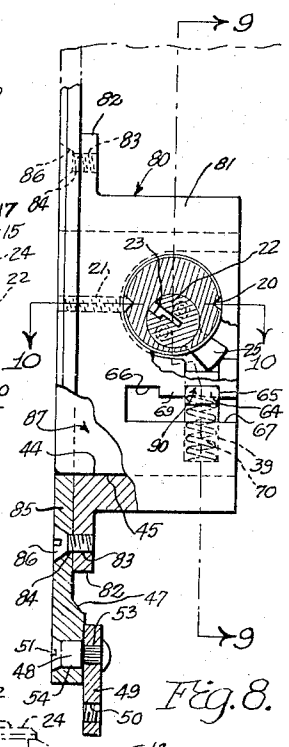


Fig. 8.

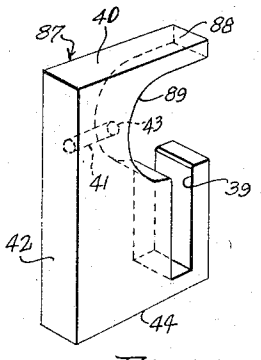


Fig. 11.

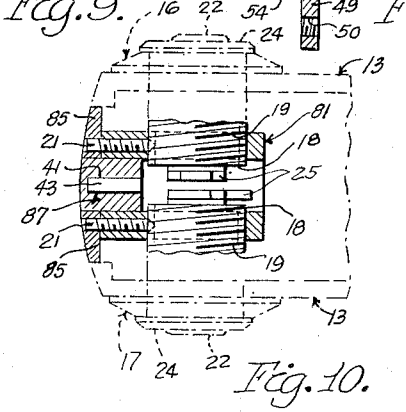


Fig. 10.

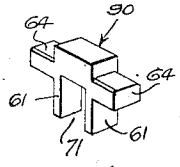


Fig. 12.

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CASE FOR CLOSURE LOCKS

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Original application September 7, 1949, Serial No. 114,422. Divided and this application May 1, 1951, Serial No. 223,932

3 Claims. (Cl. 70—448)

This invention relates to locks and, in particular, to closure locks for doors or the like.

In previous locks, such as are inserted in the edges of hollow doors, such as hollow metal doors, it has been necessary to tilt the lock inwardly through the opening and also to cut away the door rearwardly of the cavity required for the lock, in order to provide enough room for such tilting, in order to get the attachment portions of the mounting plate or front into the cavity behind the edge wall of the door so as to secure it in place by suitable fasteners. It has also hitherto been necessary to form the lock case by casting or by fitting it together in separate pieces which are rather loosely or inaccurately associated with one another.

One object of this invention is to provide a closure lock having a case which is extruded in two interlocking portions so as to give an accurate interfitting of the two portions and thereby eliminate the need for cover plates and the machining connected with them.

Another object is to provide a closure lock, the parts of which may be assembled and disassembled without the use of special tools.

This application is a division of our co-pending application Serial No. 114,422 filed September 7, 1949, now Patent No. 2,660,875 for Closure Lock.

In the drawings:

Figure 1 is a front elevation of a closure lock, according to one form of the invention, mounted in the edge wall of a door;

Figure 2 is a side elevation of the closure lock, partly in vertical section along the line 2—2 in Figure 1, showing the position of the parts in the retracted position of the bolt;

Figure 3 is a cross-section through the closure lock taken along the line 3—3 in Figure 3;

Figure 4 is a perspective view of the tumble pin or lock operating element used in the lock of Figures 1 to 3 inclusive;

Figure 5 is a perspective view of the bolt used in the lock of Figures 1 to 3 inclusive;

Figure 6 is a fragmentary side elevation of the bolt, lock, operating element and cam in the intermediate position between its fully open and fully closed positions;

Figure 7 is a side elevation of the closure lock, similar to Figure 2, but showing the position of the parts in the extended position of the bolt;

Figure 8 is a side elevation, partly in vertical section, similar to Figure 2, but showing a modified lock;

Figure 9 is a cross-section through the closure lock of Figure 8, taken along the line 9—9 in Figure 8;

Figure 10 is a horizontal section taken along the line 10—10 in Figure 8;

Figure 11 is a perspective view of the lock bolt used in the modified closure lock of Figures 8 to 10 inclusive; and

Figure 12 is a perspective view of the tumble pin or lock operating element of the modified closure lock shown in Figures 8 to 10 inclusive.

Referring to the drawings in detail, Figures 1 to 3 inclusive and 7 show a closure lock, generally designated 10, as mounted in an opening 11 in the edge wall 12 of a door 13, such as a hollow metal door. The door 13 is also provided with aligned side apertures 14 and 15 for the insertion of the lock-operating cylinders 16 and 17 respectively. The lock operating cylinders 16 and 17 are of conventional form well known to those skilled in the locksmith art and their details are outside the scope of the present invention. For the purposes of the present invention, it may be stated that the lock operating cylinders 16 and 17 consist of cylinder bodies 18 having threads 19 thereon with longitudinal notches 20 for receiving the ends of a locking set screw 21 (Figure 2) to prevent rotation after the cylinder 16 or 17 has once been placed in position. The cylinders 16 and 17 are provided with rotary elements 22 containing key slots 23 and extending through an escutcheon plate or flanged plate 24 to the opposite ends of the cylinder bodies 18, where they are provided with so-called cams 25 of keyhole-shaped form consisting of a bolt-operating finger portion 26 and a circular base portion 27 secured by fasteners 28 to the rotary elements 22 (Figure 6). Thus, when a key of suitable configuration is inserted in the key slot 23, the key pushes the tumblers out of the way and permits the rotary element 22 and cam 25 to be rotated in order to actuate the lock bolt.

The lock 10 consists of a case 30 comprising interfitting halves 31 and 32 having upper and lower dove-tail connections 33 and 34 therebetween. The halves 31 and 32 are preferably extruded, together with their dovetail portions 33 and 34, the outer half 31 thereby overhanging and partially enclosing the inner half 32. The inner half 32 has a recess or cavity 35 therein which, with the inner wall 36 of the outer half 31 (Fig. 3) forms the lock chamber 37 containing the moving parts of the lock. Reciprocably mounted in the lock chamber 37 is a lock bolt, generally designated 38, of approximately rectangular shape and having a vertical slot or guideway 39 extending downward from its upper surface 40. The bolt 38 is provided with an inclined or diagonal hole 41 extending downward nearly to the front surface 42 and containing a hardened roller 43 of steel or other suitable hard metal loosely and rotatably mounted therein. This pin 43 prevents burglary by sawing through the bolt 38 with a hacksaw, since the loosely mounted hardened pin 43 merely rotates to and fro as the saw is drawn back and forth.

It will be evident from Figures 2 and 3 and from the fact that the halves 31 and 32 are formed by extrusion, that in assembly they have a passageway 37 therethrough of substantially constant cross-section throughout its entire length and open at both of its ends. This construction thus enables case halves 31 and 32 of any desired length to be made from standard extrusions, thereby adapting a pair of standard extrusions to produce any desired "backset" of the cylinder lock 18 from the front of the lock. This is accomplished merely by cutting the extrusions off transversely to the desired length in a manner analogous to cutting slices of bread off a loaf of bread.

The top surface 40 and bottom surface 44 of the bolt 38 slide to and fro through an aperture 45 in a front or mounting plate 46 by which the lock 10 is secured to the door 13. The front 46 is in the form of an elongated plate having thickened portions or internal bosses 47 at its upper and lower ends containing pivot pins 48 on which are mounted swinging discs or tabs 49 having threaded holes 50 therein. The lock is inserted into the opening 11 with the swinging discs 49 swung inward out of the way, into the position shown in dotted lines at the lower end of Figure 2. When the lock has been thus inserted, the pivot pins 48 are rotated by means of a screw driver placed in their slots 51, rotating the discs 49 180° until their holes 50 coincide with the corresponding holes 52 in the door edge wall 12. The discs 49 are fixedly secured to the pivot pins 48 by a splined connection 53 therebetween, whereas the pins 48 are rotatably mounted in their holes 54 in the thickened portions 47 to enable this swinging of the discs 49 to be done. When the holes 50 have been thus aligned with the holes 52, fasteners 55 are then threaded through the holes 52 into the threaded holes 50, securing the lock front 46 firmly in position. The lock front 46 is provided with tapered bosses or lugs 56 which enter correspondingly tapered sockets 57 in the case half 31 and are secured in position by pins 58 entering holes 59 which are partly

within the lug 56 and partly within the case half 31 (Figure 2).

In order to move the bolt 38 to and fro in response to the rotation of the rotary element 22 and cam 25 by means of the key (not shown), the lock is provided with a tumbler pin or lock operating pin, generally designated 60 (Figure 4) and having a thickness corresponding to the width of the slot 39 in the bolt 38 with clearance sufficient to permit it to move up and down therein. The element 60 has a downwardly projecting portion 61 which is relieved as at 62 to provide smoothness of operation and at its lower end is provided with outwardly-projecting ribs 63 which engage the opposite sides of the cavity 35 and surface 36 (Figure 3). The element 60 is also provided with a laterally extending lug 64 which is of rectangular cross-section and which is adapted to fit into either of a pair of rectangular-shaped detent notches 65 or 66 (Figure 2) in an elongated slot or recess 67 in the side wall 68 of the case half 32. The notches 65 and 66 are separated from one another by a ridge or barrier 69 (Figure 2). A spring 70 inserted between the bottom of the cavity 35 and the top of a recess 71 in the lock operating element 60 urges the latter upward so that when it is released by the cam 25, it will be forced into one of the notches 65 or 66. The case halves 31 and 32 are provided with aligned threaded holes 72 and 73 (Figure 3) for receiving the correspondingly threaded portions 19 of the cylinders 16 and 17.

Operation

In the operation of the invention, let it be assumed that the cylinders 16 and 17 are separated from the lock 10 but that the front 46 has been secured thereto by the pins 59 and interfitting lugs 56 and sockets 57. The discs 49 are turned toward the lock case 30, as shown, for the lower disc, by the dotted lines in Figure 2. The lock is then inserted through the opening 11 in the door edge wall 12, whereupon a screw driver is inserted in the slot 51 to rotate the pins 48 and discs 49 upward until fasteners 55 may be threaded into the aligned holes 50 and 52 as explained above. This brings the holes 72 and 73 opposite and into alignment with the holes 14 and 15 respectively in the door 13, whereupon the cylinders 16 and 17 may be threaded into the holes 72 and 73 and secured in position by the set screws 21 entering one of the notches 26 in each cylinder 16 or 17. The casing halves 31 and 32 are assembled by sliding them together along their dovetail connections 33 and 34 until they are properly aligned with one another, whereupon they are held together by the pins 58 which also lock the front 46 to the case 30.

In order to operate the lock, a key is inserted in the key slot 23 and, by moving the tumblers out of the way, is thereby permitted to swing the cam 25 so that it enters the upper end of the bolt notch 39 (Figure 2), pushing the lock operating element or tumbler pin 60 downward as it swings in a clockwise direction (Figure 6) and at the same time moving the bolt 38 to the left when the projection 64 has cleared the notch 65 and passes over the barrier 69. When the bolt reaches its extreme position to the left so as to lock the door (Figure 7), the cam swings upward out of the notch 39 and the spring 70 urges the tumbler pin or lock-operating element 60 upward until its projection 64 enters the notch 66. The bolt 38 is thus held in its advanced position and cannot be retracted by inserting a screw driver in the crack between the door and door frame since this is prevented by the interengaging projection 64 on the tumbler pin 60 and the notch 66 into which it fits (Figure 7).

Modification

The modified lock, generally designated 80, shown in Figures 8 to 12 inclusive, is generally similar in construction and operation to the lock 10 shown in Figures 1 to 7 inclusive, and similar parts are designated with the same reference numerals. The lock 80, however, is intended for smaller doors and is therefore made in smaller sizes than the lock 10. Consequently, the lock case 81 is made in a single piece rather than in extruded interfitting halves, as in the instance of the case halves 31 and 32 of the lock 10. The case 81 is provided with upwardly and downwardly extending ears 82 which are provided with threaded holes 83 aligned with holes 84 in the front 85 and secured thereto by fasteners 86. The

upper and lower ends of the front 85 are provided with swinging tabs or discs 49 (one only being shown) similar to those in Figures 1 to 3 inclusive and similarly mounted on pivot pins 48 adapted to be rotated by a screw driver inserted in the slot 51. Installation by swinging these tabs 49 and threading fasteners into their holes is accomplished in the manner previously described.

The bolt 87 in the lock 80 is generally similar to the bolt 38 of Figure 5 in that it has a similar notch 39 and a similar but differently inclined bore 41 also containing a loosely rotatable hardened steel pin 43. The bolt 87 is provided with an upper extension 88 at the top thereof and an arcuate cut away portion 89 is provided to permit free swinging of the cam or cams 25.

The tumbler pin or lock operating element 90 of the lock 80 (Figure 12) is similar to the corresponding element 60 of Figure 4, except that it is provided with oppositely-extending projections 64 on both sides thereof instead of on a single side. The spring 70 is similarly mounted in the recess 71 and the opposite sides of the case 81 are provided with the slots 67 instead of only on one side as in the lock 10. The slots 67 of the lock 80 are similarly provided with notches 65 and 66 and have intervening projections 69. The construction of the cylinders 16 and 17 and their mounting is identical with that previously described, and hence requires no repetition.

In the operation of the modified lock 80 shown in Figures 8 to 12 inclusive, the lock is installed in the manner described in connection with the construction thereof and as also previously described in connection with the operation of the lock 10. The lock is operated, as before, by inserting the key (not shown) into the key slot 23, rotating the rotary element 22 and cam 25 in a clockwise direction, as before. This pushes the lock operating element 90 downward, unseating both of its projections 64 from their corresponding notches 65 in the opposite side walls of the case 81 and lifts the element 90 over the projections 69, at the same time pushing the bolt 87 to the left into its extended or locking position. When the bolt 87 has been fully extended, the wings or projections 64 move upward into the forward notches 66 and the cam moves upward out of the bolt notch 39 in a manner analogous to that shown in Figure 7 for the lock 10.

What I claim is:

1. A case unit for a closure lock comprising a pair of cooperating hollow case halves consisting of opposed spaced parallel side plates, each side plate having a pair of spaced parallel flanges directed transversely thereto into relative sliding engagement with the flanges of the other side plate, one pair of said flanges having guide grooves therein disposed parallel to the planes of said side plates and the other pair of said flanges having guide ribs disposed parallel to the planes of said side plates and slidably engaging said guide grooves in a plane parallel to the planes of said side plates, said case halves in assembly having a passageway therethrough of substantially constant cross-section throughout its entire length and open at both of its ends, and a separate mounting plate secured to said case halves at one end of said passageway and closing the same, said mounting plate converting said passageway into a lock chamber defined by said side plates, said flanges and said mounting plate.

2. A case unit for a closure lock comprising a pair of cooperating hollow case halves consisting of opposed spaced parallel side plates, each side plate having a pair of spaced parallel flanges directed transversely thereto into relative sliding engagement with the flanges of the other side plate, one pair of said flanges having guide grooves therein disposed parallel to the planes of said side plates and the other pair of said flanges having guide ribs disposed parallel to the planes of said side plates and slidably engaging said guide grooves in a plane parallel to the planes of said side plates, said case halves in assembly having a passageway therethrough of substantially constant cross-section throughout its entire length and open at both of its ends, and a separate mounting plate secured to said case halves at one end of said passageway and closing the same, said mounting plate converting said passageway into a lock chamber defined by said side plates, said flanges and said mounting plate, said guide grooves and said guide ribs being of dovetail cross-section.

3. A case unit for a closure lock comprising a pair of cooperating hollow case halves consisting of opposed spaced parallel side plates, each side plate having a pair of spaced parallel flanges directed transversely thereto into relative sliding engagement with the flanges of the other side plate, one pair of said flanges having guide grooves therein disposed parallel to the planes of said side plates and the other pair of said flanges having guide ribs disposed parallel to the planes of said side plates and slidably engaging said guide grooves in a plane parallel to the planes of said side plates, and a mounting plate secured to one side of said case halves, said side plates, said flanges and said mounting plate defining a lock chamber located therebetween, the flanges of one side plate being disposed closer together than the flanges of the other side plate and having their external surfaces slidably engaging the internal surfaces of said other side plate flanges.

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