Oct. 27, 1953 E. MANCUSO 2,656,704

ROTARY AND SLIDING BOLT LOCK

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FIG. 1

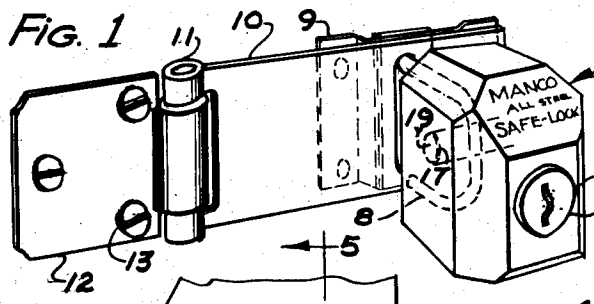


FIG. 7

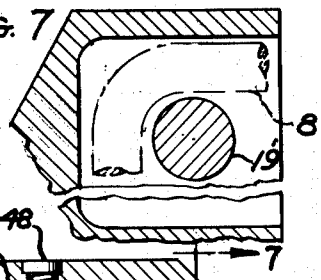
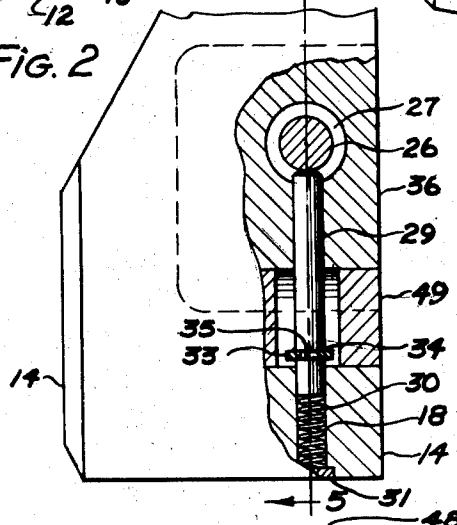


FIG. 2



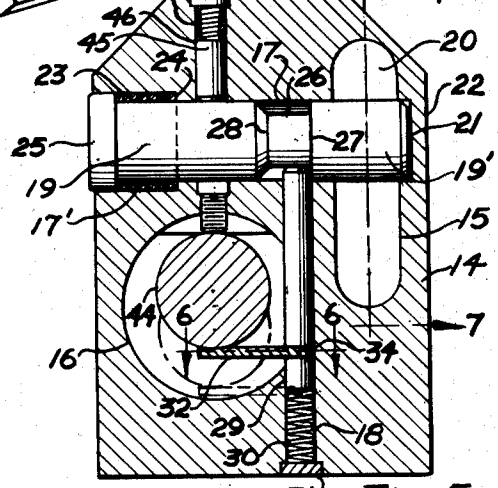


FIG. 4

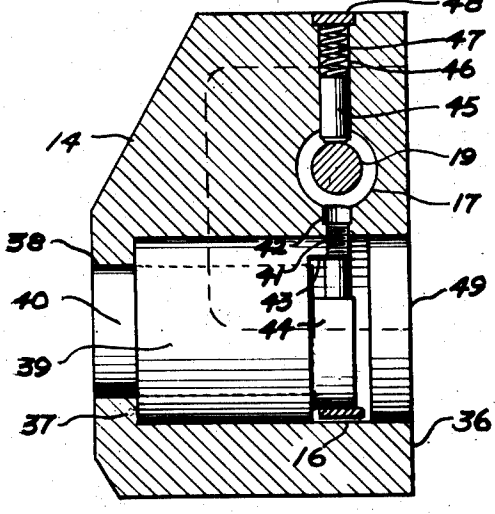


FIG. 5

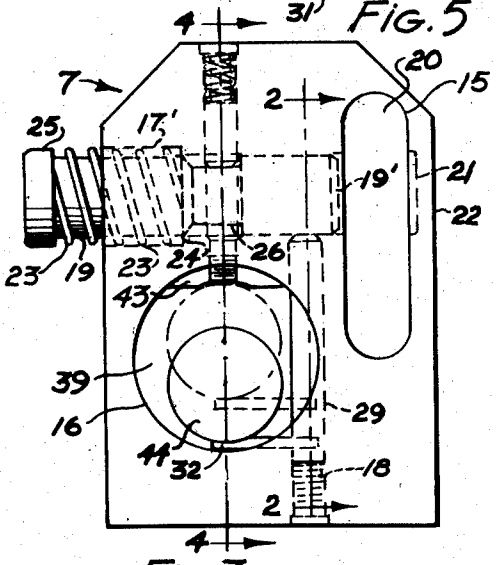
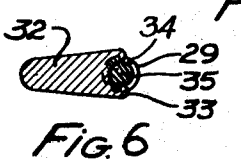


FIG. 3

FIG. 6



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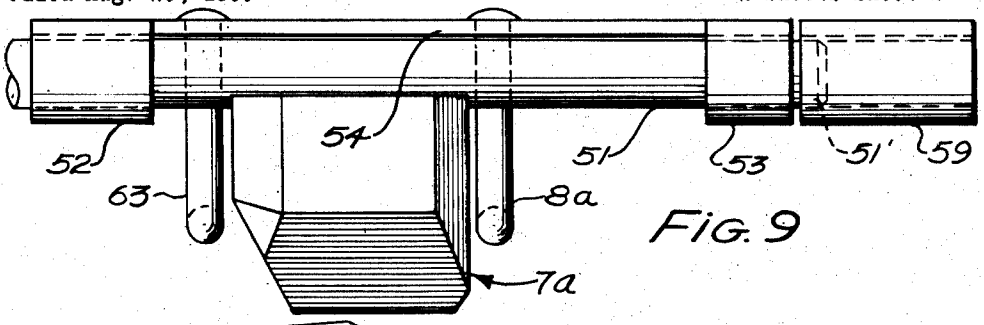


FIG. 9

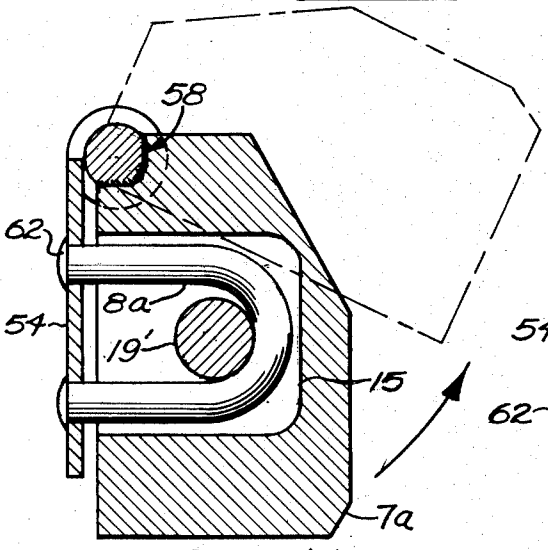


FIG. 11

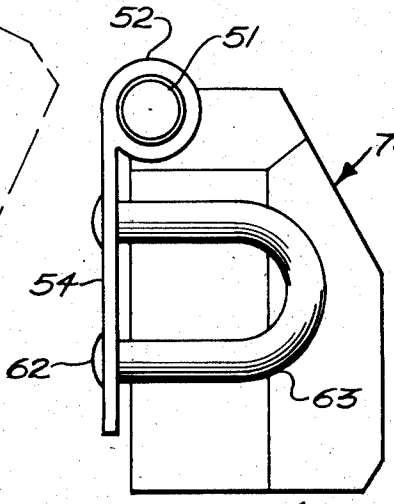


FIG. 10

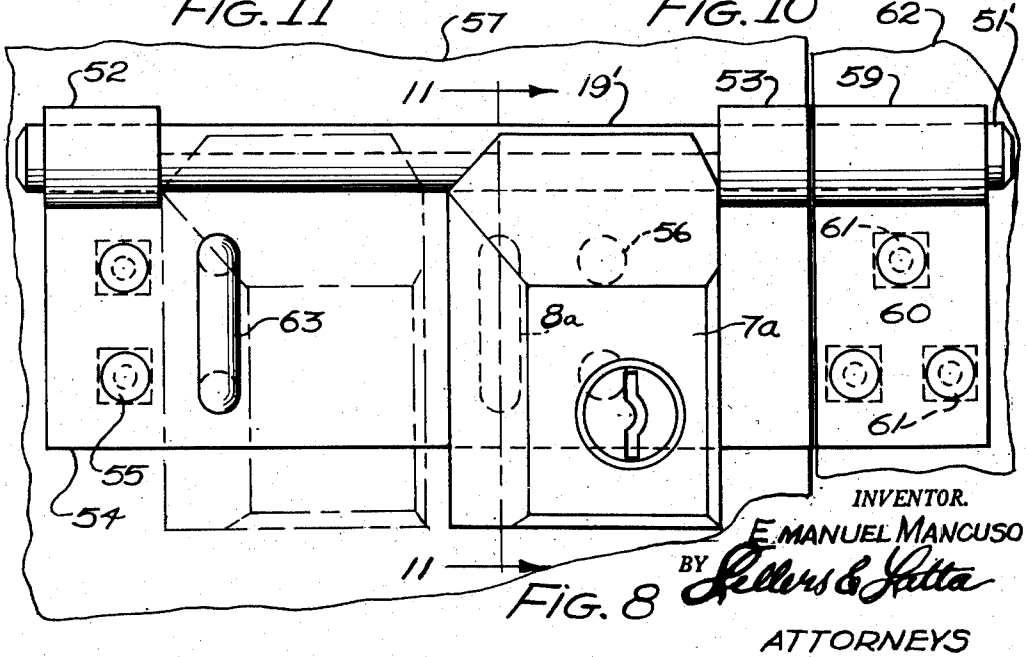


FIG. 8

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ROTARY AND SLIDING BOLT LOCK

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Application August 23, 1950, Serial No. 180,929

2 Claims. (Cl. 70—128)

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This invention relates to a padlock, particularly adaptable for use in connection with a hasp and staple type of fastening for doors, windows, chests and the like. The general object of the invention is to provide a padlock adapted to cooperate with a staple in such a manner as to protect the staple against tampering. The conventional hasp and staple mechanism for locking a garage door, for example, when secured by a conventional padlock, leaves the staple exposed so that it may be readily severed with a hacksaw or cold chisel, thus permitting the release of the hasp without unlocking the padlock. The lock of my invention is designed to enclose the staple and to fit against the hasp so as to prevent access to the staple.

Another object of the invention is to provide such a lock which is of relatively simple and durable, yet sturdy construction, resisting efforts to unlock it by damaging or destroying its parts. More specifically, the invention contemplates a lock having a locking bolt and a locking tumbler, the bolt being releasable only by rotation of the tumbler.

A further object is to provide such a lock, having a locking bolt which is spring urged toward its release position, so as to spring to the released position automatically when released by rotation of the tumbler, and which has a projecting end adapted to be manually engaged to return it to its locked position.

A further object is to provide a lock having a novel and improved arrangement of rotatable, key-actuated tumbler, a spring urged locking pin adapted to be retracted by rotation of the tumbler, a locking bolt normally held locked by the locking pin, and a staple receiving recess adapted to substantially completely receive the staple of a staple and hasp combination, the recess being intersected by the locking bolt so that the latter may project through the staple as received in the recess, whereby to secure the lock to the staple and thereby lock the hasp to the staple.

Other objects will become apparent in the ensuing specification and appended drawings in which:

Fig. 1 is a perspective view of a lock embodying the invention;

Fig. 2 is a side elevation of the same, partially in section as indicated by line 2—2 of Fig. 3;

Fig. 3 is a rear view of the same;

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 2;

Fig. 6 is a detail cross sectional view taken on the line 6—6 of Fig. 5;

Fig. 7 is a detail sectional view taken on the line 7—7 of Fig. 5;

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Fig. 8 is an elevational view of a lock and hasp assembly embodying a modified form of the invention;

Fig. 9 is a plan view of the same;

Fig. 10 is an end view of the same viewed from the left end of Fig. 9; and

Fig. 11 is a cross sectional view of the same taken on the line 11—11 of Fig. 8.

As an example of one form in which the invention may be embodied, I have shown in Figs. 1–7 inclusive of the drawing, a lock, indicated generally at 7, adapted to secure the staple 8 of a staple and hasp combination. Such a combination may include the staple 8, attached to a door or a door jamb by means of a base plate 9 in which its respective ends are secured, and a hasp including a tongue 10 hinged at 11 to a tab 12 which is adapted to be secured to a door jamb or a door.

The lock 7 embodies a housing 14 which may consist in a solid block of tough, resistant material such as manganese steel, having therein a flat elongated staple receiving recess 15, a lock tumbler barrel or bore 16, a locking bolt bearing bore 17, and a locking pin bearing bore 18, all of which may be machined in the housing block 14 by boring and routing operations (boring for the bores 16, 17 and 18 and routing for the recess 15).

Recess 15 extends parallel to the longitudinal axis of housing block 14, adjacent one side thereof, and will normally be positioned vertically when the lock is attached to a staple positioned in a normal vertical plane for a door securing arrangement. It is positioned preferably near that end of the housing block which becomes the upper end of the lock in its normal use position, in which case the lock will hang from the staple with its center of gravity below the center of the staple. A locking bolt 19 is slidably mounted in bore 17, and has a locking end that normally traverses recess 15 as shown in Fig. 5. The bore is located near the upper extremity of recess 15, so that a space 20 is defined between bolt 19 and the upper extremity of recess 15, just sufficiently wide to receive the upper arm of staple 8 with slight clearance (just adequate to allow free sliding movement of bolt 19 beneath said upper arm). Bore 17 has a closed end, indicated at 21 in Fig. 5, projecting just slightly beyond the outer side of recess 15 so that locking end 19' of bolt 19 may completely traverse the recess. The wall portion 22 of housing block 14 which closes this end of bore 17 prevents access to the locking end 19' of the bolt. The other end of bore 17 opens through the other side of housing 14 as indicated in Figs. 1 and 5. This other end of the bore is in the form of a slightly enlarged counterbore 17' which defines, with bolt 19, an annular space in

which is accommodated a coil spring 23. Coil spring 23 is engaged under compression between a shoulder 24 constituting the bottom of counterbore 17', and an enlarged head 25 on the exposed end of bolt 19. Head 25 is fitted fairly snugly in counterbore 17' while bolt 19 is fitted fairly snugly in bore 17, the fit in each case having just sufficient clearance to allow free sliding action of bolt 19.

Bolt 19 has in its intermediate portion an annular groove 26 defined on one side by a square shoulder 27 and on its other side by a frustoconical shoulder 28. Shoulder 27 defines the inner extremity of the locking end portion 19' of bolt 19. It also functions as a detent shoulder against which a locking pin 29 may engage so as to lock the bolt 19 in its locked position as shown, resisting the yielding pressure of coil spring 23 tending to withdraw locking end 19' from recess 20. Locking pin 29 is slidably fitted within bore 18, with just sufficient clearance to allow free sliding movement therein. It is spring urged, by a small coil spring 30 engaged under compression between its outer end and a plug 31 in housing block 14, the resilient pressure of spring 30 tending to move locking pin 29 into its locking position received in annular groove 26.

Secured to locking pin 29 is an abutment arm 32, which projects laterally therefrom into tumbler barrel 16. Arm 32, as illustrated in Fig. 6, has a bifurcated end 33 which is received in an annular groove 34 in locking pin 29, with its furcations snugly embracing the reduced neck portion 35 defined in locking pin 29 by groove 34. The shoulder extremities of pin 29 which define groove 34 snugly embrace the sides of bifurcated portion 33, and the latter is welded to the pin 29. Thus the arm is rigidly and securely fastened to the locking pin.

Tumbler bore 16 at one end opens into the rear face 36 of housing block 14. At the front of the block it is partially closed by an annular flange 37 which defines a reduced opening 38 in the front side of housing block 14. A locking tumbler unit which may be of conventional construction, has a casing 39 of sleeve form, mounted in the forward portion of bore 16 and has a conventional rotatable core portion 40, the outer end of which extends into and is rotatably received in reduced opening 38. The non-rotatable casing 39 of the tumbler unit, in which core portion 40 is rotatably mounted engages against flange 37 to securely retain the tumbler unit within housing block 14. A retaining screw 41, threaded into a bore 42 in housing 14, engages a lip or lug 43 projecting from one side of tumbler casing 39, to retain the latter against axial shifting in bore 16.

On the inner end of rotatable tumbler core 40 is a circular cam or eccentric 44 which bears against abutment arm 32, pushing the locking pin 29 downwardly so as to release its upper end from groove 26 when core 40 is rotated to an unlocked position. It will be understood in this connection that core 40 incorporates conventional tumblers, and also has a key slot for receiving a key to draw the tumblers from positions in which they engage within casing 39 to lock core member 40 against rotation, to withdrawn positions in which they allow core 40 to be rotated. These features, which are conventional in any rotatable tumbler core of a tumbler lock, are not shown in the drawings. The position of cam 44 when tumbler core 40 is locked is shown in full lines in Figs. 2 and 5 and in dotted lines in Fig. 3 while the position of cam 44 in the unlocked position of core 40 is shown in full lines in Fig. 3 and in dotted lines in Fig. 5. Fig. 3 illustrates how the bolt 19 has been withdrawn to the unlocking position by the action of coil spring 23, after the withdrawal of locking pin 29.

Fig. 3 also illustrates how, in the retracted position of bolt 19, the latching pin 45, slidably mounted in a bore 46 in housing 14, is moved into annular groove 26 by the action of a coil spring 47 which is engaged, in bore 46, under compression, between the outer end of latch pin 45 and a plug 48 which is press fitted into the counterbore at the other end of bore 46. The inner end of latch pin 45 is slightly bevelled as indicated, to coact with bevelled shoulder 28 of bolt 19, so that when the bolt is thrust inwardly to its locked position of Fig. 5, the pin 45 will be cammed outwardly to its inactive position shown in Fig. 5. The engagement of latching pin 45 in slot 26 has the primary function of locking the bolt 19 against complete withdrawal from housing 14 when unlocked. Shoulder 27 will engage against pin 45 to establish a positive lock preventing any further withdrawal of bolt 19. Latch pin 45 also functions to exert a camming action against shoulder 28 at the end of retracting movement of bolt 19, which supplements the action of spring 23 and positively moves bolt 19 to its fully retracted position, thus making certain that the locking end 19' of bolt 19 is fully withdrawn from recess 15. Bore 46 is an enlarged continuation of bore 42.

The open end of tumbler bore 16 is closed by a plug 49 which is fitted thereinto, the outer face of plug 49 being flush with the face of housing 14. The plug 49 has a smooth cylindrical peripheral wall press fitted into a cylindrical counterbore at the outer end of bore 16.

To disassemble the parts of the lock, it is necessary to remove not only the plug 49 but also the plug 48, which may be provided for by drilling through the plugs 48 and 49 and lifting them out with a suitable tool inserted through the respective drill hole. This is preferable since it obviously provides considerable difficulty to any efforts to disassemble the lock by an unauthorized person.

In the modified form of the invention shown in Figs. 8, 9, 10 and 11, the lock 7*a* is permanently attached to a main locking bolt or bar 51 which is slidably mounted in cylindrical sleeve bearings 52 and 53 carried by a mounting plate 54. Bearings 52, 53 are preferably formed integrally with plate 54 by conventional blanking and forming operations in which a blank having a pair of tongues projecting from one side thereof is initially shaped, and is then subjected to a forming operation in which the projecting tongues are rolled into the form of the cylindrical sleeve bearings 52, 53. Mounting plate 54 is provided with a series of openings through which securing elements 55 and 56 (e. g. bolts) may be inserted, for securing the plate to a door 57 or other member to be locked. Lock 7*a* may be attached to main locking bar 51 by welding or brazing as indicated at 58 in Fig. 11. It is preferably attached to the bolt at its upper end so that it may normally hang in a position depending from the bolt.

Bar 51 is extended beyond lock 7*a* to provide a locking portion 51' adapted to be received in a keeper sleeve 59 on the upper end of a plate 60. Plate 60 is provided with a series of openings

to receive bolts 61 for securing it to a door frame 62 or the like.

Lock 7a is identical in construction to lock 7 previously decribed, with the exception of its connection to main locking bar 51, and reference characters corresponding to those of lock 7 are used to designate the corresponding parts thereof. A staple 8a is secured to plate 54 in a position to be received in recess 15 of lock 7a when bar 51 has been projected through keeper sleeve 59 to a limit position determined by engagement of lock 7a against bearing sleeve 53. Any means for securely attaching staple 8a to plate 54 may be employed, as for example, by extending the arms of the staple through registering openings in plate 54 and heading the ends of the arms over as indicated at 62 in Fig. 11. A second staple 63 which functions merely as a means to retain the bar 51 and lock in a retracted position (indicated by broken lines in Fig. 8), is secured to plate 54 in a position spaced from staple 8a. Bearing 52 may be arranged to form a stop for engagement with lock 7a to determine the proper position of the latter for reception of staple 63 in recess 15.

It will now be apparent that lock 7a may be utilized as a handle to manipulate main locking bar 51 in sliding it in bearings 52, 53, between its retracted and locked positions respectively. In doing so, lock 7a is simply raised, bar 51 pivoting in bearings 52, 53, until it clears staple 8a or 63, as the case may be, and is then slid to its alternate position until it engages bearing 52 or 53 as the case may be and may then be simply dropped onto the other staple. When receiving staple 8a, it may be locked thereto by manipulation of the locking mechanism in the same manner as described for the lock 7. Thus, bar 51 is secured against retraction from keeper 59 and accordingly the door 57 or the like is locked in its closed position.

It will be noted that the two securing elements 56 are shown as being concealed behind lock unit 7a when the latter is in the locked position. This is a preferable arrangement to prevent access to these bolts, thereby increasing the security of the locking function.

It will be apparent from the foregoing that the invention may also be embodied in an arrangement in which the lock 7 of Fig. 1 is permanently attached to hasp member 10 instead of being separated therefrom. In all other respects, this embodiment of the invention may be identical to that shown in Fig. 1.

I claim:

1. In a locking assembly: a mounting plate adapted to be attached to a member to be locked and having a pair of spaced, integral, axially aligned bearing loops; a bolt slidable in said bearing loops and having one end adapted to be projected into a keeper; a lock housing integrally united to said bolt between said bearing loops, and engageable alternately with said bearing loops to define projected and retracted positions of said bolt respectively, said lock housing having in its rear side a recess facing said mounting plate; and a staple rigidly attached to said mounting plate in a position to be received in said recess when said lock housing engages a bearing loop in the projected position of said bolt; a locking pin slidable in said lock housing from a position extending through said staple while the latter is in said recess, to a position releasing the lock housing for swinging movement around the axis of said bolt, whereby the lock housing may be detached from the staple; and locking mechanism in said lock housing for locking said locking pin in engagement with said staple.

2. In a lock for securing a fastener of a type including a staple having a portion adapted to project for engagement by the lock, said lock comprising: a housing having a recess of dimensions corresponding to those of the projecting portion of the staple but slightly larger than the same so as to freely receive the projecting portion of the staple, said housing having a bolt slide bore disposed at right angles to the plane of said recess and intersecting the same, said bore being closed at one end and at its other end having a counterbore opening through the side of the housing, said housing having a locking pin bore disposed at right angles to said bolt slide bore, and having a locking tumbler bore intersected by said locking pin bore; a locking bolt slidably mounted in said bolt slide bore, having a locking end adapted, in a locked position thereof, to traverse said recess and to thereby extend through the staple received in the recess, so as to secure the lock to the staple, the opposite end of said bolt being adapted in an unlocked position of said bolt in which said locking end is withdrawn from said recess, to be projected through the open end of said bolt slide bore so as to be engageable for pushing the bolt back to the locked position, said bolt having, at said locking end, a locking shoulder, having, adjacent said opposite end an intermediate annular groove and having, between said annular groove and said opposite end, a head fitted within said counterbore, a coil spring encircling said bolt and engaged under compression between said head and the bottom of said counterbore for projecting the bolt to said unlocked position when the bolt is released for unlocking movement; a locking pin slidably mounted in said locking pin bore, having a locking end adapted to be projected into said annular groove to engage said locking shoulder to retain the bolt in its locking position, and having an abutment member projecting into said tumbler bore; means yieldingly engaged against the other end of said locking pin and a confining portion of said housing to urge said locking pin toward its locking position in which said locking end engages in said annular groove; a key operated rotatable locking tumbler within said tumbler bore, and a cam on said tumbler engageable with the side of said abutment member opposite said last mentioned yielding means so as to be operable when said tumbler is rotated, to move said locking pin against the resistance of said last mentioned yielding means, to an unlocking position releasing said bolt for retraction to the unlocking position of said bolt.

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