Jan. 19, 1954 J. F. PRICE 2,666,319

REVERSIBLE LATCH AND LOCK FOR SLIDABLE CLOSURE DEVICES

Filed May 20, 1950 2 Sheets-Sheet 1

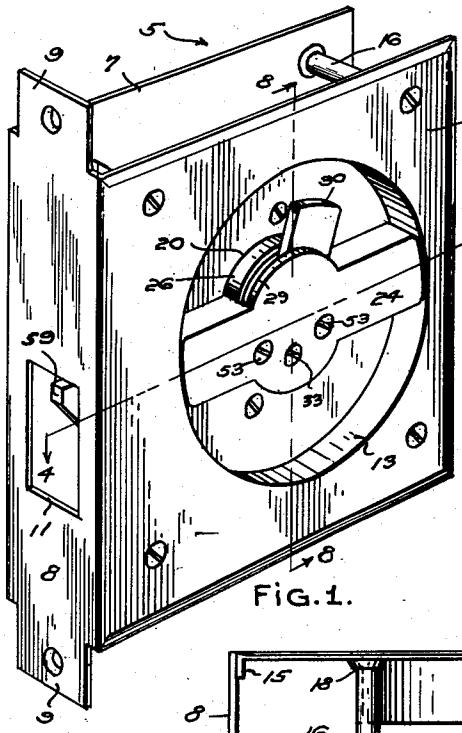


FIG. 1.

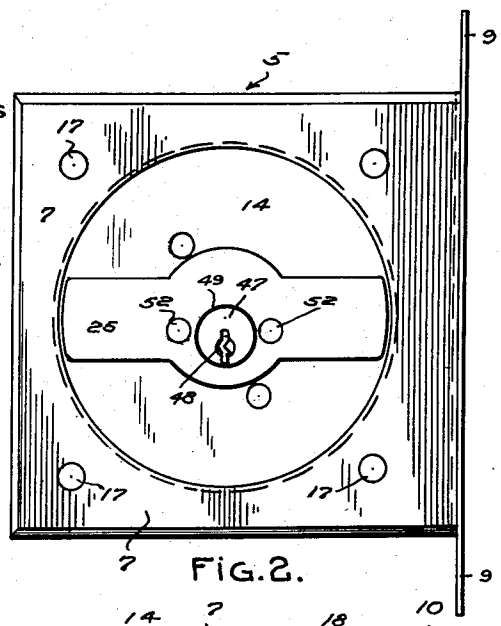


FIG. 2.

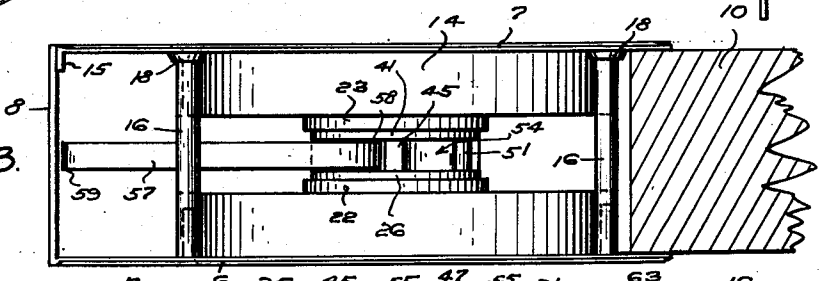


FIG. 3.

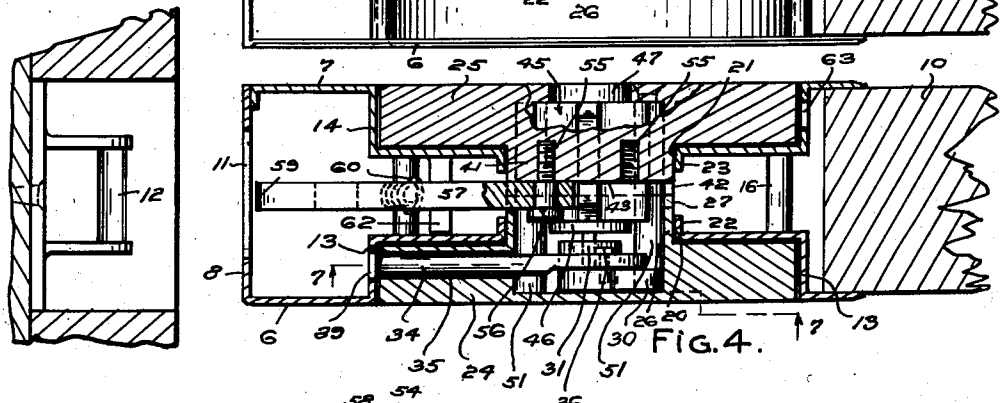


FIG. 4.

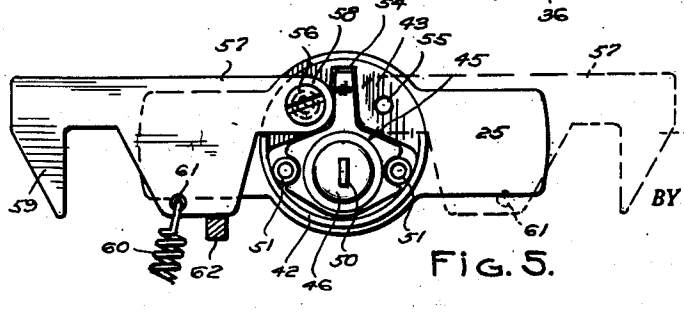


FIG. 5.

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REVERSIBLE LATCH AND LOCK FOR SLIDABLE CLOSURE DEVICES

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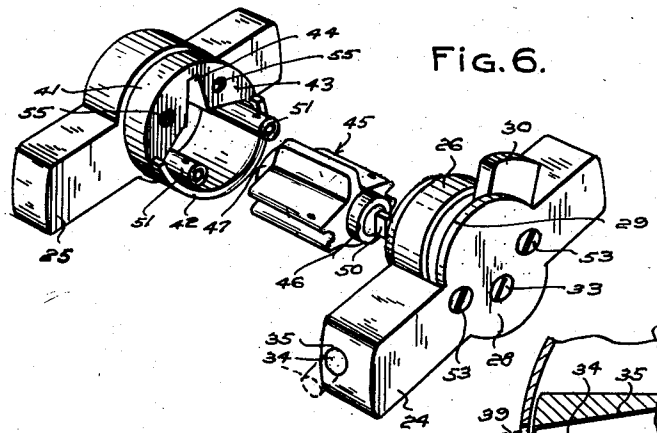


Fig. 6.

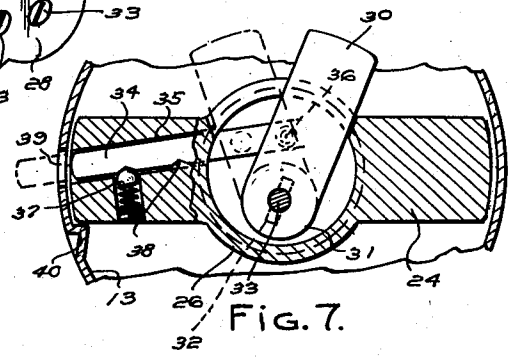


Fig. 7.

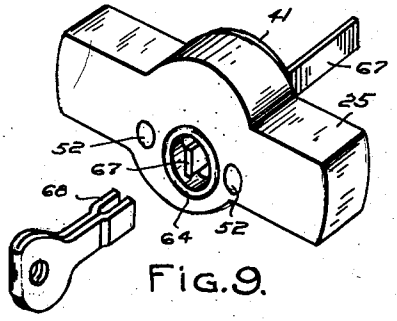


Fig. 9.

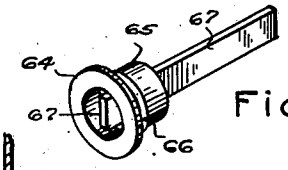


Fig. 11.

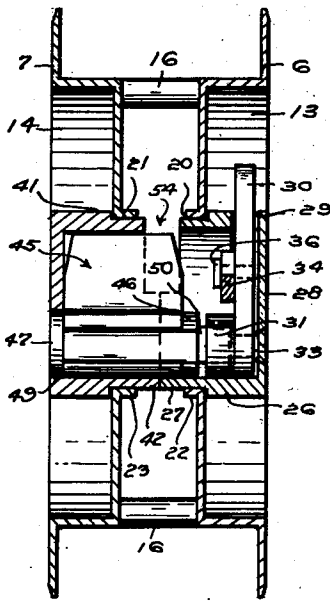


Fig. 8.

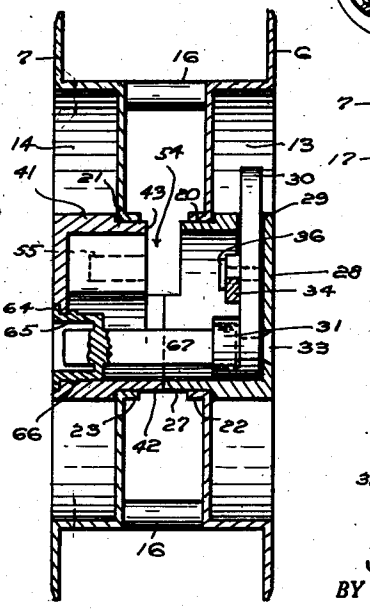


Fig. 10.

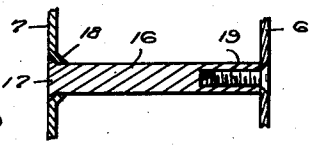


Fig. 12.

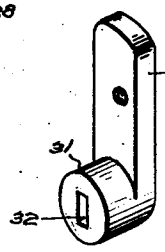


Fig. 13.

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2,666,319

REVERSIBLE LATCH AND LOCK FOR SLIDABLE CLOSURE DEVICES

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Application May 20, 1950, Serial No. 163,261

6 Claims. (Cl. 70—97)

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This invention relates to a combined latch and lock for use in connection with sliding closure devices and is a continuation in part of my copending application for a similar device, filed March 27, 1950, bearing Serial No. 152,205 now Patent No. 2,638,370, dated May 12, 1953.

The invention contemplates a combined latch and lock that includes a vertically pivoted latch member supported wholly within a housing that is mounted in the leading edge of a closure door or the like for latching engagement with a keeper supported to the door frame, the housing adapted to engage over the keeper when the door is fully closed with the keeper projecting into the housing to be engaged by the latch.

An important object of the invention resides in novel latch and locking means associated with the housing and the method of mounting and assembling the parts, with latch handles for the manual and key control of the latch and with one latch handle provided with a sliding bolt to be projected through a preformed opening in the housing to control the unauthorized operation of the latch from an outer side of the door.

The invention further contemplates a novel latch and lock device that is key controlled from the outer side of the door and finger latched from the inner side of the door, with the latch structure so arranged that the parts may be reversed as to the inner and outer side of the door.

Other important objects and advantages of the invention will be readily apparent during the course of the following description, reference being had to the accompanying drawings, wherein has been illustrated the preferred examples of the invention and wherein like characters of reference are employed to denote like parts throughout the several figures.

In the drawings:

Figure 1 is a perspective view of a combined latch and lock constructed in accordance with the invention and disclosing the inner or latching side of the device,

Figure 2 is a side elevation of the device from the opposite or key control side of the mechanism,

Figure 3 is a top plan view of the assembled device as mounted in the leading edge of a sliding closure door,

Figure 4 is a horizontal sectional view of the device in mounted relation to a door, taken on line 4—4 of Figure 1,

Figure 5 is an inner side elevation of outer latch handle and associated key controlled mechanism and latch dog, removed from its supporting housing,

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Figure 6 is a perspective view of the inner and outer latch handles and associated key controlled cylinder lock and spacing sleeves, in separated position,

Figure 7 is a fragmentary vertical section through the inner latch handle and associated housing, taken on line 7—7 of Figure 4,

Figure 8 is a transverse vertical section taken on line 8—8 of Figure 1,

Figure 9 is a perspective view of the outer latch handle illustrating a modified form of key controlled mechanism,

Figure 10 is a view similar to Figure 8, illustrating the modified key control mechanism,

Figure 11 is a perspective view of the modified key controlled mechanism prior to installation in the outer latch handle,

Figure 12 is a fragmentary section of a spacing sleeve for the housing and,

Figure 13 is a perspective view of a bolt actuating arm.

Referring specifically to the drawings, the numeral 5 indicates the complete assembled mechanism including a housing that embodies sections 6 and 7, which are preferably stamped from any suitable heavy gauged metal, the section 6 constituting the inner part of the housing and the section 7 constituting the outer part of the housing. The sections are generally square in outer side elevation. The section 6 is provided with a forward right angle flange 8 that constitutes an abutment face. The upper and lower ends of the flange 8 are extended at 9 and provided with screw openings, through the medium of which the housing is rigidly supported within an opening of the door, indicated at 10, in Figures 3 and 4. The flange is further provided with a rectangular opening 11, of a size to permit the entry of a keeper 12, to be contacted by a latch dog, to be later described. The keeper 12 is rigidly mounted at one side of the door opening and is completely recessed by the door trim, so that, when the door is moved to closed and latched position, the keeper will be completely sealed and unauthorized movement of the latch dog will be prevented.

As clearly shown, the housing member 6 is provided with a cylindrical depression 13, while the housing member 7 is provided with a cylindrical depression 14. The flange 8 is rigidly connected to the housing member 7 through the medium of a lip 15, formed upon the forward edge of the member 7 for its full height. Spacing sleeves or rods 16, serve to properly space the housing members apart at assembly. The rods 16 have bevelled heads 17, seating within recesses 18, formed in

the housing member 7, to lie flush therewith. The heads 17 are formed plain to prevent unauthorized removal from the outer side of the device. The inner ends of the rods 16 are axially drilled and tapped to receive fastening screws 19, the slotted heads of which are countersunk in the housing member 6, as clearly shown in Figure 12.

Each depression 13 and 14 is provided in its inner wall with a relatively large concentric opening 20 and 21, terminating in inwardly projecting and axially arranged bearing flanges 22 and 23 for the rotatable bearing support of lock and latch mechanism to be described. The recesses or depressions and their flanges 22 and 23 are in axial alignment at assembly of the device.

Latch handles, generally indicated by the numerals 24 and 25 are adapted to be rotatably supported within the depressions 13 and 14, with the handles being of a thickness to be wholly arranged within the depressions with their outer faces flush with the outer faces of the housing members 6 and 7 respectively.

The latch handle 24 is provided with a tubular hub 26, cylindrical in shape and equidistantly spaced from the ends of the handle and provides an inwardly extending semi-circular flange 27. The outer end of the hub is closed by an end wall 28. The upper portion of the hub is slotted at 29 for the shiftable reception of an actuating handle 30, see particularly Figures 4, 6, 7, 8, 10 and 13. The handle 30 is provided with a cylindrical hub 31 at its lower end, provided with a rectangular recess 32. The hub and its integral handle 30 is adapted to rock back and forth and is mounted preferably eccentric to the hub 26, through the medium of a shouldered screw 33, passing through a suitable opening in the wall 28. The rocking motion of the handle 30 controls the shifting movement of a locking bolt 34, shiftable through a passage 35, formed in the handle 24, opening at one end, as clearly shown in Figures 4, 6 and 7. The bolt 34 is pivotally connected to the handle 30 by a shouldered screw 36. The bolt is retained in either the extended or retracted position by a ball detent 37, urged into seating engagement within spaced notches 38 formed in the bolt. Movement of the handle by the operator to the left, causes the bolt to be projected beyond the end of the handle to pass through an opening 39, formed in the side wall of the depression 13, whereby the handle and associated parts are positively held against turning movement. The handle 24 is positively positioned in normal arrangement with the passage 35 and opening 39 accurately aligned for the reception of the bolt, by a stop lug 40, pressed inwardly from the side of the depression 13. The handles 24 and 25 are normally returned to horizontal position upon being released, by spring means, to be described.

The handle member 25 is provided centrally thereof with a solid hub 41, having a diameter identical to that of the hub 26. The hub 41 is rotatably mounted within the opening 21 and has a bearing upon the flange 23. The inner end of the hub 41 is provided with a semi-cylindrical flange 42, identical to the flange 27 and adapted to have abutting relation with the flange 27 at assembly. The inner flat face 43 of the hub 41 is cut away, as at 44 to provide a seating recess for a housing member 45 of a conventional cylinder lock mechanism having a rotatable plug 46 having a cylindrical extension 47 provided with a key opening 48. The extension 47 is rotatably supported in a cylindrical opening 49 formed in the end wall of the handle 25 and eccentrically arranged to lie in axial alignment with the hub 31 of the latch handle 30. An operating bar or tail piece 50, carried by the plug 46 freely engages in the slot 32 of the hub 31, at assembly, whereby the movement of the barrel under the influence of a key in the opening 48, is imparted to the handle 30 and subsequently shifting the bolt 34 toward or from the opening 39. It is to be understood that in various cylinder lock constructions there is a limited lost motion between the plug 46 and the bar or tail piece 50, which lost motion is adequate to permit the shifting of the handle 30 for a release of the bolt 34. The cylinder lock here employed in the combination is of well known construction and the internal structure thereof forms no part of the present invention. Posts 51 serve to secure the handles 24 and 25 together for simultaneous movement, one end of the posts being riveted through the end wall of the handle 25, as at 52, while their opposite ends are axially drilled and tapped to receive fastening screws 53, passing through the end wall 28 of the handle 24. The posts further serve to support the housing member 45 against rotation with respect to the hub 41, as clearly described in my co-pending application above identified. The rigid abutment of the flanges 27 and 42 under the clamping action of the posts 51, provides an arcuate slot 54 between the hubs, the terminal ends of the slot being somewhat above the axial center line of the hubs.

The flat face 43 of the hub 41 is provided with spaced apart openings 55, internally threaded for the reception of the threaded end of a shouldered bearing screw 56, see Figures 4 and 5. The screw 56 rockably supports a latch dog 57, having a rounded head 58 and a bevelled hooked forward end 59 for engagement with the keeper bar 12. The dog is shiftable in a vertical direction upon its bearing screw 56 and against the tension of a retractile spring 60, one end of which is attached to the dog, as at 61, while the opposite end is attached to one of the spacer rods 16, thus urging the dog to a position to lie in the path of the keeper 12, the downward movement of the dog being limited by its abutment in the end of the slot 54. A further stop device is employed, as at 62.

In the use of the invention so far described, the handle 30 having been moved to the right to retract the bolt 34, the door is shifted to cause the keeper 12 to enter through the opening 11 of the flange 8. As the forward end 59 of the dog engages the keeper bar, it will ride upwardly against the tension of the spring 60 to subsequently snap thereover to latched position. Since the handle 30 is in the unlatched position, the dog may be unlatched from the keeper by rotating either handle 24 or 25, since rotation of these handles likewise rotates their barrels or hubs and, since the dog abuts the end of the slot 54, it will be moved in an arcuate path to raise the hooked end 59 from the keeper. However, after the latching has taken place and the operator shifts the handle 30 to the left, the bolt 34 is projected into the opening 39 and the several parts are held against rotation. With the bolt in locked position, a suitable key may be inserted into the plug key opening 48 and the plug rotated, which action causes the bar 50 to shift the handle 30 to the right, withdrawing the bolt 34, after which the latch handle 25 may be rotated to lift the dog 57 from the keeper. The dog may at all times be

latched to the keeper, regardless of the position of the bolt 34.

It becomes necessary at times to reverse the mechanism, where the sides of the door are reversed from inside to outside, yet movable in the same direction in a predetermined door opening. To accomplish this, the machanism is disassembled and the latch dog 57 replaced in the position shown by dotted lines in Figure 5. The handle 25 carrying the dog and cylinder mechanism is then mounted in the opening formerly occupied by the handle mechanism 24 and the handle mechanism 24 installed in the opening formerly occupied by the handle mechanism 25 and the lock then again assembled with the screws 53 engaging the posts 51. Since the bolt 34 obviously must engage the side of the depression 14, an opening 63 is provided, see Figure 4. Thus the several parts are interchangeable from one side of the door to the other and their actuation is identical.

It has been found desirable in an inside door device to dispense with the key actuated cylinder lock and to employ a stamped or forked key device, such as has been illustrated in Figure 9. Since the cylinder mechanism has been removed from the opening 49 of the handle 25, the outer circumferential edge of the opening 49 is countersunk to receive a flange 64 for flush engagement with the end wall of the hub 41. The flange carries a cylindrical cup 65, provided with an annular bead 66 to be snapped into engagement with a groove formed in the hub at the time of the changeover. Thus, the flange and its cup are retained against accidental displacement, yet may freely rotate under the influence of the key. Welded or otherwise attached to the cup 65 to project both rearwardly and forwardly of the inner wall of the cup, is an operating bar 67, the forward end of which lies wholly within the cup, while the rear end is elongated to engage in the slot 32 of the hub 31, thus, rotation of the cup is imparted to the handle 30 for retracting or projecting the bolt 34. Any suitable form of forked key, such as that illustrated in Figure 9 may be employed, in which case the key is stamped from a single piece of sheet metal in proper and desirable design and folded upon itself and preferably spot welded. The free ends of the key are spaced apart, as at 68 to provide a fork for engagement over the end of the bar 67. The use of this form of the invention is similar with that described in connection with the cylinder lock plug and simplifies the manufacture of the inside door locks, since the same handle 25, having the identical configuration of hub and flange is employed and it only becomes necessary to cut away for the flange 64 and the bead 66, all other parts, including the dog 57 and handle mechanism 24 remaining the same. The cost of such a latch set is therefore somewhat reduced in cost, in view of the fact that the cylinder mechanism is eliminated.

It is believed that further detailed description of the machanism and its operation is unnecessary. The structure is simple and economical to manufacture, easily assembled or disassembled, is strong, durable and highly efficient for the purposes for which it was designed.

It is to be understood, that the invention is not limited to the precise shape and arrangement of parts or to any particular materials, but that it includes within its purview, whatever changes fairly come within either the spirit or the terms of the appended claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a combined latch and lock device for engagement in the leading edge of a sliding closure door, a housing comprising spaced apart plates provided with cylindrical depressions axially aligned, latch handles rotatably positioned in the depressions upon opposite sides of the housing, a manually operable sliding bolt carried by the handle upon the inner side of the door to lock the handle against rotative movement with respect to the housing, key controlled means carried by the other handle upon the outer side of the door, means connecting the two handles to rotate in unison, the key controlled means serving to retract the bolt from the outer side of the door, a latch dog pivotally mounted with respect to the handles and being independently shiftable to latching position when engaged by a keeper, the dog being shiftable to unlatching position from the keeper when either of the handles are rotated, the handles and the dog being reversible for operative mounting upon either side of the door.

2. In a combined latch and lock for mounting within the leading edge of a sliding closure door, a housing including a pair of spaced apart plates, the plates provided with cylindrical depressions in their outer faces that are axially aligned with each other, each depression provided with a relatively large concentric opening, inner and outer latch handles for rotative mounting within the depressions with their outer faces flush with the plates, hubs formed on the handles for rotative reception in the concentric openings, the hubs extending inwardly of the housing and connected with each other to rotate in unison, an end closure for the housing that is provided with an opening for the passage of a keeper carried by the door opening, a latch dog pivotally supported upon the hub of one latch handle to be vertically shiftable to latched position when engaged by the keeper, a spring for urging the dog to normal latching position, the dog being bodily shiftable to unlatching position when one of the handles is actuated, a bolt carried by one of the handles to slidably engage in an opening of the housing, manual means to project and retract the bolt, key controlled means carried by the other handle and connected to the manual control means of the other handle whereby the bolt may be retracted through the medium of the key from the opposite side of the door, the pivotal support of the dog being such that the dog may be reversed and pivotally mounted to its hub in an opposite direction to permit the handles being reversed from one side of the door to the other.

3. The structure as recited in claim 2, wherein the hubs are provided with arcuate flanges to be abutted in clamping relation, the flanges being identical in length and jointly terminating to provide an arcuate slot between the inner ends of the hubs as a clearance for the pivotal reception of the dog.

4. The structure as recited in claim 2, wherein the key controlled means consists of a cylindrical cup having an outer flange, the outer hub provided with a cylindrical opening counterbored for the reception of the cup and its flange, an annular groove formed in the opening and an annular bead formed on the cup for snapping engagement into the groove whereby the cup may be rotated, a flat bar carried by the cup axially and having its outer end positioned in the cup for engagement

by a forked key and its inner end extended to engage the bolt actuating handle.

5. In a combined latch and lock mechanism adapted to be mounted in the leading edge of a sliding closure device, a housing for enclosing the mechanism, the housing being adapted to be recessed into the leading edge of the closure device and with the housing being concentrically recessed upon opposite sides, inner and outer latch handles positioned in the housing recesses and rotatable on a common axis, a sliding bolt carried by one of the handles to be manually projected into an opening formed in the adjacent housing, key actuated means carried by the other handle for retracting the bolt, a latch dog positioned in the housing and that is actuable in one direction to release position by the latch handles, the latch dog adapted to have engagement with a keeper device fixed within an opening to be covered by the closure device, the latch dog being freely shiftable to latched engagement with the keeper device independent of the latch handles, the latch handles and latch dog being reversible for operative mounting within the housing at either side of the closure device.

6. A latch and lock mechanism for use with a slidable door that covers and uncovers a closure opening and with the opening provided with a fixed latch keeper at one side, a combined latch and lock adapted to be fixedly mounted in a leading edge of the door and comprising a pair of identical plates spaced apart by rods, a leading closure wall carried by the plates that is provided with an opening for the passage of the keeper, the plates provided with cylindrical recesses in their outer faces that are axially aligned with each other, the recesses each provided with a relatively large concentric opening having inwardly extending bearing hubs, a latch handle for the inner side of the door and a latch handle for the outer side of the door, the handles being rotatively supported within the recesses with their outer faces flush with the plates, the handles being provided with cylindrical hubs that are rotatively supported within the concentric openings, the hub of the inner handle being tubular and rotatively supporting therein a bolt handle, the bolt handle projecting outwardly through a slot formed in the hub, a locking bolt carried by the inner handle to be projected through an opening formed in the side of the adjacent recess and shiftably controlled by the bolt handle, the hub of the inner handle being provided with a concentric arcuate flange inwardly projecting, the outer handle having a solid hub provided with a flat inner face, the hub of the outer handle being provided with an arcuate flange identical in size and length to the first named flange, internally threaded posts fixed to the hub of the outer handle and projecting inwardly into the hub of the inner handle, screw means carried by the inner handle for threaded engagement with the posts whereby the handles and their hubs are fixed with respect to each other to rotate in unison, the flanges being in abutting clamping relation, the flanges terminating at an identical elevation to jointly provide an arcuate slot, the flat face of the outer hub being provided with spaced apart screw holes at an identical elevation, a latch dog supported upon the flat face with one end of the dog being pivotally supported by a shouldered screw in one of the screw holes for independent vertical shifting movement in the arcuate slot, the dog extending forwardly to lie in the path of the keeper, a spring for retaining the dog in normal latching position with the keeper, the dog limited in its downward swinging movement by its abutment against an end of the arcuate slot, stop means in one of the recesses to limit the pivotal movement of the handles in one direction, the hub of the outer handle being provided with a recess, a key controlled cylinder lock disposed in the last named recess the plug of which having a tubular extension that projects through an opening formed in the hub, and a bar that projects inwardly from the plug engaging and to actuate the bolt handle, the dog being reversible from one screw hole to the other whereby the outer and inner latch handles and their associated mechanisms may be reversed from one side of the door to the other.

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