April 19, 1932. J. F. BOOTHE 1,855,089

COMBINED LATCHING AND LOCKING DEVICE FOR DOORS

Filed Aug. 27, 1930 2 Sheets-Sheet 1

Fig. 1.

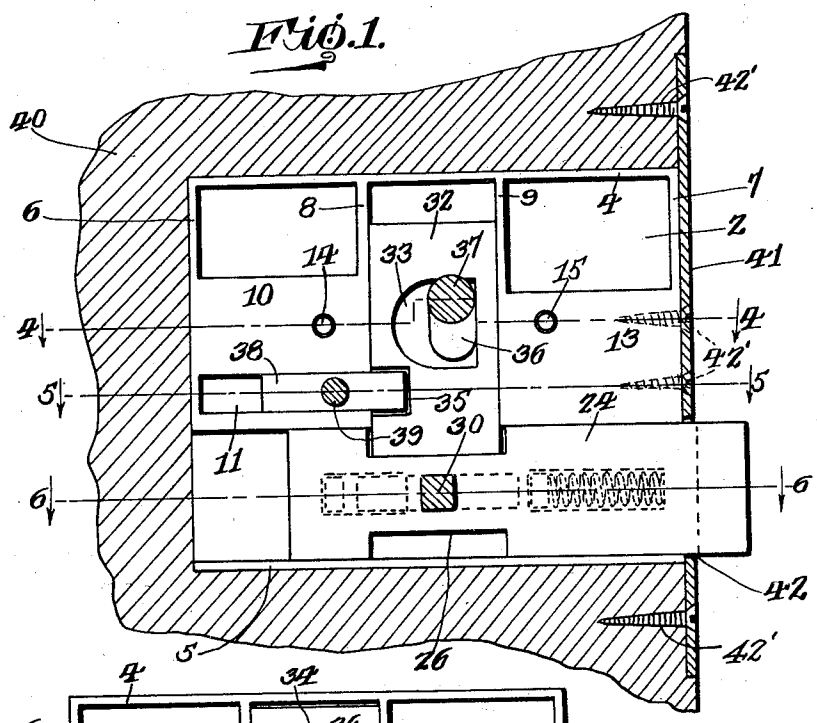

Fig. 2.

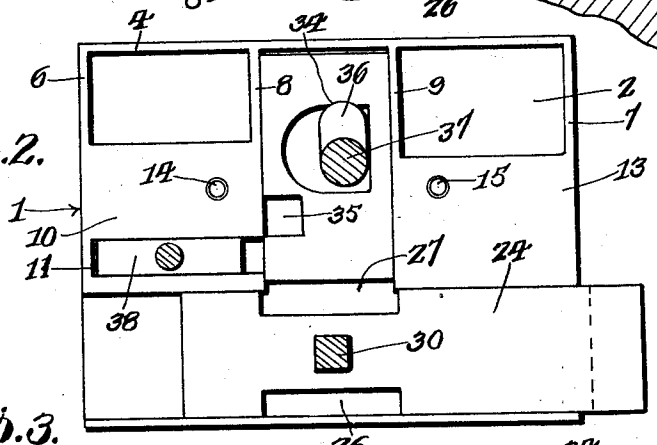

Fig. 3.

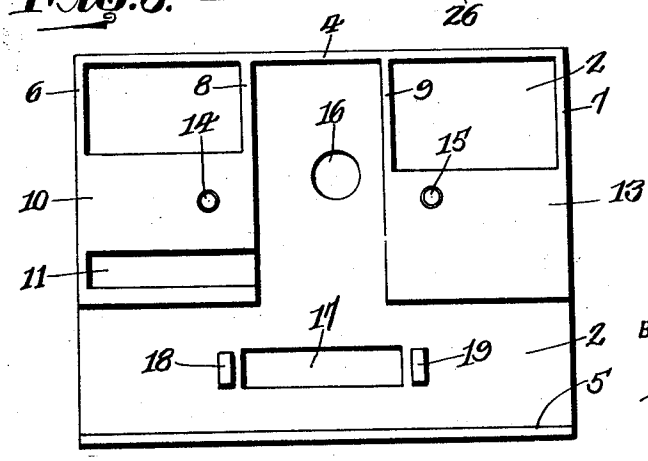

Fig. 9.

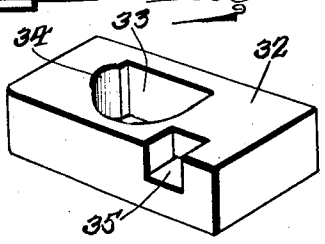

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Fig. 4.

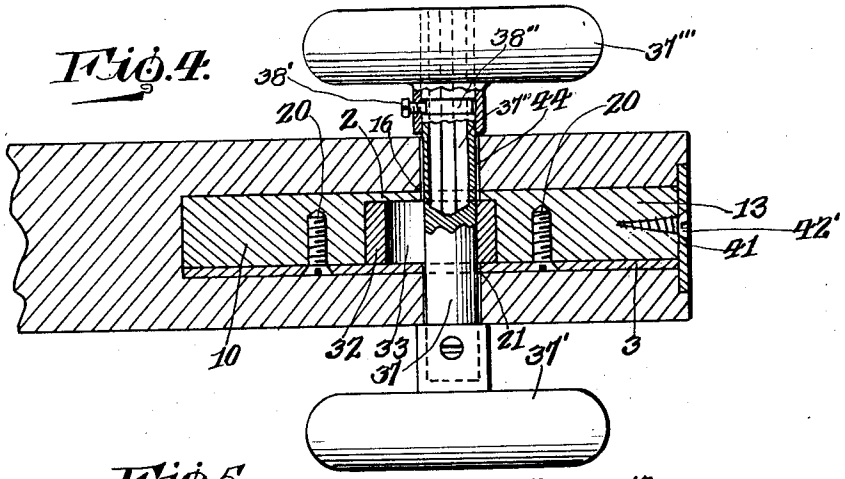

Fig. 5.

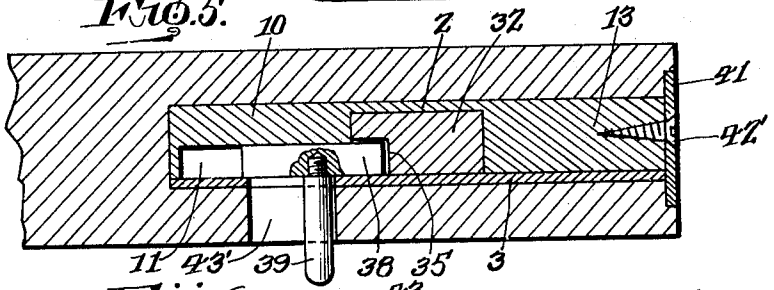

Fig. 6.

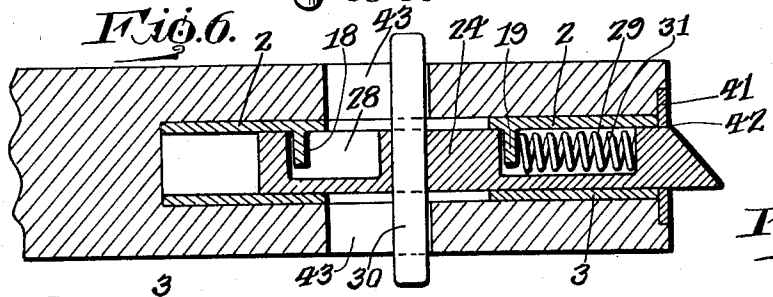

Fig. 8.

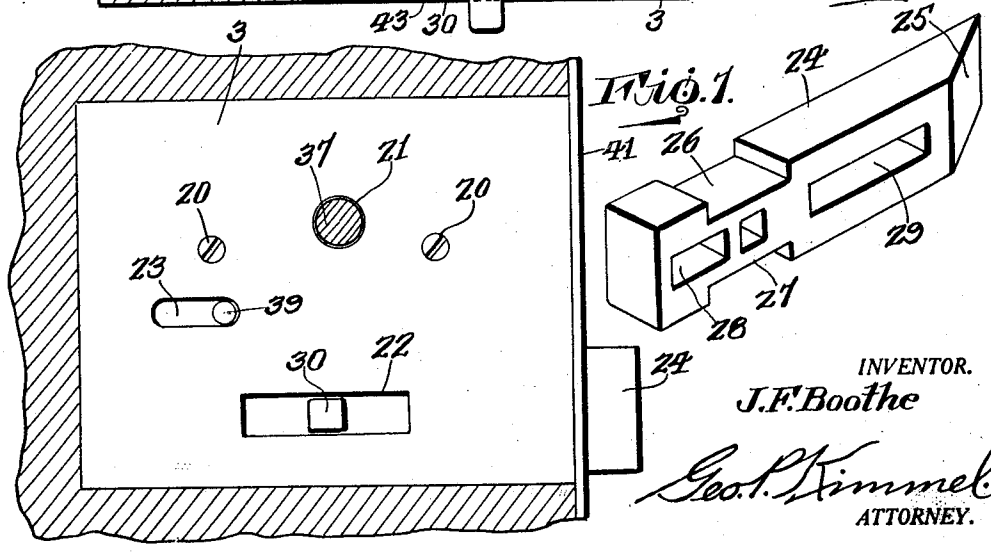

Fig. 7.

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UNITED STATES PATENT OFFICE

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COMBINED LATCHING AND LOCKING DEVICE FOR DOORS

Application filed August 27, 1930. Serial No. 478,244.

This invention relates to a combined latch and lock of the mortise lock class, but more particularly to that type mounted within doors, and has for its object to improve the construction and to increase the efficiency, utility and durability of a device performing the functions of a combined latch and lock.

A further object of the invention is to provide, in a manner as hereinafter set forth, a spring controlled latching member having engageable therewith a locking element to prevent it from being shifted to non-latching position and means to prevent the release of the locking element when desired, the locking element being key-operated to released position from the exterior of the door, manually operated to released position from the interior of the door and manually operated to locking position from the interior of the door, and the means to prevent the release of the locking element being manually operated from the interior of the door.

A further object of the invention is to provide, in a manner as hereinafter set forth, a combined latch and lock including a latching member capable of being reversed to enable the device to be arranged upon a door opening in either direction.

With the foregoing and other objects in view the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described, and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:

Figure 1 is an elevation of a combined latch and locking device in accordance with this invention as secured to a door, with one side wall of the casing of the device removed and illustrating the elements of the latter in latching and locked positions.

Figure 2 is a view similar to Figure 1 with the locking element for the latching member in released position relative to the latter, and the locking means for the locking element in released position with respect to the latter.

Figure 3 is a view similar to Figure 1 with the latching member, locking element for the latter and locking means for the locking element removed.

Figure 4 is a section on line 4—4, Figure 1.

Figure 5 is a section on line 5—5, Figure 1.

Figure 6 is a section on line 6—6, Figure 1.

Figure 7 is a view looking toward the outer face of the removable side wall of the casing and with the side wall in attached position.

Figure 8 is a perspective view of the latching member looking toward the socketed face thereof.

Figure 9 is a perspective view of the locking element.

A combined latching and locking device in accordance with this invention includes a shell or rectangular casing 1, formed with an inner side wall 2, a detachable outer side wall 3, a top wall 4, a pair of end walls 6, 7, a pair of partitions 8, 9 which correspond in length with that of the end walls, and a pair of solid blocks 10, 13. The solid blocks 10, 13 are flush with the ends of the casing 1, and extend inward, the interior ends forming flush extensions of partitions 8, 9. The top, bottom and end walls, partitions and solid blocks are of like width and are integral with the inner face of side wall 2, and are interposed between the side walls. Each end wall and partition has its upper end extending from the top wall to the respective ends of the solid blocks and is integral and flush with the ends of the latter a substantial distance above the bottom wall. The outer faces of the top, bottom and end walls and solid blocks are flush with the edges of the side walls.

Partitions 8, 9 as extended by the ends of blocks 10, 13 are arranged in parallel spaced relation and each is positioned adjacent the vertical median of the side wall 2, and provide guides for a purpose to be presently referred to.

Formed in proximity to its lower end, is a transverse groove 11, in solid block 10, having one end closed near the outer edge of the casing, the other end opening into the slide-way for the locking element, to provide

a slide-way for a locking means for the latching member, to be hereafter referred to.

Blocks 10, 13 are provided with sockets 14, 15 respectively.

The side wall 2 at a point between its longitudinal median and top wall 4 and eccentrically disposed with respect to its vertical median is an opening 16. The side wall 2 below blocks 10 and 13 and centrally with respect to the bottom wall 5 and lower ends of said blocks is formed with a longitudinally extending slot 17 provided adjacent each end with a lug which is integral with the inner face of side wall 2. The lugs are indicated at 18, 19, and the former is arranged below block 10 and the latter below the block 13.

The top wall 4, in connection with the partitions 8, 9 as extended provide a slide-way for the locking element for a latching member. The side wall 2, in connection with the lower ends of the blocks 10, 13 and bottom 5 provide a slideway for a latching member or bolt. The groove 11 provides a slideway for a locking means for the latching member. The latching member or bolt, locking element for the latter and locking means for the locking element are to be hereinafter more specifically referred to. The side wall 3 acts to retain the latching member or bolt, locking element and locking means within the slideways when the side wall 3 is secured in position.

Extending through the side wall 3 and detachably engaging in the sockets 14, 15 are fastening devices 20 for detachably securing the side wall 3 in position to close the slideways. The slide-way for the latching member or bolt is open at each end for a purpose to be presently referred to. The slide-way for the locking element opens into the slideway for the latching member or bolt. The side wall 3 is formed with an opening 21 which registers with the opening 16 and also formed with a slot 22 which aligns with the slot 17. The side wall 3 is also formed with an opening 23 for a purpose to be presently referred to and which is arranged over the groove 11.

The latching member or bolt is spring controlled and carried its controlling spring. The latching member or bolt consists of a bar 24 of the desired length and of rectangular cross section. The thickness of the bar 24 is such as to provide a sliding fit therebetween and the walls of the slide-way. One end of the bar 24 is bevelled as at 25. The sides of the bar 24 are grooved as at 26, 27 and each groove corresponds to the width of the slide-way for the locking element. One face of the bar 24 is provided with a pair of spaced, endwise aligning rectangular sockets 28, 29. When the bar 24 is mounted in the slide-way, in the position as illustrated the lug 18 extends in the socket 28 and the lug 19 into the socket 29, but when bar 24 is reversed lug 18 extends into socket 29 and lug 19 in socket 28. The socket 29 is of greater length than the socket 28. Extending through the bar 24 and positioned in proximity to the inner end of slot 28 is a handle member 30 which extends through the slots in the side walls of the casing. Positioned within the socket 29 and having one end abutting the outer end of the socket is a controlling spring 31 for the latching member or bolt. When the parts are in the position as shown the other end of sping 31 abuts lug 19, but when bar 24 is reversed the said end of spring 31 is engaged by lug 18. The spring 31 normally projects the latching member or bolt from one end of its slide-way.

The locking element for the latching member or bolt comprises a rectangular body 32 slidably mounted between the guides provided by the partitions 8, 9. The body 32 is formed with a semi-oval shaped opening 33 having the upper wall thereof recessed as at 34. The straight wall of the opening 33 is disposed parallel to the side walls of the body 32. Below the opening 33 the body 32 is formed with a pocket 35 which opens at one side edge of body 32 and at one face of the latter, and said pocket is adapted to align with the open end of groove 11. The width of the body 32 is such as to permit it to enter a groove 26 or 27 formed in the side of the latching member or bolt. The opening in the side wall 2 communicates with the opening 33 in the locking element and also with the opening formed in the side wall 3 which aligns with the opening in the side wall 2.

When the latching member or bolt is in projected position it can be retained in such position by the locking element which is shifted downwardly to engage in a groove 26 or 27 and thereby preventing the latching member from being shifted to released position. The lugs 18, 19 of the latching member limit the projected position thereof with respect to an end wall of the casing. When the latching member or bolt is shifted inwardly within the casing it is held against the action of its controlling spring, whereby when the latching member is released it will swing outwardly to latching position.

The locking element is shifted to and from locking engagement with respect to the latching member or bolt by a cam 36 which operates against the curved wall of the opening 33. When the cam 36 has shifted the locking element clear of engagement of the latching member or bolt it seats in the recess 34. The cam 36 is carried by a shifting element 37 mounted in the aligning openings of the side plates 2, 3 and which also extends through the opening 33 in the locking element. The outer end of the element 37 is formed in a manner to receive a key to enable the rotation of said member from the outside to shift the locking element from locking po-

sition with respect to the latching member to release the latter. The inner end of the element 37 is manually operated from the inside. The element 37 is mounted for rotation in the side plates 2, 3 and has a knob 37′ on its inner end to facilitate the shifting of element 37 from the inner side of the door. The key receiving means on the outer end of element 37 is indicated at 37″. Before element 37 can be shifted from the outside of the door to release the locking element it requires the use of a key for fitting the key receiving means 37″. The element 37 has mounted on its outer end a knob 37‴ in a manner whereby the latter will revolve on and not rotate the former. A pin and groove connection 38′, 38″ respectively is provided for such purpose. The key splines with the element 37 and the knob 37‴ to provide for rotation of element 37 by the knob.

The locking element can be held in locking position to prevent the latter from being operated from the exterior of the door, as well as from the interior thereof. The means for retaining the locking element in locking engagement with respect to the latching member or bolt consists of a bolt 38 slidably mounted in groove 11 and adapted to engage in the pocket 35 when the locking element is in lowered position. When the bolt 38 engages in the pocket 35 the locking element cannot be shifted in either direction. The bolt 38 is provided with a finger piece 39 which extends through the opening or slot 23 formed in the plate 3 to enable the bolt 38 to be shifted to and from engaging position with respect to the locking element from the interior of the door.

As each end of the slide-way for the latching member or bolt is open the said member or bolt can be selectively positioned to project from either one of the open ends of the slide-way, and by this arrangement the device can be employed upon a door opening in either direction.

The body of the door is indicated at 40. A facing plate 41 is employed and it is provided with a slot 42 for the passage of the projected end of the latching member or bolt to extend into a keeper not shown, and of known form. The plate 41 can be secured to the casing or door but preferably to the door and casing by the holdfast devices 42′. The holdfast devices 42′ which secure the plate 41 to the casing engage in the block 13 and which securely anchors the casing from shifting. The door 40 has slots 43, 43′ for the passage of handle member 30 and finger piece 39 respectively. The door 40 also has an opening 44 to receive the outer end of element 37.

The sides of the grooves 26, 27 being at right angles to the longitudinal axis of the latching member or bolt, and the adjacent end of the locking element being square, the latching member or bolt is effectively held from all longitudinal movement, that is to say, when the locking element engages in a side groove formed in the latching member or bolt, and no force applied to the latching member or bolt will cause longitudinal movement of the locking element, and therefore the latching member or bolt cannot be released until the locking element has retracted by the operation of the cam by the shifting element.

It is thought that the many advantages of a combined latching and locking device, in accordance with this invention and for the purpose set forth can be readily understood, and although the preferred embodiment of the invention is as illustrated and described, yet it is to be understood that changes in the details of construction can be had which fall within the scope of the invention as claimed.

What I claim is:—

1. A combined latching and locking device for doors comprising a casing open at each end at the lower portion of the latter, a reversible, spring controlled latching bolt slidably mounted in the casing, aligning with said openings and provided with transverse grooves in its side edges, an apertured locking element slidably mounted in the casing above and disposed at right angles to the bolt and engageable in one of said grooves to maintain the bolt in latched position, rotatable means extended through the casing and said element and including a cam riding against the wall of the aperture in the locking element for shifting it to and from engageable position with respect to the latching bolt, said rotatable means being key-operated from the exterior of the door and manually operated from the interior of the door, and means mounted in said casing and operated from the interior of the door for locking said element in engaged position with respect to said bolt.

2. A combined latching and locking device for doors comprising a casing open at each end at the lower portion of the latter, a reversible, spring controlled latching bolt slidably mounted in the casing, aligning with said openings and provided with transverse grooves in its side edges, an apertured locking element slidably mounted in the casing above and disposed at right angles to the bolt and engageable in one of said grooves to maintain the bolt in latched position, rotatable means extended through the casing and said element and including a cam riding against the wall of the aperture in the locking element for shifting it to and from engageable position with respect to the latching bolt, said rotatable means being key-operated from the exterior of the door and manually operated from the interior of the door, and means mounted in said casing and

operated from the interior of the door for locking said element in engaged position with respect to said bolt, said bolt formed on one face with spaced lengthwise extending, endwise opposed sockets, lugs on the casing engageable in said sockets for arresting the projecting movement of the bolt, and the controlling spring for the latter positioned in one of said sockets.

3. In a combined latching and locking device for doors, the combination of a casing provided with a lengthwise extending slideway open at each end, a slide-way disposed at right angles to the first mentioned slideway and a slide-way disposed at right angles to the second mentioned slide-way, a spring controlled locking bolt slidably mounted in the first mentioned slide-way, a locking element for said bolt slidably mounted in the second mentioned slide-way, a locking means for said locking element slidably mounted in the last mentioned slide-way, said locking element provided with a pocket for the reception of said means to prevent the shifting of the locking element when in locking position with respect to the latching bolt, means operated from the exterior of the door for shifting the locking means, and a combined key-operated and manually operated means carried by the casing and engaging with the locking element for shifting the latter to and from locking position with respect to the latching bolt, said last mentioned means being key operated from the exterior of the door and manually operated from the interior of the door.

4. In a combined latching and locking device for doors, the combination of a casing provided with a lengthwise extending slideway open at each end, a slide-way disposed at right angles to the first mentioned slideway and a slide-way disposed at right angles to the second mentioned slide-way, a spring controlled locking bolt slidably mounted in the first mentioned slide-way, a locking element for said bolt slidably mounted in the second mentioned slide-way, a locking means for said locking element slidably mounted in the last mentioned slide-way, said locking element provided with a pocket for the reception of said means to prevent the shifting of the locking element when in locking position with respect to the latching bolt, means operated from the exterior of the door for shifting the locking means, and a combined key operated and manually operated means carried by the casing and engaging with the locking element for shifting the latter to and from locking position with respect to the latching bolt, said last mentioned means being key operated from the exterior of the door and manually operated from the interior of the door, said casing and locking bolt having coacting means for arresting the projected position of the latching bolt, the controlling spring for said bolt being housed therein.

5. In a combined latching and locking device for doors comprising a casing, a latching bolt slidably mounted in said casing for extension from one end thereof, said casing and bolt having coacting means for arresting the extendible movement of the latching bolt, means on the casing being in the form of spaced lugs and the means on the bolt being in the form of spaced sockets, said lugs extending in the sockets, a controlling spring for the bolt mounted in one of said sockets and bearing against one of said lugs, an apertured locking member engageable in the bolt for locking it in latching position, a cam operating against the walls of the aperture in said element for shifting it to and from engaged position with respect to the bolt, means extending through the casing, carrying said cam and key operated from the exterior of the door and manually operated from the interior of the door to shift the cam against the walls of the aperture in said element, and means within the casing and engageable in said element for latching it in engaged position with respect to the bolt.

6. In a combined latching and locking device for doors, a casing, a latching bolt slidably mounted therein, and provided with a pair of sockets, a controlling spring mounted in one of the sockets, means extending into that socket carrying the spring to provide an abutment for the latter, means extending into the other of the sockets to provide a stop for limiting the sliding movement of the bolt in opposite directions a locking element disposed at right angles to said bolt, formed with a transversely disposed semi-oval shaped opening and engageable in the bolt for locking the latter in latched position, the wall of said opening having a recess, a shiftable cam riding against the wall of said opening for moving the locking element to and from locking position with respect to the bolt and seating in said recess when the locking element is in non-locking position, slidable means within the casing and engageable in said locking element for maintaining it in locking engagement with respect to the bolt.

7. In a combined latching and locking device for doors, a casing, a latching bolt slidably mounted therein and formed with a pair of spaced lengthwise extending endwise opposed sockets in one side thereof and a transverse groove in one edge, said groove arranged between said sockets, a controlling spring for the bolt mounted in one socket, a lug extending into the latter and positioned against one end of said spring, a lug extending into the other of said sockets and coacting with opposed walls of the latter for limiting the sliding movement of the bolt in opposite directions, a shiftable locking element engage-

able in said groove for locking the bolt in latched position, means engaging with said element for shifting it into and out of said groove, and shiftable means engaging in said element for maintaining it in locking position with respect to the bolt.

8. In a combined latching and locking device for doors, a latching bolt slidably mounted in the latter, a controlling spring for the bolt mounted thereon, spaced lugs extending into the bolt, one providing an abutment for the spring and the other a stop for limiting the sliding movement of the bolt in opposite directions, a shiftable element capable of engaging in the bolt at a point between said lugs for locking the bolt in latched position, means for shifting said element to and from engaged position with the bolt, said means being key operated from the exterior of the door and manually operated from the interior of the door, shifting means operated from the exterior and interior of the door for moving said bolt to non-latching position when said shifting means is clear of the bolt, and slidable means operated from the interior of the door for engaging in said element for maintaining it in locking position with respect to the bolt.

9. In a combined latching and locking device for doors, a casing, a spring controlled latching bolt mounted in the door, a shiftable locking element for engagement in the bolt for locking the latter in latched position, an actuating mechanism for said element operated from the exterior and interior of the door for shifting the element to and from engaged position with the bolt, said mechanism being manually operated from the interior of the door and having means to provide for key operation from the exterior of the door, and slidable means engageable in said element for non-yieldingly maintaining it in engaged position with respect to the bolt.

10. In a combined latching and locking device for doors, a casing, a spring controlled latching bolt mounted in the door, a shiftable locking element for engagement in the bolt for locking the latter in latched position, an actuating mechanism for said element operated from the exterior and interior of the door for shifting the element to and from engaged position with the bolt, said mechanism being manually operated from the interior of the door and having means to provide for key operation from the exterior of the door, and slidable means operated from the interior of the door and engageable in said element for non-yieldingly maintaining it in engaged position with respect to the bolt.

11. In a combined latching and locking device for doors, a casing, a spring controlled latching bolt mounted in the door, a shiftable locking element for engagement in the bolt for locking the latter in latched position, an actuating mechanism for said element operated from the exterior and interior of the door for shifting the element to and from engaged position with the bolt, said mechanism being manually operated from the interior of the door and having means to provide for key operation from the exterior of the door, slidable means engageable in said element for non-yieldingly maintaining it in engaged position with respect to the bolt, and spaced means extending into said bolt to provide an abutment for the controlling spring of the latter and for limiting the sliding movement of the bolt in opposite directions.

In testimony whereof, I affix my signature hereto.

JOHN F. BOOTHE.