W. H. THOMAS.

AUTOMATIC LATCH AND KNOB LOCKING LATCH LOCK.

APPLICATION FILED MAR. 8, 1910.

995,640.

Patented June 20, 1911.

Fig. 1.

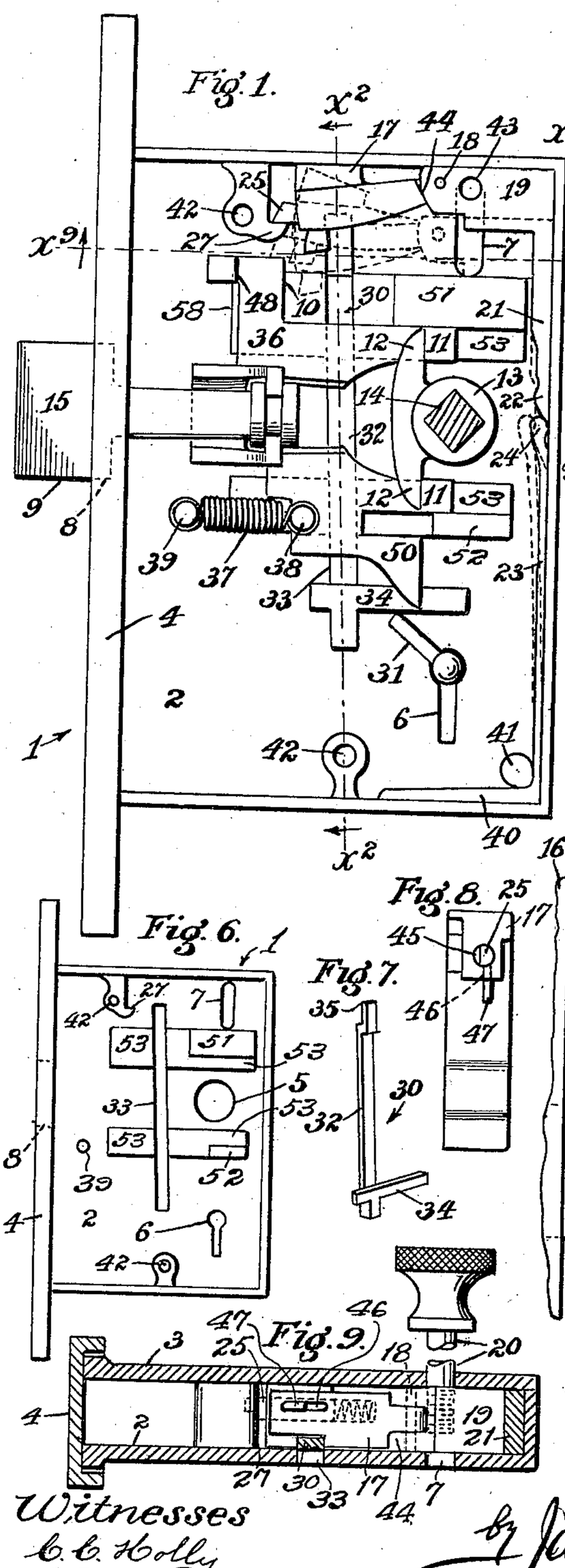

Fig. 2.

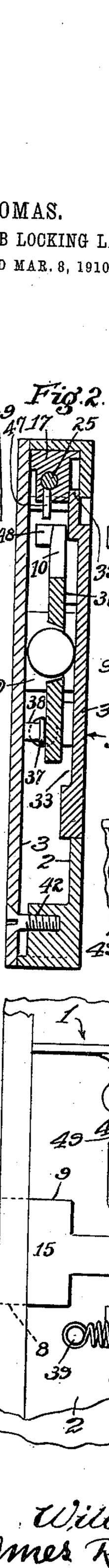

Fig. 5.

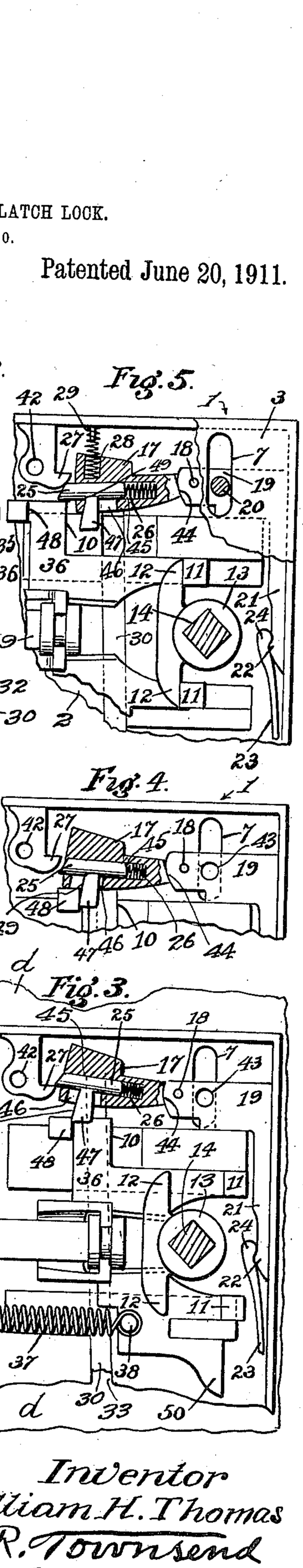

Fig. 4.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 3.

Witnesses

C. C. Holly

L. Belle Rice

Inventor

William H. Thomas

by James R. Townsend

his Atty.

UNITED STATES PATENT OFFICE.

WILLIAM H. THOMAS, OF WHITTIER, CALIFORNIA.

AUTOMATIC LATCH-AND-KNOB-LOCKING LATCH-LOCK.

995,640. Specification of Letters Patent. Patented June 20, 1911.

Application filed March 8, 1910. Serial No. 548,089.

To all whom it may concern:

Be it known that I, WILLIAM H. THOMAS, a citizen of the United States, residing at Whittier, in the county of Los Angeles and State of California, have invented a new and useful Automatic Latch-and-Knob-Locking Latch-Lock, of which the following is a specification.

Heretofore there has been no provision whereby the latch-bolt of a day and night knob-operated latch-lock can be positively locked so as to be proof against being operated by a thin instrument inserted between the door stop and the door frame and thus between the strike and the face-plate of the lock to act upon the beveled face of the latch-bolt and thus to force the latch-bolt back to unlock the door.

An object of this invention is to provide a lock having a latch-bolt, with means whereby, whenever the lock is adjusted for that purpose, the latch-bolt may be forced in but once only; so that if the door to which the lock is attached is once closed, the latch-bolt becomes positively locked, by the closing operation, so that said bolt cannot be retracted except by a key fitted for that purpose, or except by throwing off the night latch; also to make provision whereby both of the knobs as well as the latch-bolt are locked by the one operation; also to simultaneously unlock and retract the latch-bolt with one operation of a key.

The accompanying drawings illustrate the invention.

Figure 1 is a view of a lock constructed in accordance with this invention, one plate of the case being removed to expose the locking mechanism. The latch-bolt locking mechanism is shown in solid lines in its inoperative position; dotted lines indicate the operative position of said mechanism, the locking bolt being shown in two dotted positions, the upper of which is the latched position and the lower of which is the locking position. Fig. 2 is a section on line X^2, Fig. 1, looking toward the face plate of the lock. Fig. 3 is a fragmentary view analogous to Fig. 1, showing the parts in the position occupied when the latch-bolt has been almost fully retracted by the strike and just before the bolt latch has been released. Fig. 4 is a fragmentary view showing the position of parts just after the latch-bolt-locking bolt has been released; the bolt-latch having been fully withdrawn by the latch-bolt, which is still retracted by the strike. Fig. 5 is a fragmentary view showing the latch-bolt-locking mechanism in locking position after the latch-bolt has entered the strike and reached the position shown in Fig. 1. The locking bolt is shown in section and a portion of the plate omitted from Fig. 1 is shown. Fig. 6 is a view of that portion of the lock case shown in Fig. 1. The locking mechanism is omitted. Fig. 7 is a perspective view of the bolt lifter detached. Fig. 8 is an elevation of the latch-bolt-locking mechanism and its slide detached, viewed from the left in Fig. 1. Fig. 9 is a fragmental section on a line practically indicated by X^9, Fig. 1, looking up.

The lock case 1 may be of any suitable form provided with side plates 2, 3 and a face plate 4, and being provided with hub orifices 5, with a latch key hole 6, with slots 7 for the adjusting knob, and with a hole 8 in the face-plate through which the bifurcated latch bolt 9 slides. Said latch bolt has connected therewith an upwardly projecting arm 10 and is provided with shoulders 11 to be operated by the arms 12 of the hub 13, which in turn is operated by the usual spindle 14 and knobs, not shown, to retract the latch bolt 9. The latch-bolt is also constructed in the usual form with a bevel face 15 for contact with the usual strike 16. The latch locking bolt 17 is pivoted at 18 to the slide 19 which is operated by a thumb piece 20 to lower and raise the latch locking bolt 17 to and from latch-bolt locking position, and has an extension 21 provided with a shoulder 22 engaged by a spring 23 fixed in the lock and provided with a knob 24 adapted to engage the shoulder 22 and to hold the slide in adjusted position either in or out of latch bolt locking position.

The latch locking bolt 17 is provided with a latch 25 and a spring 26, which normally projects the latch 25 to engage a catch 27 which is fixed to the plate 2 of the lock case, being a lug or plate formed thereon. The bolt 17 may also be provided with a seat 28 for a spring 29 to hold the bolt down on the

arm 10 of the latch-bolt, or in the path thereof, but ordinarily the spring 29 will be omitted for the reason that the gravity of said bolt 17 will be sufficient to hold it down so that it will enter locking position under ordinary circumstances. Said spring is only shown in Fig. 5, being omitted from the other views.

The abutting tips of the latch 25 and the shoulder 27 are beveled so that as the locking bolt 17 is lifted from the position shown in Fig. 3, the latch 25 will be retracted to pass the shoulder.

A bolt lifter 30 is constructed and arranged to be operated by a key 31 to lift the bolt 17. In the form shown said lifter is provided with a body 32 to slide in a slot 33 in the plate 2 of the case and is also provided at one end with a shoulder 34 to be engaged by the key 31, and at the other end with a shoulder 35 to engage the locking bolt 17. The shoulders are offset to extend along, and to rest on the inside of the case. It is understood that the lifter may be operated by the key of a cylinder lock or by an ordinary key. In the drawings shown an ordinary key is illustrated for convenience.

The latch bolt may be an easy-tip bolt constructed in two parts so that the easy-tip may be reversed, the arm 10 being on the body 36 of the latch bolt and the spring 37 which holds the latch bolt in latching position being fastened to a stud 38 on said body 36 and to a stud 39 on plate 2.

The spring 23 that holds the slide 19 may be mounted in any approved manner, being shown in the drawings as having an L extension 40, which fits in the angle of the case behind a stud 41. The plate 3 of the case is fastened in the usual manner with screws, not shown, screwed in the screw holes 42 in the plate 2. The shank of the thumb-piece 20 may be screwed into a screw hole 43 in the slide 19. The joint 44 between the locking bolt 17 and the slide 19 is a knuckle joint adapted to hold the bolt 17 from dropping, so that when the slide 19 is slid up from the position shown in Fig. 3, to the position shown in Fig. 1, the locking bolt 17 is carried upward and the latch 25 is carried past the shoulder 27.

In practical use when it is not desired to lock the latch bolt, the slide 19 will be drawn up as shown in Fig. 1 whereupon the knob 24 of the spring 23 engages the underside of the beveled shoulder 22 and yieldingly holds the slide up. When the slide is moved down, the knob 24 engages the top of the shoulder and yieldingly holds the slide down.

The bolt 17 is provided with a bore 45 and with a slot 46 which extends from the lower side of the bolt to the bore, and the latch practically fits the bore and is provided on its underside with an arm 47 that projects through the slot 46 into the path of an outwardly projecting shoulder 48 on the latch bolt body 36 and spaced forwardly from the arm 10 so that when the arm 10 is moved inwardly by the retraction of the latch bolt 9, and the bolt 17 is in its latched position as indicated by the upper dotted lines in Fig. 1 said latch will be retracted by the outwardly projecting shoulder 48 in the manner indicated in Fig. 4. The shoulder 48 and arm 10 are in staggered relation to each other so that the latch locking bolt may ride on the arm 10 while the shoulder 48 is retracting the latch 25.

In practical use the slide 19 will be kept in the elevated position shown in solid lines in Fig. 1, when it is desired to allow the latch bolt to be retracted by the knobs, not shown, through the spindle 14 and hub 13. When it is desired to lock the latch bolt so that it cannot be operated either by the knobs or by any instrument, excepting a key which will operate the lifter 30, the slide 19 will be moved by the thumb-piece 20 down into the position shown in Fig. 3; the latch 25, however, remaining in the position shown in Fig. 1, the bolt being down in the upper dotted position shown in Fig. 1. In this position the lower end of the arm 47 extends into the path of the shoulder 48 so that when the latch bolt 9, with its body 36 and the arm and shoulder 10 and 48 is retracted either by the operation of the knobs or by the closing of the door as indicated in Fig. 3, the latch arm 47 will be moved by the shoulder 48 and the latch 25 will be withdrawn from the catch 27, and thereupon the bolt 17 will drop down into the position shown in Fig. 4, where it rests on the top of arm 10, until the latch bolt is again moved out into latching position, whereupon the locking bolt 17 falls from the top of arm 10 into the path of arm 10 so that the latch bolt cannot be retracted to unlatch the door *d*, (see Fig. 3.) to which the lock is attached.

In order to prevent the arm 47 from upholding the bolt 17, the contacting face 49 of said arm 47 is aslant upward away from the latch bolt, so as to readily escape from the shoulder 48. The offset 34 of the lifter 30 constitutes key-contacting means for the lifter, and the body of the latch bolt is provided with a downwardly projecting lug 50 which constitutes key-contacting means of the latch bolt so that when the key is inserted and turned, it will simultaneously operate the lifter and retract the latch bolt. The slide 19 constitutes means to shift the locking bolt 17 to convert the lock into night latch position and the spring actuated knob 24 constitutes means to hold the night latch means in position while the lock is in night lock position. The plate 2 is provided in-

ternally with two outward projections forming upper and lower parallel slide bars 53, upon which the latch-bolt-body rides to hold it away from the face of the plate 2 to reduce friction, the two outward projections 53 having two extensions 51, 52, at their rear ends. The upper extension 51 serves as a positive stop and rest to support the slide 19 which is bent to rest thereon when moved down into night lock position.

The lower extension 52 is preferably elongate parallel with the axis of the latch bolt and the latch bolt is provided in the key contacting lug 50 with a slot 54 which receives the extension 52, thus serving to hold and guide the latch bolt when retracted and to guide it in its back and forward movement.

I claim:—

1. A lock comprising a catch plate rigidly attached to the lock case, a bifurcated latch bolt, a latch bolt locking bolt, a small latch bolt carried in and moving with the latch bolt locking bolt to contact with the catch plate to hold the latch bolt locking bolt out of locking position, a vertical movable slide having a horizontal body and a downwardly projecting arm forming a right angle to said body and provided at its lower end with a beveled shoulder; said latch bolt locking bolt being pivoted to said body, and a vertical spring attached at its lower end to the lock case and extending upward and terminating in a knob adapted to engage the beveled shoulder to yieldingly hold the slide in position.

2. A lock comprising a bifurcated latch-bolt, and a latch-bolt locking-bolt having a receptacle therein with a slot at the bottom, a small sliding spiral spring actuated latch bolt within the receptacle, an arm projecting downward from the small latch-bolt and adapted to move back and forth in the slot.

3. A lock comprising a bifurcated latch-bolt and a latch-bolt locking-bolt having a receptacle therein with a slot at the bottom, a small sliding spiral spring actuated latch-bolt within the receptacle, an arm projecting downward from the small latch-bolt and adapted to move back and forth in the slot, a rigid catch plate attached to the lock case to contact with the small latch-bolt to hold it in locking position.

4. A lock comprising a bifurcated latch-bolt and a latch-bolt locking-bolt having a receptacle therein with a slot at the bottom, a small sliding spiral spring actuated latch-bolt within the receptacle, an arm projecting downward from the small latch-bolt and adapted to move back and forth in the slot, a rigid catch plate attached to the lock case to contact with the small latch-bolt to hold it in locking position, and the latch-bolt locking-bolt carrying the small latch bolt out of latch-bolt locking position.

5. A lock comprising a bifurcated latch-bolt and a latch-bolt locking-bolt having a receptacle therein with a slot at the bottom, a small sliding spiral spring actuated latch-bolt within the receptacle, an arm projecting downward from the small latch-bolt and adapted to move back and forth in the slot, an arm extending upward from one branch of the latch-bolt with an outwardly projecting shoulder on the arm to contact with the downwardly projecting arm of the small latch-bolt to retract the same and cause the latch-bolt locking-bolt to drop and lock the latch-bolt.

6. A lock comprising a bifurcated latch-bolt and a latch-bolt locking-bolt having a receptacle therein with a slot at the bottom, a small sliding spiral spring actuated latch-bolt within the receptacle, a bolt-lifter with an arm extending from its lower end at a right angle, a downwardly projecting arm from the lower branch of the latch-bolt, a key to contact with the horizontal arm of the bolt-lifter, and the downwardly projecting arm on the lower branch of the latch-bolt to release the latch-bolt locking-bolt and retract the latch-bolt simultaneously.

7. A lock comprising a bifurcated latch-bolt and a latch-bolt locking-bolt having a receptacle therein with a slot at the bottom, a small sliding spiral spring actuated latch-bolt within the receptacle, a bolt-lifter with an arm extending from its lower end at a right angle, a downwardly projecting arm from the lower branch of the latch-bolt, a key to contact with the horizontal arm of the bolt-lifter, and the downwardly projecting arm on the lower branch of the latch-bolt to release the latch-bolt locking-bolt and retract the latch-bolt simultaneously, and means to hold the latch-bolt locking-bolt in unlocking position while the lock is not in the night lock position.

8. In a lock, a bifurcated latch-bolt, a bolt to lock the latch-bolt having a receptacle therein, a small sliding spiral spring actuated latch-bolt within the receptacle to hold the latch-bolt locking-bolt out of contact with the latch bolt for day use, means to release the latch-bolt locking-bolt so that it will lock the latch-bolt, thus to convert the lock into night latch position and means to hold the night latch means in position while the lock is in said night latch position.

9. In a lock provided with a case and a rigid catch plate attached to the case, the combination of a bifurcated latch-bolt, a bolt to lock the latch-bolt; said bolt having a receptacle therein, a small sliding spiral spring actuated latch-bolt within the receptacle to contact with said rigid catch-plate; said catch-plate being adapted to hold the latch-bolt locking-bolt out of locking position, a slide pivoted to the latch-bolt locking-bolt, means to raise the slide, a spring

to yieldingly hold the slide and the latch-bolt locking-bolt attached thereto out of contact with the latch-bolt.

10. In a lock, the combination of a bifurcated latch-bolt with an arm extending upward with an outward projecting shoulder on the arm, a locking bolt adapted to engage the arm having a receptacle therein with a slot at the bottom, a small spiral spring actuated latch-bolt within the receptacle to hold the locking-bolt out of arm engaging position and a shoulder moving with the arm to release the latch.

11. In a lock, the combination of a bifurcated latch-bolt, an arm extending up from the latch-bolt, a locking-bolt adapted to engage the arm having a receptacle therein; a small sliding spiral spring actuated latch-bolt within the receptacle to hold the locking-bolt out of arm engaging position, an outwardly projecting shoulder on the arm and moving with it to release the latch, and a bolt-lifter to return the bolt to latching position.

12. In a lock, the combination of a bifurcated latch-bolt with an arm extending upward, an outwardly projecting shoulder on the arm, a locking-bolt adapted to engage the arm having a receptacle therein with a slot at the bottom, a small sliding spiral spring actuated latch-bolt within the receptacle to hold the locking-bolt out of arm engaging position, a shoulder moving with the arm on the latch-bolt to release the latch, a bolt-lifter to return the bolt to latching position; said locking-bolt being adapted to ride on the latch-bolt after the latch has been unlatched.

13. In a lock, the combination of a bifurcated latch-bolt, an arm projecting upward on the latch-bolt having an outwardly projecting shoulder on the arm, a bolt adapted to engage the arm to lock the latch-bolt, a small latch within and carried by the locking bolt with a downwardly projecting arm to be engaged by the shoulder for retraction of the latch, said locking-bolt being adapted to ride on the latch-bolt when the arm is engaged by the shoulder.

14. In a lock having a case and a catch-plate rigid with the case, the combination of a bifurcated bolt having an upwardly projecting arm and a shoulder on such arm, a small latch-bolt, a slide consisting of two arms forming a right angle, a latch-bolt locking-bolt pivoted to the end of the horizontal arm of the slide and forming a knuckle-joint, and adapted to hold the locking-bolt in a horizontal position and to hold the small latch-bolt within the locking-bolt in contact with the catch-plate, and holding said small latch-bolt in latching position after the slide is lowered and until it is contacted by the shoulder on the upwardly projecting arm of the latch-bolt.

15. In a lock, the combination of a bifurcated latch-bolt, a locking-bolt having a receptacle with a slot at the bottom, a small sliding spring-actuated latch-bolt within the receptacle and having an arm extending through the slot for retraction by the latch-bolt, a slide to carry the locking-bolt in and out of operative position and a spring to yieldingly hold the slide in its two positions.

16. In a lock, a latch bolt having upper and lower limbs, a hub to move the latch bolt, a latch bolt locking bolt, a slide to raise and lower the latch bolt locking bolt in and out of contact with the latch bolt, a vertical spring having a knob on its upper end to engage the slide to hold it against accidental movement, a casing provided internally with upper and lower parallel elongated outward projections forming slide bars for the upper and lower limbs of the body of the latch bolt to ride on and to hold said limbs out of contact with the face of the lock-case to reduce friction, there being an outward extension on the rear end of the upper projection forming a positive stop and support for the body of the slide when it is moved down in night-lock position so as to prevent the knob on the upper end of the vertical spring from being forced out against the hub.

17. In a lock, a latch bolt having upper and lower limbs, and a casing provided internally with upper and lower parallel elongated outward projections forming slide bars for said upper and lower limbs to ride on and to hold the latch bolt from the face of the lock-case to reduce friction, there being an outward elongated extension on the lower part of the rear end of the lower projection parallel with the axis of the latch-bolt, and a downwardly projecting key contacting lug on the lower limb of the latch bolt having a slot therein to receive the extension on the rear end of the lower projection, thus serving to hold the latch bolt body and to guide it in its forward and backward movements.

18. In a lock, the combination with a bifurcated latch-bolt, means for automatically locking the latch-bolt consisting of a latch-bolt locking-bolt having a receptacle therein, a small sliding spiral spring actuated latch-bolt within the receptacle, a downwardly projecting arm on the small latch-bolt, a horizontal slot at the bottom of the receptacle to allow the downward projecting arm from the small latch-bolt to travel back and forth, a slide pivoted to the locking-bolt, means to lower the slide and contact the locking-bolt with the latch-bolt, a catch plate fixed to or cast on the lock case to contact with the small latch-bolt to hold the locking-bolt out of locking position, an outwardly projecting shoulder on the upwardly projecting arm of the latch-bolt to

contact with the downwardly projecting arm on the small latch-bolt to retract the small latch-bolt and allow the locking-bolt to drop and lock the latch-bolt, a bolt-lifter with a staggered shoulder on the upper end to contact with a flange on the inner side of the locking bolt to raise it out of locking position.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 2d day of March, 1910.

WILLIAM H. THOMAS.

In presence of—
JAMES R. TOWNSEND,
L. BELLE RICE.