

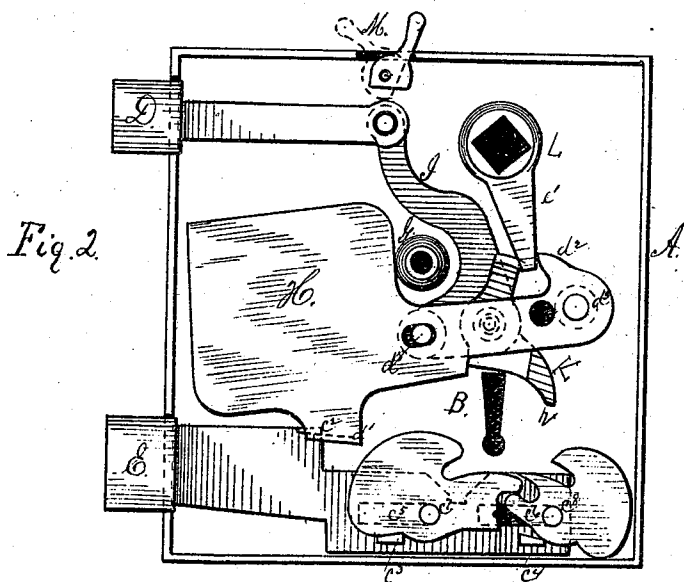
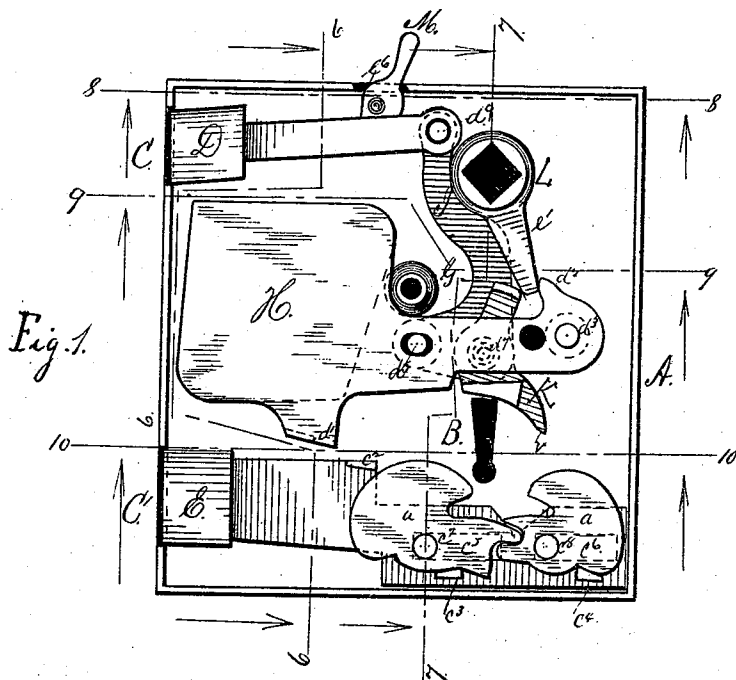
(Model.)

4 Sheets—Sheet 1

J. ADAMS.  
LATCH AND LOCK COMBINED.

No. 501,474.

Patented July 11, 1893.



Witnesses  
Thos. Roule  
Chas E. Horton.

Inventor  
John Adams  
By his Attorney  
H. Harrison

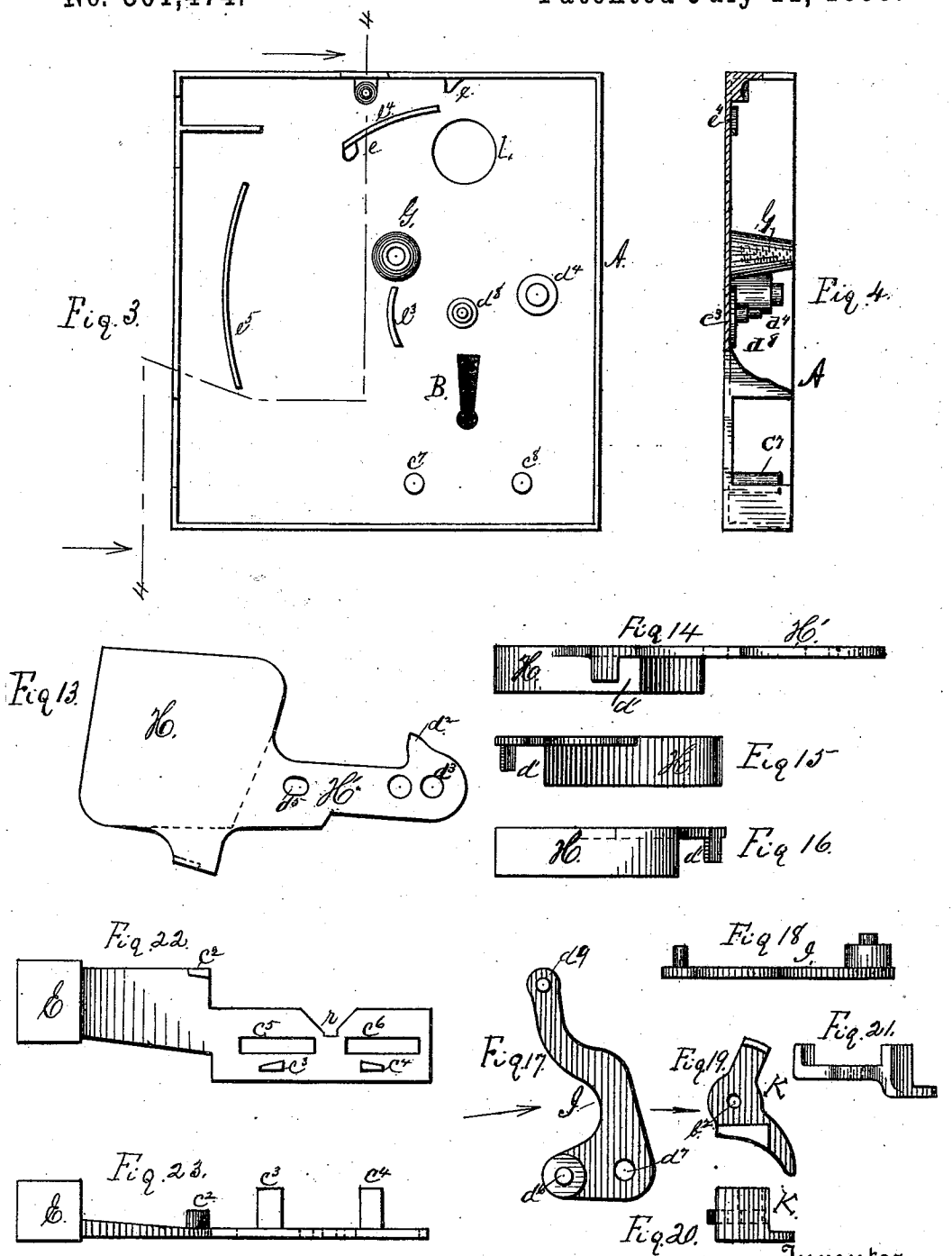
(Model.)

4 Sheets—Sheet 2.

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## Witnesses

Thos. Proulx  
Chas. E. Gorton

By his Attorney

Inventor  
John Adams

H. Harrison

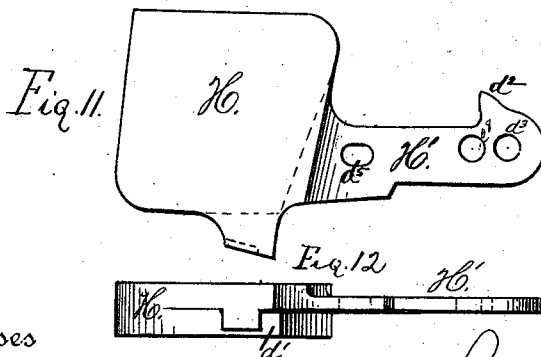
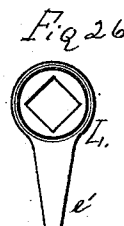
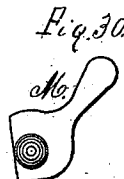
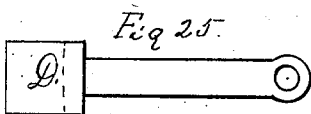
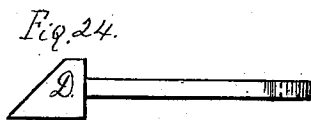
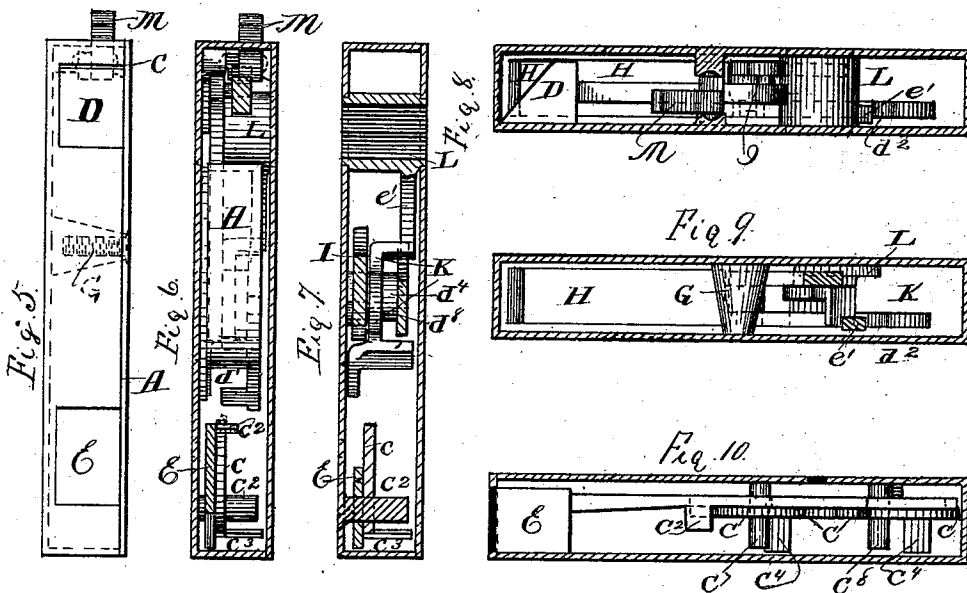
(Model.)

4 Sheets—Sheet 3.

J. ADAMS.  
LATCH AND LOCK COMBINED.

No. 501,474.

Patented July 11, 1893.



Inventor.

Witnesses  
Thos. Proulx  
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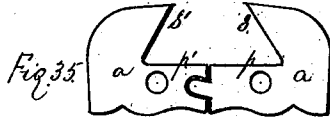
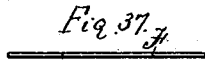
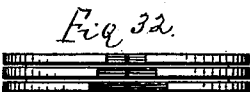
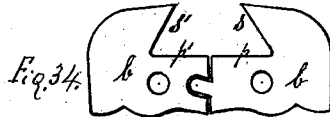
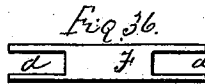
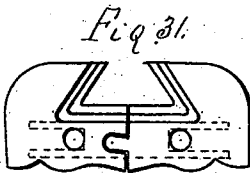
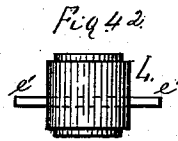
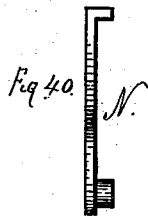
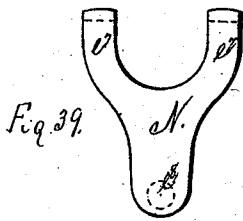
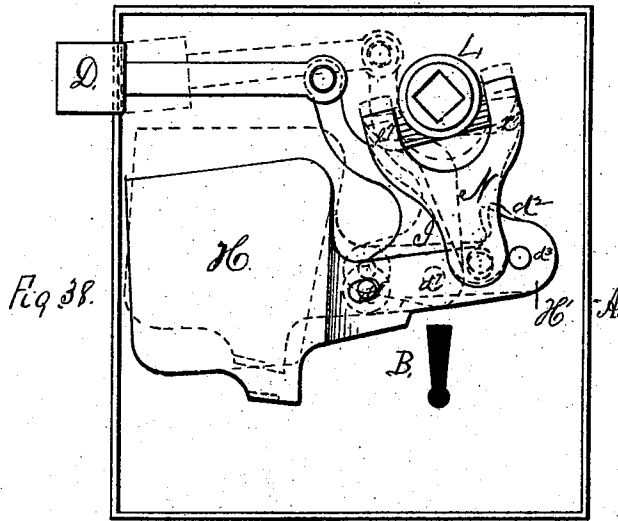
(Model.)

4 Sheets—Sheet 4.

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Patented July 11, 1893.



Witnesses  
Theo. Proulx  
Chas E. Gordon.

Inventor  
John Adams  
By his Attorney H. H. Harrison

# UNITED STATES PATENT OFFICE.

JOHN ADAMS, OF CHICAGO, ILLINOIS, ASSIGNOR TO ELEANOR ADAMS, OF  
SAME PLACE.

## LATCH AND LOCK COMBINED.

SPECIFICATION forming part of Letters Patent No. 501,474, dated July 11, 1893.

Application filed July 22, 1890. Renewed November 2, 1892. Serial No. 450,781. (Model.)

*To all whom it may concern:*

Be it known that I, JOHN ADAMS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have  
5 invented certain new and useful Improvements in a Combined Latch and Lock, of which the following is a specification.

My invention relates to improvements in combined latches and locks, and consists in the combination of lever and weight and details of mechanism arrangement and operation substantially as will be hereinafter fully described and pointed out in the claims.

To enable others skilled in the art to which  
15 my invention appertains to make and use the same I will now proceed to describe my improvements referring to the accompanying drawings in which—

Figure 1. is a plan elevation of my combined latch and lock with the cover removed showing it in an unlocked position. Fig. 2. is a similar view to Fig. 1 showing it locked. Fig. 3. is a plan view of the bottom plate of casing with internal mechanism removed showing the stationary pins, anti-friction burrs and standard. Fig. 4. is an end sectional view taken on line 4. 4. of Fig. 3. Fig. 5. is an end elevation view of Fig. 1. Fig. 6. is an end sectional view of Fig. 1 on line 6. 6. Fig. 7. is an end sectional view taken on line 7. 7. of Fig. 1. Fig. 8. is a top sectional view of Fig. 1 taken on line 8. 8. Fig. 9. is a like view on line 9. 9. Fig. 10. is a similar view taken on line 10. 10. of Fig. 1. Fig. 11. is a view of the preferred form of the weight showing the arm lowered. Fig. 12. is a longitudinal side view of Fig. 11. Fig. 13. is a plan view of a modified form of the weight showing the arm even and not lowered. Fig. 14. is a longitudinal side view of Fig. 13. Fig. 15. is a rear view and Fig. 16. is a front view of Fig. 13. Fig. 17. is a plan view of the lever operating the weight and latch-bolt. Fig. 18. is an end view of same shown by arrow. Fig. 19. is a plan view of the key-lever for operating the latch bolt. Fig. 20. is an end view of said lever. Fig. 21. is a side elevation of the same. Fig. 22. is a plan view of the locking bolt. Fig. 23. is an end view of the same. Fig. 24. is a top view of the latch-bolt. Fig. 25. is a side elevation of Fig. 24. Fig. 26. is a top view of

the hub having a single lug. Fig. 27. is a side elevation of the same. Fig. 28. is an enlarged view in detail of the friction cam, as a dead lock, for latch-bolt. Fig. 29. is a plan view of same. Fig. 30. is a reverse side view of Fig. 28. Fig. 31. is a plan view showing the means by which one or more sets of tumblers can be used to operate the lock-bolt. Fig. 32. is a side elevation of Fig. 31. Figs. 33, 34 and 35, are detail views, showing three separate sets of tumblers to correspond to different keys. Fig. 36. is a plan view of bridge-plate in connection with cams. Fig. 37. is a side elevation of the bridge plate. Fig. 38. is a plan view of lock with cover removed, showing the yoke or pitman for operating weight and latch. Fig. 39. is a plan view of yoke or pitman. Fig. 40. is a side view of yoke. Fig. 41. is a plan view of hub having shoulders or lugs for operating yoke or pitman, and Fig. 42. is a side view of the same.

Similar letters refer to similar parts throughout the several views.

It is found by experience, that locks as heretofore constructed in which a gravity weight is used, are objectionable for several reasons, among some: their operation is slow and uncertain, the weight being compelled necessarily to fall too far to throw the latch, and the leverage insufficient to return the knob, and when springs are used, a strong spring endangers the lock, and a weak one gives uncertain action. I overcome these objections by combining with the weight a lever, so arranged and operating with other mechanism, as to give instantaneous action and sufficient power to return the knob. The arrangement of the lever permits the latch to be operated with nominal if any resistance. I also overcome other objections to locks by providing a series of tumblers, and bridge plates, obviating the use of springs, except for special purposes, and in other details of construction, arrangement and operation of mechanism as will be fully described and be understood from the drawings in which—

A. is the shell or casing of any suitable material and form containing the operating mechanism. It is provided with the usual key-hole B. preferably reversed, and also with the usual opening C. for the play of the latch

D. and a similar opening C'. for the locking bolt E. the latch being similar to the latches in common use. The bolt E. is provided or formed with the lugs  $c^2$ ,  $c^3$ , and  $c^4$ , the latter two being at one side near the lower end, and  $c^2$ , being at the opposite side near the upper portion of the bolt, contacting with the weight as presently explained; the bolt is also provided near its lower end with two slots  $c^5$ , and  $c^6$ , through which are retaining standards  $c^7$  and  $c^8$ , secured to or projecting from the upper surface of the casing for regulating the throw of the bolt and the retention of the tumblers as presently set forth; pivoted upon the standards  $c^7$ , and  $c^8$ , is a series of tumblers, one or pairs or sets, interlacing or interlocking each other; in the drawings I have shown three sets,  $a$ ,  $a$ ,  $b$ ,  $b$ , and  $c$ ,  $c$ , preferably of the form shown, but of any other suitable form to correspond with the keys used, the tumblers being placed interchangeably to admit changes of keys. I also provide a reversible bridge-plate F. having slots or forks  $d$ ,  $d$ . The forks of the bridge-plate rest over the standards  $c^7$ , and  $c^8$ , and are retained in position by the same: the bridge-plate may be placed above, between or underneath the tumblers as desired; by preferably enlarging one side of the bridge-plate I obtain a further change of keys. G. is a standard rigidly secured to the bottom of the case by which the top or retaining cover is held. H. is a weight having the ordinary main body, and the arm H'; with the exception that the main body is provided or formed with a slot or groove  $d'$ , which receives or engages the lug  $c^2$ , of bolt, which insures the locking of the latch as presently explained; the end or back of the arm H', of the weight is formed or provided with a beak, hook or projection  $d^2$ , to engage with a lug on the hub for the purpose of raising the weight thereby throwing back the latch, but in the use of the yoke or pitman as presently explained this beak  $d^2$ , can be dispensed with; near the inner or back end the arm is provided with a pivotal hole  $d^3$ , swinging or retained by pin  $d^4$ , rigidly secured to the bottom of the case, permitting the weight to swing, forming a fulcrum as a lever to return the hub; near the main body the arm is provided with an elongated hole  $d^5$ , into which fits a pin or projection  $d^6$ , on, at or near one end of the arm of lever I. The lever I, is of any suitable form or shape, but preferably as shown in the drawings; it is provided with a pivotal hole  $d^7$ , at or near one end into which fits the pin  $d^8$ , the said pin projecting from the bottom of case above the surface of the lever to receive pivotally the key-lever K. for operating the latch; the outer end of the lever I. is provided with a pin  $d^9$ , fitting or engaging with a hole in the end of the latch; the movement of the upper end of the lever I is limited by the lugs  $e$ ,  $e$ , one on each side thereof. L. is the hub into which fits the knob-shank or spindle; it is provided preferably with a lug  $e'$ , near the top, which engages with the

weight and key-lever for the purpose of raising the weight, thereby withdrawing the latch. In Figs. 41 and 42 of the drawings I have shown the hub provided with two lugs  $e'$   $e'$  one on each side, which will be used for the same purpose as a single lug, when the yoke or pitman is used for the special purpose as hereinafter stated. K. is the key lever, of any suitable form, but preferably as shown in Figs. 19 and 20 of the drawings, it is provided with the hole  $b^2$  into which pivotally fits the pin  $d^8$ ; said key-lever is preferably placed between the lever I. and the arm of the weight, but may be placed either above or below the arm of the weight. This lever engages with the key and weight for the purpose of raising the weight to withdraw the latch.  $e^3$  and  $e^4$  are anti-friction bearings on the bottom of the case for the lever I, and  $e^5$ , is a similar bearing for the weight, there being a corresponding bearing on the cover of the casing.

M. is a friction-cam having a bearing in or near the upper wall of the case through an opening  $e^6$ , in the wall thereof, having also a bearing in the cover which keeps it in position; the tumbler M. engages with the latch for holding it in a locked position; in mortise locks this may be dispensed with. All of the parts of mechanism described, are arranged and combined relatively together in the positions with each other and operate as shown in Figs. 1 and 2 of the drawings.

It will be seen from the drawings, that lever I, will describe in its movement a shorter radius, than the weight H pivoted or fulcrumed at  $d^4$ , and consequently the weight and latch could not be operated properly. I therefore provide said elongated hole  $d^5$ , as shown in the drawings, which will equalize the radii, described by the weight and lever insuring the positive and proper action and operation of the weight, lever and latch. The contact or engagement of the lug  $e'$  of the hub L. with the beak or hook  $d^2$ , of the weight, near the weight's fulcrum insures a very slight turn of the knob to withdraw the latch. In case the yoke or pitman, hereinafter described, is used the same result is obtained, the yoke or pitman being connected at a point equally distant, as  $e'$ , from the fulcrum of the weight.

N. Fig. 39, is a yoke or pitman, which is used for railway cars or other special purposes; it has the bifurcated arms  $e^7$   $e^7$  at one end which engage with the lugs  $e'$   $e'$  on the hub L as shown in Fig. 42, and is pivotally connected at its lower end at  $e^8$  to the arm of the weight as near as practicable to the fulcrum or pivotal center of the weight; this will insure an additional leverage power to the weight to return the knob.

I have found from experience with locks or latches as heretofore constructed, that sufficient power could not be obtained to return the knob. I obtain the necessary power and result by the leverage and operation above

described. For railroad locks a spring or springs may be used in connection with the tumblers  $a a b b c c$  to hold them in position and to avoid the effects of jolting or jarring.

5 It will be noticed that the tumblers  $a a b b$  and  $c c$  are of different diameters. This is for the purpose of permitting changes of keys.

The manner of operation is as follows, (the casing having the internal mechanism assembled preferably as shown in Figs. 1 and 2 of the drawings:) It will be seen that in its normal position, the latch extends or projects beyond the face of the lock, when the latch is in contact with the strike-plate on door jamb; 15 in the act of shutting the latch is forced back owing to the beveled surface of the same; this movement through its lever connection will raise the weight until the contact with the strike-plate is passed, when the weight 20 will fall and latch return instantly to its normal position. By having this lever connection we obtain several advantages: first, less resistance of the latch, thereby decreasing the danger of breakage; second, I secure a more 25 positive and quicker action than when springs are used, and third it materially reduces the distance of the fall of the weight insuring quicker action than in other gravity locks. The knob being turned in one direction the 30 lug  $e'$  on the hub will contact with the beak or projection  $d^2$  on the end of the arm of the weight at a point near its fulcrum. This raises the weight and thereby withdrawing the latch; the knob being turned in the opposite direction the lug  $e'$ , will contact with the upper 35 point of key lever K, raising the lower end of said lever, which end contacts with and raises the weight producing the same result, as when the knob is turned in the other direction; the 40 length of the lug  $e'$  contacting with the arm of the weight near its fulcrum lessens the turn of the knob, thereby avoiding friction in the escutcheons, and insuring the positive return of the knob; the same result being obtained in the action upon the key-lever, as it 45 also contacts with the arm of the weight near its fulcrum. The object of this contact or connection near the fulcrum of the weight is to give additional power to the weight, as the latter acts as a lever to return the knob. The 50 tumbler M. is used when additional safety is required; in its normal position, as shown in Fig. 1, it allows free action of the latch, but by turning the tumbler in the direction and position as shown by dotted lines in Fig. 2 it operates as a dead-lock, the latch having an upward tendency when withdrawn.

The operation of the locking bolt is as follows: The bolt being in an unlocked position 60 as shown in Fig. 1 of the drawings, the key being in its hole, and being turned to lock the bolt, the key contacts with a set or sets of tumblers at the points  $p$  and  $p'$  depressing the tumblers at said points, thereby raising 65 the tumblers from their contact with the lug  $c^4$ . As the key continues to turn in the process of locking, the key contacts with the talent

$r$ , of the bolt forcing the bolt out, and as the key leaves the talent it contacts with the tumblers at points  $s'$  forcing the tumblers 70 onto or in contact with lug  $c^3$  of the bolt thereby firmly locking the bolt without depending on gravity or springs. To unlock the bolt, the key is turned in the opposite direction contacting with the tumblers at  $p$  and 75  $p'$  depressing the tumblers at said points, thus raising them from their contact with lug  $c^3$ ; as the key continues to turn it contacts with the talent  $r$  forcing the bolt backward; 80 as the key leaves the talent it contacts with the tumblers at points  $s$  forcing the tumblers into contact with the lug  $c^4$  of the bolt thereby holding the bolt in an unlocked position, this operation being the reverse of the former. 85 As the bolt moves into a locked position, the lug  $c^2$  enters the slot or groove  $d'$  in the weight H, thereby preventing the weight from being raised or the knob from being turned thus locking the latch firmly. In the process of 90 unlocking the bolt the lug  $c^2$  will be removed from the slot  $d'$  thereby releasing the weight. After the key leaves the points  $s s'$  it comes in contact with the key lever K at the point 95  $v$ , forcing it upward thereby lifting the weight and withdrawing the latch, making it unnecessary to turn the knob to withdraw the latch. Thus by the use of a swivel-shank or spindle I have a night latch. In locks where a night 100 latch is not a desirable feature as in railroad and common door locks and to cheapen the construction I substitute in place of key lever K. the yoke or pitman N. and in this case the 105 hub will have the two lugs  $e' e'$  as before stated with which the yoke N. will contact thereby raising the weights and accomplishing the same results as before. When a knob is used without a hub, which may be done, in this case the yoke or pitman is used, the bifurcated ends of the yoke will be connected 110 by a bar running across which leaves a space for the spindle or shank to pass through, when the same action will be had as when a knob with lugs is used.

What I claim as new, and desire to secure by Letters Patent, is—

115 1. The bolt having two lugs, combined with the opposite tumblers connected to swing together and having shoulders to engage the lugs alternately, said tumblers constructed substantially as described to release the bolt 120 as the key moves the latter and to lock the bolt as key leaves the latter, substantially as set forth.

2. In a combined latch and lock a bolt having a lug projecting to one side, in combination with a weight provided at one side with a slot or groove adapted to receive said lug substantially as shown and described.

3. In a lock the combination of a bridge plate with a bolt and interlocking tumblers 130 mounted on a pair of standards, said bridge plates being constructed to embrace said standards whereby changes of keys are obtained, substantially as shown and described.

4. In the lock the combination of a bridge plate, a slotted bolt provided with lugs, and interlocking tumblers having shoulders for engaging said lugs pivoted on standards on the case, whereby changes of keys are obtained and the picking of the lock rendered difficult, substantially as shown and described.

5. In a lock the bolt E having lugs  $c^3$ ,  $c^4$ , and slots  $c^5$ ,  $c^6$ , in combination with the tumblers pivoted on standards  $c^7$ ,  $c^8$ , operating by a key to lock or unlock the bolt without the aid of springs or weights substantially as shown and described.

6. In a lock the combination of the bridge plate F, having slots  $d$ ,  $d$ , with the slotted bolt E, having lugs  $c^3$ ,  $c^4$ , and the tumblers pivoted on standards  $c^7$ ,  $c^8$ , whereby changes of keys are obtained and the picking of the lock avoided, substantially as shown and described.

7. In a latch lock the combination of a weight with a latch through an intermediate lever pivotally connected at one end to the latch and pivotally connected at the other end to the weight by a pin and slot, and a fixed pivot upon which said intermediate lever vibrates, substantially as shown and described and for the purpose set forth.

8. In a latch-lock a pivoted key lever K in combination with a weight connected through intermediate lever I to the latch, and with knob operating hub, having a lug  $e'$ , whereby the latch is operated by either knob or key at will substantially as shown and described.

9. In a latch-lock, the combination of the weight H, having the arm  $H'$ , provided with beak  $d^2$ , holes  $d^3$ , and  $d^4$ , key lever K, lever I hub L, having lug  $e'$  and latch D, all constructed arranged and operating substantially as shown and described.

10. The combination of the key lever K, with the weight H, having arm  $H'$ , and hub L, having lug  $e'$  substantially as shown and described and for the purpose set forth.

11. The combination of the hub L, having lug  $e'$  with the key lever K and the weight H, having arm  $H'$  formed with beak or hook  $d^2$  and connected to latch by connecting lever substantially as shown and described and for purpose set forth.

In testimony whereof I have hereunto set my name in the presence of two witnesses.

JOHN ADAMS.

In presence of—

H. HARRISON,  
THEO. PROULX.