

3 Sheets—Sheet 1.

Patented July 12, 1892.

No. 478,783.

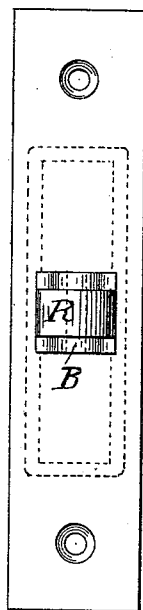


Fig. 8.

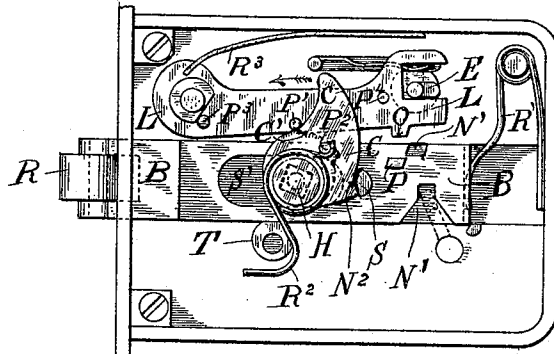
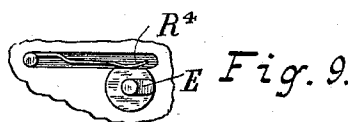
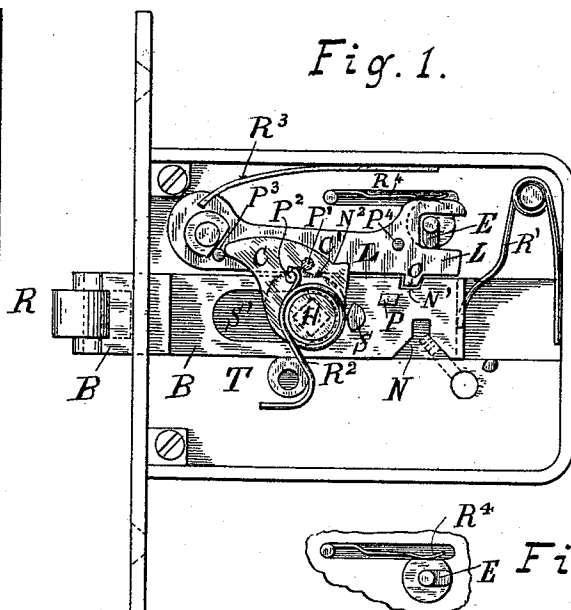


Fig. 2.

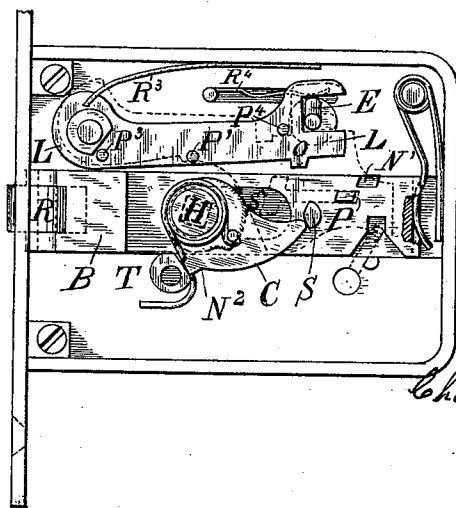


Fig. 3.

Witnesses
Chas. Hanemann
Edward S. Berrall.

Charles Edwin Landee
Inventor.

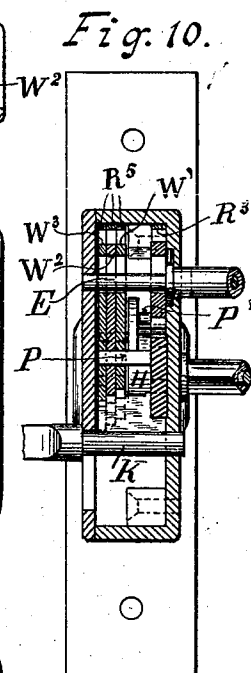
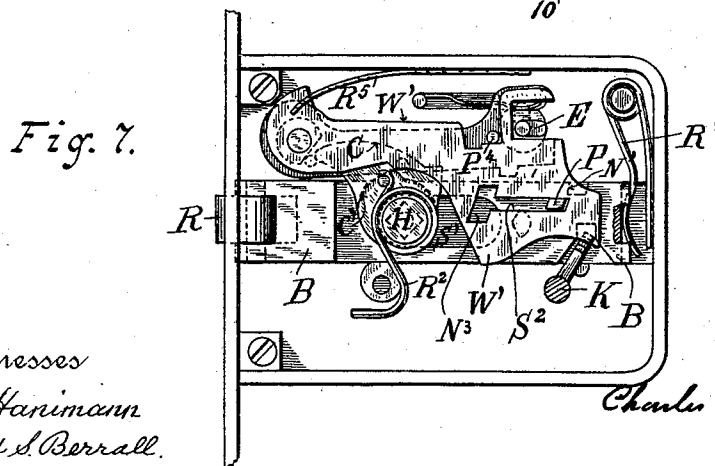
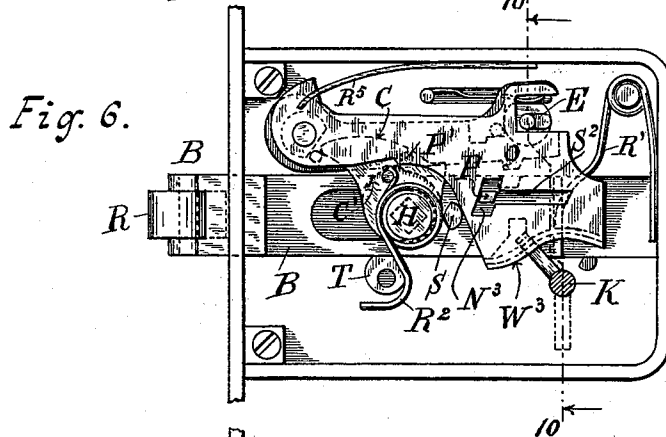
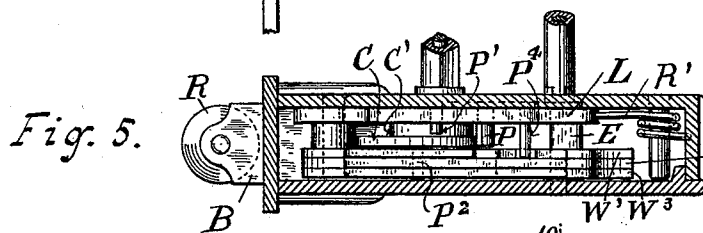
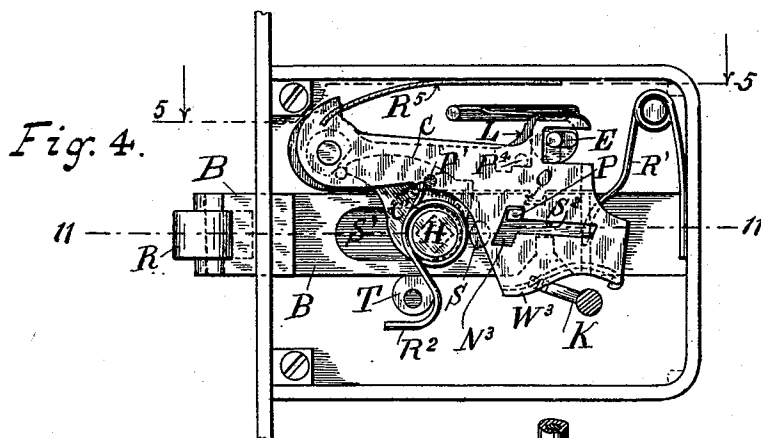
(No Model.)

3 Sheets—Sheet 2.

C. E. CANDEE.
LOCK.

No. 478,783.

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Witnesses
Chas. Hanemann
Edward S. Berrall.

Inventor
Charles Edwin Candee

(No Model.)

C. E. CANDEE.
LOCK.

3 Sheets—Sheet 3.

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Fig. 11.

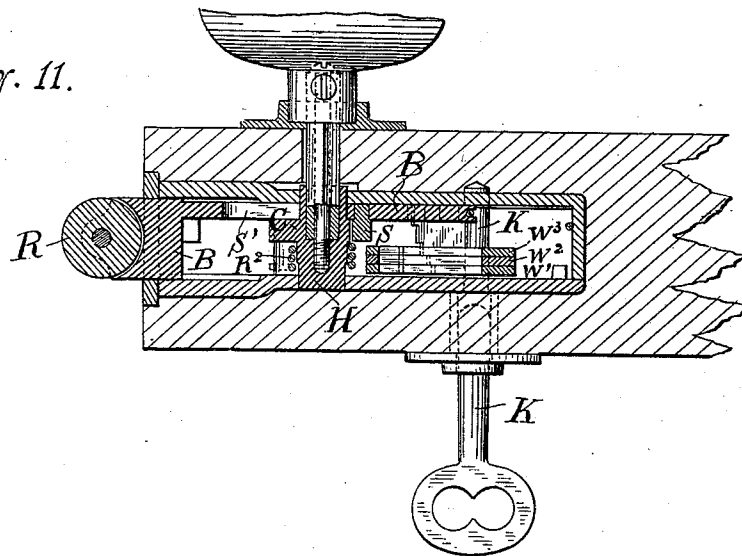
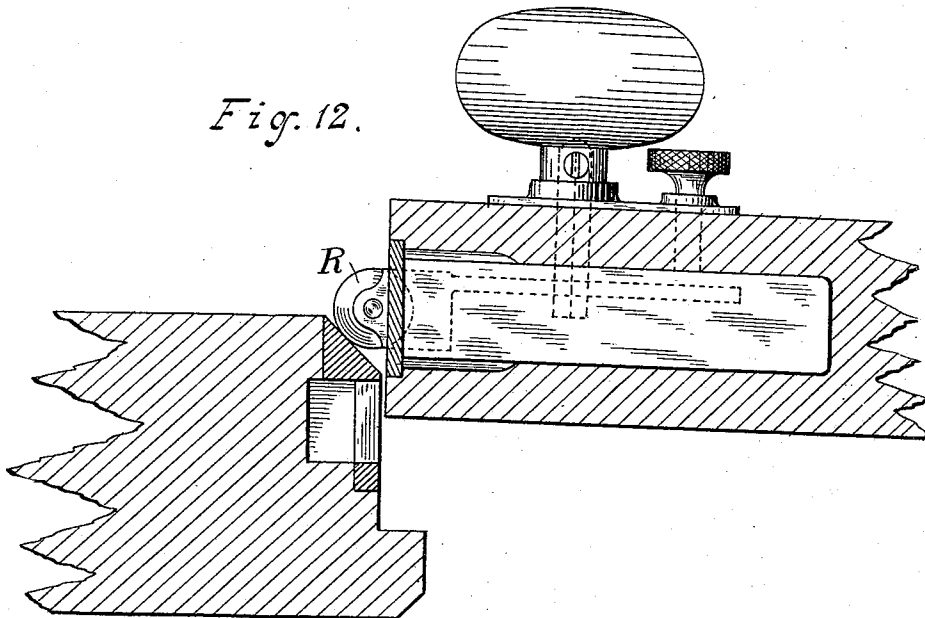


Fig. 12.



Witnesses
Chas Hanemann
Edward S. Berrall.

Charles Edwin Candee
Inventor

UNITED STATES PATENT OFFICE

CHARLES ERWIN CANDEE, OF NEW YORK, N. Y.

LOCK.

SPECIFICATION forming part of Letters Patent No. 478,783, dated July 12, 1892.

Application filed July 13, 1891. Serial No. 399,393. (No model.)

To all whom it may concern:

Be it known that I, CHARLES ERWIN CANDEE, a citizen of the United States, residing in the city, county, and State of New York, have invented a new and useful Improvement in Locks, (for which I have obtained no foreign Letters Patent whatever,) of which the following is a specification.

My invention relates to a lock in which the catch-bolt is also a lock-bolt and in which, preferably, anti-friction devices relieve the bolt in its operative movements in catching and uncatching with the jamb-escutcheon and also under some conditions in locking.

The objects of this improvement are, first, to provide in connection with a spindle and spindle-socket devices for unlocking, retreating, tripping, and relocking the bolt, which is both a catch-bolt and a lock-bolt; second, to provide devices connected with the same spindle and spindle-socket which co-ordinately with the accomplishment of the object first mentioned will unlock the tumbler and the locking-lever, thereby releasing the bolt and permitting it to be retreated, tripped, and relocked both by the locking-lever and by the tumbler, leaving the tumbler, the locking-lever, and the bolt in positions to be operated upon at will by the key; third, to provide devices for unlocking or releasing the tumbler and the locking-lever and retreating the locking-bolt independently and through the action of the key, which being withdrawn the tumblers, the locking-lever, and the bolt will resume their positions automatically and relock the bolt; fourth, to provide means for accomplishing these three objects in connection with co-ordinated devices for positively locking, positively unlocking, and freeing the locking devices. I attain these objects by the mechanism illustrated in the accompanying three sheets of drawings, in which—

Figure 1 is a view of the bolt, the locking-lever locked, the locking, unlocking, and freeing cam, and of the spindle-socket and its associated cams, together with the four springs operating the same located in the lock-frame, the lock-plate being removed, the bolt being in its most advanced and locked position, and the other parts being in their corresponding relations. Fig. 2 is a representation of the same parts in the positions they occupy when

the bolt is unlocked and partially retreated and from which it may be tripped and automatically relocked. Fig. 3 is a representation of the same parts when the bolt is fully retreated and there held by the point of its operating-cam and with one of the tumblers shown in dotted outline. Fig. 4, except as to the locking of the locking-lever, which is unlocked, is the same as Fig. 1, but with the three tumblers added and by which the bolt is locked as also by the locking-lever. Fig. 5 is a horizontal sectional view of the same cut on the line 5 5, Fig. 4. Fig. 6 is the same as Fig. 4, but with the three key-tumblers raised and lifting the locking-lever as for beginning the retreat of the bolt by the action of the key. Fig. 7 is the same as Fig. 6, except that the bolt is completely retreated. Fig. 8 is a front end view of Fig. 1. Fig. 9 is a detail view of the lifting, locking, and unlocking or freeing cam in the position shown in Fig. 2. Fig. 10 is a vertical sectional view cut on the line 10 10, Fig. 6. Fig. 11 is a horizontal sectional view of the lock in position in the door, and Fig. 12 is a horizontal sectional view of the same in outline and also of the door-jamb and jamb-escutcheon.

Similar letters represent similar parts throughout the drawings.

The bolt B is provided with the anti-friction roller R and is associated with the locking-lever L and with the locking, unlocking, and freeing cam E, the unlocking and locking positions of which are positive and the freeing position of which is negative and leaves the bolt B and locking-lever L in the control of their springs and other associated devices.

The bolt B is provided with a notch N, in which the key takes for the purpose of retreating the bolt, with a stud S for engaging with the cam connected with the spindle-socket for the purpose of retreating and detaining the bolt in one or more positions of retreat, with a pin or stud P for engaging with one or more tumblers W¹ W² W³, and with a notch N' for the engagement of a shoulder O on the locking-lever L.

The spindle-socket cam C is provided with the notch N², located between the two extremes of the cam-surface for the purpose of engaging the stud S and holding the bolt in a semi-retreated position. On the under side

of the cam C there is another cam-surface C', at the rear end of which there is a socket or shoulder to receive the pin P', secured in the lever L in such a position that the backward
 5 throw of the double cam C and C' will first cause the lever L to rise, except when it is positively locked by the cam E, and remain lifted and thereafter permit the bolt B to be retreated by the action of the cam C upon
 10 the stud S along that part of the cam which is between the notch N² and the point of the cam. When the cam C moves back far enough to receive and engage the stud S in the notch N², the bolt B will be held in a half-
 15 back position against the action of the spring R', as shown in Fig. 2, starting from the position shown in Fig. 1. The spindle-socket, or, more properly speaking, the cam C, is provided with a spring R², which engages the
 20 pin P² at one end and the screw-post T at the other end. The spring R' being stronger than the spring R², the cam C will hold the bolt against the action of the spring R², which last tends to trip the same, until the spring
 25 R² is aided by slight pressure on the roller or the end of the bolt B, as by a touch of the hand or by the contact of the roller with the jamb-escutcheon in closing the door, whereby the spring R' being slightly overcome release is effected both of the bolt B and of the
 30 cam C, and the parts will be immediately and automatically thrown into the positions shown in Fig. 1, starting from the positions shown in Fig. 2. When the cam C is retreated to its extreme limit, the bolt and the cam will
 35 take the positions shown in Fig. 3, from which position the bolt may be released by turning the knob, the spindle-shank, and the cam C forward slightly, whereupon the parts will automatically return to the positions shown
 40 in Fig. 1, in which the point of the cam C is detained by a stop P³ on the lever L, with which the forward end of the cam makes contact, as shown in Fig. 1, or in any other suitable way, the shoulder of the cam C' being
 45 in position to act upon the pin P' on the lever L.

The arrangements and devices so far described give the bolt B three characteristic positions—as the most advanced position in
 50 which it is held by the contact of the rear end of the slot S' with the spindle-shank, Fig. 1, the extreme position of retreat in which it is held by the nose of the cam C, Fig. 3, and the middle position in which it is held by the stud S taking in the notch N². In the most advanced position the relations of the stud S to the cam C and the spindle-shank must be such that the cam C' may first lift the locking-lever L
 55 before retreating or backward pressure is brought to bear by the cam C on the stud S and bolt B, otherwise the bolt would be locked and held by the lever L against such retreat at the time when backward pressure
 60 would be exerted thereon. The cam C is also provided with the pin P², an additional function of which is to engage with the shoulders

of the tumblers W', W², and W³ for the purpose of lifting the tumblers and also the locking-lever L, so as to disengage the bolt B
 70 or release it from the locking-lever and tumbler before the cam C, operated through the spindle-socket, strikes the stud S and bears thereon for the purpose of retreating the bolt. The lever L is provided with the pin P¹, with
 75 which the tumbler W' engages when it is lifted in such a way as to lift the locking-lever L and free the bolt from control of the locking-lever for retreat. The lifting of the tumbler W' and of the lever L when lifted
 80 thereby is effected by the pin P² on the cam C, as also is the lifting of the tumblers W² and W³, the pin P² being made long enough to lift all three of them, along with the locking-lever L, high enough to disengage the
 85 notches N³ from the pin or stud P on the bolt B and allow the stud to traverse the slot S² as the bolt is retreated, the pin or stud engaging the notches N³ of the three tumblers automatically when the knob is released, so
 90 as to assist the lever L in holding the bolt B. So far as now described the bolt B acts either as a catch or as a lock-bolt under the control of the knob, spindle, &c., and without
 95 any aid from the key, but from one side of the door and lock only. Such being the arrangement of the parts when the locking-lever L is raised by the cam E above and clear from the bolt B the door may be opened and
 100 closed from the inside like any door provided with an ordinary catch-bolt, and will still be locked from the outside as effectually as if
 105 locked by an ordinary lock-bolt in addition thereto, or when the bolt is retreated by the knob, so as to be caught and held in its intermediate position by the stud S. On stepping
 110 outside and closing the door slight contact of the roller with the jamb-escutcheon will trip the bolt B, cause it to advance automatically to its first position, and the locking-lever L,
 115 being released and left free, will engage and lock the bolt B, so as to prevent its being retreated, as it can be in the case of most, if not all, latch-locks by the use of a knife inserted between the door and the door-jamb until the
 120 locking-lever is lifted.

From the outside, in all cases except when the locking-lever L is positively locked by the cam E, the bolt B may be retreated, and the door held by this lock may be opened by the
 125 use of the key K, which lifts the tumbler W' and the lever L by and through the tumbler W', and also the tumblers W² and W³, until the bolt B is freed from the control of the three tumblers, as well as from the control of
 130 the locking-lever. The forms and arrangements of the tumblers are such that the key K, bearing upon the tumblers W', W², and W³, lifts the locking-lever when the same is not locked before the key makes contact with
 135 the bolt B for the purpose of retreating the same.

Of course the relations of the different tumblers to the key may be varied indefinitely,

so that each key will only fit and operate a particular lock, the tumblers of which have been shaped and adapted thereto. Each one of the tumblers, like the lever L, is provided with a spring, under the influence of which each tumbler automatically locks the bolt at all times when either the key or the cam E, the pin P², or the lock-key are not overcoming the same. The cam E is provided with the spring R⁴ for the purpose of maintaining it in either one of its three positions.

From the foregoing description it is evident that the bolt B may be retreated from the inside of the door by means of the knob, spindle-socket, and attachments, the lever L being first disengaged from the positive locked position shown in Fig. 1 and in which it is held by the cam E. It is also evident that the locking-lever not being itself locked the bolt may be retreated after the disengagement or release from the control of the locking-lever L by the key inserted from the outside of the lock and door. From the inside the bolt B may be locked not only against the key inserted from the outside, but against the knob when used from the inside. It is also evident that while the bolt B, except when released from the control of the locking-lever L by means of the positive unlocking-action cam E, locks automatically whenever it is allowed to resume its most forward position. It may, nevertheless, be used as a mere catch-bolt by simply turning the inside knob so as to detain the bolt in its first retreated or intermediate position, the contact of the front end of the bolt with the jamb-escutcheon tripping the cam, releasing the bolt, and causing it to be locked automatically, so that it can be unlocked and the door opened from the outside by means of the key only. The key, however, has no bearing upon the locking-lever, but only upon the tumblers W', W², and W³ and upon the bolt B. At all times, except when positively locked by the lever L and cam E, the bolt B may be unlocked and retreated by the key from the outside of the door or by the knob-spindle, spindle-shank, cams, and the tumblers W' W² W³ from the inside of the door. The lower tumbler W' lifts the locking-lever L and releases the bolt B, whether the knob-spindle or the key be used, and the tumblers W² and W³ are also lifted, so as to release the bolt from their control either by the knob-spindle or by the key.

When the lever and the tumblers are lifted by the cam E, the bolt B may be retreated and operated either by the key K or by the cam C at will as a catch-bolt.

The notches N³, of which each tumbler has one, are related to the slot S² as the head or top of the letter T to its body, making two shoulders, one above and one below the upper end of the slot or body of the letter T. In its normal locking position in relation to the tumblers the pin P engages the upper shoulder, as shown in Fig. 4. When the

tumblers are lifted in either way preparatory to retreating the bolt, the pin P occupies a position in line with the slot S², as shown in Fig. 6, preparatory to passing into the slots to the position occupied, as shown in Fig. 7. The pin P is made, preferably, to fit the slot S² closely on its sides, so that only the properly and accurately fitted key will lift the tumblers into such position as to permit the retreating of the bolt B and the pin P along the slot of each tumbler. The object of the lower shoulder of the notch N³ is to engage the pin P and prevent the retreating of the bolt when any other than the proper key—say with the key ward or bridge even a slight degree longer—may be inserted in the lock. In this way a double set of guards is provided against any tampering with the lock—that is, when the key-bridge of the inserted key is too short the upper shoulder of the notch will engage and hold the bolt and when it is too long the lower shoulder will do so. In order to permit the tumblers to rise high enough to enable the lower shoulder of the notches N³ (one or more) to engage the pin P, sufficient space should be left between the side and back side of the cam E and the adjacent part of each tumbler to prevent the stopping of the tumblers when the pin P is in line with the slot S², although of course the lock may be made in that way—that is, so that the cam E will stop the tumblers in position to receive the pin in the slot S². When made with this additional guard, although by the insertion of the improper key the locking-lever L may be raised, as well as the tumblers, one or more, the retreating of the bolt will be prevented by the contact of the pin P with the lower shoulder of the notch N³, one or more, except when the proper and accurate key is used. The spring operating the locking-lever L is marked R³ and that operating each tumbler W is marked R⁵ and the spindle-socket is marked H in the drawings.

I claim as my invention—

1. The locking-lever L, provided with the pin P', shoulder O, and spring R³, in combination with the positive locking, positive unlocking, and freeing cam E, the bolt B, provided with the stud S, notch N', and spring R', and the spindle-socket H, provided with the cams C and C' and spring R² for the purpose of unlocking, retreating, and holding in retreat the bolt B.

2. The locking-lever L, provided with the pin P', the shoulder O, and spring R³, in combination with the positive locking, positive unlocking, and freeing cam E, the bolt B, provided with the stud S, notch N', and spring R', and the spindle-socket H, provided with the cam C, having the notch N², the spring R², and the cam C' for the purpose of unlocking, retreating, and holding in intermediate retreat and tripping the bolt B.

3. The locking-lever L, provided with the shoulder O, the pin P', and the spring R³, in combination with the positive locking, posi-

tive unlocking, and freeing cam E, the bolt B, provided with the stud S, pin P, notch N', and spring R', the spindle-socket H, provided with the cam C, having the pin P², the cam C', and the spring R², and one or more tumblers W' W² W³, provided with the notch N³ and slot S², and springs R⁵, respectively, all in combination for the purpose of unlocking, retreating, and holding in retreat the bolt B and relocking the same automatically.

4. The locking-lever L, provided with the shoulder O, the pin P', and the spring R³, in combination with the positive locking, positive unlocking, and freeing cam E, the bolt B, provided with the stud S, pin P, notch N', and spring R', the spindle-socket H, provided with the cam C, having the notch N², the pin P², the cam C', and spring R², and one or more tumblers W' W² W³, provided with the notch N³ and slot S² and springs R⁵, respectively, all in combination for the purpose of unlocking, retreating, and holding in intermediate retreat the bolt B and relocking the same automatically.

5. The locking-lever L, provided with the pin P⁴, shoulder O, and spring R³, in combination with the positive locking, positive unlocking, and freeing cam E, the bolt B, provided with the pin P, notches N and N', and spring R', the tumblers W' W² W³, one or more, provided with the slot S², notch N³, and springs R⁵, in combination with the corresponding key K for the purpose of unlocking and retreating the bolt B.

6. A tumbler provided with the notch N³, slot S², and spring R⁵, in combination with the locking-lever L, provided with the pin P⁴ and spring R³, the positive locking, positive unlocking, and releasing cam E, and the key K.

7. The combination of the cam E, lever L, and tumblers W', W², and W³, one or more, for the purpose of positively locking, positively unlocking, and releasing the bolt B.

8. In locks, the double system of devices shown and described, consisting of the bolt B, lever L, and tumblers W' W² W³, in combination with a suitable key K and a spindle-socket H, provided with cams C and C', whereby the bolt may be operated at will either by the key or by the spindle.

9. In locks, the bolt B, provided with the roller R, in combination with a cam provided with means for engaging and retreating, holding, and automatically tripping the bolt, substantially as shown and described.

10. In locks, the bolt B, provided with a roller R, in combination with a cam which is capable of retreating, holding, and also tripping the bolt, with a locking and unlocking lever and with a cam for locking and unlocking the same, substantially as shown and described.

CHARLES ERWIN CANDEE.

Witnesses:

EDWARD S. BERRALL,
JOHN J. F. O'CONNOR.

It is hereby certified that in Letters Patent No. 478,783, granted July 12, 1892, upon the application of Charles Erwin Candee, of New York, N. Y., for an improvement in "Locks," errors appear in the printed specification requiring correction as follows: In line 104, page 2, the comma after the word "thereto" should be stricken out and a semicolon inserted instead, and in line 106, same page, the period after the reference-letter "S" should be stricken out and a comma inserted instead, and the following word "On" should commence with a small o, making a continuous sentence; and that the said Letters Patent should be read with these corrections therein that the same may conform to the papers pertaining to the case in the Patent Office.

Signed, countersigned, and sealed this 2d day of August, A. D. 1892.

[SEAL.]

Countersigned:

N. L. FROTHINGHAM,

Acting Commissioner of Patents.

CYRUS BUSSEY,

Assistant Secretary of the Interior.