(No Model.) 2 Sheets—Sheet 1.

C. E. CANDEE.

LOCK.

No. 478,916. Patented July 12, 1892.

Fig. 1.

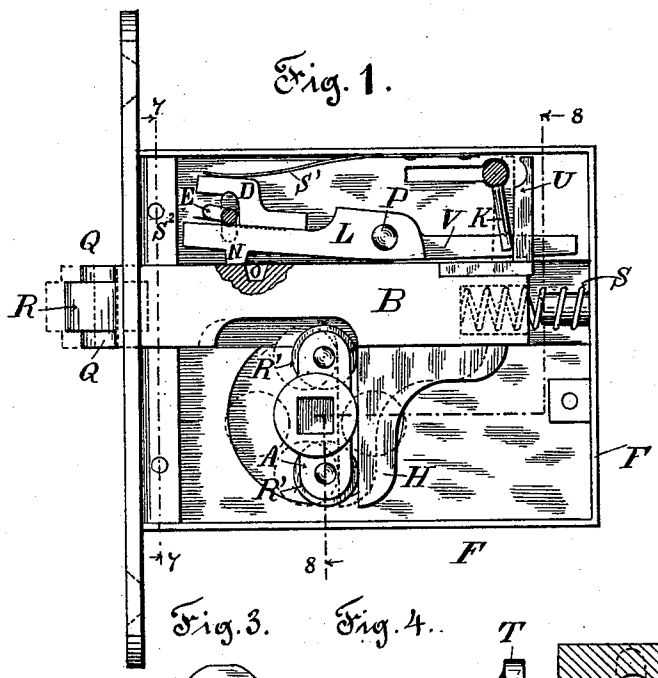


Fig. 5.

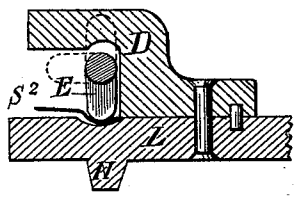


Fig. 3.

Fig. 4.

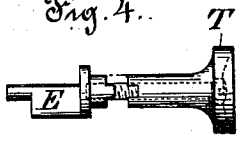
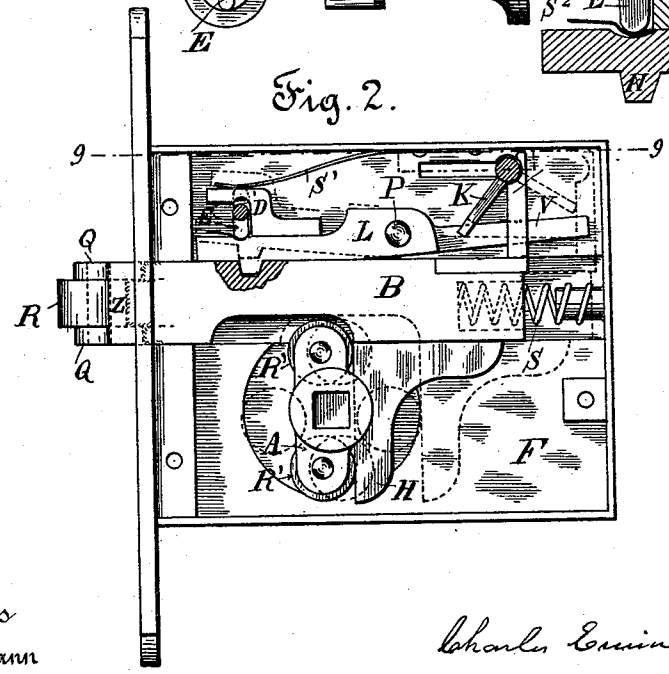


Fig. 2.



Witnesses
Chas Hanimann
Edward S. Berrall.

Inventor
Charles Erwin Candee

(No Model.) 2 Sheets—Sheet 2.

C. E. CANDEE.

LOCK.

No. 478,916. Patented July 12, 1892.

Fig. 6.

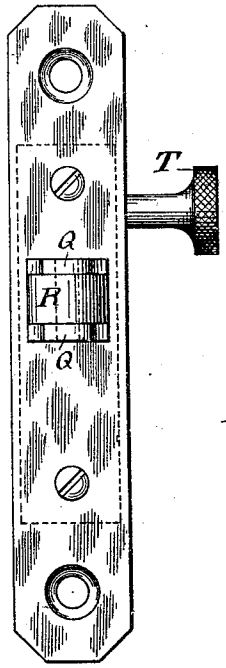


Fig. 7.

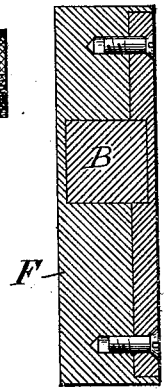


Fig. 8.

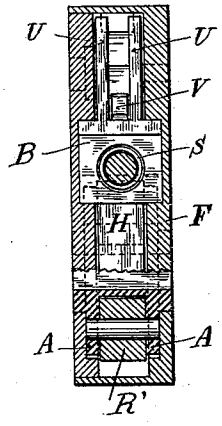
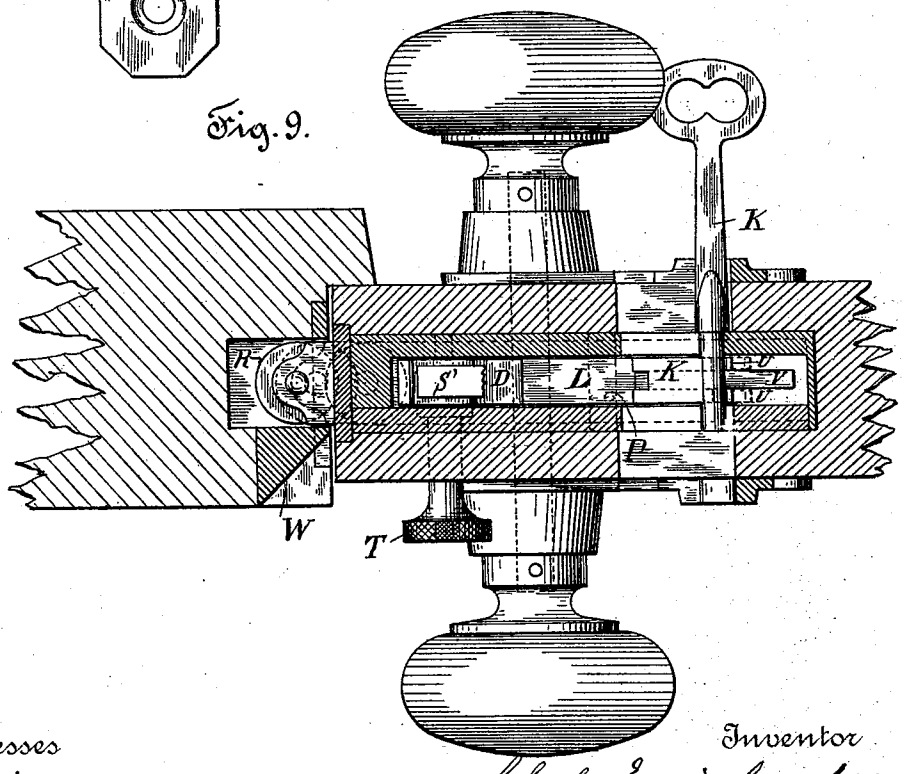


Fig. 9.



Witnesses
Chas Hanimann
Edward S. Berrall.

Inventor
Charles Edwin Candee

UNITED STATES PATENT OFFICE.

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

LOCK.

SPECIFICATION forming part of Letters Patent No. 478,916, dated July 12, 1892.

Application filed February 4, 1891. Serial No. 380,143. (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 Door-Locks, for which I have obtained no foreign Letters Patent whatever, and of which the following is a specification.

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

The objects of my improvement are, first, to provide an anti-friction catch-bolt that is in the first stage merely a catch-bolt and an ordinary spring lock-bolt at one and the same time, but capable in both cases of holding the door against pressure in either direction as well, to be operated by a knob or key at will, and in the second stage is first a spring lock-bolt with positive locking attachment, to be unlocked and operated entirely only by the key or to be unlocked by the key and subsequently retreated either by the key or knob; second, to provide for such a catch and lock bolt a merely engaging and locking device to be operated for the purpose of disengaging and unlocking, preferably by a key, from one side of the lock and also for the purpose of unlocking and further and subsequently retreating the bolt or by a lifting-cam from the other side for the purpose of disengaging and unlocking; third, to provide for such engaging and locking device another device to lift it out of its locking position or fixedly lock it and secure it therein or leave it free to act as an engaging and locking device from one side of the lock, the locking device when held in either the neutral or active unlocking position permitting the key, as well as the knob and spindle, to operate the bolt independently and alone, and, fourth, to provide means for holding the bolt in such position as to act automatically as a catch-bolt only or automatically as a spring locking-bolt or by reversing the knob to act as a positive locking device controlled only by the key or by neither the key nor the knob, at will, by or through an additional independent and positive locking and unlocking device acting upon the device for locking the bolt. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 represents a side view of the lock and its operating parts with the cap or cover removed and the parts in position to allow the bolt to operate automatically as a catch-bolt only, but to be operated either by the key or the knob and spindle. Fig. 2 represents a similar view of the lock and its parts, but in position as when the bolt is locked both against the action of the knob and spindle and the key. Fig. 3 is an end view, Fig. 4 a side view, and Fig. 5 a part detail view, of the lifting or locking cam in its locking position. Fig. 6 is a front end view of the lock and lock-plate. Fig. 7 is a sectional view on lines 7 7 of Fig. 1, and Fig. 8 is a similar view on lines 8 8 of Fig. 1. Fig. 9 is a similar view on lines 9 9 of Fig. 2.

In the lock to be described features requiring especial attention are the first and secondary movements of the bolt, in the former of which the bolt advances one stage and retreats either by the action of the key or knob at will, the bolt acting like an ordinary catch-bolt moved forward by a spring, but holding the door either by the periphery of the roller on opposite sides or by a solid part of the bolt upon opposite sides, as may be desired, the bolt being held and hindered from retreating only by its spring, and in the latter of which the bolt is free to advance another stage, there to be held positively or not, as may be desired, and to be unlocked and retreated by the key or to be retreated by the knob after it is unlocked by the key or by another device permanently related to the locking device, or by this other device to be permanently or positively locked against the key, the knob, and all other devices, whether belonging to the lock or not. To these features are to be added, as requiring attention, the associated devices for operating the same.

The bolt B is provided at its front end with the roller R, is at all times pushed into or toward its foremost position by the spring S, except when the spring is overcome either by one or the other of the double spindle-arms,

by the jamb-escutcheon in opening and closing the door, by some other application of force upon the roller R or the front end of the bolt itself, or is stopped or held by the long or short side of the spindle-socket, whichever is presented to the opposite extension H of the bolt B, has on one side an arm or extension H for the engagement of the double spindle-arms and socket A on the other side and toward its forward end an engaging notch or shoulder O for the engagement of the locking-lever L, an arm or extension U, with which the unlocking-key K makes contact for the purpose of retreating the bolt after the key or the cam E has disengaged the lever L, or when the bolt is held in the position in which it acts as a catch-bolt, and is held in position in the lock-frame F by guides, as shown, or in any usual way.

The locking-lever L is pivoted or supported in the center P, is provided with a spring S′, so located as to force the locking-lever toward or upon the bolt B continuously, particularly at near or opposite the point where a shoulder or stop N is located, so as to engage the shoulder O in the bolt B with an extension V back of the pivot P in such relation to the bolt B and arm or extension U that the key K will strike and depress that end of the lever, and thereby disengage the stop N from the shoulder O before it strikes the arm or extension U in the motion of the key made to retreat the bolt B, and with a lifting, locking, and freeing cam-seat D and double-acting detaining-spring S^2.

The lifting, locking, and freeing cam E is provided with an extension or stem, which passes through the frame F of the lock on one side and has secured thereon a thumb or finger piece T for operating the same.

The bolt B and the lever L, when the latter is free from the control of the cam E and key K, have two distinct or semi-distinct relations, which are controlled on the side of or in and through the bolt by or through the manipulation of the eccentric spindle-socket A and its roller-arms in contact with the arm or extension H of the bolt B. When the spindle-socket is so turned that its center is nearest to the arm H, the bolt B is permitted to advance to its second or foremost position, and the lever L will then, when free, engage and lock the bolt B in that position, and the bolt B can then only be unlocked by the key K or cam E; but when the opposite side of the spindle-socket is presented to the arm or extension H then the bolt B is stopped by the spindle-socket in its first or rearward position or prevented from advancing to its foremost position, the stop N of the lever L will slide back and forth on the adjacent side of the bolt B without engaging or locking the same, and the bolt B becomes merely a catch-bolt, except that it may be retreated not only by the knob, spindle-socket, and arm, but by the key K, like any spring lock-bolt. The spindle-socket and arms A act as a stop to limit the forward motion of the bolt B, moved forward under the impulse of the spring S. The spindle-socket is cut away on one side more than on the other, so that the outer surface of one side approaches nearer to the center of the socket than the other, and the extension-arms, with the rollers R′ R′ secured therein, are centered on a line drawn to one side of the center of the spindle-socket. When that side of the spindle-socket and of the rollers R′ which are on a line lying nearest to the spindle-socket center is adjacent to the arm H, the bolt B will be in its foremost position, and when the spindle-socket is reversed and the other side of the spindle-socket and of the rollers R′ located on a line farthest from the center of the spindle-socket is turned so as to present itself to the arm H the bolt B will be stopped in a less advanced position, and in the first instance the stop or shoulder N on the locking-lever L will engage with the notch or shoulder O of the bolt B and lock the same; but in the second instance the stop or shoulder N will not make an engagement, the bolt B will not be locked and will remain in the control of the spindle and spindle-socket arms for the purpose of retreating the same as a catch-bolt or advancing it under the control of the spring S until the extension H makes contact with the spindle-socket and rollers. The spindle-socket being double or having two arms, it will operate the bolt when turned in either direction from either one of the two positions described, so long as the locking-lever is prevented from engaging the bolt B.

The lifting, locking, and freeing cam E performs its functions in and in relation to the cam-seat D and the double-acting detaining-spring S^2, and also S′, and has practically three functions to perform: first, to lift the locking-lever out of function and action against the pressure of the spring S′, as shown in the uppermost dotted lines in Figs. 1, 2, and 5; second, to lock the locking-lever and bolt B in the locking position in which the cam is held by the spring S^2, as shown in solid lines, Fig. 5, and, third, to free the locking-lever L, so as to leave the bolt B in the control of the key K, (as well as the locking-lever L itself,) as shown in full lines in Fig. 1 and in horizontal dotted lines in Figs. 2 and 5, in which position it is held by that portion of the spring S^2 which is outside of the bent portion in which the cam E is held when in the locking position, and also by the upper side of its seat D as to the other side, which resist the upward movement of the cam first by gravity additional to the gravity of the cam itself and also by the pressure exerted upon the cam by the spring S′ through the upper part of the cam-seat D. The spring S^2 co-operates with the cam E in performing each one of its three functions. The rear arm or extension V of the lever L is located in such relation to the arm or extension U of the bolt B that the key K must first strike the arm V and unlock the bolt by lifting the for-

ward end of the lever L before it can make contact with the extension U of the bolt B for the purpose of retreating the same, and so that these operations will be reversed when the motion of the key K is reversed. When the cam E is in position to perform its second function, neither the key nor the knob and spindle can move the bolt B, nor can the door be opened until the cam E is released from the locking position.

As shown, the extension U is bifurcated or divided centrally into two parts, between which the arm or extension V of the lever L passes, and I consider this the most convenient method of bringing both the parts into the control of the key K; but I do not desire to limit my invention to this precise arrangement, as it is evident the part V might be extended to one side of the extension U, the latter being left solid and not divided or bifurcated, and in the absence of one branch of the extension U the other would perform the functions of both. When the cam E is in the third position, (shown in horizontal dotted lines in Figs. 2 and 5 and in solid lines in Fig. 1,) which is, strictly speaking, an intermediate position between its other two positions, the locking-lever may or may not engage and lock the bolt B, according to the relative positions of the spindle-socket and arms A, as previously described—that is to say, when the key is not in the lock, acting upon the extension V of the lever L, and in the one case can only unlock the same either through the lifting action of the cam E or of the key K, and whichever device does lift the lever L the bolt B is left both in the control of the spindle-socket arms and of the key K, and in either case when such control is relieved or released the bolt B comes under the control of the spring S and resumes its functions and the position to perform the functions of a catch-bolt, but can only occupy the position to act as a locking-bolt when the spindle-socket is so turned as to allow the arm or extension H of the bolt B to approach nearest to the center of the spindle-socket, in which case, the lever L being relieved by the key K, unless its forward end be elevated by the cam E, the bolt B will be positively locked through engagement by the stop N. The locking position of the bolt B is therefore entirely under the control of the spindle-socket and not under the control of the key, as the key cannot in any way control the advance of the bolt B to its foremost position. When acting as a catch-bolt simply, the bolt B is left free from the control of the locking-lever L while the cam E is in the first position, and in the other two positions of the cam E the bolt is in the one case actually and in the other case potentially in the control of the lever L. The roller R is located in a recess in the front end of the bolt B, with the ears Q extending upon its sides to receive the bearings of the roller or the roller-pin and the extensions Z covering more or less of the two inward quadrants of the roller R, leaving more or less of the two outward quadrants at all times uncovered. Of course the extent of protrusion of the bolt and roller in either stage may be varied to suit the different doors and places in which the lock may be used.

I claim as my invention—

1. In locks, an automatic locking-lever, in combination with a positive locking, positive unlocking, and freeing cam E, a bolt B, and a removable key K, engaging the locking-lever to disengage the same and also the bolt B to retreat the same, substantially as shown and described.

2. In locks, the locking-lever L, fulcrumed centrally, in combination with the positive locking, positive unlocking, and freeing cam E, the bolt B, and the removable key K, engaging, first, the locking-lever L to unlock the same, and, second, the bolt B to retreat the same, substantially as shown and described.

3. In locks, an automatic locking-lever, in combination with the positive locking, positive unlocking, and freeing cam E, a bolt B, a removable key K, engaging the locking-lever to disengage the same and also the bolt B to retreat the same independently of the knob and spindle, and an eccentric spindle-socket stopping the bolt in either one of two positions at will, one of which is a locking position in relation to the locking-lever.

4. In locks, the locking-lever L, fulcrumed centrally, in combination with the positive locking, positive unlocking, and freeing cam E, the bolt B, the removable key K, engaging, first, the locking-lever L to unlock the same, and, second, the bolt B to retreat the same, and an eccentric spindle-socket stopping the bolt B into two positions at will, substantially as shown and described.

5. In locks, an automatic locking-lever, in combination with the positive locking, positive unlocking, and freeing cam E, a bolt B, a removable key K, engaging the locking-lever to disengage the same and also the bolt B to retreat the same independently of the knob and spindle, and an eccentric spindle-socket stopping the bolt in either one of two positions at will, one of which is a locking position in relation to the locking-lever, the spindle-socket being provided with the rollers R′ for retreating the bolt independently of the key.

6. In locks, the locking-lever L, fulcrumed centrally, in combination with the positive locking, positive unlocking, and freeing cam E, the bolt B, the removable key K, engaging, first, the locking-lever L to unlock the same, and, second, the bolt B to retreat the same, and an eccentric spindle-socket stopping the bolt B in two positions at will and provided with the rollers R′ for retreating the bolt B independently of the key K.

CHARLES ERWIN CANDEE.

Witnesses:
WM. FORTNAM,
EDWARD S. BERRALL.