

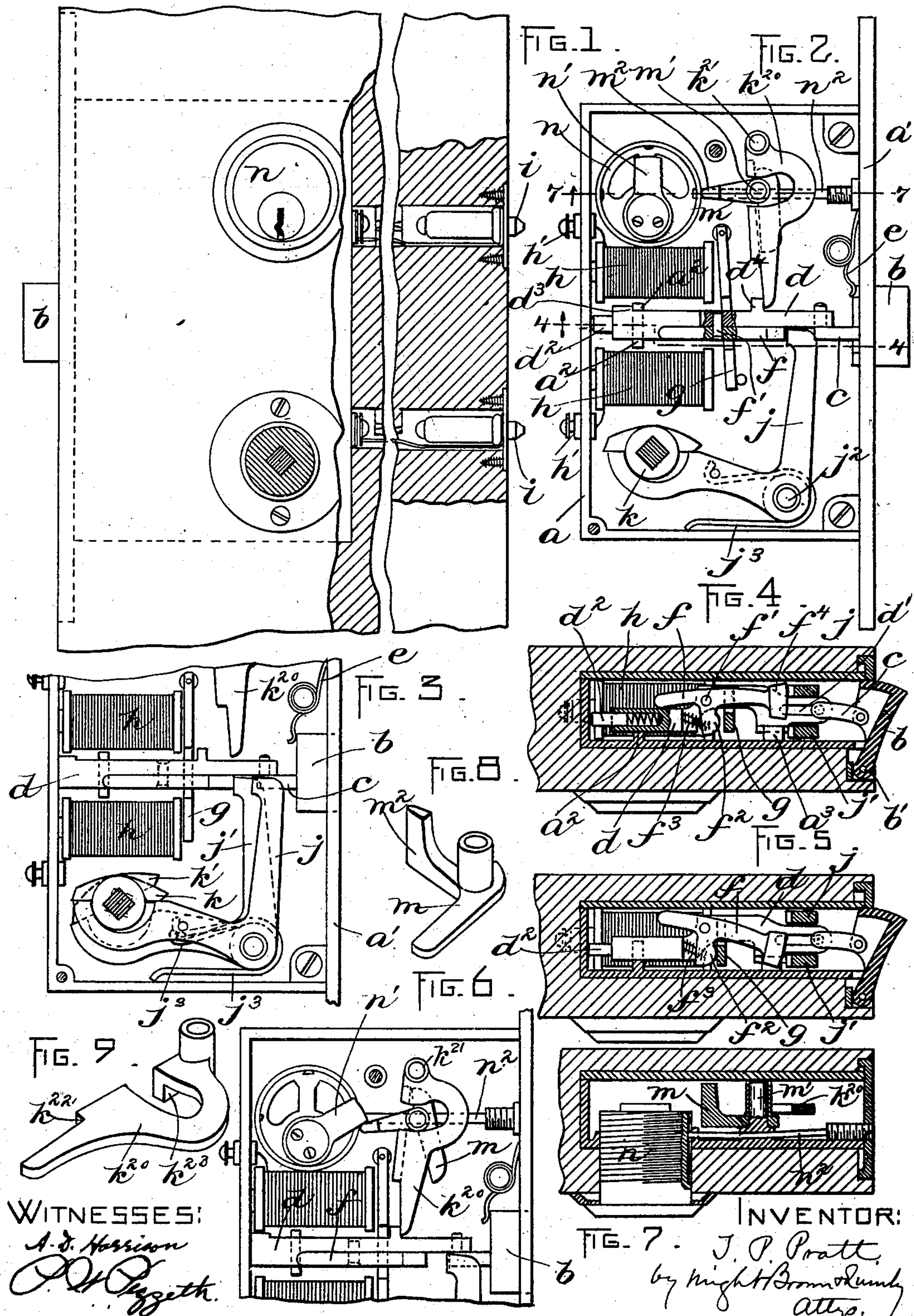
No. 655,006.

Patented July 31, 1900.

T. P. PRATT.
ELECTRIC LOCK.

(Application filed Apr. 21, 1900.)

(No Model.)



UNITED STATES PATENT OFFICE.

THEODORE P. PRATT, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO FRED WARREN CLARK, OF SAME PLACE.

ELECTRIC LOCK.

SPECIFICATION forming part of Letters Patent No. 655,006, dated July 31, 1900.

Application filed April 21, 1900. Serial No. 13,737. (No model.)

To all whom it may concern:

Be it known that I, THEODORE P. PRATT, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Electric Locks, of which the following is a specification.

This invention relates to an electric lock or latch the bolt of which is adapted to be operated by the rotation of outside and inside knob-spindles, as well as by a key, and in which the operation of the bolt by the knob-spindles is controlled by an electromagnet within the casing, said magnet being included in an electric circuit adapted to be closed and broken at one or more points remote from the lock.

One of the objects of my invention is to provide a lock of this class having independently-operating outside and inside knobs and electrically-controlled devices whereby either knob can be controlled and made operative or inoperative by the act of a person at a distant point in changing the conditions of the electric circuit.

Other objects of the invention are to provide a compact arrangement of the various parts of the lock and to minimize the work which the electromagnet has to perform.

The invention consists in the novel features of construction and relative arrangement of parts which I shall now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents, partly in side elevation and partly in section, a door provided with my improved lock. Fig. 2 represents a lock in side elevation with one of the side plates of the casing removed, showing the lock in its normal condition and adapted to be operated by the inside knob. Fig. 3 is a similar view showing the position of the knob-operated parts when the outer knob has been rotated to draw the bolt. Fig. 4 represents a section on the line 4 4 of Fig. 2. Fig. 5 is a similar view to Fig. 4, showing the lock in a condition to be operated by the outside knob. Fig. 6 is a view similar to Fig. 2, showing the position of the key-operated parts when the key has been inserted and turned to draw the bolt. Fig. 7 represents a section on line 7 7 of Fig. 2. Figs. 8 and 9 are

detail perspective views showing certain of the key-operated parts.

The same letters of reference indicate the same parts in all the figures.

Referring to the drawings, *a* designates the casing of the lock, *a'* the face-plate, and *b* a bolt-head or latch which occupies an opening in the face-plate, being pivoted at *b'* at one side of said opening. A link *c* connects the bolt-head with one end of a sliding latch-bar *d*, in which is a slot *d'*, which allows the bolt-head to yield when the door is closed. Lugs *a² a³*, formed on the casing *a*, act as guides to the latch-bar, and a spring-pressed plunger *d²*, which occupies a socket in the rear end of said latch-bar, abuts against the casing and tends to project the latch-bar in the direction of the bolt-head or latch, its forward motion being limited by means of a stop *d³*, abutting against one of the lugs *a²*. The bolt-head is normally projected by a spring *e*, and its forward motion is limited by the engagement of the link *c* with the end of the slot *d'*. Thus it will be seen that by sliding the latch-bar toward the rear wall of the casing *a* the bolt-head or latch will be retracted.

f designates a dog pivoted at *f'* to one side of the latch-bar *d* and provided on its under side beneath said pivot with a projection or lug *f²*. Between an abutment on the latch-bar and the rear side of said projection is located a spring *f³*, which normally keeps the dog in the position shown in Fig. 4. The front side of said projection is adapted to be engaged by the armature *g* of an electromagnet whose coils *h h* form part of an electric circuit, which enters and leaves the door by way of the yielding contact-plungers *i i*, connected to suitable conducting-wires. When said magnet is energized, the armature is attracted and the dog *f* depressed to the position shown in Fig. 5, the two returning to their normal positions when the electric circuit is open.

j j' designate two bell-crank tumbler-dogs mounted to oscillate independently on a fixed stud *j²* and provided with springs *j³*, which keep them in yielding contact with the knob-operated tumblers *k k'*. The said tumblers are of the usual construction and operate by the turning of their respective knob-handles in either direction to oscillate the tumbler-

dogs $j j'$, the tumbler k corresponding to the inner knob-handle and the tumbler k' to the outer one. The upper or operating ends of the two tumbler-dogs $j j'$ are located side by side in juxtaposition to the pivoted dog f , upon which either may operate to retract the bolt, according to the position of said dog f . When in the normal position, (shown in Fig. 4,) the rotation of the inner knob causes the tumbler-dog j to engage a head f^4 on the dog f , and thereby slide the latch-bar d rearwardly and retract the bolt-head b . When the pivoted dog is in its normal position, the turning of the outer knob will oscillate the tumbler-dog j' , but will not retract the bolt, as may be plainly seen in Fig. 4. When it is desired to make the outer knob operative, the electric circuit is completed at some point and the attraction of the armature g by the electromagnet $h h$ brings the head f^4 of the pivoted dog into the path of the tumbler-dog j' , as shown in Fig. 5, in which position the rotation of the outer knob will cause said tumbler-dog to engage the pivoted dog f and retract the bolt-head b . In this latter position of the parts the inner knob will be inoperative, and a person may thereby be prevented from departing from the house or apartment by any one in control of the electric circuit.

The means for operating the bolt-head b by a key comprise, as here shown, a dog k^{20} , pivoted to a fixed stud k^{21} and engaging a stud d^4 on the latch-bar d , a T-shaped lever m , pivoted underneath the dog k to a fixed stud m' and adapted to engage either one of two ears $k^{22} k^{23}$, formed on said dog, and a pivoted arm n' , adapted to be turned by a key and to engage the stem m^2 of the T-shaped lever m . The pivoted arm n' forms part of a "cylinder-lock" n of approved pattern, which screws into a threaded socket in the casing a and is reversibly held therein by means of an elongated pin n^2 , which may be adjusted from the outside of the face-plate a' and which engages either of two oppositely-located grooves in said lock. The arm n' is adapted by the reversibility of its casing to engage either side of the stem m^2 , and it will be observed that the dog k^{20} operates to retract the latch-bar d by the turning of the lever m in either direction on its pivot.

It will now be seen that I have provided a very advantageous construction and arrangement of parts in my improved lock. The location of the magnet-coils on the rear wall of the casing instead of on the top or bottom wall, as is usually the case, avoids the necessity for carrying the terminal wires from said coils across the casing to the binding-posts or studs on the rear wall thereof. The coils are instead situated in immediate proximity to said binding-studs h' , and the wires leading thereto are very short and free from all liability to short-circuiting by contact with any of the movable parts of the lock. The magnet-coils $h h$ are separated sufficiently,

as will be seen, to admit the latch-bar d between them, and the armature g is recessed for a like purpose.

It is obviously of vital importance in locks of this character that the electromagnet may always be depended upon to perform its function. If for any reason the electric current which is used to energize the magnet becomes weakened, the power of said magnet is decreased as a consequence, and it is from this cause that many of the electric locks in present use fail to operate satisfactorily. It is therefore desirable as a remedy that the work which the electromagnet has to perform shall be made as light as possible, an object which is satisfactorily accomplished in my invention. By reference to the drawings it will be noted that practically the only resistance which the magnet $h h$ has to overcome is the tension of the small spring f^3 , and it will be further noted that the armature is caused to act near its middle point on the pivoted dog f , thereby obtaining great leverage on said dog and minimizing the force necessary to tilt the same.

I do not confine myself to the exact construction of any of the above-described parts or features, but reserve the right to a proper amount of variation consistent with the scope of my invention.

I claim—

1. In an electric lock, the combination of a pivoted bolt-head or latch, a latch-bar connected with said latch and adapted to be moved to retract the same, two independent knob-operated tumbler-dogs arranged in proximity to said latch-bar, a dog pivoted to the latch-bar and adapted to be moved simultaneously into engagement with one tumbler-dog and out of engagement with the other, said bolt having a spring whereby it is normally engaged with one of the tumbler-dogs and normally separated from the other, and electrically-controlled means for displacing the latch-bar dog from its normal position and moving it into engagement with the tumbler-dog from which it is normally separated.

2. In an electric lock, the combination of a pivoted bolt-head or latch, a latch-bar connected with said latch and adapted to retract the same, two independently-operated tumbler-dogs arranged in proximity to said latch-bar, a dog pivoted to the latch-bar and adapted to be moved simultaneously into engagement with one tumbler-dog and out of engagement with the other, said dog being normally engaged with one tumbler-dog and separated from the other, an electromagnet, and an armature for said magnet adapted to move the latch-bar dog out of engagement with one tumbler-dog and into engagement with the other when the position of the armature is shifted.

3. In an electric lock, the combination of a latch, a latch-bar connected therewith and adapted to be moved to retract the same, two independent knob-operated tumbler-dogs ar-

5 ranged in proximity to said latch-bar, a dog pivoted to the latch-bar and adapted to engage either of said tumbler-dogs, an electromagnet having two coils situated on either side of the latch-bar, and an armature pivoted at one side of said latch-bar and adapted to engage the pivoted dog intermediate of the ends of said armature, for the purposes specified.

10 4. In an electric lock, the combination of a casing, a pivoted latch, a latch-bar connected therewith and adapted to be moved to retract the same, two independent knob-operated
15 tumblers arranged on one side of said latch-bar and with their ends in proximity thereto, a dog pivoted to said latch-bar and adapted to engage either of said tumbler-dogs, an electromagnet attached to the rear wall of the casing for the purpose specified and hav-

ing two coils arranged on either side of the 20 latch-bar, a pivoted armature adapted to engage the latch-dog intermediate of the ends of said armature for the purposes specified, a dog pivoted to the casing at the opposite side of the latch-bar from the knob-operated 25 tumbler-dogs and engaged with said latch-bar, and a T-shaped key-operated lever pivoted underneath said dog and engaged therewith, the said lever being adapted to be turned in either direction to cause the said dog to 30 retract the latch.

In testimony whereof I have affixed my signature in presence of two witnesses.

THEODORE P. PRATT.

Witnesses:

C. F. BROWN,
J. R. TUFTS, Jr.