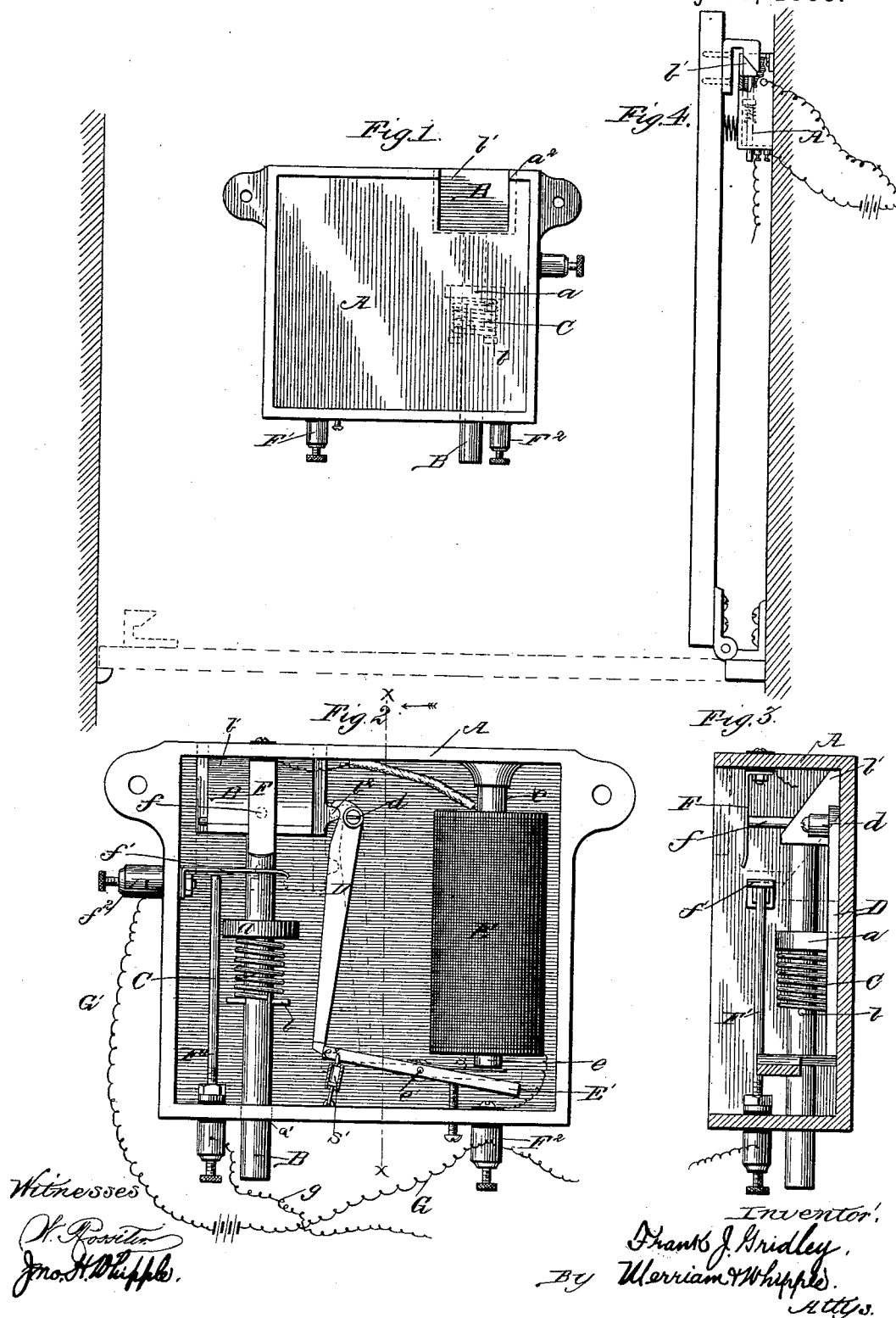


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ELECTRIC LOCK.

No. 386,066.

Patented July 10, 1888.

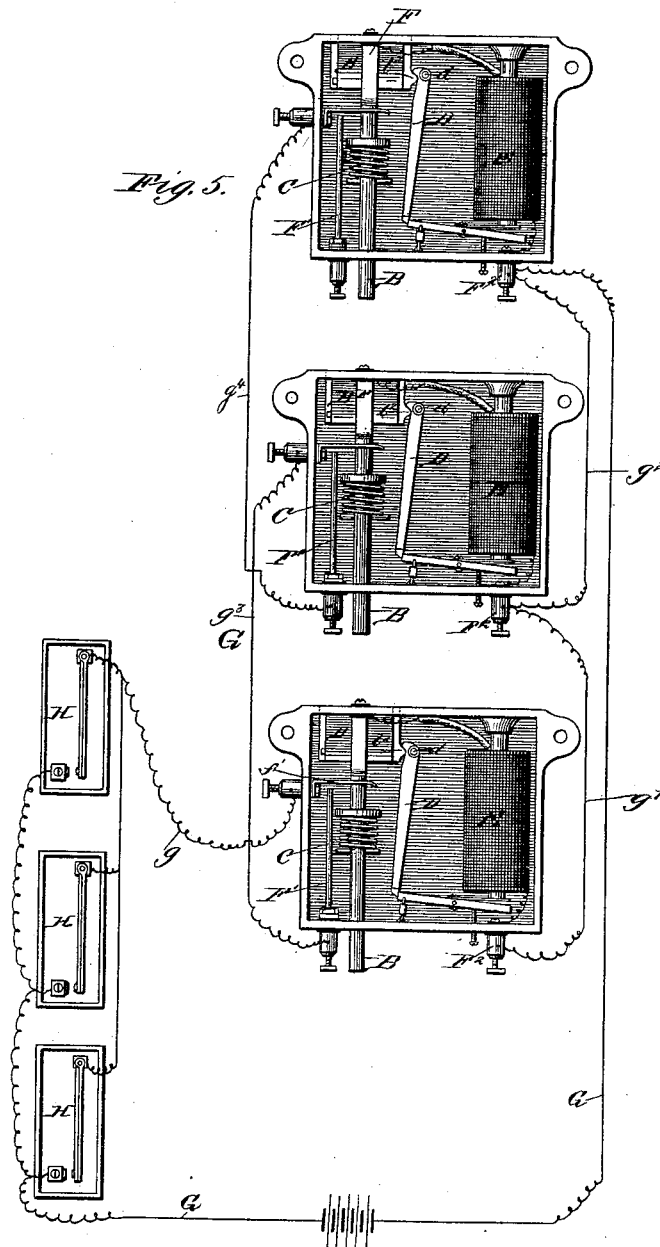


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No. 386,066.

Patented July 10, 1888.



Witnesses
W. H. Rowlett
James H. Whipple

Inventor:
Frank J. Gridley
By *Merriam & Whipple*
Attys.

UNITED STATES PATENT OFFICE.

FRANK J. GRIDLEY, OF CHICAGO, ILLINOIS, ASSIGNOR TO FREDERICK G. WHEELER, OF NEW YORK, N. Y.

ELECTRIC LOCK.

SPECIFICATION forming part of Letters Patent No. 336,066, dated July 10, 1888.

Application filed January 28, 1888. Serial No. 262,217. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. GRIDLEY, of Chicago, in the State of Illinois, have invented certain new and useful Improvements in Electric Locks and Method of Connecting the Same in Circuit, of which the following is a specification.

My invention relates to improvements in electric locks used for securing or fastening doors in elevator-wells, light-shafts, stairways, or other openings in buildings in such manner that the fastening may be released by an electrical impulse; and the object is to provide in such locks an electrical switch in combination with mechanism for operating the bolt, the arrangement being such that the sliding of the bolt or detent in the operation of unlocking will cut the electro-magnet of the lock out of the circuit and form a connection with extended wires arranged to carry the current farther on. In this manner a battery force just sufficient to operate one lock may be successfully used to operate a great number of locks connected so as to be successfully brought within one circuit by the operation of the switch. The switch and operating mechanism may be placed in various mechanical relations or arrangements with reference to the bolt, so that the vibrations thereof shall respectively break and restore the connection with the electro-magnet of the lock and respectively connect and disconnect the switch with the extended wire in the manner required. The mechanism and arrangement which at present appear to me to be best adapted to the purpose are illustrated in the accompanying drawings, in which—

Figure 1 is a front side view of a surface-lock. Fig. 2 is a view of the reverse side enlarged, showing the side that goes against the door. Fig. 3 is a section on line *xx* of Fig. 2, looking in the direction of the arrow. Fig. 4 is a vertical section of an elevator-well, showing the lock applied to a door therein. Fig. 5 represents a series of such locks connected in a circuit provided with thermostats for closing the same at various points.

A designates the casing or frame of the lock.

B is the bolt or detent, which is supported by being passed through an opening in a lug

or projection, *a*, of the casing and an opening in the casing at *a'*, so that it may slide freely back and forth. In the present instance the casing is cut away at *a''* to adapt it to the peculiar form of catch on the door used with it.

A spring, C, is placed between the lug *a* and a pin or projection, *b*, on the bolt and arranged so as to press against the pin and draw the contact end *b'* inward. When the bolt is pressed forward or set, as in locking, a lug or projection, *b''*, thereon engages a lever, D, pivoted at *d* and held against the lug, so as to counteract the spring and hold the bolt set.

An electro magnet consisting of a coil, E, and its core *e*, connected in the electrical circuit and arranged to actuate an armature, E', the latter being pivoted at *e'*, so as to be easily vibrated, is employed to operate the lever D. The end *e''* of the armature, resting against the lever, holds it set, and this is displaced by the vitalization of the magnet, so as to trip the lever and allow the bolt to slide in under the force of the spring C. To prevent accidental displacement, as by a slight jar in the building or concussion of air, a spring, *s*, or an ordinary dash-pot, *s'*, or both, may be employed to hold the end *e''* of the armature normally in position to engage the lever D against any slight impulse other than that of the electro-magnet tending to displace it.

The casing of the lock is made of metal or other conductive material, so as to form part of the circuit-way. It is provided with two insulated points, F and F', the first of which, through a metal projection, *f*, is in electrical contact with the bolt when extended, as seen in Fig. 3, but not when withdrawn, and the second of which, F', through a metal spring, *f'*, is in like contact when the bolt is withdrawn, as represented in the dotted lines, Figs. 2 and 3, showing the lowered position of the bolt, in which position the projection *f* has passed out of connection with the point F and has forced the spring *f'* into contact with the point F'. The circuit-wires G connect with the electro-magnet through an insulated post, F², and through said magnet with the point F on one side and with the lock-casing at *f*² or anywhere on the other side.

Referring to Fig. 5, which shows a series of

locks, the bolts thereof being set and the circuit being open at the thermostats H, it will be seen that the closing of the circuit by either of the thermostats would first form a short circuit over the wires G g g' g² through the lowermost lock, which would vitalize the electro-magnet thereof and trip the lever D. By this the bolt would be sprung down and the connection broken at F and closed on the point F' in said bolt. The breaking of the circuit at F and closing it at F' of this lock would cut out the wire g' and include g² to form a more extended circuit over the wires G g g² g³, including the second lock, which would receive the full force of the battery and be unlocked like the first, and this last operation would cut out the wire g² and bring in g³, extending the circuit to the third lock. In this manner the battery power might be thrown successively to each of an indefinite number of such locks so connected in circuit. The setting of the locks restores the connection at F and breaks it at F'. The setting of the lock is done by hand when locking the door to which the lock is attached. The projection b² rides on the edge of the lever D as the bolt is sprung down when the lever is released, and the lower end of the lever rides back on the armature, as shown in dotted lines, Fig. 2. The bolt is set by merely pushing it against the spring by the lower projecting end. This movement causes the projection b² to strike a corresponding projection on said lever at the top and swings the other end of the same by the end e² of the armature, which is weight or spring pressed, so as to come behind the other part and hold it against the projection of the bolt.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an electric lock, the combination, with an electro-magnet, of a bolt or detent under stress and an electrical switch, said switch being adapted to break an electrical connection with the electro-magnet and close the same with another circuit adapted to extend the said circuit by the operation of the bolt, substantially as specified.

2. In an electric lock, the combination, with an electrical switch, of a sliding spring-pressed bolt, an electro-magnet, and a separate insulated point distinct from said electro-magnet, for connecting a separate wire adapted to extend the electric circuit beyond said lock, said switch being connected with said bolt, substantially as shown and described, so that the vibrations thereof will operate said switch and alternately connect and disconnect the same with the coil of the electro-magnet and with said other insulated point, as specified.

3. In an electric lock, the combination, with an electrical switch, of a spring-bolt under stress, a lever and armature mechanism, substantially as shown and described, for holding and releasing said bolt, and an electro-magnet for operating said armature mechanism, said switch being connected with said bolt and the coil of the electro-magnet, substantially as shown and described, so that the vibration of the bolt in the direction required to unlock it will also throw the switch and sever the electrical connection with the electro-magnet, substantially as specified.

4. The combination, with an electric lock having a vibrating bolt under stress and connected with an electrical switch, so as to vibrate the same, and an electro-magnet in connection with mechanism, substantially as shown, for holding and releasing said bolt, of a battery and one set of wires, arranged, substantially as shown, with relation to said switch so as to form a short circuit over the coil of said electro magnet when the switch is thrown in one direction, and another set of wires employed in connection with part of the first set, and arranged, substantially as shown, with relation to said switch so as to cut out said electro-magnet and form a long circuit extending beyond said lock when said switch is thrown in the other direction, substantially as specified.

FRANK J. GRIDLEY.

Witnesses:

JNO. H. WHIPPLE,
JAMES R. DEAN.