

(No Model.)

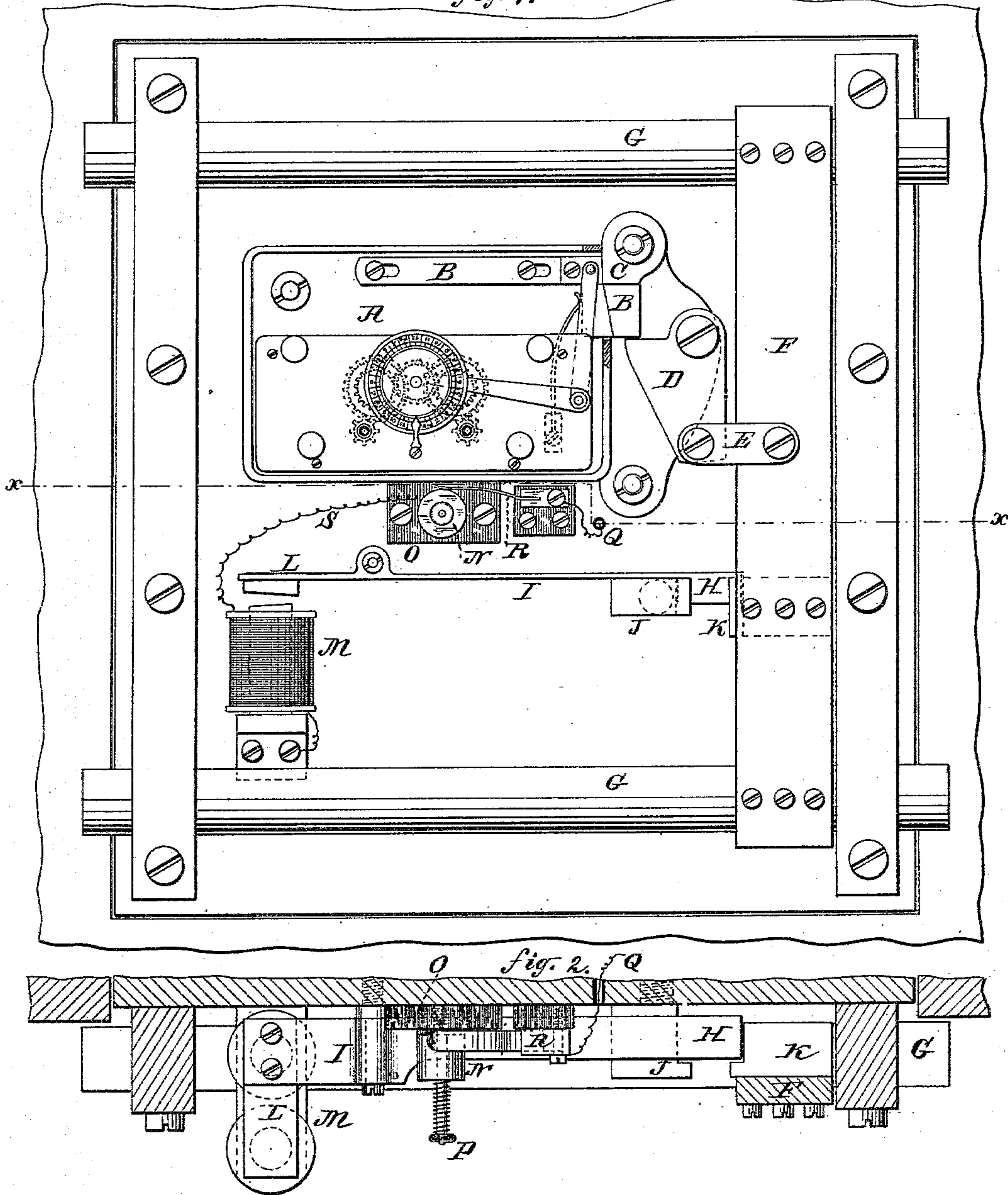
H. F. NEWBURY.

ELECTRIC LOCKING MECHANISM FOR SAFES AND VAULTS.

No. 296,866.

Patented Apr. 15, 1884.

fig. 1.



Witnesses:

Henry Pickling.

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ELECTRIC LOCKING MECHANISM FOR SAFES AND VAULTS.

SPECIFICATION forming part of Letters Patent No. 296,866, dated April 15, 1884.

Application filed April 24, 1883. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. NEWBURY, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Locking Mechanism for Safes and Vaults, (Case X;) and I hereby declare that the following is a full, clear, and exact description of one division of my invention, and will enable others skilled in the art to make, construct, and use the same.

I have discovered that when a chronometric lock is provided with a time-movement of ordinary construction it is liable, unless peculiarly mounted, to be defeated by the simple explosion against the outside of the safe or vault in which the lock is used of a small charge of dynamite or other quick explosive. The sudden and heavy shock occasioned thereby, if properly directed, can be made to break or disarrange the more delicate parts of the clock-work. This releases the main wheel from the control of the escapement, and the time-movement immediately begins to "run down," and as the dial or other device which acts upon the lock-bolt to withdraw it or to permit it to be withdrawn from the locking position is actuated by the same spring that drives the main wheel, its speed will be correspondingly accelerated, so that the lock will be unlocked almost instantly. I have also discovered that both time-locks and combination-locks, when bolted rigidly to the door of a safe or vault, (which is the mode of mounting them more generally heretofore practiced,) can be unseated by the explosion of a charge of dynamite or similar material against the exterior of the door. This is due to the momentum communicated to the lock by the explosion. The displacement of the lock releases the door-bolts from its guarding action and leaves the door in condition to be opened.

The object of the present invention is to provide means whereby, under the circumstances indicated, the door can be kept locked; and it consists in combining with a locking-bolt (either the main bolt of the lock or a bolt supplemental to the main lock) an electro-magnet capable of operating the same or of acting upon a detent to permit the same to be operated, such magnet being placed in an electric circuit, the parts of which are so constructed and arranged that upon the occur-

rence of a sudden and heavy shock the circuit will be changed, being either opened or closed, as the case may be, or the magnet will be moved out of operative relation to the armature, or the latter to the magnet.

The invention is fully illustrated in the accompanying drawings, in which Figure 1 shows the interior of a safe-door provided with a time-lock, a supplemental locking-bolt, and an electro-magnet arranged to operate in conformity with the invention, Fig. 2 being a horizontal section of the same on the line *x x*.

Referring to the drawings more in detail, A represents a time-lock, the bolt or "dog" of which, B, when in the advanced position, comes between the fixed abutment C and the pivoted jaw D, which is connected by the link E to the tie-bar F, that unites the door-bolts G G. With the lock-bolt B in the position shown in the drawings, the door is locked; but if it be removed from between the abutment C and the jaw D (as occurs periodically at predetermined hours when the mechanism is operating normally, or as might occur instantly upon the occurrence of a shock sufficient either to displace the lock or to break its works and release the mainspring from the control of the escapement) the lock-bolt will cease to oppose any resistance to the retraction of the door-bolts when pressed back by the ordinary door-handle and spindle.

Arranged below the lock A is a supplemental locking device, H, which, in the form here shown, (although it may be constructed in various other forms and be arranged in many other ways and still embody the same principle of operation,) is attached to one end of a lever, I, and works between the fixed abutment J, secured to the safe-door, and the stud K upon the tie-bar F. Upon the other arm of lever I is arranged an armature, L, under the control of the electro-magnet M. This magnet is placed in a circuit which communicates with the exterior of the safe. Whenever, by the manipulation of a contact key or button provided for that purpose, the circuit is closed, the armature is attracted and the supplemental locking bolt or dog is raised from between the abutment J and the stud K, and ceases to oppose the retraction of the door-bolts. When, on the other hand, the circuit is interrupted or open, the bolt H falls into the locking po-

sition, and alone would hold the door locked independently of the main lock A.

N is a movable block placed in the circuit of the electro-magnet and arranged in proximity to the main lock. This block is secured to a plate of vulcanite or other non-conducting material, O, by means of a long bolt, P, provided with a spiral spring, which normally holds the block back against the plate O. The rear of the block N is faced with a non-conducting substance. The current, entering the safe-door at Q, passes to the flat spring R, which also is supported by a plate of insulating material, to the block N, and thence by the wire S to the coils of the magnet, the battery being arranged in any convenient locality.

In order to unlock a safe-door provided with a time-lock and this supplemental locking mechanism, it will be necessary that both bolts—the lock-bolt B and the supplemental bolt H—be withdrawn from the locking positions. If at any time the attempt should be made by the use of an explosive against the exterior of the safe to remove the time-lock or to damage its works so as to cause it to unlock, the shock, if sufficient to produce either of these results, would project the block N inwardly, permitting the spring R to fall in behind it, which would lock it in such position that the circuit would be permanently interrupted. This would secure the bolt or dog H in the locking position, and thus hold the door of the safe locked, regardless of any injury done to the main lock.

It is manifest that many other devices might be arranged for interrupting or breaking the circuit. The electro-magnet itself might be arranged upon a slight support near the main lock, so as to be thrown by the shock out of operative relation with the armature; or the armature might be so arranged as to be thrown out of place; or various contrivances might be arranged to break the wire. It is immaterial to the invention what particular means be adopted, provided only the circuit be so far disturbed by the shock as to make it impracticable to operate the bolt H by electrical connections with the exterior of the safe.

An electro-magnet placed in a circuit capable of being interrupted in the manner above described may also be applied with advantage to the ordinary lock-bolt, provided the lock be so secured to the safe as not to be dislodged by the shock to which it may be subjected, and provided, also, the lock be so constructed that its bolt is not withdrawn from the locking position by the positive action of the clock, but is allowed to remain in such position after

the arrival of the predetermined hour for unlocking. In such lock the magnet could be utilized to withdraw the lock-bolt after the arrival of the hour for unlocking in precisely the same manner in which it is made to withdraw the supplemental bolt H in the mechanism shown in the drawings after the bolt B of the lock A has moved into the unlocking position.

As above indicated, this invention is not limited to time-locks, but may be used also in connection with ordinary combination-locks, and this whether it be applied to the lock-bolt proper or to a supplemental locking-bolt.

Instead of arranging a supplemental locking-bolt in such manner that normally it will be in the locking position, being capable of being withdrawn therefrom by the magnet on the closing of the circuit in which the magnet is placed, as shown in the drawings, it is plain that the magnet might be placed in a normally-closed circuit and made normally to hold the locking device in the unlocking position. With such construction and arrangement of parts the battery and entire circuit might be within the safe, although such special arrangement would not be the most desirable, because of the possibility of the battery, if not properly cared for, running down while the door of the safe is closed, and then producing a lock-out.

Still another way of arranging the electrical connections of the magnet would be to employ a normally-open circuit, some part of which is made movable under the force of an explosion directed against the exterior of the safe, and capable by the movement thus imparted to it of closing the circuit. The magnet thus energized could be made to withdraw a detent from the supplemental locking-bolt and let it fall into the locking position. With this arrangement, again, the magnet and the entire circuit might be inclosed within the safe.

What is claimed as new is—

The combination of the door-bolts of a safe or similar structure, a locking device for holding said bolts in the locking position, an electro-magnet for controlling such locking device, and an electric circuit leading to the magnet, with provision for a change in the continuity of the circuit, substantially as and for the purpose described, whereby a sudden and heavy shock directed against the exterior of the structure will change the electric circuit from its normal condition, and thus secure the door-bolts from being unlocked.

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Witnesses:

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