(Model.)

3 Sheets—Sheet 1.

H. F. NEWBURY.

TIME LOCK.

No. 265,932. Patented Oct. 10, 1882.

Fig. 1.

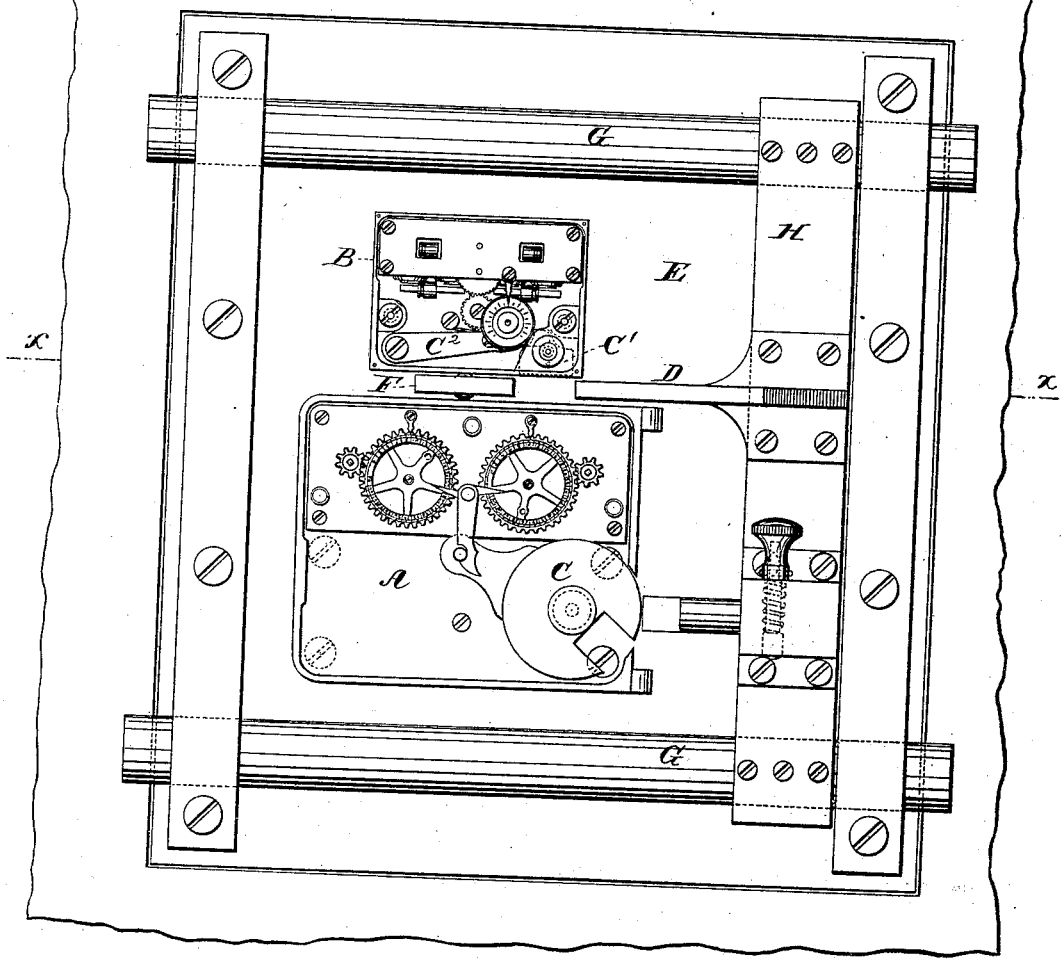
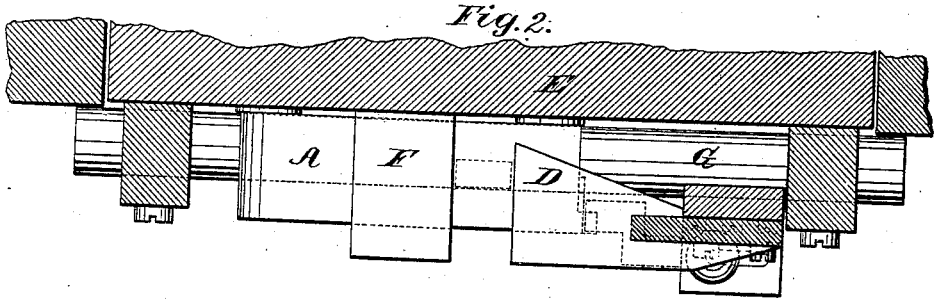


Fig. 2.



WITNESSES:

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(Model.) 3 Sheets—Sheet 2.

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TIME LOCK.

No. 265,932. Patented Oct. 10, 1882.

Fig. 3.

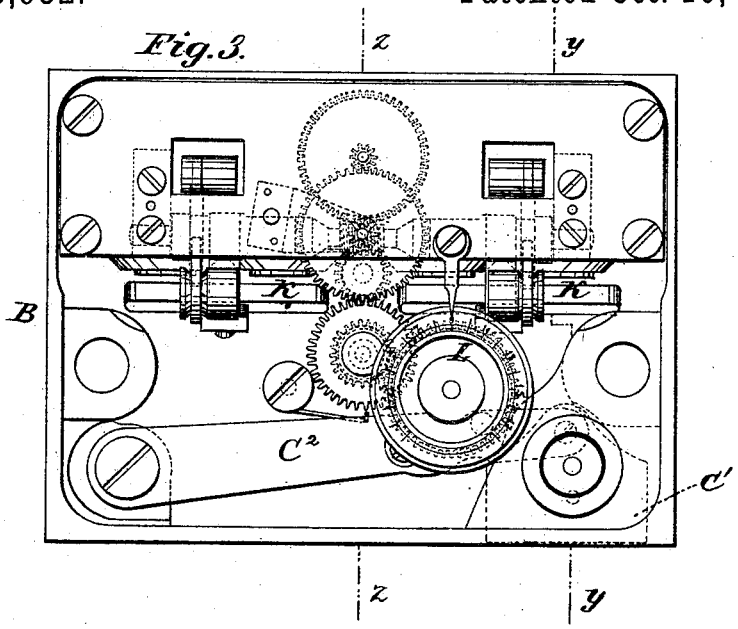


Fig. 4.

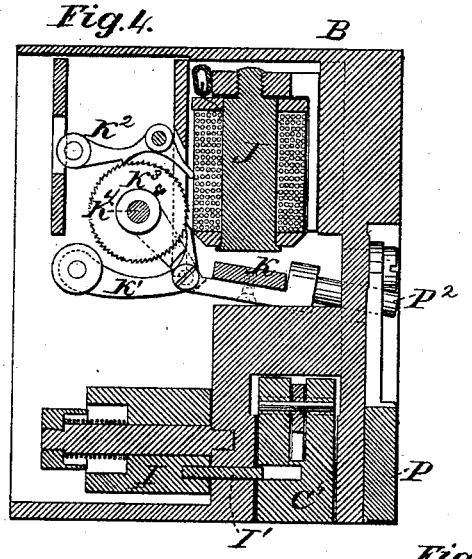


Fig. 5.

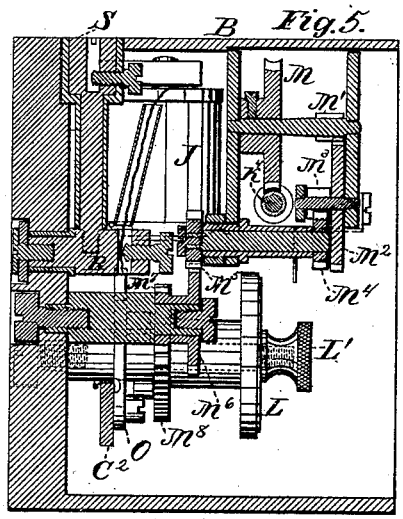
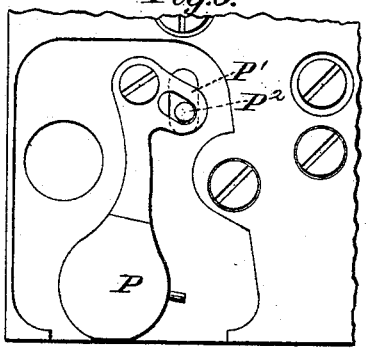


Fig. 6.



WITNESSES:

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(Model.)

3 Sheets—Sheet 3.

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TIME LOCK.

No. 265,932. Patented Oct. 10, 1882.

Fig. 7.

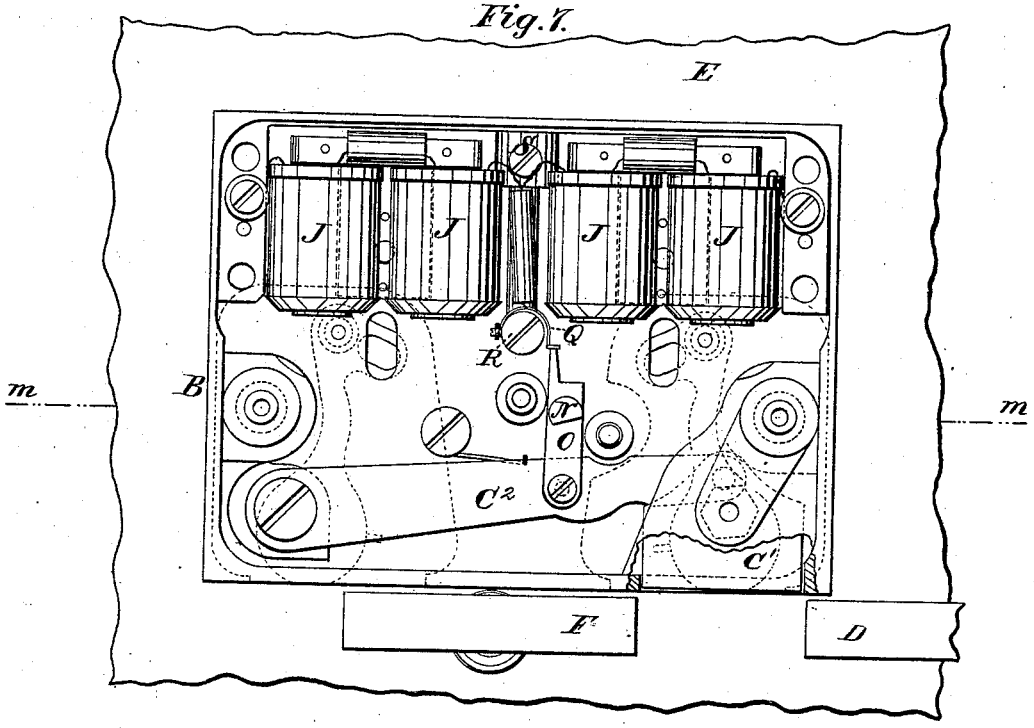
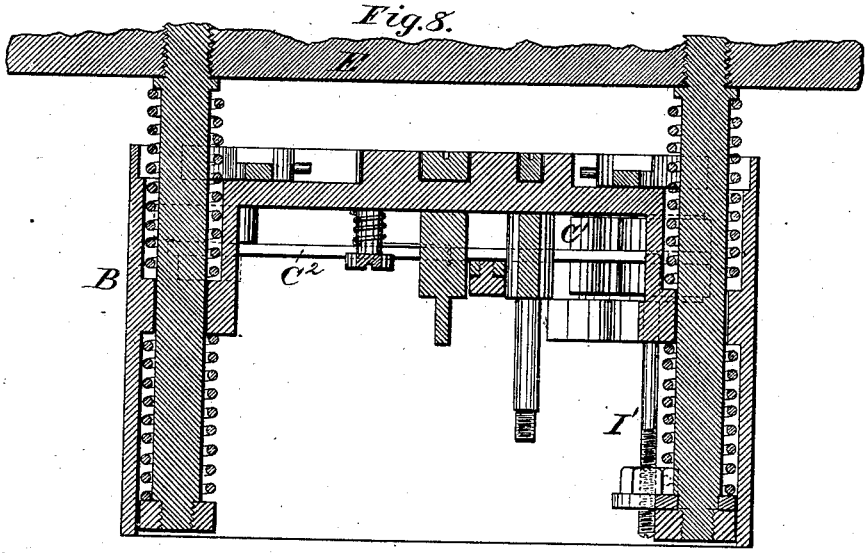


Fig. 8.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HENRY F. NEWBURY, OF BROOKLYN, NEW YORK.

TIME-LOCK.

SPECIFICATION forming part of Letters Patent No. 265,932, dated October 10, 1882.

Application filed May 22, 1882. (Model.)

To all whom it may concern:

Be it known that I, HENRY F. NEWBURY, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Locks and the Mode of Mounting the Same; 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 which it appertains to make, construct, and use the same.

The invention, although serviceable with any kind of a lock, is designed more particularly for use in connection with time-locks.

I have discovered that any of the time-locks now in use can be defeated by the burglar without difficulty by the simple explosion against the outside of the safe or vault in which the lock is used of a small charge of dynamite, nitro-glycerine, or other quick explosive, whereby the lock is subjected to a sudden and heavy shock, sufficient to break or disarrange its more delicate parts. This releases the main wheel from the control of the escapement, and the clock or time movement of the lock 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 move from the locking position is actuated from the same spring that drives the main wheel, its speed will be correspondingly accelerated, so that the lock will be unlocked almost immediately, as the result of the explosion or other shock. This kind of insecurity in time-locks may be overcome in various ways, different means therefor being made the subject of several applications for Letters Patent heretofore filed by me in the Patent Office of the United States, and designated as Cases "A," "B," "C," and "D," patented August 1, 1882, and numbered, respectively, 262,093, 262,094, 262,095, and 262,096. According to the inventions described in those applications, a supplemental guard or checking device may be arranged in combination with the lock in such a manner as to remain inactive under ordinary circumstances, but to be brought into operation to dog the train of the clock or the bolt of the lock upon the occurrence of any shock sufficient to break the time-movement, (Case A;) or (Case B,) the construction may be such that upon the occurrence of a shock calculated to injure the clock, some part of the train between the mainspring and the lock-bolt will be moved out of position, so as to interrupt the connection between these parts, which will permit the lock-bolt to remain in the dogging position, notwithstanding the mainspring runs down; or, again, (Case C,) the staffs of the time-movement may be provided with supplemental bearings, which will preserve the continuity of the train although the staffs should be broken; or (Case D) a centrifugal detent may be attached to one of the wheels of the clock, which, upon any undue acceleration of speed, will be thrown out, and by acting upon a fixed stop or upon the trigger of some supplemental automatic stop, will arrest or retard the motion of the clock.

Whenever a supplemental check or guard is brought into action in any of the ways described in Case A, or otherwise, it will be found exceedingly desirable to be able to withdraw such device from the locking position without the necessity of cutting into the safe or vault. The present invention relates to means for accomplishing this desirable result, and is fully illustrated in the accompanying drawings, in which—

Figure 1 is a view, in elevation, of a time-lock and a supplemental locking mechanism mounted on the inner face of the door of a safe or vault, Fig. 2 being a plan of the parts shown in Fig. 1 below the line *x x*. Fig. 3 is an enlarged elevation of the supplemental safety mechanism, Fig. 4 being a vertical transverse section of the same on the line *y y* of Fig. 3, looking toward the left, and Fig. 5 a vertical transverse section on the line *z z* of Fig. 3, looking toward the right, while Fig. 6 is a partial rear elevation of the mechanism, showing the pendulum, described in full hereinafter. Fig. 7 is a view of the interior of the case containing the mechanism, showing more particularly the arrangement of the magnets and the mode of short-circuiting them; and Fig. 8 is a horizontal section on the plane of the line *m m* of Fig. 7, designed to show the mode of mounting the supplemental mechanism to prevent it from being torn away from the safe.

Referring to these several figures more in de-

tail, A, Fig. 1, represents a time-lock, that here shown being of the well-known Sargent pattern, and B the supplemental safety mechanism to which the present invention relates. This mechanism is mounted upon the door E independently of but near to the main lock.

C is the bolt or dog of the time-lock, and C′ the dog of the supplemental safety mechanism, which is pivoted on the end of the lever C^2.

D is a rigid stud or tongue-piece attached to the tie-bar H, which connects the door-bolts G G, and F is a stud secured to the door and serving as an abutment for the supplemental dog, C′. When this secondary dog is in the raised position, as indicated in Fig. 1, it offers no resistance to the retraction of the bolt-work of the door; but when it is caused to take up a position between the stud F and the end of the tongue-piece D the door at once becomes locked thereby independently of the main lock below. A convenient mode of holding this secondary check in the raised position is shown in section in Fig. 4, in which I is a tubular block of metal supported by a stationary central stud and carrying a pin-detent, I′. When the parts are so adjusted that this pin enters the recess in the dog C′ the dog is held up; but when the pin is withdrawn the dog immediately falls into the locking position. The pin is capable of being thus withdrawn by the movement of the detent-block I on its supporting-stud. A spiral spring interposed between the cap of this stud and the block holds the latter to its seat, and thus keeps the pin I′ in engagement with the dog under normal conditions. If, however, the mechanism be at any time subjected to a violent shock, such as would arise from an explosion occurring near it but on the outside of the safe, the block I will be projected inward against the force of its spring, and thus will withdraw the pin I′ from the dog C′.

An alternative mode of supporting and releasing the secondary dog is shown in Figs. 7 and 8, in which the supplemental safety mechanism is so mounted as to be capable of a longitudinal motion on its supporting-bolts. The detent-pin I′, which, under ordinary circumstances enters the dog C′ and holds it in the raised position, is attached to an arm which is rigid on the end of one of these bolts. A violent explosion directed against the outside of the door E will force it inward, and will withdraw the detent-pin from the dog and let the dog fall. This secondary dog may be withdrawn from the locking-position by the use of electro-magnets and armatures operating on the same general principle as the electromotors described in Letters Patent No. 213,809 for time-lock, granted to Charles E. Chinnock, April 1, 1879.

The manner in which I propose to use these devices is illustrated in Figs. 3 to 7, inclusive.

Referring to these figures more in detail, J J are electro-magnets, (one only may be used; but it is deemed preferable to duplicate them,) to which a current of electricity is supplied by properly-insulated wires leading through the walls of the safe. The making and breaking of the circuit in which these magnets are placed will alternately attract and release the armatures K, and the repeated movement of either of these armatures, under normal conditions, will, through the medium of the gravity-pawls K′, the retaining-pawls K^2, and the ratchet-wheel K^3 produce rotation of the worm-shaft K^4. The revolving motion of this shaft is transmitted to the dial L through the medium of the worm-wheel M, Fig. 5, pinion M′, wheel M^2, pinion M^3, wheels M^4, M^5, and M^6, pinion M^7, and dial-wheel M^8. The revolution of this dial-wheel M^8 brings a pin projecting from the rear of the wheel against a stud or projection, N, on an arm, O, which rises from the lever C^2, and thereby gradually and slowly lifts the dog C′ from the locking position.

The speed of the electromotors may be controlled by the use of suitable governors, the form of governor here shown being the same as that described in the Chinnock patent above referred to. It consists of a pendulum, P, pivoted in a recess in the back of the clock-case, Fig. 6, and connected with the corresponding armature by the slotted arm P′ and the arm P^2. With this arrangement each upward movement of the armature necessitates the swinging of the pendulum from its position of rest, and of course retards the movement of the armature, and thus the speed of the worm-shaft and the connected train through to the unlocking or dial wheel. Some governor acting to prevent the too rapid movement of the armatures is important. Otherwise the electromotors might be used to aid one seeking surreptitiously to open the safe or vault.

It will readily be understood that the spaces between the teeth on the ratchet-wheel and the resistance of the coils and the weight of the pendulum should be so adjusted that with the highest attainable rate of vibration of the armature the dial and the unlocking-wheel M^8 will be moved through less than an entire revolution within such period of time as would be available to a person seeking surreptitiously to withdraw the dog C′ after it has been brought into the locking position.

In practice it will be found easy to adjust the parts so that the dial at its highest attainable speed will move approximately at the rate of one revolution in twenty-four hours or any other definite period of time. When it is attempted to move the armatures more rapidly, they will fail to move far enough to actuate the ratchet-wheels.

The normal adjustment of the unlocking-wheel M^8 is regulated by means of the dial L. By unscrewing the nut L′ and moving the dial forward, the wheel M^8, which is on the same sleeve with the dial, will be disengaged from the pinion M^7. The dial can then be shifted on its axis, so as to set the unlocking-pin at any desired point. An index aids in this adjustment.

In order to prevent tampering with this sup-

plemental safety mechanism and changing the adjustment of the unlocking-pin by clandestinely connecting a battery with the mechanism, and operating it in advance of an attack upon the other locks of the safe or vault, a cut-off should be provided, so that when the dog C′ is in the raised position the magnets will be short-circuited. This may be accomplished in various ways. The means here shown consists in causing the lifting-arm O on the dog-actuating lever C^2 to strike against and lift the spring Q, attached to the post R. When these parts are in contact the magnets are short-circuited, and the main current is from the insulated post S, where it enters the lock-case, to the insulated post R, on which the spring Q rests, thence to the arm O, lever C^2, and walls of the case. It is only when the dog C′ falls and contact between the arm O and the spring Q is broken that the magnets are brought into operation, the entire current in that case passing from the post R directly to the coils of the magnets, and thence to the walls of the case. Instead of short-circuiting the magnets, other means may be provided for rendering the electromotors inoperative to change the adjustment of the unlocking-wheel while the dog remains raised. For instance, the raising of the dog-actuating lever might be made to act mechanically to stop the operation of the parts either by limiting the range of the armatures, so as to prevent them from moving the ratchet-wheels, or by tripping the lower pawls, K′, or, again, by interposing an obstruction in the train between the ratchet-wheels and the dial-wheel.

The current for operating the electromotors is preferably to be supplied from any suitable generator outside the safe or vault in which the mechanism of which these motors form a part is used. When so supplied the walls of the safe or vault may be made a part of the circuit. It is possible, however, to use a battery placed inside the safe. In this case the fall of the dog C′ may be made to close the circuit previously open, and if the circuit be provided with an automatic circuit-breaker the work of unlocking will immediately begin; but the adjustment of the unlocking-wheel should be such that the work will not be completed during the time available to the burglar who is seeking to effect an entrance into the safe.

Instead of retracting the dog of the supplemental safety mechanism by means of an electromotor, as above described, it might, by proper connections, be operated mechanically through the medium of the handle and spindle, which are used to move the door-bolts substantially as these parts are used to retract the bolt of the main lock in the event of a lock-out, as set forth in Letters Patent to Lewis Lillie, granted on the 7th day of August, 1877, No. 193,973; or, again, it might be operated by the movement of the spindle of an adjacent combination-lock, if such be used, as set forth in Letters Patent granted to C. O. Yale on the 21st day of March, 1876, No. 174,996.

In order to prevent the supplemental safety mechanism to which this invention relates from being torn away from the inner face of the safe by the violence of the shock used to cripple the main lock, the safety mechanism should be mounted upon flexible and elastic supports in the manner provided for the protection of time-locks in an application for Letters Patent heretofore filed by me, and designated as "Case H." Such mode of mounting is shown in the present case in Fig. 8. As here shown the case of the supplemental mechanism is secured to the face of the safe-door by means of screw-bolts of such length as to leave a considerable space between the lock and the door, and stiff spiral springs are placed on the bolts, both between the case and the door and between the case and the heads of the bolts. This mode of mounting, it is found, will preserve the connections of the safety mechanism with the door as against the force of the severest shock.

As hereinbefore indicated, the present invention is not necessarily limited to the use of the supplemental check and mechanism for withdrawing such check from the locking position in connection with time-locks. It is also serviceable with ordinary combination or non-time locks when these latter are so mounted as to be capable of being removed from their fastenings by an explosion on the outside of the safe. With the latter, as well as the former, if the supplemental check is arranged to take against some part of the bolt-work of the safe-door, as shown in Fig. 1, the main lock might be wholly destroyed, and yet the supplemental check furnish complete protection to the safe.

What is claimed as new is—

1. The combination of a lock arranged to dog or guard the bolts of a safe or vault door, a supplemental guard or check arranged to be brought into action by the force of a shock capable of breaking or displacing the main lock or parts of the same, and means for withdrawing such supplemental check from the locking position arranged within the safe or vault and constructed to be operated with a slow motion, as set forth.

2. The combination of a lock arranged to dog or guard the bolts of a safe or vault door, a supplemental guard or check arranged to be brought into action by the force of a shock capable of breaking or displacing the main lock or parts of the same, and one or more electric motors for withdrawing such supplemental check from the locking position, and a governor for retarding the speed of such motors, for the purpose set forth.

3. The combination of a lock arranged to dog or guard the bolts of a safe or vault door, a supplemental guard or check arranged to be brought into action by the force of a shock capable of breaking or displacing the main lock or parts of the same, and means for withdrawing such supplemental check from the locking

position with a slow motion, such supplemental check and such unlocking mechanism being mounted on a flexible and elastic support, as set forth.

4. In combination with a supplemental guard or check arranged to be brought into action by a shock capable of breaking or displacing the main lock of a safe or vault, means for withdrawing such supplemental guard from the locking position with a slow motion, and devices for short-circuiting such unlocking mechanism or otherwise rendering it inoperative while the supplemental guard is in the raised position.

HENRY F. NEWBURY.

Witnesses:
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ROBT. H. DUNCAN.