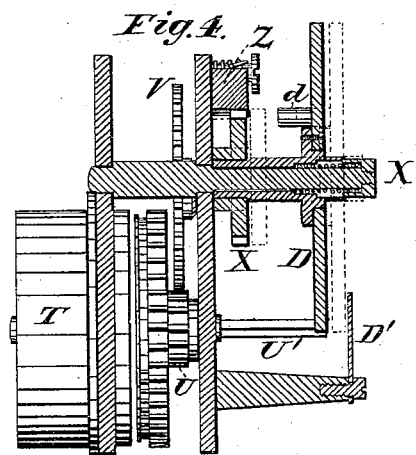
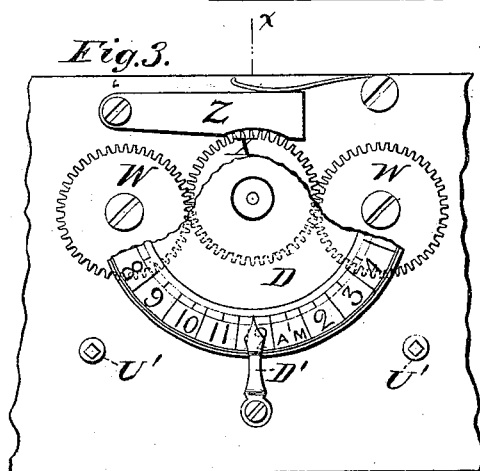
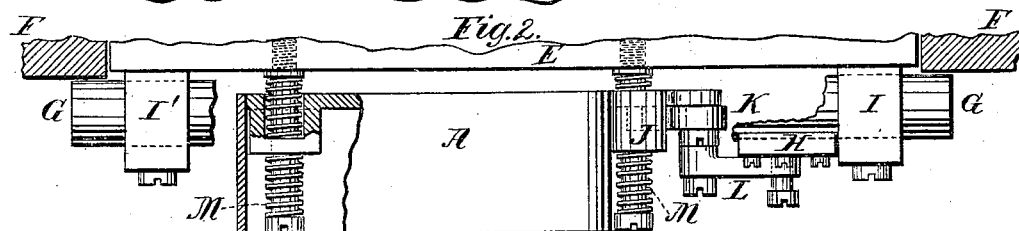
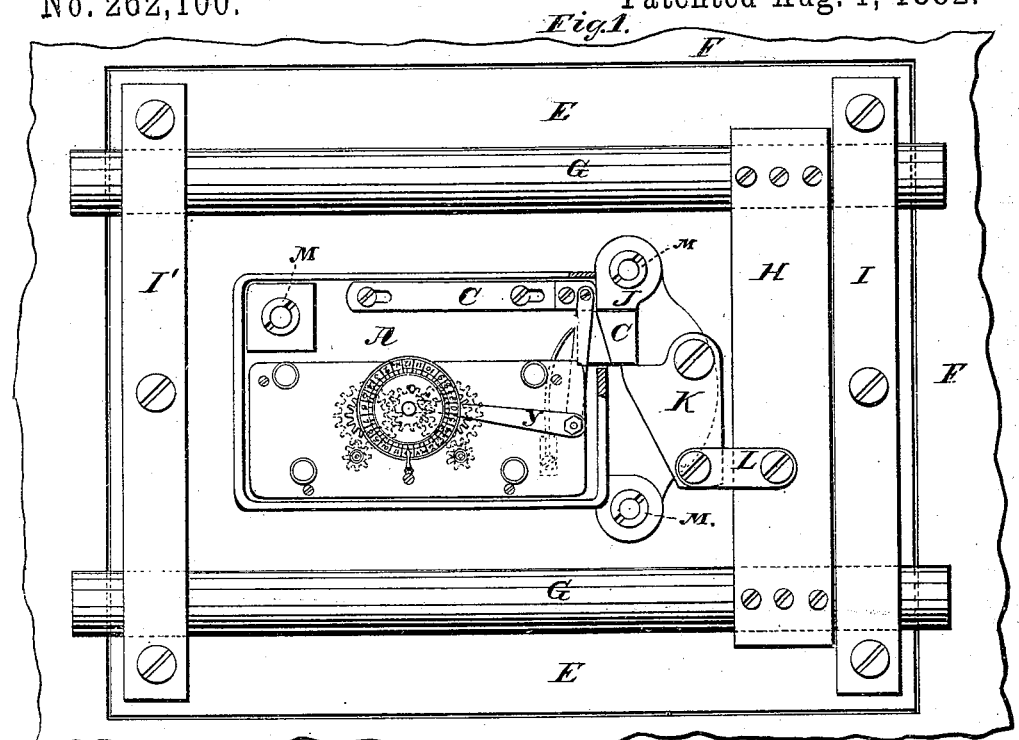


H. F. NEWBURY.

TIME LOCK.

No. 262,100.

Patented Aug. 1, 1882.



WITNESSES:
R. D. Gaylord,
Rich. H. Duncanson

INVENTOR
Henry F. Newbury

H. F. NEWBURY.

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Fig. 6.

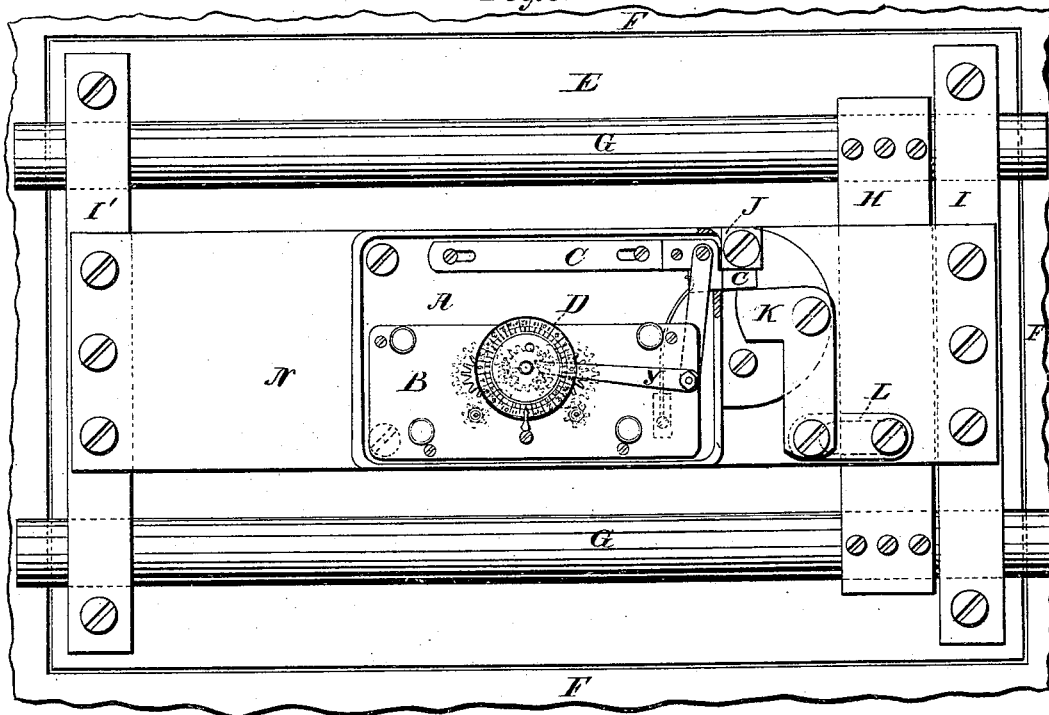


Fig. 7.

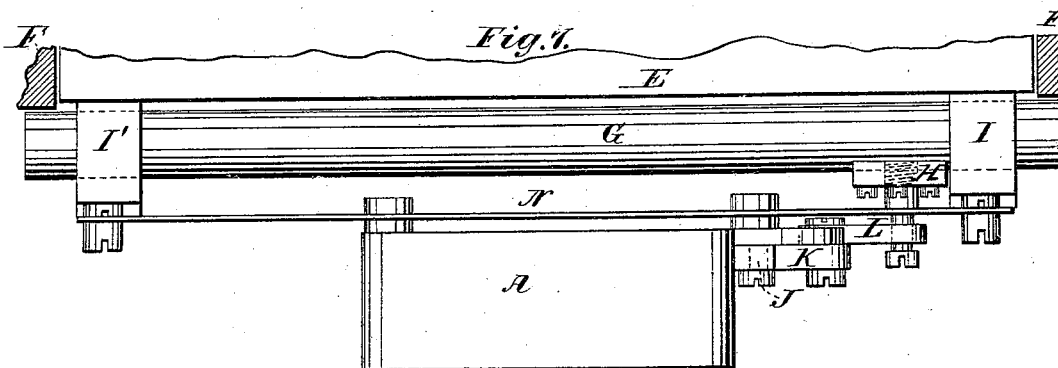
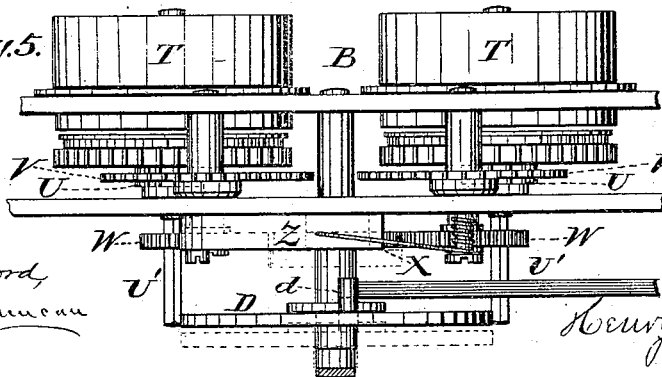


Fig. 5.



WITNESSES:

R. D. Gaylord,
Robt H. Duncan

INVENTOR

Henry F. Newbury

UNITED STATES PATENT OFFICE.

HENRY F. NEWBURY, OF BROOKLYN, NEW YORK.

TIME-LOCK.

SPECIFICATION forming part of Letters Patent No. 262,100, dated August 1, 1882.

Application filed April 27, 1882. (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 Chronometric or Time Locks and the Mode of Mounting the Same, (Case H;) and I do hereby declare that the following is a full, clear, and exact description of my invention, and will enable others skilled in the art to which it appertains to make and use the same.

A chronometric or "time" lock, as the term is understood in the art of safe or vault protection, is a lock whose bolt or checking device (sometimes technically called "dog") is, for the purpose of unlocking, at least, under the control of a time-movement capable of withdrawing it automatically, or of permitting it to be withdrawn, from the locking position upon the arrival of the hour for which the mechanism has been set. By placing such locks upon the interior of structures to be protected, and without mechanical connection with the exterior thereof, it has been supposed that an efficient security is provided against what are known as "masked burglaries," and that thus locks of this class afford complete protection against the operations of the burglar, except when he resorts to violence calculated to force the walls of the safe or vault. I have discovered, however, that the security thus afforded is apparent only, and that any of the time-locks now upon the market, when mounted in the established way, can be defeated by the burglar without difficulty and without resort to force to break or penetrate the walls of the structure in which the lock is used. From this it results that practically a safe or vault guarded by a combination-lock has its security increased but little, if any, by the addition of any of the existing time-locks, and that the protection afforded by such time-lock alone is far less reliable than that afforded by an ordinary combination-lock alone. This defect in the existing chronometric locks as heretofore mounted arises from the frangible character of certain parts of the time-movement, which in all fine work are made so slight and delicate as to be broken readily by a sudden shock, such as might be communicated to them through the walls of the safe or vault by the explosion of a small charge of dynamite, nitro-glycerine, or

other quick explosive outside the walls of the structure, but in proximity to that part of the walls against which the lock is secured. The parts of a time-movement which are the farthest removed from the main wheel are the most delicate, and therefore the most easily broken, this being the case especially with the staff of the third wheel and with the pallet and escape-wheel staffs. The journals of these staffs, as ordinarily constructed, are made exceedingly small for the purpose of reducing the surfaces of contact, and thus the friction, to a minimum, and the finer the workmanship of the lock the slighter and more frangible these parts are likely to be. Any material increase in the extent of the bearings, whereby the strength of the parts would be augmented, would correspondingly increase the friction and impair the time-keeping properties of the movement. Time-locks with jeweled movements, also, are especially exposed to injury in the manner indicated, since the jewels, by reason of their brittleness, might easily be broken by the force of an explosion of great intensity in close proximity to them. The destruction of any of the parts intermediate between the balance-wheel and the main wheel at once releases the main wheel from the control of the escapement, and the movement immediately begins to "run down," a movement which otherwise would continue to run for several days now running down in as many seconds. As the dial or other device arranged to act upon the lock-bolt or dog to withdraw it or permit it to move from the locking position is actuated from the same spring which drives the main wheel, its speed will be correspondingly accelerated, so that the dog, instead of being withdrawn from engagement with the bolt-work of the door at the regular hour for which the lock has been set, will be withdrawn immediately upon the explosion or other shock, leaving the safe or vault, so far as the time-lock is concerned, entirely under the control of the burglar. If there are other locks on the door (either combination or key locks) the burglar will probably have effected the unlocking of them in advance of his attack upon the time-lock, either by picking them, or forcing them, or by threats compelling the cooperation of the custodian of the key or combination. In whatever way this may be done, the subsequent unlocking of the bolt of the

time-lock in the manner indicated (and repeated experiments show that this can readily be done with a charge of dynamite so small as to make but little noise and not even indent or otherwise appreciably affect the walls of the safe) removes all obstruction to free access to the valuables placed under the protection of such lock.

The present invention seeks to overcome this difficulty in the use of time-locks as heretofore mounted; and it consists in providing the lock with some form of safety mechanism to prevent the retraction of the lock-bolt in case the lock is broken, and in mounting the lock upon flexible and elastic supports to prevent it from being torn from its fastenings and to preserve its operative connection with the door-bolts.

The invention is fully illustrated in the accompanying drawings, in which Figure 1 is a view of the inner face of the door of a safe or vault, showing the ordinary multiple bolt-work and the lock in elevation, the lock here shown being the well-known Holmes time-lock, although it will be evident that the invention is applicable to the Sargent and the Yale locks, or to any other of the existing time-locks; and Fig. 2 is a plan of the parts shown in Fig. 1, the upper door-bolt being broken away and a part of the lock-case being removed for the purpose of showing with greater distinctness the arrangement of the supporting-bolts and their spiral springs. Fig. 3 is a front view of the dial (shown in part only) and the parts immediately connected therewith, Fig. 4 being a transverse vertical section of the lock mechanism, the section being taken along the dial-arbor on the dotted line *x x* of Fig. 3, and Fig. 5 being a plan or top view of the two time-movements, showing their relation to and connection with the dial. Figs. 6 and 7 show in elevation and plan, respectively, a modified form of flexible mounting.

Referring to the drawings more in detail, A represents the time-lock; B, the time-movements of the same; C, the lock-bolt; D, the dial; E, the door of the safe or vault; F, the frame or jamb of the door; G G, the door-bolts; H, the carrying or tie bar; I I', the bolt-bars; J, the abutment for the end of the lock-bolt C to bear against; K, a pivoted angle or bell-crank lever, and L the link which connects such lever with the carrying-bar. When the dog or end of the bolt C is interposed between the abutment J and the head of the angle-lever K the door-bolts are locked. When the lock-bolt is retracted the door-bolts G G can be thrown back and the door opened. This last may happen at the predetermined hour under the regular action of the time mechanism; or, as above explained, it may be effected at exceptional hours by the breaking of some part or parts of the clock-work by a sudden and heavy shock, unless special appliances are used to prevent the clock from running down at such times, or if the mainspring runs down to prevent it from acting on the lock-bolt. Such appliances have been invented by

me, and have been made the subject of various applications for Letters Patent heretofore filed by me in the Patent Office of the United States, and designated Cases A, B, C, and D. According to these inventions 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—illustrated also in Figs. 3, 4, and 5 of the present application) 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. These special modes of protection will be found sufficient, except as against a shock of such intensity as to destroy the fastenings of the lock and remove it bodily from its seat. To prevent such destruction of the fastening-bolts, it is proposed by the present invention to make the mounting of the lock flexible and elastic by means of springs or equivalent devices. One mode of effecting this is illustrated in Figs. 1 and 2. In these figures the lock is shown as secured to the door of the safe by four long screw-bolts; M M, each of these bolts being provided with stiff spiral springs interposed between its head and the lock-case and between the lock-case and the face of the door. The lock-case is suitably recessed for seating these springs, as fully shown in Fig. 2. Another mode of mounting, involving the same principle, is illustrated in Figs. 6 and 7, in which, instead of securing the lock directly by long screw-bolts passing through the case, and cushioning the parts with spiral springs, the lock is attached directly to a thin elastic metal bar, N, spanning the space between the bolt-bars I I' or other suitable supports. As this supporting-bar is fixed, and the pin which connects the link L to the tie-bar H passes through it, there must of course be a slot in this bar for the pin to work in to permit of the requisite backward-and-forward movement of the door-bolts. Such slot is indicated by dotted lines behind the link in Fig. 6.

Whatever the form of supports which may be selected, it will be understood that it is not proposed by the present invention to make the

space between the lock and the door or wall to which it is attached so wide as thereby to secure the lock against contact with the door or wall as the result of a sudden and heavy shock directed against the exterior, as such mode of mounting a time-lock, by the use of flexible supports, forms the subject of another application for Letters Patent heretofore filed by me and designated as "Case E." The present invention, on the other hand, contemplates that the door of the safe may be driven by such a shock against the lock and with such violence as would be sufficient to break it and cause the mainspring to run down or the lock-bolt to move into the unlocking position; hence the necessity in the present case of some form of safety mechanism to prevent the movement of the lock-bolt under such circumstances. One of the various forms of mechanism adapted to this purpose is illustrated in Figs. 3, 4, and 5, being the mode of protection which forms the special subject of my application for patent above referred to as "Case B." The mainsprings are contained in the drums T T, and the connections between each of these springs and the dial D, which is revolved thereby, is by means of the pinions U on the arbors of the springs, the spur-wheels V, the pinions W on the same shafts as the wheels V, and the intermediate dial-wheel, X, secured to the same hub as the dial and turning with it. The pin d, projecting from the back of the dial, is the pin which operates the bolt-withdrawing lever Y. A hollow nut, X', screwed on the end of the dial-arbor, conceals a spiral spring, which serves, under ordinary circumstances, to hold the dial-wheel X in mesh with the wheels W; but under the influence of a sudden shock the dial will be thrown forward, the spring yielding sufficiently to permit the wheels X and W to disengage, when the pivoted detent Z, which previously had ridden on the periphery of the wheel X, now drops behind it and prevents its return. The dial thereupon comes

to a halt, notwithstanding the clock may have been broken and have thus caused the mainspring to take on unusual speed. The dotted lines in Figs. 4 and 5 indicate the position of the dial and the dial-wheel X when the latter has been disengaged from the wheels which connect it with the main spring or springs. U' is the winding-post, and D' the dial-index.

By providing the lock with the above or some other suitable form of safety mechanism which will prevent the retraction of the lock-bolt when a shock occurs which breaks the lock the door-bolts will still be dogged, provided the fastenings of the lock itself have not given way, and this is prevented by making these fastenings flexible and elastic, as above explained. Of course in the use of the flexible and elastic supports the connections between the lock and the carrying-bar should be made somewhat loose, to compensate for the to-and-fro movement of the lock. It is for this purpose that the pin which connects the link L with the carrying-bar H is slightly elongated, as seen in Figs. 2 and 7. The amount of play thus required will be small, however, as compared with that required by the conditions of protection set forth in Case E, above referred to. In the present case the spiral springs of Fig. 2 or the flexible bar of Figs. 6 and 7 may be made very stiff, comparatively speaking, and still possess all the required utility of keeping the lock from being torn off by the force of a shock acting against the outside of the door.

What is claimed as new is—

The combination, with a time-lock, of a flexible and elastic mounting and means, substantially as described, for preventing the premature retraction of the lock-bolt when the time mechanism is subjected to a shock sufficient to break its more delicate parts.

HENRY F. NEWBURY.

Witnesses:

A. B. JONES,
ROBT. H. DUNCAN.