

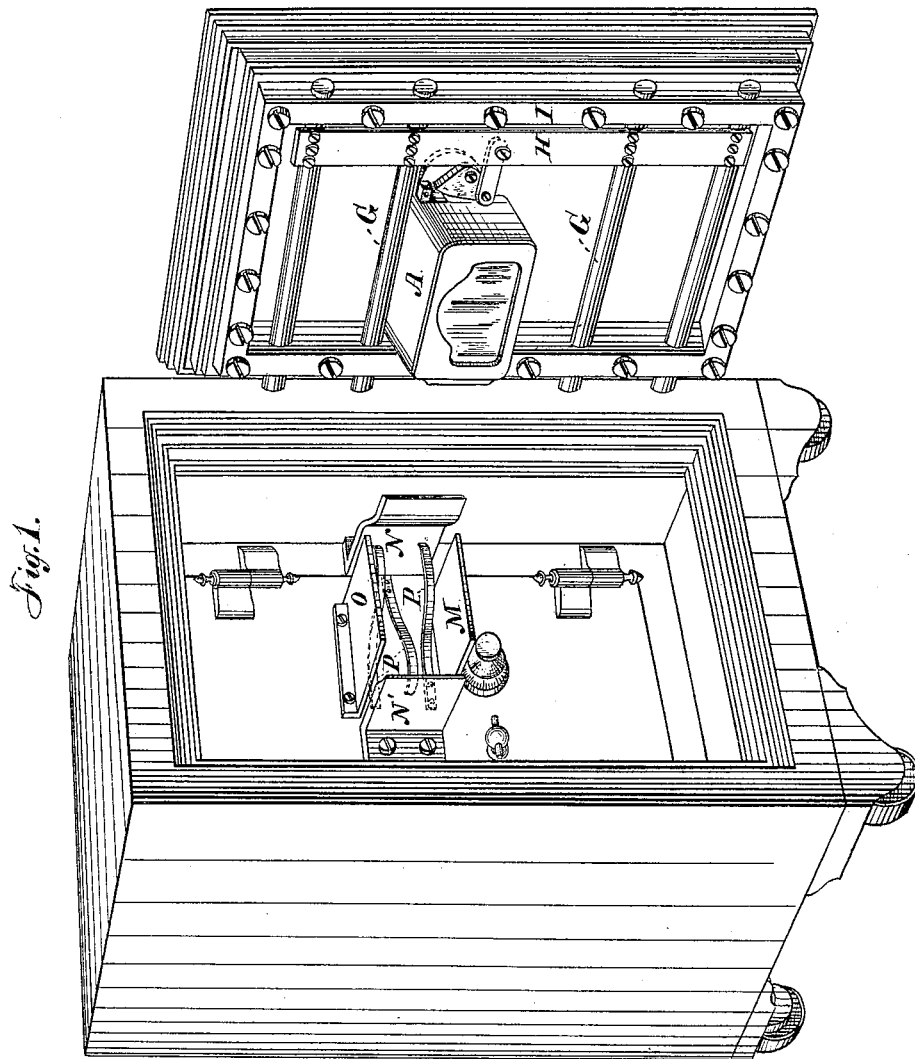
(No Model.)

3 Sheets—Sheet 1.

H. F. NEWBURY.
TIME LOCK.

No. 262,101.

Patented Aug. 1, 1882.



Witnesses:
R. D. Gaylord,
Robt. H. Duncan

Inventor
Henry F. Newbury

(No Model.)

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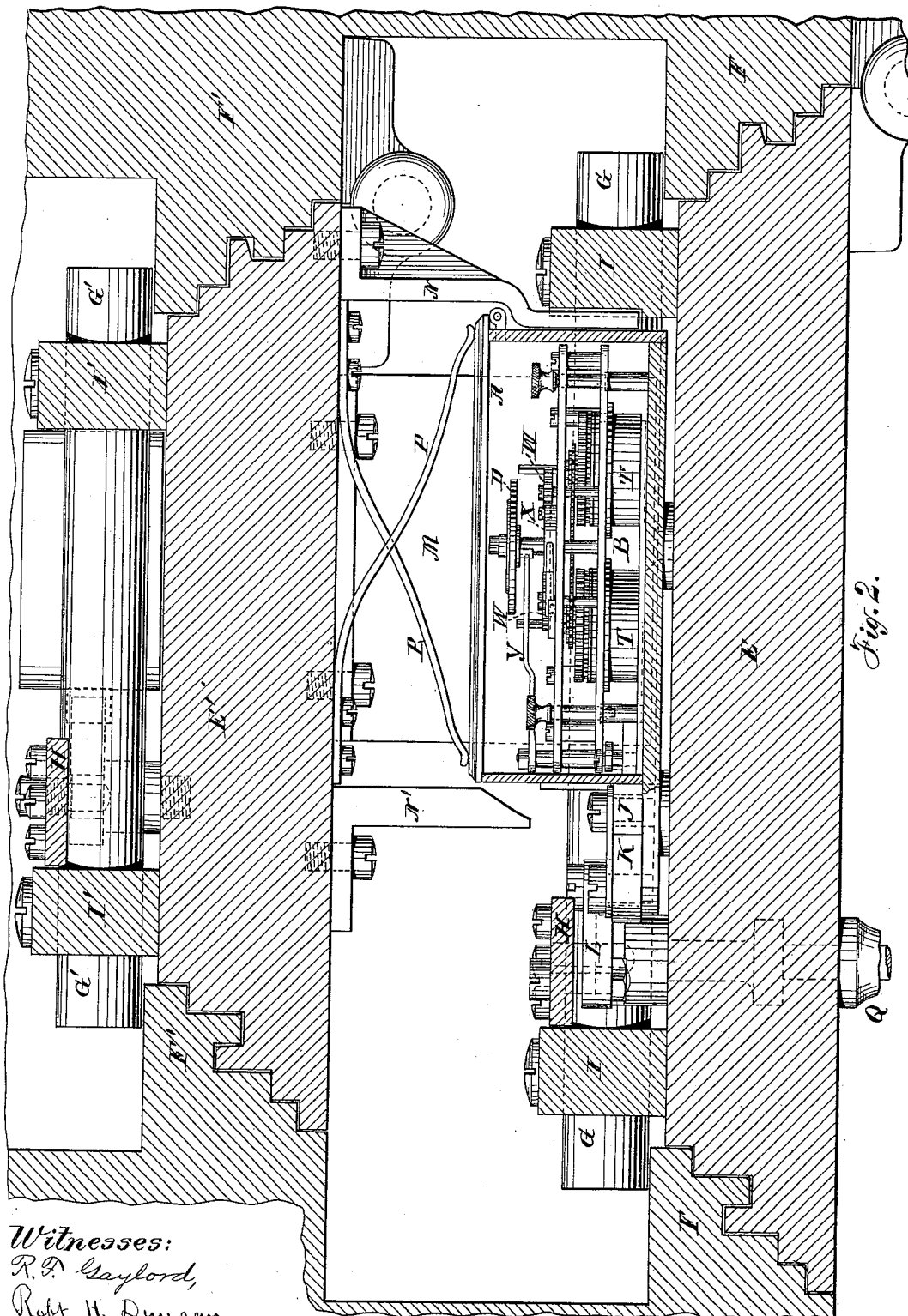


Fig. 2.

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Robt H. Duncan

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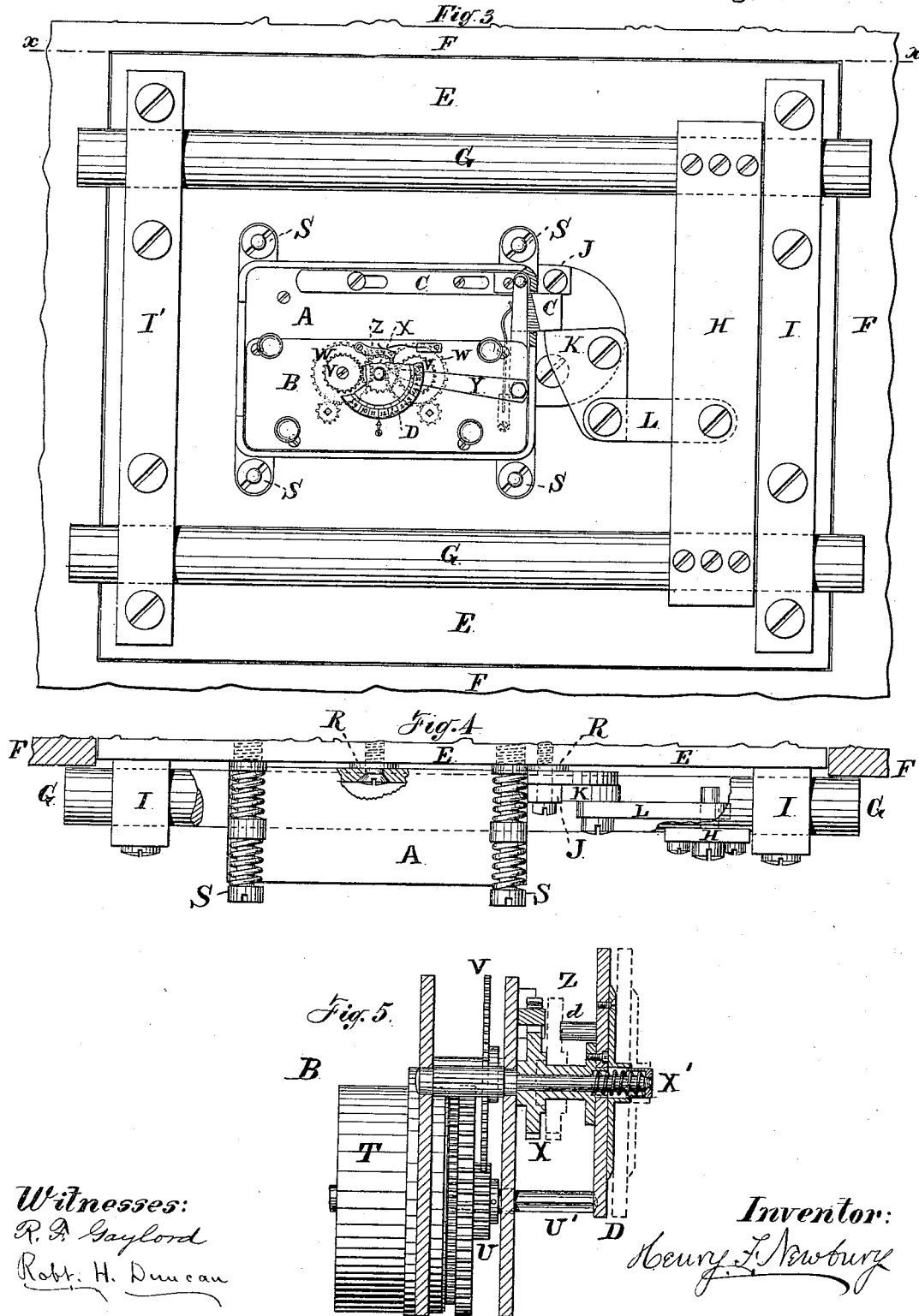
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UNITED STATES PATENT OFFICE.

HENRY F. NEWBURY, OF BROOKLYN, NEW YORK.

TIME-LOCK.

SPECIFICATION forming part of Letters Patent No. 262,101, dated August 1, 1882.

Application filed April 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. NEWBURY, of the city 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 I;) and I do hereby declare that the following is a full, clear, and exact description of my invention, which 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at least, under the control of a time-movement capable of withdrawing it automatically or of permitting it to be withdrawn from the locking position upon the arrival of the hour for which the mechanism has been set.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 the 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 surface-contact, and thus the friction, to the 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 without rewinding 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 co-operation 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 connected with the use of existing 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 providing a supplemental support to sustain the lock if the ordinary fastenings are destroyed, and thus preserve its operative connection with the door-bolts.

The invention is fully illustrated in the accompanying drawings, in which Figure 1 is a view in perspective of an open safe, showing a time-lock secured to the inner face of the outer door and a supplemental support secured to the outer face of the inner door. Fig. 2 is a horizontal section of a portion of the safe, showing the two doors, the space between them, the time-lock, from which the top of the case has been removed, and the supplemental support; and Fig. 5 is a transverse vertical section of the lock mechanism shown in Fig. 2, the section being taken along the dial-arbor. Figs. 3 and 4 show in elevation and plan, respectively, a modified form of supplemental support.

Referring to the drawings more in detail, A is a time-lock, that here shown being the well-known Holmes lock; B is the time-movement; C, the dog or lock-bolt; D, the dial; E and E', the outer and inner doors of the safe; F F', the door frames or jambs; 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 bolt-work is 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-work 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 already been

made the subjects of various 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. 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 Fig. 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 that 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 the 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 the lock from being thrown or from falling out of position when its fastenings are thus destroyed, and thereby releasing the bolt-work, the present invention provides supplemental supports so arranged that although all the fastening-bolts of the lock be broken the lock will still be held in working position by the supplemental supports. One form of such supplemental support is shown in Figs. 1 and 2. In these figures M is a shelf bolted to the inner door at a height a trifle lower than the bottom of the lock, and extending forward under the lock when the outer door is closed. N N' are two end abutments to prevent lateral movement of the lock, and O is an upper abutment, designed to prevent the lock from being lifted upward. P P are stiff springs, arranged to press against the face of the lock and crowd it against the door in opposition to its tendency to be thrown inward away from the door by the force which breaks the fastening-bolts. These springs would be unnecessary if the space between the two doors were but a trifle in excess of the thickness of the lock. The special function of the rear lateral abutment, N, and of the top abutment, O, is to prevent the lock from being forced out of place by pressure brought against it from the outside through the medium of the spindle Q after its fastening-bolts may have been destroyed. A lock constructed like the Holmes lock (shown in Fig. 1) would

require both of these abutments; but in using locks in which a backward pressure on the carrying-bar would not tend to lift the lock, as in the case of the Yale or the Sargent time-lock, the top abutment would ordinarily not be necessary. On small safes, however, the top abutment as well as the two lateral ones should be used, as it would prevent the lock from being displaced by the overturning of the safe.

The inner door of the safe in Figs. 1 and 2 is shown as carrying a combination-lock and bolt-work which are operated in the usual way, the spindles and handles for operating them not being shown in Fig. 2.

Another form of supplemental support is illustrated in Figs. 3 and 4. In this case the lock is secured to the door of the safe by the use of bolts, with only thin rubber washers R interposed between the safe-door and the lock-case, in the manner at present usually practiced. In addition to this, however, other bolts, S S, are provided, which pass through ears on the lock-case, and are seated in the safe-door. These bolts are of much greater length than the others, and carry spiral springs in the manner shown. If the main bolts should be broken by the force of a shock, these supplemental bolts, with their springs, could be relied upon to sustain the lock and keep it from being thrown out of operative connection with the bolt-work of the door, the springs being useful also to graduate the shock, so as to relieve the bolts from the danger of being broken. It will be seen that the operation is substantially the same as in Figs. 1 and 2; but in one respect the latter construction is superior. When the supplemental support is attached to the inner door it is far less likely to be affected by an explosion or other heavy shock directed against the door which carries the lock.

Both of the above forms of supplemental support, but particularly the first one, (shown in Figs. 1 and 2,) will be found advantageous when the interior space immediately adjacent to the door is too limited to permit much play to the lock. Where a wider space is available the lock may be mounted on flexible supports, and at such distance from the face of the door as by this very means to be protected from any considerable shock. Such mode of mounting, however, forms no part of the present invention, but is the subject of another application for Letters Patent heretofore filed by me and designated as Case E.

It is evident that the present invention is not limited as to the particular construction of the time-lock used, but is broad enough to include the use, in the manner described, of other locks—such, for instance, as the Sargent or the Yale—the principle of the invention being, first, to protect the lock-bolt against retraction, and, second, to prevent the lock from being released by the destruction of its ordinary fastenings from its operative connection with the bolt-work of the door.

One of the modes above referred to of protecting the lock-bolt against retraction by the premature running down of the mainspring is illustrated in detail in Figs. 2, 3, 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 connection 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 Fig. 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.

The invention herein set forth differs from that which forms the subject of another application for patent filed by me contemporaneously herewith and designated as Case H, in that in the present invention the lock has two sets of supports, one of which, spoken of as the "supplemental support," is intended to be brought into action only when the other has been destroyed, and which may or may not be elastic according to circumstances, while in Case H the lock is mounted directly upon supports, which are so constructed and arranged that their flexibility and elasticity prevent them from being materially injured by any shock directed against the safe less than what would be required to set or bind the door-bolts by the distortion of the parts.

What is claimed as new is—

1. The combination, with a time-lock, of a supplemental support for holding the lock in operative connection with the door-bolts of the safe or vault in which the lock is used in case the main fastenings are destroyed, and means for preventing the retraction of the lock-bolt when the time mechanism is subjected to a shock sufficient to break its more delicate parts, substantially as specified.

2. The combination, with a time-lock, of a supplemental support for holding the lock in

operative connection with the door-bolts of
the safe or vault in which the lock is used in
case the main fastenings are destroyed, such
support being attached to the same door as
5 the lock and provided with springs to gradu-
ate the shock, and means for preventing the
retraction of the lock-bolt when the time mech-

anism is subjected to a shock sufficient to
break its more delicate parts, substantially as
specified.

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