(No Model.) 2 Sheets—Sheet 1.

H. F. NEWBURY.

TIME LOCK.

No. 265,933. Patented Oct. 10, 1882.

fig. 1.

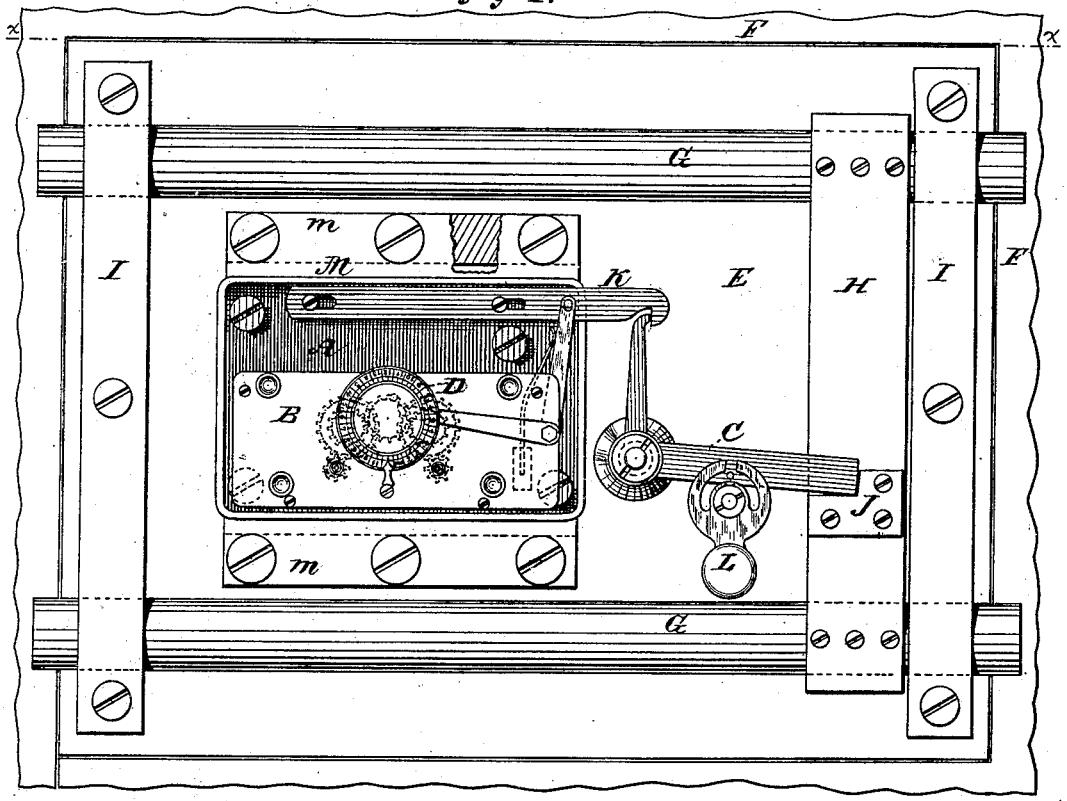
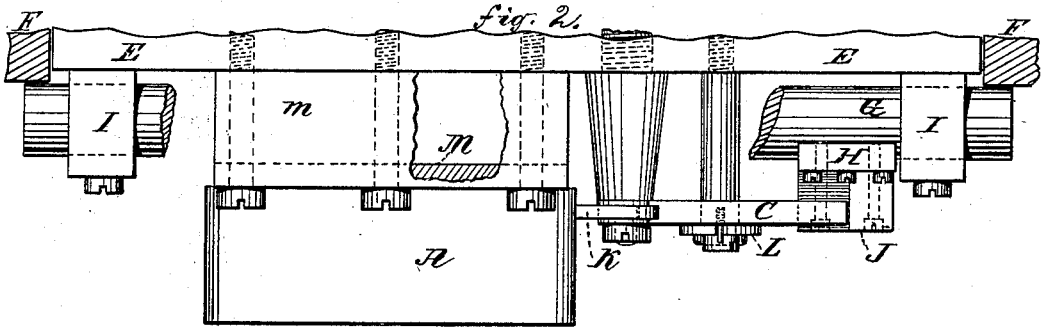


fig. 2.



Witnesses:
Henry Gibling
R. D. Gaylord

Inventor
Henry F. Newbury

(No Model.)

2 Sheets—Sheet 2.

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Patented Oct. 10, 1882.

fig. 3.

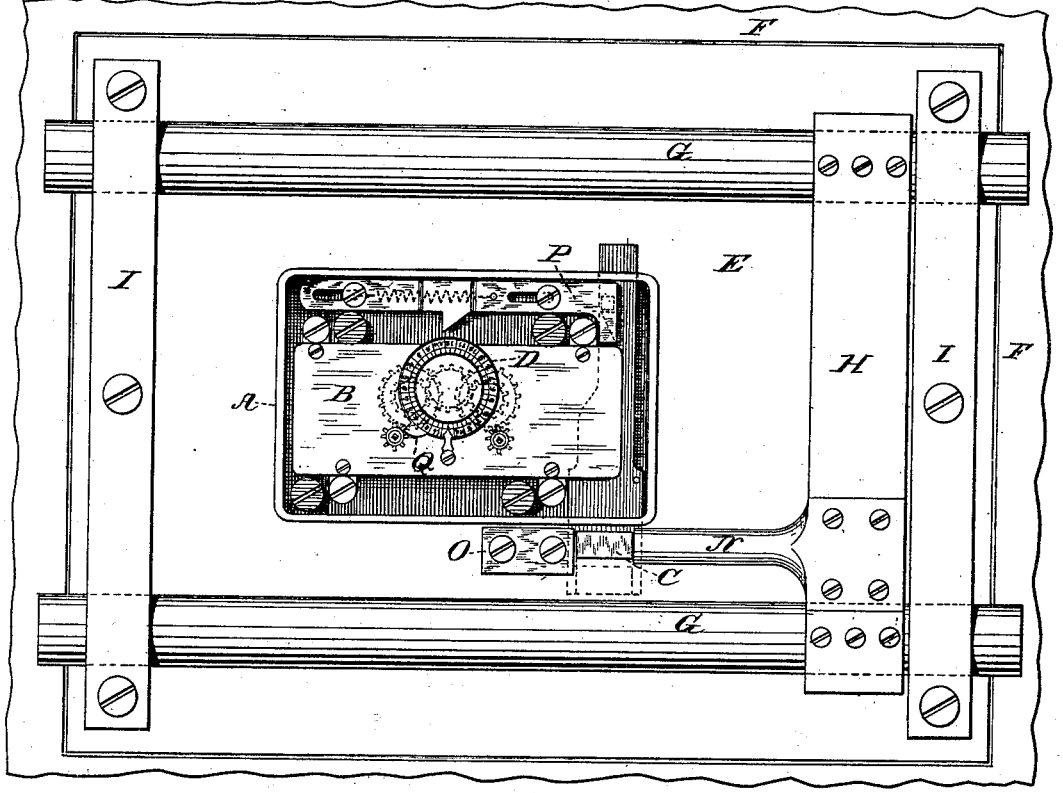


fig. 4.

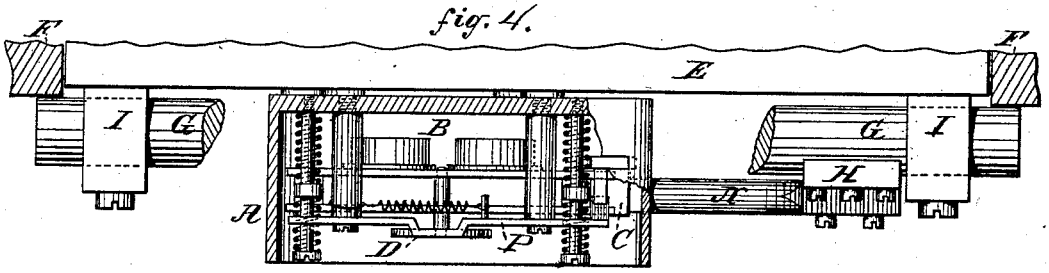
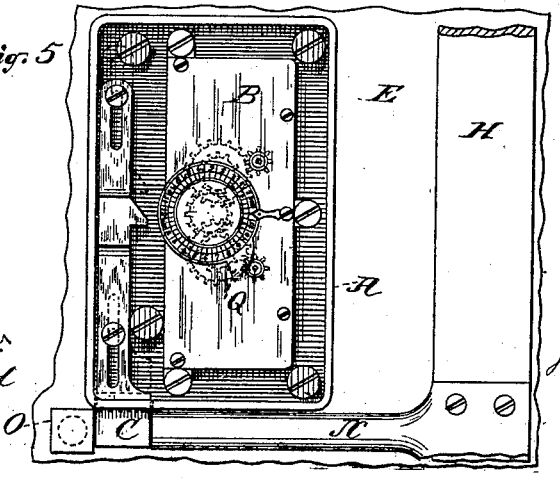


fig. 5



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. 265,933, dated October 10, 1882.

Application filed June 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 Mode of Mounting the Same; and I do 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 and use the same.

A "chronometric" or "time" lock, as the term is understood in the art of safe and 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 previously 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-locks 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 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 are these parts 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 that 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 any 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 what-

ever 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 the existing time-locks as heretofore mounted; and it consists, in a general way, in mounting the time mechanism of the lock upon a flexible or yielding support or supports, a sufficient space being left between the parts thus flexibly mounted and the adjacent portions of the safe or vault or the rigidly-mounted parts of the lock to prevent concussion of the clock-work under the force of an explosion or other shock directed against the exterior of the structure for the purpose of damaging the lock, and thus destroying its control over the door-bolts, the lock-bolt or dogging device being at the same time attached to the door or wall of the safe rigidly, or at least comparatively so, and normally being held in the locking position by means outside the flexible support to which the time mechanism is attached.

The invention is fully illustrated in the accompanying drawings, in which—

Figure 1 is a view in elevation of a modified construction of the well-known Holmes lock applied to the door of a safe in conformity with the present invention, Fig. 2 being a plan view of the lock and its connections, the upper door-bolt being broken away the better to show the lock, and a part of the rubber support being broken away the better to show the space between the lock and the door. Figs. 3 and 4 show in elevation and plan, respectively, another construction of lock mounted so as to embody the invention; and Fig. 5 is an elevation of a third form, all to be more fully explained hereinafter.

Referring to Figs. 1 and 2 more in detail, A is the case of the time-lock, and B the time mechanism, this form of lock usually having two clocks acting on the common dial, D. The clock-work is not fully shown, as its construction is too well understood in the art to render this necessary.

C is the lock bolt or dog, which, instead of being arranged within the lock-case, as is usual with the Holmes lock, is pivoted directly and rigidly upon the door E of the safe, its form also being changed to meet the requirements of the changed location.

F is the door-frame; G G, the door-bolts; H, the carrying or tie bar; I I, the bolt-bars, and J a shouldered stud attached to the tie-bar and adapted to serve as a rest for the end of the lock-bolt C. This bolt is connected with the clocks for the purpose of unlocking, through the medium of the sliding bar K, with which it engages. When bar K is in the advanced position the lock-bolt falls down into the angular recess in stud J, and this locks the door-bolts against retraction. When, however, the bar K is drawn back, as normally it will be by the action upon it of the revolving dial at the predetermined hour, the lower end of the bolt or dog C is thereby raised and the door is unlocked.

As shown in Figs. 1 and 2, the mounting of the lock is as follows: The entire lock, except the lock-bolt, is first bolted to a sheet of rubber, M, and this sheet of rubber is then bolted to the door; and for this purpose it is provided on its back with two flanges or ribs, *m m*, which serve the double purpose of strengthening the rubber when the screw-bolts pass through it and of raising the body of the sheet, and thus lifting the lock away from the door.

With a time-lock mechanism mounted in this manner, if sufficient space be left between the lock and the door or other adjacent portion of the safe, a very heavy and sudden shock may be brought against the exterior of the structure in the locality of the lock without producing any material injury to the time mechanism. By reason of the yielding or flexible connection between the lock and the door, the vibration imparted to the solid mass of the door by such shock is not transmitted to the lock except in a slight degree, and not enough to break or displace any of the parts of the lock, as would immediately happen were the lock so near the door that it would be brought into contact therewith by the force of the explosion or other shock.

As above stated, the lock-bolt C is arranged outside the lock-case. If it were placed within such flexibly-mounted case, it would of course partake of all the vibrations of the case, and this would require the use of extended bearings or yielding connections between the lock-bolt and the bolt-work of the door, for the purpose of preserving the continuity of the connection between them. Such use of extended bearings or yielding connections is fully illustrated and described in another application for Letters Patent (Case E) heretofore filed by me in the Patent Office of the United States, (a patent therefor having been granted me August 1, 1882, as No. 262,097,) and therefore need not here be more fully explained. The present invention, while completely protecting the clocks from injury by the mode of mounting the parts of the lock which embrace the clocks, does not require either the extended bearings or the flexible or yielding connections which form an essential part of the invention set forth in Case E. With the mechanism shown in Figs. 1 and 2, for instance, a violent shock, as from an explosion of dynamite against the exterior of the door, would put the parts into such vibration as to produce a disconnection between the upper end of the bell-crank bolt C, which is mounted rigidly on the door, and the hooked end of bar K, which is flexibly mounted with the clocks; but such disconnection will be only temporary, since the recoil of the parts will bring them back into their nor-

mal relation to each other. This can safely be permitted, inasmuch as the mounting of the clocks protects them from such injury as would cause them to run down. It will also be seen that when the back is disconnected from the lock-bolt C the latter cannot fall out of the locking position, as it is held therein by the rest or stud J.

L in Figs. 1 and 2 is a slotted and weighted pendulous detent, which is provided for the purpose of engaging with a pin on the bell-crank bolt C to prevent it from falling out of engagement with the stud J in case the safe should be turned over.

In the mechanism shown in Figs. 3 and 4 the time-movements only are mounted on flexible supports, and these supports, instead of being of rubber, consist of long screw-bolts provided with spiral springs in front of and behind the ears through which the bolts pass. With this construction the lock-bolt C can be mounted in the lock-case. In order to lock the door, the lower end of this bolt comes in between the tongue-piece N, attached to the tie-bar, and the fixed stud O upon the door, and it is held in this position by the detent-bar P, a projection, *a*, on this bar taking in under a pin, *b*, Fig. 4, on the bolt C. This detent is withdrawn at the predetermined hour by the finger Q, projecting from the rim of the dial D, whereupon the bolt C falls by the force of gravity and the door is unlocked. The violent vibration of the flexibly and the rigidly mounted parts of this lock relatively to each other under the force of a sudden and heavy shock may temporarily carry the bar P past the vertical plane of the dial; but the recoil will bring the parts back to substantially their normal relative position, so that the clocks, being protected from injury by the flexible mounting, will act upon the detent-bar P to withdraw it at the required hour.

It will of course be understood that with this construction the lock-case must be effectively secured to the door to which it is attached. If otherwise, its displacement would unlock the door. Making the case and the bolt C and bar P as thin and light as may be consistent with the requisite strength will contribute to the security of attachment, since the lighter the parts are the less the momentum that they will acquire under a given shock and the less liable to be torn away from their fastenings.

In Fig. 5, again, the clock mechanism only is understood to be on flexible supports, the locking-bolt or dog C, as in Figs. 3 and 4, being mounted in the lock-case. In this instance, differently from the lock in those figures, the bolt C moves into the locking position by the force of gravity, and is withdrawn by the positive action upon it of the dial. Otherwise the construction and operation of the mechanism is substantially the same as that in Figs. 3 and 4. In the construction here shown the lock-bolt C is held in the locking position by means of the screws *c c*, which secure it to the lock-case, these screws being so placed as to arrest the downward movement of the bolt before its dogging end has passed the tongue-piece N.

It will be observed that in all the several constructions shown the temporary interruption of the operative relation between the lock-bolt and the clock-work does not endanger the security of the safe or vault, since the lock-bolt is not only placed outside the flexibly-mounted parts of the lock, but is held in the locking position by devices which also are placed outside such parts.

What is claimed as new is—

In combination with the time-movement or the time-movement and other parts of a chronometric lock, a yielding or flexible support therefor and a lock-bolt or dog mounted outside the flexibly-supported parts of such lock and held in the locking position by suitable means also located outside such parts of the lock, substantially as and for the purpose set forth, whereby the clock mechanism will have freedom of motion relatively to the door or wall of the safe without disturbing the action of the lock-bolt, and will itself be protected from injury under the force of an explosion directed against the exterior of the structure and of a character to break the more delicate parts of the lock if mounted in the modes hitherto practiced.

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Witnesses:
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ROBT. H. DUNCAN.