(No Model.)

3 Sheets—Sheet 1.

H. F. NEWBURY.

TIME LOCK.

No. 265,930. Patented Oct. 10, 1882.

Fig 1.

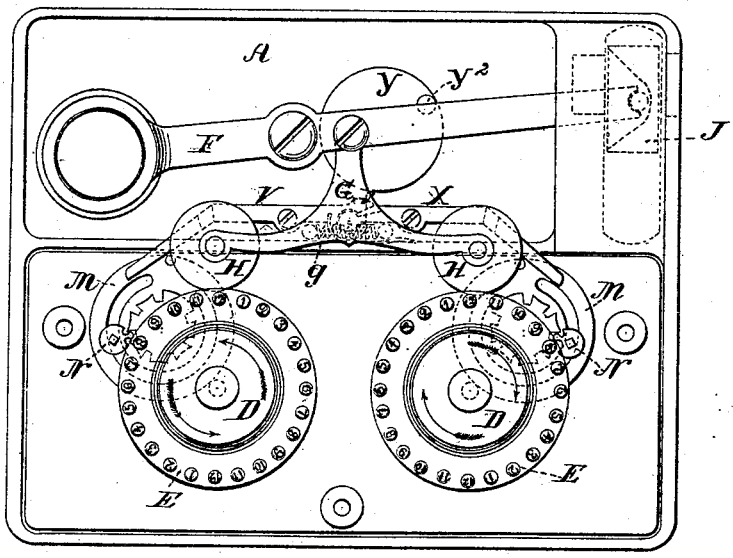


Fig. 2.

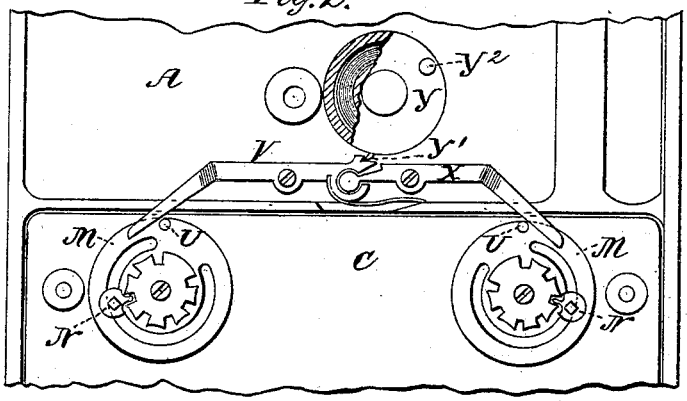
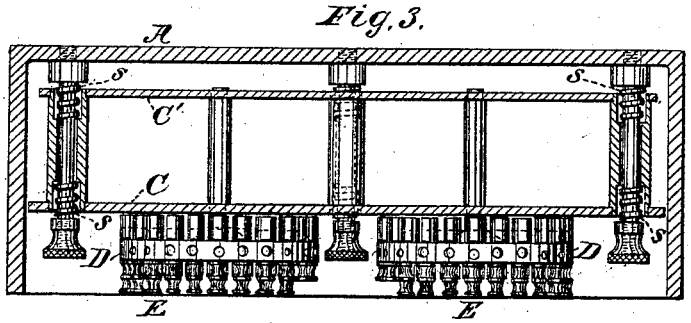


Fig. 3.



WITNESSES

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 4.

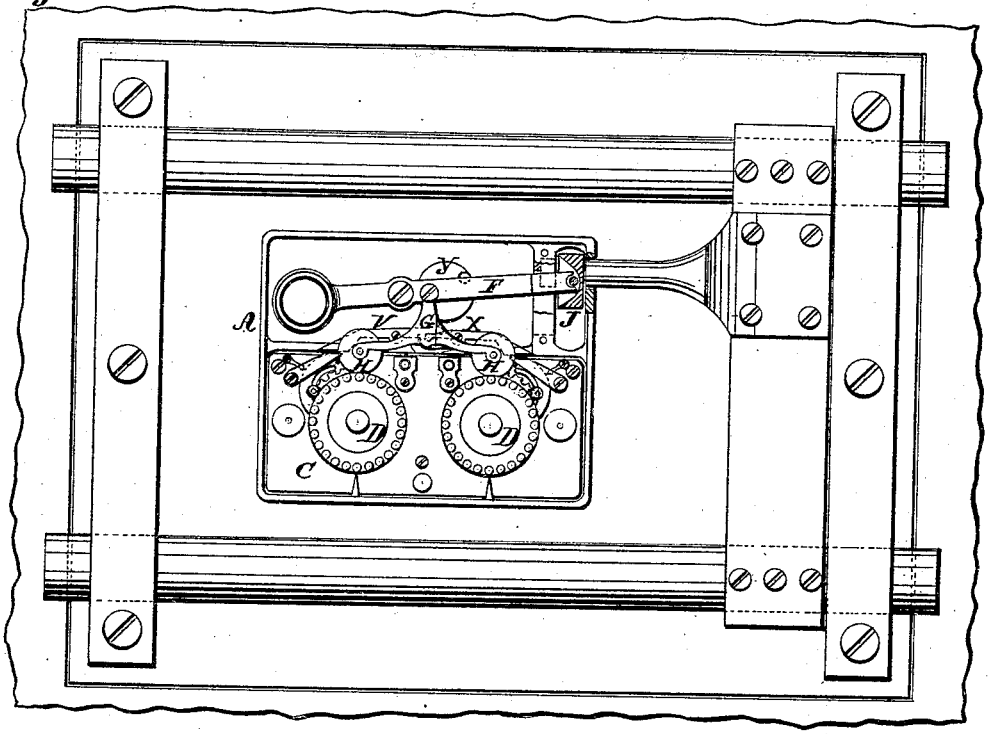


Fig. 5.

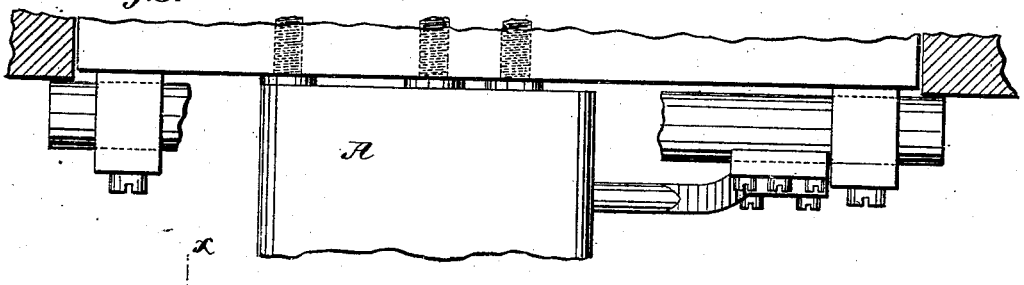
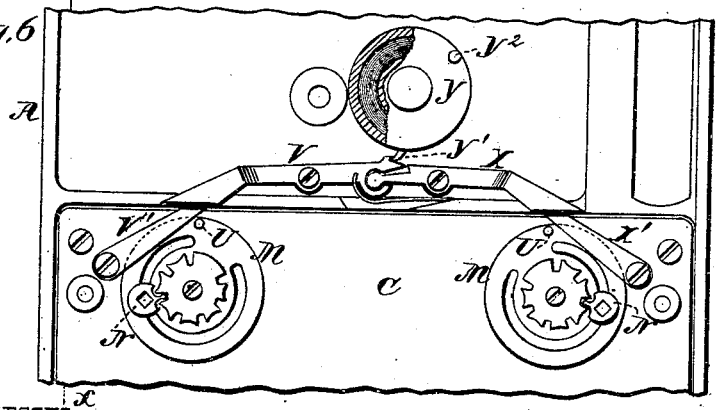


Fig. 6



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(No Model.) 3 Sheets—Sheet 3.

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TIME LOCK.

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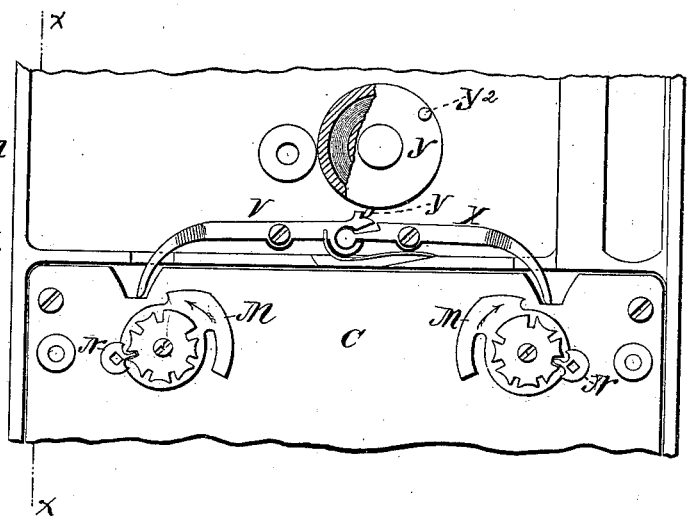
Fig. 8.



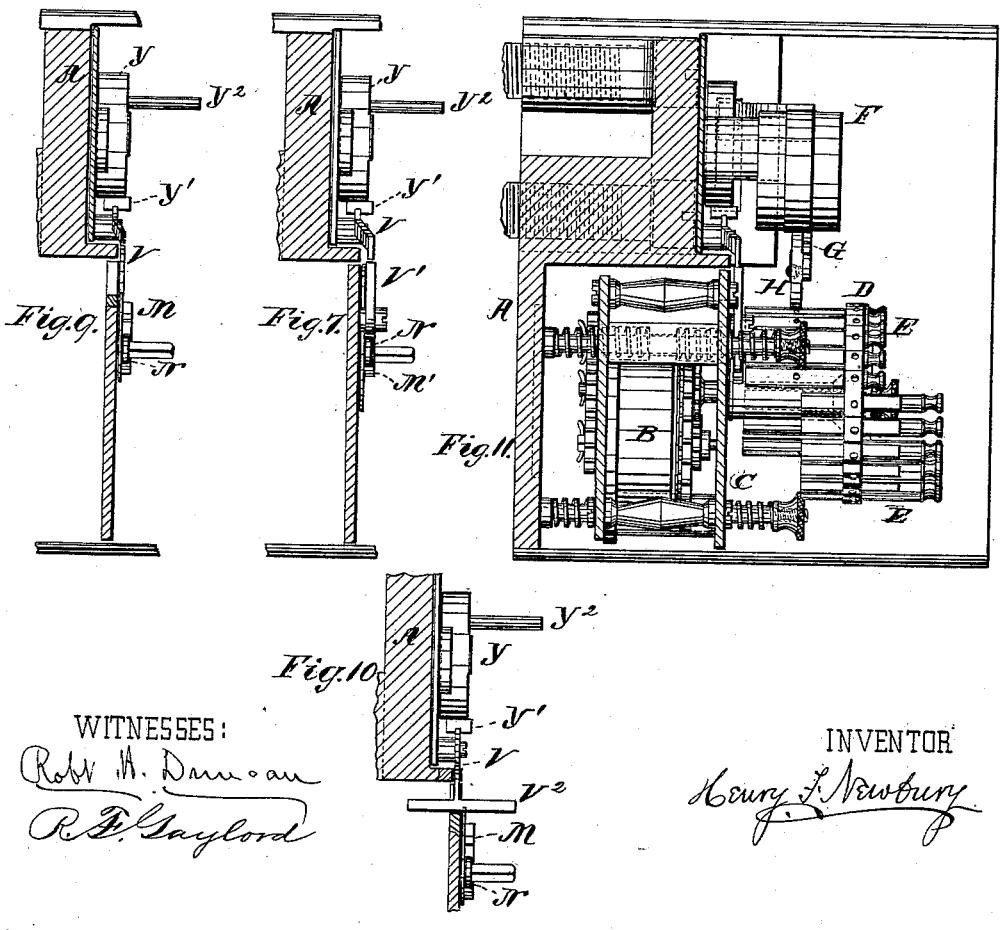


Fig. 9. Fig. 7. Fig. 11.

Fig. 10.

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UNITED STATES PATENT OFFICE.

HENRY F. NEWBURY, OF BROOKLYN, NEW YORK.

TIME-LOCK.

SPECIFICATION forming part of Letters Patent No. 265,930, dated October 10, 1882.

Application filed May 5, 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; and I do hereby declare that the following is a full, clear, and exact description of one division of my invention, which will enable others skilled in the art to which it appertains to make and use the same.

The object of the present invention is to improve the well-known Yale lock. This lock in its principal parts is made substantially in conformity with the descriptions contained in Letters Patent No. 168,062 and No. 186,177, granted respectively to Emory Stockwell and to the Yale Lock Manufacturing Company, as assignee of Emory Stockwell, September 21, 1875, and January 9, 1877. The time mechanism of this lock, as is well known, consists of a duplication of a continuously-running movement, the operation being such that either clock will effect the unlocking automatically at prearranged daily times; but to guard against a "lock-out" from the running down of the clocks during the locking period (which might happen from a negligent or willful omission to wind them properly) the lock is provided with a special supplemental unlocking mechanism, which continues inert so long as the periodical winding of the clocks is regularly performed, but which, if by neglect or willful derangement either of the clocks is permitted to run down when the lock-bolt or dog is in the locking position, will unlock the lock irrespective of the position of the other or ordinary unlocking devices.

The construction and operation of this supplemental unlocking mechanism is fully explained in Letters Patent No. 186,177, above referred to, and is shown on Sheet I of the drawings hereto attached. Referring to this sheet, Figure 1 is a front elevation of the lock, Fig. 2 being a partial detached view of the supplemental unlocking devices. Fig. 3 is a view partly in plan and partly in section, showing the mode in which the clocks of the Yale lock ordinarily are mounted in the lock-case.

In these figures, A represents the lock-case. C C′ are the plates which support the clock mechanism; D D, the hour-dials, with adjustable pins E for regulating the hours of locking and unlocking; and F, a counterbalanced lever, carrying the lock-bolt or dog J.

G is a swinging yoke, divided into two parts, which are held together by the spiral spring *g*, and are pivoted at a common point to the long arm of the lever F. This yoke carries friction-rollers H H, which traverse the rear ends of the dial-pins when the pins are pushed in to their full extent.

M M are the winding-indicators, which as the clocks are wound up are rotated by the pinion N in one direction, and as the clocks run down are rotated in the opposite direction by the backward motion of this pinion.

The operation of these parts, as is more fully explained in Letters Patent No. 168,062, is as follows: The dials are revolved by the clocks (shown in part in Fig. 11 of the present drawings) once in twenty-four hours, and so long as the friction-rollers ride upon the pins E of the two dials the dog J is held in its upper or locking position. When, however, either clock brings opposite to the corresponding roller H any portion of the dial in which the pins E have been pulled out, the roller, being no longer supported, will drop, and this will permit the dog J to fall out of the locking position. By adjusting the dial-pins according to the number of hours for which it is desired that the safe shall remain locked it is manifest that if the clocks are kept properly wound and working the unlocking will take place automatically at the predetermined hour.

The supplemental unlocking mechanism of the Yale lock, as described in the aforesaid Letters Patent, and shown in Figs. 1 and 2 of the present drawings, consists essentially of the spring-barrel Y, carrying a pin or catch, Y′, and a stud, Y^2, the interlocking triggers V and X, pivoted to the lock-case, and the winding-indicators M M, each of which carries a pin, U, so arranged as to come in contact with the tail of the adjacent trigger a short time before the final stoppage or running down of the corresponding clock. Whenever either of the pins U strikes the tail of the corresponding trigger it lifts it, and thereby releases the spring-barrel Y, which is revolved by the recoil of the contained spring, thus bringing the stud Y^2 down upon the lever F and forcing this lever down-

ward until the dog J is brought into the unlocking position, the spiral spring which connects the two parts of the divided yoke yielding sufficiently for this purpose. I have discovered that locks constructed as above described not only possess a defect incident to all classes of time-locks as heretofore constructed and mounted—viz., that the more delicate parts of the time mechanism may be broken by a severe and sudden shock, such as would be produced by the explosion of a small charge of dynamite, nitro-glycerine, or other quick explosive outside the safe or vault, but in proximity to that part of the walls against which the lock is secured, and that thus the mainspring may be caused to run down and withdraw the lock-bolt from the locking position—but I have also discovered that the construction of the supplemental unlocking mechanism is such as to create an additional source of danger, which is of the following nature: If an explosion of the character indicated be directed against the exterior of the safe or vault at a point near the lock, the time-movements, which, as shown in Fig. 3, are not secured rigidly to the lock-case, will be moved inward by the force of the shock slightly farther than the case A itself, and as the triggers of the supplemental unlocking mechanism are pivoted to the solid parts of the case, but extend down directly in front of one of the plates which support the time-movements, this plate will strike against the tails of the triggers, and by the resulting wedging action will release the supplemental unlocking-spring. A very slight motion of the time mechanism will produce this result; and in the Yale lock such motion is possible as a consequence of the mode adopted for mounting the movements in the case, short spiral springs (*s s* in Fig. 3) being introduced between the case and the lock for the purpose of cushioning the latter to prevent stoppage of the clocks by a jar or concussion. This source of danger I propose to obviate in the manner shown on Sheets II and III of the accompanying drawings, in which Fig. 4 shows a Yale lock provided with my improvement mounted on the door of a safe or vault, Fig. 5 being a plan showing the relative position of the lock, the door, and the bolt-work, Fig. 6 being a detached view, in elevation, of the improved supplemental unlocking device, and Fig. 7 being a partial section view on the line *x x* of Fig. 6. As here shown, the triggers V and X, instead of extending down in front of the time-movements, so as to be acted upon directly by the pins of the winding-indicators, terminate at a point a little above the plane of the top of such movements. Short levers V′ X′ are pivoted to the plate C of the time mechanism in such position that they will be acted on by the pins of the indicators when the mainsprings have nearly run down, and thus will be caused to strike against and lift the triggers V X. With this construction all danger of tripping the supplemental unlocking mechanism by the backward and forward movement of the clocks, however great this movement may be, is avoided.

Instead of the construction shown in Fig. 6, the triggers can be brought down so as to be acted upon directly by the winding-indicators, if the plate of the time-movements be cut away so as to permit the latter to have a free play back and forth without striking the triggers. Such construction is shown in Fig. 8 in elevation and in section in Fig. 9. In such case, instead of using pins in the winding-indicators, the indicators are made cam-shaped, as seen in Fig. 8, the tiggers being raised by the action of the cams upon their lower ends as the indicators are revolved. When this construction is adopted the ends of the triggers may be provided with cross-pieces V^2, as seen in Fig. 10. The utility of such an attachment would be that a heavy shock operating upon the lock might to some extent permanently displace the time-movements and their supporting-plates without stopping the clocks, in which case the winding-indicators would still be able to act upon the triggers through the medium of such cross-pieces. Either of the above methods of construction—as, in fact, any relative construction and arrangement of the triggers and the time mechanism which will prevent the vibration of the latter from acting on the former and causing them to release the supplemental unlocking-spring—will furnish a protection against the particular danger hereinbefore pointed out. It will be found advisable, also, to employ in connection with such improved construction some appliance or appliances to prevent the breaking of the more delicate parts of the time-movements by the same force which would suffice to operate the supplemental unlocking mechanism in the manner above indicated. The destruction of any of the parts intermediate between the balance-wheel and the main wheel (and repeated experiments prove that with any of the existing time-locks this is easily effected with a charge of dynamite exploded against the outside of the safe so small as to make but little noise and not even indent or otherwise appreciably affect the walls of the safe) 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 a few seconds.

Appliances designed to furnish this last-mentioned protection 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," "D," and "E," (patents therefor having been granted me on the 1st day of August, 1882, numbered respectively 262,093, 262,094, 262,095, 262,096, and 262,097.) 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) 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; or (Case E) the time-movements may be mounted upon a flexible or yielding support, with sufficient space between them and the adjacent parts of the lock-case or the safe to prevent concussion between them under the force of the explosion directed against the exterior of the structure. This last mode of protection, in one form of application to the Yale lock, is illustrated in Fig. 11 of the accompanying drawings, in which the time mechanism B is shown as secured to the lock-case by means of bolts which carry long and stiff spiral springs both in front of and behind the movements, and in which the space between the movements and the back of the lock-case is greatly increased over that which exists in the lock as now used. The dial-pins E, also, have been greatly lengthened—this, as is fully explained in my pending application, (Case E,) being rendered necessary for the purpose of preserving the continuity of the connection between the lock-bolt and the bolt-work of the safe-door under the increased travel which this mode of mounting will permit the movements to have.

What is here claimed as new is—

The combination, in a chronometric or time lock, of a time movement or movements, a supplemental unlocking mechanism operated by a power other than that of the mainsprings of the clocks, and an intermediate detent or detents for holding such mechanism out of action during the normal operation of the parts, but capable of being tripped by the clocks a brief interval before the clocks run down, such detent or detents being constructed and arranged relatively to the time mechanism, substantially in the manner set forth, being thereby wholly out of the path of travel of the time mechanism when put in motion relatively to the other parts of the lock by a sudden and heavy shock.

HENRY F. NEWBURY.

Witnesses:
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ROBT. H. DUNCAN.