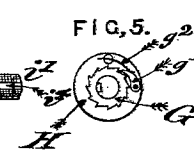
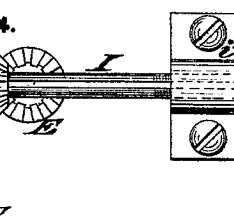
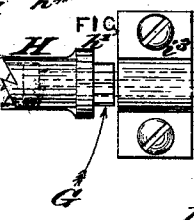
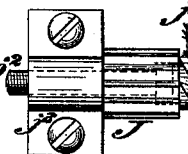
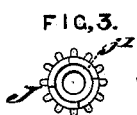
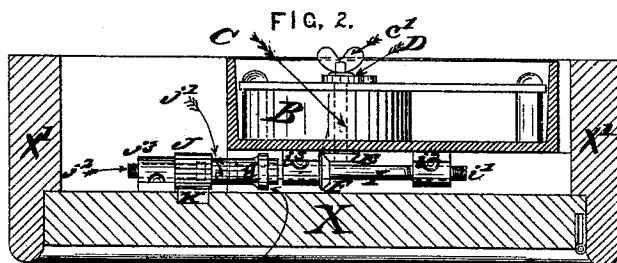
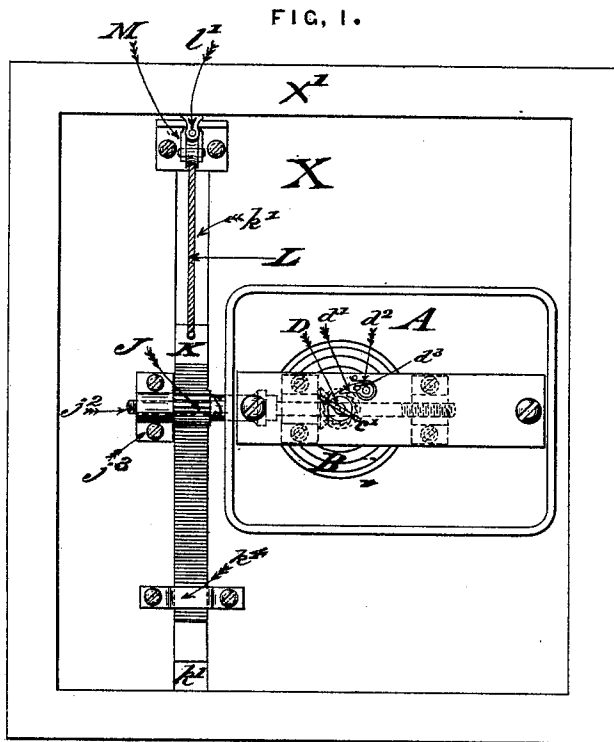


E. STOCKWELL.

WINDING DEVICE FOR CHRONOMETRIC LOCK.

No. 175,198.

Patented March 21, 1876.



WITNESSES:

William H. Burr
Charles W. Burroughs

INVENTOR:

Emory Stockwell

UNITED STATES PATENT OFFICE.

EMORY STOCKWELL, OF STAMFORD, CONNECTICUT, ASSIGNOR TO THE YALE
LOCK MANUFACTURING COMPANY, OF SAME PLACE.

IMPROVEMENT IN WINDING DEVICES FOR CHRONOMETRIC LOCKS.

Specification forming part of Letters Patent No. **175,198**, dated March 21, 1876; application filed
December 27, 1875.

To all whom it may concern:

Be it known that I, EMORY STOCKWELL, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Time-Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

In time-locks, as heretofore constructed, their efficiency is wholly dependent upon the due and regular winding of the clocks. A single omission in this respect may at once produce serious inconvenience from the clock-work running down and stopping when the lock is locked, or from it so stopping in the interval between the closing of the door and the performance of the automatic locking-movement.

My invention obviates these defects, and it consists in so constructing chronometric locks as to render the winding of the clock-mechanism thereof automatic, the said operation of winding being effected in the ordinary course of swinging open the safe or vault door, without any attention or care from the persons using the safe or vault, the overwinding of the clock-mechanism being at the same time guarded against and prevented.

In the drawing, Figure 1 is a front elevation, showing my improvements applied to the inner face of a safe or vault door; Fig. 2 is a horizontal section of the same, and Figs. 3, 4, and 5 are details.

X is the door, and X' the contiguous portion of the safe or vault. A is the case or frame of the chronometric lock. B is the clock mainspring, attached at its inner end to the winding-shaft C. *c'* is a thumb-piece attached to the winding-shaft merely for turning the shaft either way. D is a ratchet-wheel fixed to the shaft C for retaining it in the wound position, in conjunction with a detent, *d'*, and spring *d''*, secured to the clock or lock frame-work. *d'''* is a small stud merely for lifting the detent *d'* and allowing the mainspring to unwind. E is a bevel-wheel, fixed rigidly on the end of the winding-shaft C, and is geared or engaged

with the bevel-wheel F on the counter-shaft I. The shaft I, by the swinging open of the door, receives a rotatory motion for the winding up of the clock-work from the rack-pinion or rotatory driver J being traversed and driven by the rack-bar K, which is attached by the cord L or flexible connector, passing over the swivelled guide-pulley M, to its terminal attachment at *l'* on the safe or door-jamb. The rack-bar K also forms a counter-weight to keep taut, and haul in, the cord L, as the door is closed, and it slides in a groove, *k'*, wherein it is retained by straps or guides *k''*. The rack-pinion J turns upon a short stationary shaft, *j''*, carried by a fixed bearing, *j'''*. The diameter of the said pinion J may be so proportioned to the travel of the rack-bar K that the act of opening the door once will suffice to wind the clock-work fully.

On the projecting end of the pinion J is formed a claw-clutch, *j'*, adapted to engage with a corresponding clutch, H, placed loosely upon the counter-shaft I. The shaft I has a collar or head at its end, within the clutch H, between which collar and the ratchet-wheel G the clutch H is retained in its longitudinal position upon the shaft I. The ratchet-wheel G is fixed rigidly to the shaft I, and, with the latter, is capable of being driven only in the direction for winding up by the click or pawl *g'* hung to the end *h'* of the clutch H. *g''* is a spring for pressing the pawl *g'* into the teeth of the ratchet G. The counter-shaft I has its end *i'* screw-threaded, to engage with a corresponding screw-thread in the fixed bearing *i''*, and it also has a longitudinal groove, *i'''*, adapted to an internal key or feather in the bevel-wheel F, through which the said shaft slides as it is rotated, the sliding motion being produced by the screw-thread engagement of the shaft with the bearing *i''*. The said sliding motion of the shaft I, as the clock is wound, gradually retires the clutch H from engagement with the clutch *j'* of the rack-pinion, and in this way overwinding is obviated. The pitch of the screw-thread on the shaft end *i'* is so proportioned that, when the shaft has performed the requisite number of revolutions for fully winding the clock, the clutches H and *j'* are drawn clear of each other and disengaged.

The further swinging to and fro of the door then simply runs the rack-bar back and forth with the pinion J, but has no effect upon the disconnected clutch H and shaft I until, by the running down of the clock-work, the shaft I has been rotated backward and gradually screwed back to its unwound position, when the clutch H is again pressed into gear with the clutch *j*¹. The full winding up of the clock is thus insured, and any overwinding is rendered impossible, so that at all times the door may be swung open as often as required, the clock-work being wound thereby automatically if it requires winding, and if not, the swinging of the door has no effect upon the clock-work.

It is obvious that an additional element of security in chronometric locks is obtained by my invention in insuring the winding of the clocks by the ordinary use or swinging open of the door, and it is also obvious that my invention may be advantageously employed in chronometric locks generally—that is to say, in a chronometric lock acting upon the bolt-work of the door, or acting directly, or acting as a guard to another lock, or in any combination of the chronometric lock with other locks or lock mechanism.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. In combination with a chronometric lock connected to the door of a safe or vault so as

to guard the same, a winding device, constructed to be operated by the opening of said door.

2. In combination with a chronometric lock connected to the door of a safe or vault, so as to guard the same, and having a winding device constructed to be operated by the opening of said door, a connector or driver attached at one of its ends to the winding mechanism of said lock, and at its other end connected with the safe or its door in such manner as that the opening of said door effects the winding of said chronometric lock.

3. In a chronometric lock, the flexible connector L, pinion or rotatory driver J, ratchet G or their operative equivalents, in combination with the winding mechanism of the clock-work of the said lock.

4. In a chronometric lock, an automatic winding device, consisting of the cord L, rack K, pinion J, clutches *j*¹ and H, shaft I, ratchet G, and gear-wheels E F, when constructed as and for the purposes specified.

5. In a chronometric lock having an automatic winding device, a device for preventing overwinding, consisting of the screw *i*¹ and disconnecting-clutch H, when constructed substantially as and for the purpose set forth.

EMORY STOCKWELL.

Witnesses:

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