

106691

Lewis A. Haines.

Time-Lock.

Fig. 1.

PATENTED AUG 23 1870

Fig. 3.

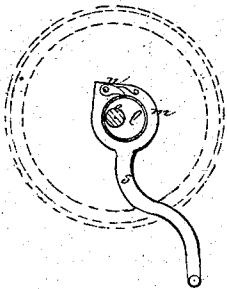


Fig. 4.

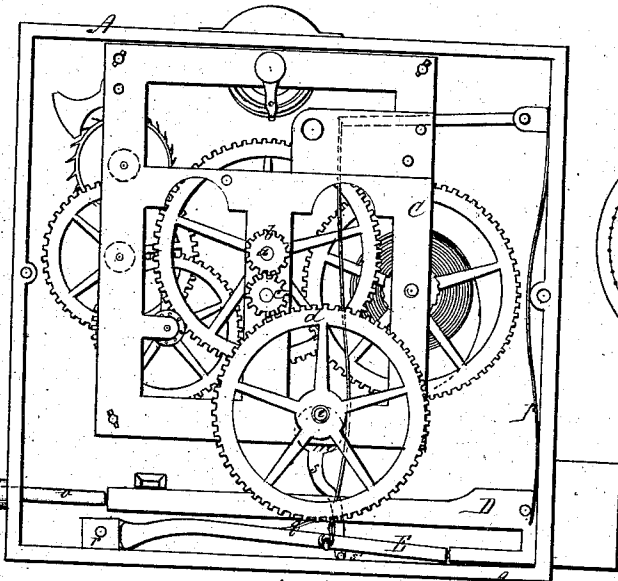
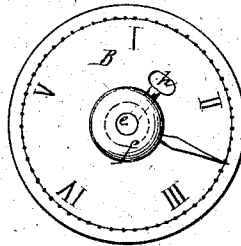


Fig. 5.

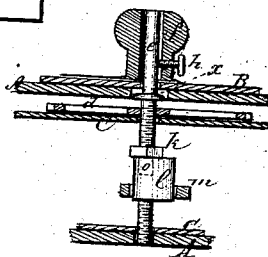


Fig. 2.

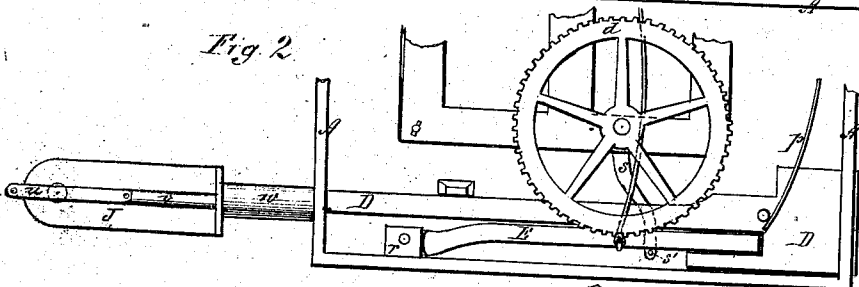


Fig. 6.

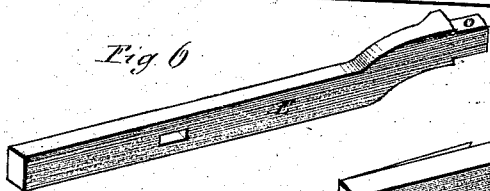
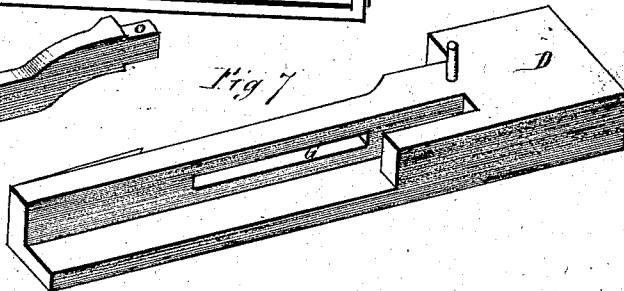


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

LEWIS A. HAINES, OF WAKEFIELD, MARYLAND.

IMPROVEMENT IN TIME-LOCKS.

Specification forming part of Letters Patent No. 106,691, dated August 23, 1870.

To all whom it may concern:

Be it known that I, LEWIS A. HAINES, of Wakefield, in the county of Carroll and State of Maryland, have invented a new and Improved Time-Lock; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a rear elevation of the clock-work and internal mechanism of the lock with the bolt thrust outward into the keeper. Fig. 2 is a rear elevation of the lock mechanism with the bolt withdrawn from the keeper. Fig. 3 is a horizontal section of the eccentric, and its strap, rod, and pawl. Fig. 4 is a side elevation of the dial. Fig. 5 is a side elevation of the eccentric, with a section of the covering-plate, dial, and knob. Fig. 6 is a view in perspective of the locking lever, and Fig. 7 a view in perspective of the lock-bolt.

This invention relates to a lock especially designed for safe-doors.

The invention consists in the combination of a lock of peculiar construction with a clock-work in such a manner that the lock-bolt may be withdrawn from the keeper at any hour to which the clock-work may be set, and not a moment sooner.

In the drawing, A is a metal case, which contains most of the locking mechanism and the clock-work that operates the same, and is designed to be let into the door of a safe from its rear side, the front side of the door being made continuous throughout, so as to show no trace of the whereabouts of the lock. The dial B, Fig. 4, is inscribed in the rear covering-plate of the case on the inside of the safe door. *a* is the hour-shaft of the clock-work; *b*, a pinion on the outer end of the hour-shaft; *c*, a pinion intermediate between the pinion *b* and a spur-gear, *d*, by which the connection between the clock-work and the locking mechanism is effected. The shaft *e* of the spur-gear passes through the rear covering-plate centrally of the dial B. The shaft *e* bears on its outer end a knob, *f*, detachable, and provided with a set-screw, *h*, and an index-finger, *i*, which moves over the dial B. On the shaft *e*, within the frame-work C that sustains the shaft, is a fixed nut, *k*, Fig. 5, and back of the nut on the shaft *e* is an eccentric, *l*, movable

lengthwise of the shaft on a screw-thread that is cut on the outside of the same, such movement being effected by the forward rotation of the shaft, and being limited in one direction by the nut *k*, and in the other direction by the back plate of the case. A strap, *m*, is combined with an automatic pawl, *n*, Fig. 3, whose point bears against the eccentric *b*. When the eccentric is in contact with the nut *k*, and the shaft *e* is rotating forward, the eccentric revolves with the shaft, the pawl *n* presenting no opposition; but if the shaft *e* be rotated backward while the eccentric is in contact with the nut *k*, the pawl *n* slips into a notch, *o*, Fig. 5, formed in the periphery of the eccentric, and prevents the revolution of the latter with the shaft *e*. As a consequence the eccentric moves backward on the screw-thread of the shaft as long as the reverse motion of the latter continues.

D is the lock-bolt, occupying the lower front corner of the case A. Within the lock-bolt is a recess in which is placed a lever, E, that is pivoted at one extremity between lugs *r*, which project upward from the bottom of the case A. G is a slot in the upper side of the bolt D. The eccentric rod *s* passes through the slot G in the bolt D, and also through the slot in the lever E. A pin, *s'*, passed through the end of the rod *s* serves to lift the lever E when the rod *s* is drawn up by the eccentric *l*. When the bolt D is thrust outward from the case A, so as to enter the keeper, the lever E both falls and is thrown downward by the spring *q* against the bottom of the case, and in this position it holds the bolt outward, as shown in Fig. 1. The thrusting of the bolt outward is effected by turning the knob I, Fig. 1, the stem of which passes through a plate, J, that projects from one side of the case.

An arm, *t*, is affixed to the rear end of said stem, and is connected by a pitman, *u*, with a reciprocating plunger, *v*, which plays in the tube *w*, and whose inner end bears against the extremity of the bolt D when the latter is wholly within the case. The knob I projects outward from the front side of the safe-door, and is the one by which said door is opened and shut. The knob and lock being separate, as shown in Figs. 1 and 2, the latter may be placed in the door at any distance from the

knob. Consequently the knob affords no clue whereby a burglar may discover the position of the lock; but if, by some means, the location of the lock in the door has been ascertained, and the burglar proceeds to drill into the door in order to get at the lever E, which holds the bolt in the keeper, he is compelled to work his way not only through the door and the case A, but also through the bolt D, before he can gain access to the lever. It will thus be seen with what extraordinary safeguards against burglary my lock is provided.

There is a small recess, X, Fig. 5, in the back plate of the case A, beneath the dial B, which admits of drawing the shaft *e* outward, when desired, until the spur-gear *d* is clear of the pinion *c*. When the shaft has been thus drawn outward, by turning the knob *f* the spur-gear may be revolved without disturbing the clock-work until the head of the eccentric rod *s* enters a recess formed in the upper side of the bottom of the case A. In this position the pin *s'* is out of the way of the lever E. This adjustment of the pin *s'* must, of course, be effected previous to closing the door of the safe. The next step is to set the clock-work so that it will unlock the door at the proper time. If the interval during which the door is to remain locked is five hours, the eccentric *l* being in contact with the nut *k*, the index-finger is left at the point to which it is brought by the above-mentioned adjustment of the pin *s'*, and the spur-gear *d* is restored to connection with the pinion *c*. Then the door is closed and the bolt D thrust into the keeper by turning the knob I. Thereupon the lever E drops so as to lock the bolt. The knob I should be turned on until the plunger *i* is drawn backward into the tube *u*, in order that the said plunger may be out of the way when the time comes for the bolt to be released from the keeper. The clock-work causes the shaft *e* to revolve. The shaft *e* rotates the eccentric *l*, and the eccentric, by means of the pin *s'*, draws the lever E upward.

By the time the index-finger reaches "V" on the dial the lever E will have been raised clear of the bolt. Immediately upon the raising of the lever clear of the bolt the spring *p* throws the latter inward, and the door is unlocked.

If the door is to remain locked for less than five hours, the index-finger should be moved on until the interval between it and "V" on the dial is such as may be passed over by the finger in the required time.

If the door is to remain locked for more than five hours, the eccentric *l* must be moved away from the nut *k* by the reverse motion of the shaft *e*, as before described, until an interval is obtained which may be traversed by the eccentric while returning toward the nut in the excess of time above five hours. Not till the eccentric strikes the nut again will the pin *s'* begin to raise the lever E.

The slot G through the bolt D permits the clock-work to run on without interruption after the bolt has been released.

The clock-work may be set so as to unlock the door after an interval of any length, from five minutes up.

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

1. The combination of the bolt D and door-knob I, by means of the plunger *v*, pitman *u*, and the stem of the knob, or other equivalent mechanism, which is operative when the knob and lock are entirely separate, and the knob does not indicate the position of the lock.
2. The combination of the lever E, bolt D, eccentric rod *s*, eccentric *l*, nut *k*, and shaft *e*, in the manner and for the purpose specified.
3. The combination of the shaft *e*, eccentric *l*, eccentric strap *m*, and automatic pawl *n*, in the manner and for the object set forth.

L. A. HAINES.

Witnesses:

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CHAS. A. PETTIT.