2 Sheets—Sheet 1.

J. L. HALL.

Time-Lock.

No. 214,034. Patented April 8, 1879.

Fig. 1.

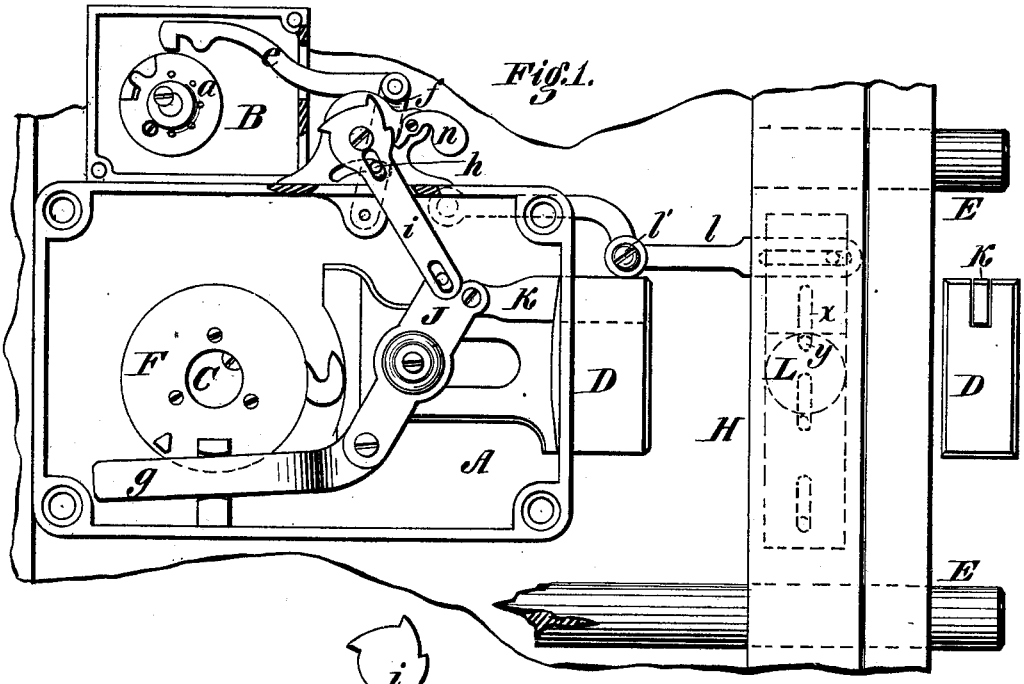
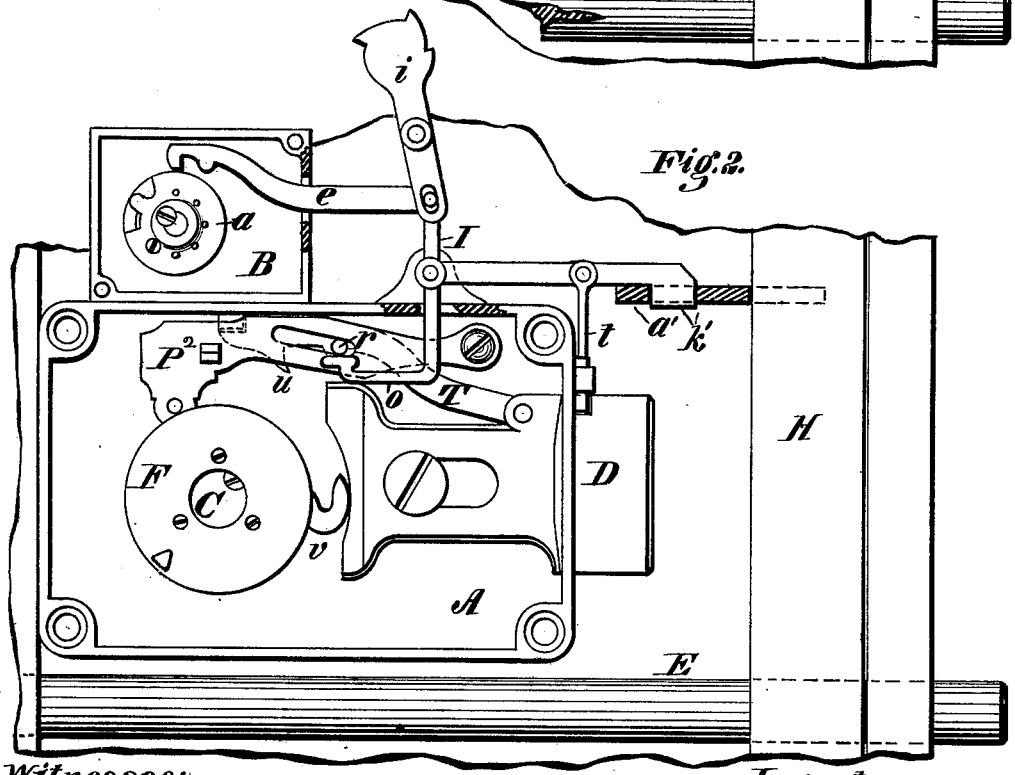


Fig. 2.



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by his Atty's.

Dodge & Son

2 Sheets—Sheet 2.

J. L. HALL.

Time-Lock.

No. 214,034. **Patented April 8, 1879.**

Fig. 3.

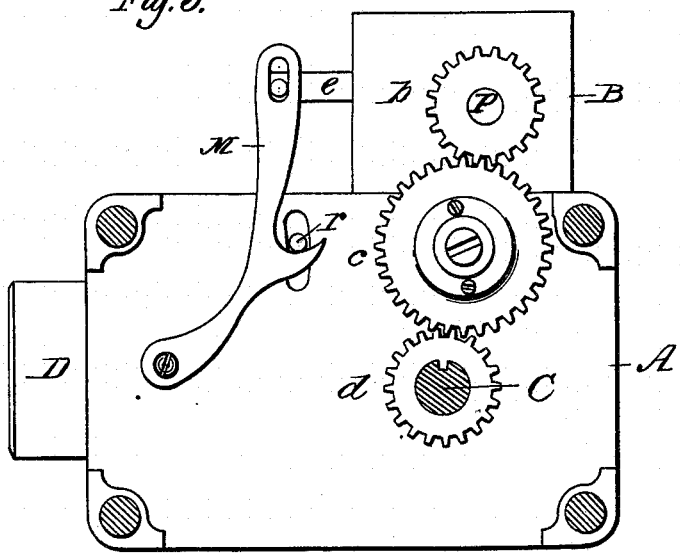


Fig. 4.

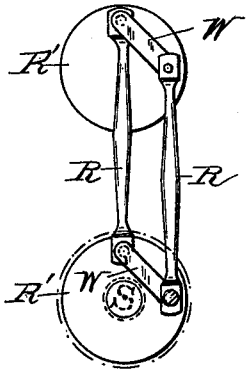
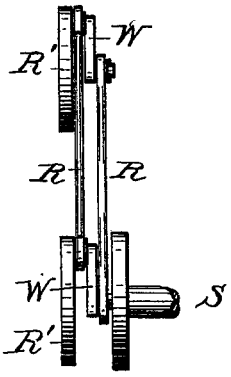


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH L. HALL, OF CINCINNATI, OHIO.

IMPROVEMENT IN TIME-LOCKS.

Specification forming part of Letters Patent No. **214,034**, dated April 8, 1879; application filed May 7, 1877.

To all whom it may concern:

Be it known that I, JOSEPH L. HALL, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain Improvements in Locks, of which the following is a specification.

My invention consists in a novel construction of a controlling device, which I denominate a "guard-lock," and in the combination of the same with a time attachment, or with dogging devices other than the bolt of the main lock, or with both the time attachment and the said separate dogging devices, in such a manner that said guard-lock can be made to release the separate dogging devices, or both said dogging devices and the time attachment in case the latter shall stop or fail to operate as designed, and thereby prevent the lock-out that would otherwise occur, all as hereinafter more fully described.

Figures 1 and 2 are elevations representing the inside face of a portion of a safe or vault door with my invention applied thereto. Fig. 3 is a rear face view of the main and guard locks, showing the manner of operating the tumblers of both locks from one spindle or dial; and Figs. 4 and 5 represent a modification of the same.

In the drawings, A represents the main lock, which is an ordinary permutation-lock, and B indicates the guard-lock, which is not a lock in the proper sense of the term, as it has no locking-bolt or locking device of any kind, but, on the contrary, is a device for undogging or releasing the parts which do serve to lock the bolt-work.

Any suitable time attachment may be used in this connection; but I prefer that patented to H. Gross, February 8, 1876, No. 173,121, to which reference is made for a more detailed description, and of which the connecting-lever *i*, with its pawl *n*, only is shown in the drawings, that being sufficient to enable any one skilled in the art to fully understand the construction and operation of my present invention.

In Figs. 1 and 2, the main lock A is represented with its face-plate and tumblers detached for the purpose of better illustrating the several forms in which I have applied my invention; and to illustrate the application of my invention to the well-known detachable arbor which is used for operating the bolt-work of safe and vault doors, I have also shown the latter, which consists of a vertically-sliding bar, H, which, when down, connects with the bolts E, and serves to move them to and fro. This bar H is provided with a slot, *x*, in which, when the bar is down, a crank-pin, *y*, on the inner end of the bolt arbor or spindle L engages, and by which motion is imparted to the bar H, and through it to the bolts E; but when the bar H is elevated the pin *y* is disconnected from the slot *x* of bar H, in which case, of course, the turning of spindle L has no effect upon the bolt-work.

In Fig. 1 there is shown a lever, *l*, pivoted at its rear end to the door or to the main lock-case, and connected at its outer end by a slot and pin to the bar H, this lever *l* being provided with a roller, *l'*, arranged to bear upon the bolt D of the main lock A when the latter is thrown out, and which is thereby made to hold up the bar H, so as to keep it disconnected from the spindle L until the bolt D is withdrawn.

In order to afford still greater security, I have provided an additional means for holding up the bar H, even when the bolt D of the main lock is withdrawn; and this consists of a sliding bar, K, resting in a recess or groove in the bolt D, as shown in Fig. 1, its inner end being connected by a racking-lever, J, to the lower end of the time-attachment lever *i*, as shown.

The lever J may be dispensed with and the connection be made direct, the only object of the lever J being to enable a sliding bar, *g*, to be attached, as shown, to serve as a guide and balance for the movement of the parts. In this case it will be seen that even though the bolt D of the main lock be withdrawn, the bar K would still remain protruded, and, holding up the lever *l*, would still keep the bar H detached from the bolt-arbor L, and consequently the bolt-work could not be operated until such time as the time attachment, operating on its lever *i*, should retract the slide K.

In Fig. 2 I have shown the lever *i* of the

time attachment connected directly to an elbow-lever, I, which is made to operate in several ways to prevent opening the door until said lever shall be operated by the time mechanism. In the first place, there is shown upon the outer end of the lever I a hook or projection, *k'*, arranged to engage in a notch or hole in a stud, *a'*, attached to bar H, which, in this case, is supposed to be rigidly connected to the bolts E. When so arranged, it is obvious that the bolts E cannot be retracted until the lever I is raised, so as to disconnect its outer end from the stud *a'*.

Instead of using the hook *k'* and the hole in stud *a'*, the operation will be the same if the end of lever I be simply arranged to bear against the rear end of any suitable projection on the bar H, so that the bar, with the bolts E, cannot be moved until the lever I has its end raised out of the way of the stud or projection on bar H.

To the lever I, I have shown connected a bolt, *t*, arranged so that its lower end will drop into a notch in the bolt D of the main lock, and thus prevent the latter from being retracted until this dogging-bolt *t* is raised out of the notch by the elevation of lever I. In the same figure I have also shown the lever I provided with an arm, *o*, arranged to engage under the pin *r* of the racking-bar P^2 of the main lock, thus serving to hold the latter up, so that even if the combination of said lock should be known, its bolt could not be retracted until this arm *o* should be removed by the operation of the time attachment upon the lever I.

It will be understood that any one or more of these several plans may be used for dogging the bolt-work or the main lock, or both, as occasion may require, or as may be preferred, they in all cases being connected with the time attachment in such manner that at the appointed time the latter shall operate to undog or release the bolt-work or main lock from the operation of these several dogging devices.

It is apparent that if from any cause the time attachment should stop or become deranged, so as not to operate at the proper time, it would be impossible to open the safe or vault, and thus the persons having charge of the same would be locked out, which would be a most serious inconvenience in business affairs. To prevent this I have devised and applied my guard-lock, as before stated. This guard-lock consists of two or more permutation-tumblers mounted in a suitable case, which is made separate from that of the main lock, so that it can be more readily applied in connection with the permutation-locks already in place on doors. This guard-lock B is provided with a draw-bar, *e*, arranged to operate in the same manner as in ordinary permutation-locks, so that when the tumblers of the guard-lock are properly set this bar *e* can be drawn back by turning the spindle of said lock; and, as shown in Figs. 1 and 2, this bar *e* is connected to the lever *i* of the time attachment, and through it to the various dogging devices which the time attachment is designed to operate, so that in case the time attachment should fail to operate, the guard-lock can be used to release the parts in its stead. This device, which, for the want of a better name, I have denominated a "guard-lock," is, in fact, not a lock in the strict sense of the term, as it has no bolt or dogging device of any kind, but is used wholly for operating or releasing the time attachment and the dogging devices in case these parts fail to be released by the stoppage of the time-movement or otherwise, as designed.

In Fig. 1 the bar *e* is is shown connected to the time-attachment lever *i* by means of an intermediate lever, *f*, which has a pin, *h*, engaging in a slot in lever *i*. In Fig. 2 it is shown connected to the same pin which connects the time-attachment lever *i* and the elbow-lever I. It is, however, obvious that these are mere matters of mechanical detail, and may be varied to suit the circumstances of the various cases or the will of the constructer, the effect being the same in all cases so long as the guard-lock is made to do the work that the time attachment would have done had it operated as intended.

In order that both the guard and the main lock may be operated by one spindle and have their tumblers set by one dial, their spindles P and C are connected by pinions *b c d*, as shown in Fig. 3. As the combination on which the tumblers of these two locks are to be set will always be different, it follows that the setting of one set of tumblers will never set the others, and therefore, when either set is set and the lock operated, the only effect it will have upon the other set will be to cause them to rotate loosely without permitting their racking or draw bar to come into operation.

In Fig. 3 I have shown the pin *r* (which in Fig. 2 is shown as connecting the bars of the main lock A) as protruding through a slot in the back of the lock-case, where it is held up by a projection on a lever, M, which is connected to the bar *e* of the guard-lock, it being merely a substitute for the arm *o* of the elbow-lever I.

In Figs. 4 and 5 is shown an arrangement of double cranks and connecting-rods, which is well adapted for connecting the spindles of the two locks, instead of the pinions shown in Fig. 3. One advantage of this device for this purpose is that, if necessary or desired, the two spindles may be set any distance apart, as the rods R may be of any required length.

From the foregoing description it will readily be seen that the time attachment may be so applied as to prevent the main lock or the bolt-work from being operated, and also so as to prevent the detachable arbor of the bolt-work from being connected with the bolt-work until the time for which the attachment was or may be set shall arrive; and that in case the time attachment shall fail to operate as designed the guard-lock may be made to do

its work by operating the connecting-lever *i*, and through it the various dogging devices connected therewith.

In using this invention, it will, of course, be understood that it is not intended to make any use of the guard-lock, except in cases where the time attachment fails to operate. The combination on which the guard-lock is set need not be known by those ordinarily having charge of the safe or vault, but may be kept entirely by a person at another point, who will furnish the same only in cases when the time attachment fails to operate; or it may be sealed up and deposited in some other safe place, to be called for only when needed, a new combination being arranged each time after the guard-lock is operated, so as to prevent those in charge from knowing what the combination is. By this means not only are burglars prevented from compelling those in charge to open the safe or vault after the time attachment has been set, but it also prevents the same from being opened clandestinely by dishonest employés.

While I have shown the guard-lock and time attachment applied in connection with a main lock, it is obvious that the latter may be omitted, if desired; but ordinarily it will not be desired, because the main lock will be used during business hours, and during which time the guard-lock and the time attachment with the dogging devices will be disconnected or thrown out of operation.

It is obvious that the dogging devices may be constructed and arranged in a great variety of ways, the only requisite being that they shall be so arranged in connection with the time attachment as to be operated by the latter at the time set, and the guard-lock so combined with the time attachment that in case the latter fails to operate, the guard-lock may be brought into operation and made to disconnect the time attachment and its dogging devices from the main lock or bolt-work, or both, according as they may be arranged to dog one or both. It will therefore be seen that my invention is not limited to any special style or arrangement of dogging devices, several different styles and arrangements of these being shown in the accompanying drawings.

I am aware of the patent of F. McDuffee, dated June 20, 1876, No. 178,940, in which one division of the tumblers is used for disconnecting or releasing the time attachment or for releasing a hook arranged to hold the swinging bolt of a combination-lock, and therefore I do not claim such; but

What I do claim is—

1. In combination with the bolt-work of a safe or other door, a time attachment arranged to withdraw one or more dogging devices from the bolt-work, and a separate guard-lock, B, arranged to operate or disconnect the lever of the time attachment and the dogging devices in case the time mechanism should stop or fail to operate, substantially as described.

2. The combination of a main permutation-lock, a time attachment having one or more dogging devices, in addition to the bolt of the main lock connected thereto, and arranged to dog the bolt-work, and a guard-lock, B, arranged to operate or disconnect the lever of the time attachment in case the latter stops or fails to perform its work, substantially as described.

3. The herein-described guard-lock B, consisting of a set of tumblers and a draw-bar without any lock-bolt, the said parts being constructed and arranged in a case separate from that of the main lock, whereby the said guard-lock may be applied in any position necessary to connect with the time attachment or bolt-dogging devices, as set forth.

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