W. KOOK & J. L. HALL.

Time-Lock.

No. 212,610. Patented Feb. 25, 1879.

Fig. 1.

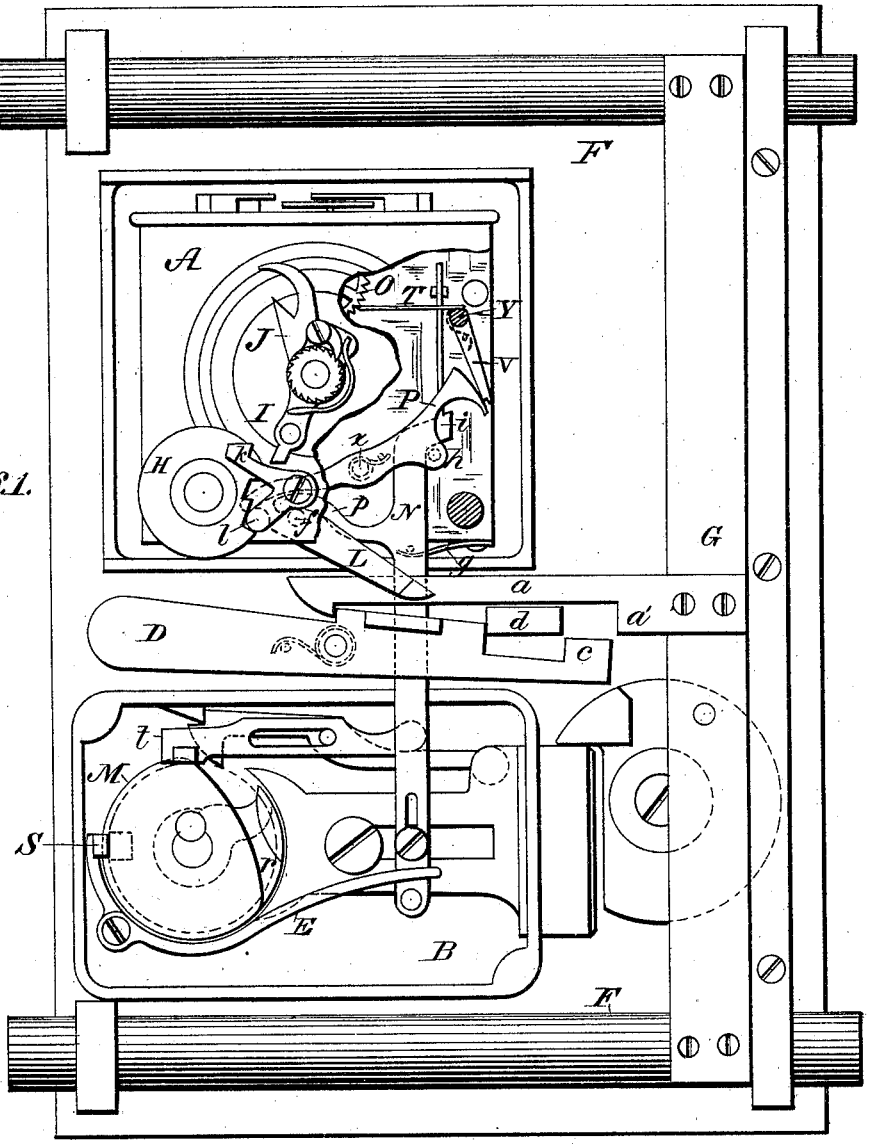


Fig. 3.

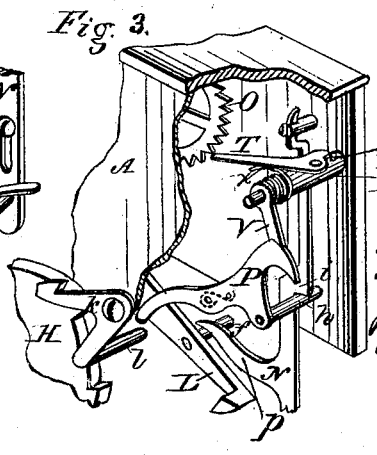


Fig. 2.

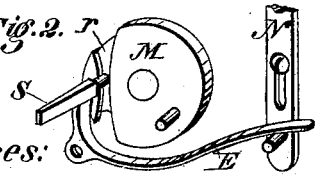
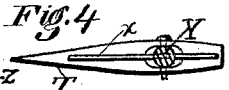


Fig. 4



Witnesses:

Down & Twitchell.

Will N. Dodge.

Inventors:

Wm. Kook &

J. L. Hall.

by Dodgerson,

Attys

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM KOOK AND JOSEPH L. HALL, OF CINCINNATI, OHIO; SAID KOOK ASSIGNOR TO SAID HALL.

IMPROVEMENT IN TIME-LOCKS.

Specification forming part of Letters Patent No. **212,610**, dated February 25, 1879; application filed October 28, 1878.

To all whom it may concern:

Be it known that we, WILLIAM KOOK and JOSEPH L. HALL, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain Improvements in Time-Locks for Safes, &c., of which the following is a specification:

This invention consists of a time-movement, so connected with a non-time-lock, or with other dogging or fastening devices of the bolt-work of a safe or vault door, that the movement may be disconnected from the non-time-lock or other fastenings at any desired time, whether the time-movement is in motion or has stopped, and of a device so arranged that if the time-movement be running it will automatically connect or set the same in a locking position again before the combination of the non-time-lock can be set and operated.

It further consists in combining with a single set of tumblers two or more angle-bars, so arranged that each can be operated by the same tumblers, but on different combinations or numbers on the same dial, one for operating the non-time-lock, and the other operating the disconnecting devices of the time-movement, all as hereinafter more fully set forth.

Figure 1 is a front elevation of the apparatus complete as applied to a safe-door, the cover of the main lock being removed, and a portion of the case of the time-movement being broken away to show the parts more clearly. Fig. 2 is a perspective view of the disk and extra angle-bar, shown detached. Fig. 3 is a perspective view of a portion of the time-movement with its disconnecting and resetting devices attached. Fig. 4 shows a modified method of constructing and pivoting the trip-lever to its shaft.

One of the greatest objections urged against the use of time-locks on safes and vaults is the possibility or danger of being locked out by the stoppage of the time-movement, whether single or double. To obviate this objection various guard-locks and other secret arrangement of devices for disconnecting the time attachment have heretofore been invented by us; but in those there was a possibility that if a burglar or other unauthorized party became possessed of the secret and of the combination on which the main or non-time-lock was set, he might open the safe by first disconnecting the timer, and then setting up the combination of the main lock and operating it.

Now, the object of this invention is to so construct and arrange the various parts that the owner or parties in charge may have the means of disconnecting the timer in case it stops, and, at the same time, if disconnected while running, have it automatically connect itself again before the main lock can be opened, thus preventing burglars or other unauthorized parties from opening the door, even though they should become possessed of a knowledge of the secret of disconnecting the timer, and also of the combination of the main or non-time lock.

To accomplish these results we construct an apparatus as shown in the drawings, in which A represents an ordinary time-movement, and B a combination-lock. F represents the ordinary train-bolts, connected by the usual bar G, having a rigid stump, *a*, with a shoulder, *a'*, between which and a fixed stud, *d*, the front end, *c*, of an automatic dogging-lever, D, engages whenever an attempt is made to retract the bolt-work, these parts being the same as shown and described in an application filed by us October 24, 1878. As in that case, the function of the timer is to hold the dogging-lever D out of action when it is desired to open the door; and it is provided with the same notched disk H, mounted on the outer end of a rock-shaft, which carries the arm L for holding down the dogging-lever D, and also the tripping-dog *k* for locking down the arm L and the hands I and J, the one for throwing down the arm L, and the other for tripping the dog *k*, and thereby releasing the arm L, all these parts, as well as the dogging-lever D, being arranged to operate the same, as more fully described in said application, as also in another application filed by us October 25, 1878, and to which applications reference is made for a more detailed description.

We now proceed to describe, in detail, our present improvements or additions to the foregoing apparatus.

In the first place, we provide a sliding rod or bar, N, which has an arm, *p*, arranged to engage with a pin, *f*, on the arm L of the timer, as shown in Figs. 1 and 3, and also a shoulder or projection, *i*, arranged to engage with a pin, *h*, projecting from the side of a lever, P, which

has its opposite end arranged to engage with a pin, *l*, on the dog *k*, as shown in said Figs. 1 and 3, so that when the bar N is depressed it will operate to throw down the arm L, thereby holding out of action the dogging-lever D, and at the same time drawing down the end of lever P, so that the arm V will engage upon and hold it until released, as hereinafter explained.

To operate this bar N we provide the main lock B with two angle-bars, *t* and E, as shown in Fig. 1, the first being the usual one for operating the bolt of the lock, and the latter being arranged to connect with the bar N in such a manner as to draw down said bar when this angle-bar E is operated. In order to operate this angle-bar the cam-disk M, which is secured to the inner end of the lock-spindle, and has the usual hook for drawing back the bolt of the lock B and pin for operating the tumblers, has also a cam-groove, *r*, cut in its face, as shown in Figs. 1 and 2. The fence or arm S of this angle-bar E has its opposite end made to project on the side next to the disk M, so that when the arm S falls into the notches of the tumblers this inner end will enter the groove *r*, and thus the rotation of the spindle will act upon the angle-bar E, throwing down its opposite end, and thereby drawing down the bar N, which is held up by a spring, which may be applied as shown at *g*, Fig. 1, or in any suitable manner.

It will be observed that the location of the fences or arms of the two angle-bars is such that the tumblers must be set in different positions in order to operate them, and that when one is being operated the other cannot be, but that both are operated in turn by the same set of tumblers, and that either one may be operated, whenever desired, irrespective of the other. It also follows from this arrangement that, while the tumblers can be set to operate each of the angle-bars by means of the same spindle and dial, the numbers on the dial used for setting them must be different, because the notch in the tumblers must be brought to different positions in order to correspond with the different positions of the arms of the respective angle-bars.

With reference to this feature of our invention we would remark that it is obvious that the mechanical details or construction of the parts may be varied and still operate upon the same principle, and, further, that more than two angle-bars may thus be arranged to be operated in connection with a single set of tumblers, if desired. So, too, the location, form, or shape of the extra angle-bars may be varied at will, and must necessarily be varied to adapt them to operate upon the various devices which they may be designed for in the numerous and varying circumstances where this part of our invention may be advantageously used. It is also obvious that this extra angle-bar may be connected directly to the automatic dogging-lever D, or to any other dogging device, and made to operate or control them just as in this case it is made to control the time-movement.

Now, when the arm L of the timer has been drawn down by the bar N through the medium of the angle bar E, the dog *k* will catch in the notch of disk H, and thus the arm L will be held down, thereby holding the dogging-lever D out of action, so that if the time-movement has stopped the door can be opened by operating the main lock B; but if the time-movement is running the action of the wheel O on the arm T will throw the arm V off of the lever P, and it being operated by a spring wound around its pivot *x*, as shown in dotted lines, Fig. 1, or applied in any other manner, its opposite end will strike on the pin *l* of the dog *k* and trip the dog, so as to release the disk H from its hold, when the arm L will at once fly up, thereby releasing the dogging-lever D, which will again operate to prevent the bolt-work from being retracted.

It will be seen that if the time-movement is running when the arm L is drawn down, as above described, the time that it will be held down is only so long as it takes for the wheel O to move through the distance from one tooth to another, because the instant that the next tooth comes in contact with the arm T the lever P will be released from its detent V, when it will instantly trip the dog *k* and release the arm L. As this takes but a few seconds, it follows that even if a person has the combination of the main lock there is not time enough to set up the combination before the automatic tripping device will have released the arm L, thus leaving the bolt-work locked both by the automatic dogging-lever D and the main lock B.

The time that the detent shall hold the lever P before releasing the arm L, as above described, can be more or less by merely arranging the lever T so that it shall be moved by a slower or faster moving wheel of the time-movement. In any event, the time should be so short that it shall be impossible for a person to set up the combination of the main lock and retract its bolt before the dog *k* is tripped by the lever P or automatic tripping mechanism.

As there is a possibility that the end of the arm T may engage against the point of one of the teeth of its operating-wheel O, in which case it would stop the time-movement, we have provided for such a contingency by pivoting said arm T to its shaft Y in such a manner that it may have a lateral movement sufficient for it to be moved sidewise away from contact with the tooth against which it may thus lock, as shown in Fig. 3, there being a spring, *x*, arranged to bear against said arm T and throw it back in line with the wheel again as soon as released. Two forms of pivoting the arm T to its shaft Y are shown, but any form or method may be used that will permit the end of the arm to be moved away from the point of the tooth; and to effect this lateral movement of the arm T we either curve

the upper end of the bar N where it passes above the arm T, or secure to said bar a projection of any kind in such a position that when the bar is drawn down it will press against the arm T and throw it laterally away from the tooth against which it may be locked. By this arrangement also the arm T will be held laterally away from the wheel so long as the bar N is held down, but will be released and resume its position the instant the bar N is thrown up, and thus be again ready to trip the detent V, and thereby the dog *k*, and this it will repeat as often as the bar N is drawn down, so long as the time-movement continues to run.

At first sight it might be thought that if the disk M should be stopped in such a position as to hold the bar N depressed, (and which may be done,) the door might be opened, because by thus holding the bar N down the automatic dogging-lever will be held out of action; but this cannot be, because, in order to set up the combination of the main lock the disk M must be turned, thereby releasing the angle-bar E and bar N, when the latter will instantly spring up, and the dog *k* will be tripped, as above described.

It will be seen that the tumblers can only be set for one angle-bar at a time, and, consequently, that whichever one they may be first set for, that combination or setting will be broken up or disarranged by the act of setting them for the other.

In Fig. 3 the tripping-arm T is shown pivoted on the top of its shaft Y with a stop-pin, *z*, to limit its backward movement, so that it shall not pass beyond the line of the wheel O. In Fig. 4 this arm T is shown as straddling the shaft Y with a pin passing vertically through both. In this latter case the spring *x* is passed through a hole in the shaft, and its rear end serves as a stop. It is obvious that it is immaterial how these parts are connected so long as the arm T can have the lateral movement required.

It will, of course, be understood that the mechanical details may be varied materially from those here shown, so far as the construction and arrangement of devices in the automatic tripping apparatus is concerned, as with the description and illustration herewith given any mechanic skilled in the art will be able to apply our invention in a variety of ways; and therefore we do not intend or desire to be understood as limiting ourselves to the special construction or arrangement of parts, but merely present this as one of the simplest and best forms at present known to us of constructing and applying our invention.

It is obvious that this automatic tripping apparatus or invention may be applied to any time-lock or attachment in which provision is made for disconnecting the time movement or attachment, whether said time movement or attachment be used to dog a non-time-lock or be used to operate on or in connection with other kinds or styles of locking or dogging devices, and we so intend to apply it wherever applicable or desirable.

It will be readily seen from the foregoing description that this invention will enable its owner to prevent being locked out in case the time-movement should stop from any cause, and at the same time will prevent any one from unfastening or opening the door so long as the time-movement continues to run up to the time for which it may have been set to be opened, thus affording perfect control and absolute security.

Having thus described our invention, what we claim is—

1. The combination of two or more separate angle-bars with a single set of tumblers, said angle-bars being all arranged to be operated by the same tumblers and by a single spindle and dial, substantially as described.

2. The combination of a time attachment and a non-chronometer-lock with a single set of tumblers and two independent angle-bars, one of said bars being arranged to operate the lock and the other to disconnect the time attachment, substantially as herein set forth.

3. The combination of a time attachment, mechanism for disconnecting the same, whether running or not, from the part that it dogs, and an automatic tripping device arranged to throw said time attachment into operation again, substantially as and for the purpose set forth.

4. The automatic tripping device consisting of the two arms T V, arranged to turn on a common center, with the arm T, that engages with the wheel of the time-movement, arranged to have an independent lateral movement, whereby it can be disengaged from the tooth of the wheel in case it becomes locked therewith, substantially as and for the purpose set forth.

5. In combination with the tripping-arm T, the movable bar N, constructed and arranged to operate on said arm T, substantially as described, for the purpose of releasing said arm from the tooth of the wheel, as set forth.

6. In combination with the bolt-work of a safe or vault door, an automatic dogging device, D, a non-chronometer-lock, B, and a time attachment, A, with means, substantially such as described, for disconnecting the time attachment and for automatically connecting it again before the non-chronometer-lock can be operated, the combination being substantially such as is herein set forth.

7. The combination-lock B, provided with two angle-bars, *t* and E, both arranged to be operated by the same set of tumblers, in combination with a time attachment, A, provided with an automatic tripping mechanism and the connecting-bar N, all combined and arranged for joint operation, substantially as and for the purpose set forth.

WM. KOOK.
JOSEPH L. HALL.

Witnesses:
R. W. BULLA,
R. G. PULLEN.