2 Sheets—Sheet 1.

W. KOOK & J. L. HALL.

Time-Lock.

No. 206,677. **Patented Aug. 6, 1878.**

Fig. 1

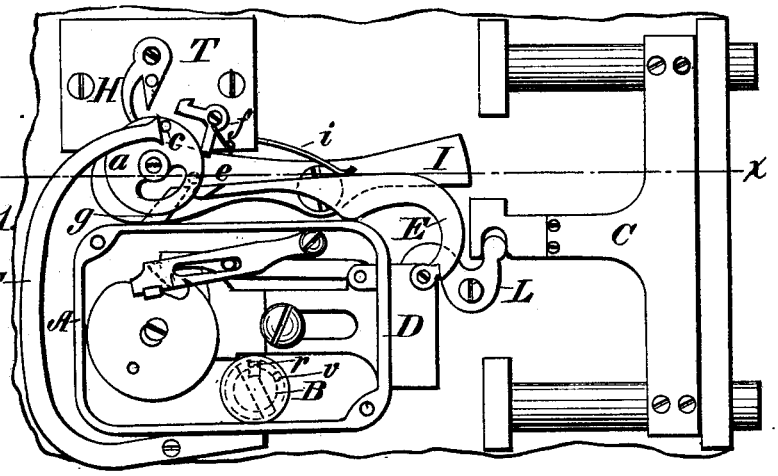

Fig. 2.

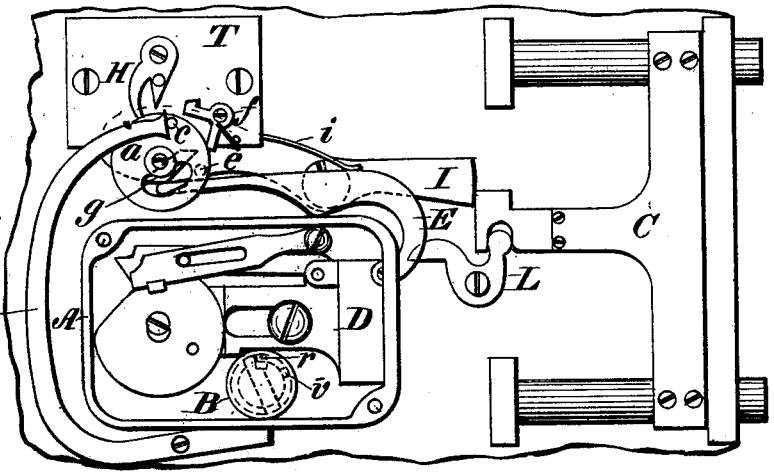

Fig. 3.

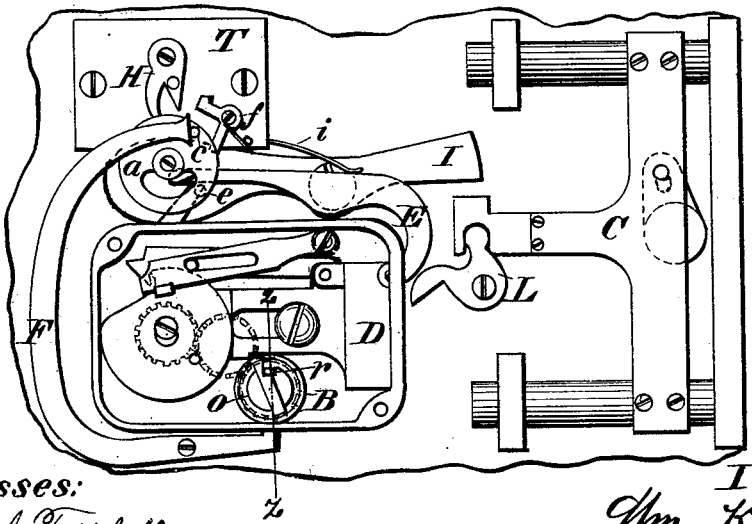

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Fig. 4.

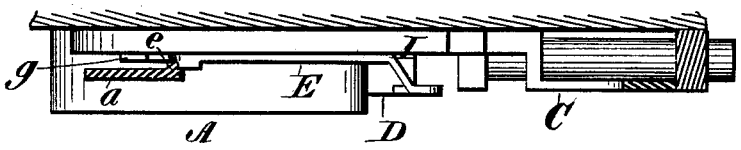


Fig. 5.

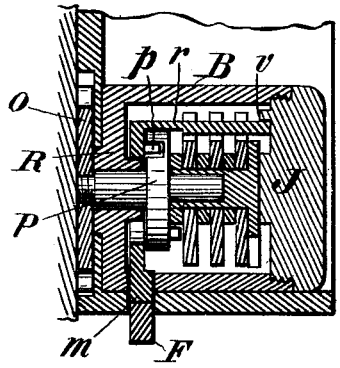


Fig. 6.

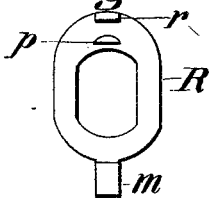
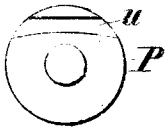


Fig. 7.



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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. **206,677**, dated August 6, 1878; application filed April 27, 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 Locks for Safes, of which the following is a specification:

This invention consists in a novel combination and arrangement of a main lock, a separate dogging-lever, a time attachment, and a guard-lock, all constructed to operate as hereinafter more fully set forth.

Figures 1, 2, and 3 are face views of the inside of a safe or vault door, showing the improvements applied thereto, the front plate of the main and guard locks being removed to show the interior works, and the several figures representing the locking and dogging devices in their several positions. Fig. 4 is a transverse horizontal section on the line *x x* of Fig. 1; and Figs. 5, 6, and 7 are views showing the construction of the guard-lock.

In the drawings, A indicates the main lock, which in this case is a permutation-lock, though any other style may be used, if desired. B indicates the guard-lock, which is located within the case of the main lock, though it may be located outside, if preferred. T indicates the time attachment, of which H is one of the hands, arranged to operate on the pivoted disk *a*, there being also a spring dog or catch, *f*, arranged to engage in a notch in the disk *a* after it has been moved by the hand H, and thus lock it in position and prevent it from turning back until released, there being a spring connected to the disk in such a manner as to throw it back whenever released from the action of the dog *f*, these parts being well understood, and therefore not necessary to describe more in detail.

In this case an elbow-lever, L, is pivoted to the door, and has one end working loosely in a notch, or may be otherwise connected to the train-bolts C, its other end being locked fast by the bolt D of the main lock when the said bolt is thrown forward, as shown in Fig. 1. In this way the main bolt is made to lock or unlock the train-bolts, and this is designed for use during business hours.

A strong lever, I, is bolted to the door, as shown, in such a position that when its front end is depressed, as in Fig. 2, it will bear against the train-bolts and hold them fast, even though the bolt D of the main lock be withdrawn, as there shown, but when its front end is raised it will permit the train-bolts to move freely.

The rear end of this dogging-lever I is made to overbalance the front end, so that if the safe be turned over it will fall into position behind the train-bolts by gravity, and thus hold them fast. As shown in Figs. 1, 2, 3, and 4, the rear end of this lever I passes behind the disk *a*, and it has on its face an inclined projection, *g*, under which the end of a bar, E, that is pivoted to the front end of the main-lock bolt D, engages as the bolt and bar E are thrown back, thereby raising the rear end of the lever I, throwing down its front end, and holding it in position to dog the train-bolts, as represented in Fig. 2.

By this arrangement, it will be seen that if burglars or others should attempt to open the door, and should even succeed in operating the main lock, they could not open the door, because when they threw back the bolt of the main lock that would depress the front end of the lever I, and thus dog the train-bolts.

In order, however, that the door may be opened at the proper time after the time attachment has run the length of time for which it may have been set, the disk *a* has a pin, *e*, arranged to project from its rear face, as shown in Fig. 4, and in dotted lines in Figs. 1, 2, and 3. This pin *e* is located just at the front end of the incline *g* on the lever I in such a position that, as the sliding bar E is moved back, its beveled end will strike upon this pin, which will cause it to ride up over the incline *g*, instead of passing under it, as represented in Fig. 3, thereby leaving the dog or lever I disconnected from the train-bolts, which are then free to be operated whenever the bolt of the main lock is withdrawn, as shown in Fig. 3.

It will be understood that when the hand H of the timer T has operated to turn the disk *a* to the position above described, the dog *f* will lock the disk in that position, and thereafter, during the day, or until the disk *a* is undogged, the main lock can be operated at will without throwing into operation the dog-

ging-lever I; but that as soon as the disk is released, or the time attachment set in operation at the close of the day, then any withdrawal of the bolt of the main lock will cause the lever I to dog the train-bolts and prevent the opening of the door.

In order to release the train-bolts from the lever I in case the time attachment should stop or fail to operate, we provide the guard-lock B, and arrange it to operate upon one end of a pivoted lever, F, the opposite end of said lever being arranged to bear against a pin, *c*, on the disk *a*, whereby the latter may be turned so as to be caught and held by the dog *f*, as shown in Fig. 3, this lever F thus being made to move the disk to the same extent that the time attachment would had it operated as intended.

By this means the pin *c* is brought to the position where it will cause the sliding bar E to ride up over the incline *g*, thus leaving the rear end of lever I depressed and disconnecting it from the train-bolts, as before described. Then, by withdrawing the bolt of the main lock, the train-bolts can be thrown back and the door opened.

The guard-lock B consists of a small circular case, provided with a set of permutation-tumblers mounted on a spindle which is driven by gear-wheels from the spindle of the main lock, as shown in dotted lines in Fig. 3, they being fitted in a recess in the back plate of the main-lock case, as shown in Fig. 4, where *o* represents the pinion that is secured to the spindle of the guard-lock. Secured to the spindle is a disk, P, which has a groove in its rear face, as shown in Fig. 7, and between this disk and the back of the case is mounted a yoke, R. (Shown detached in Fig. 6, and in place in Fig. 5, which latter is a vertical section on the line *z z* of Fig. 3.) This yoke has a projecting stud, *p*, which, at certain times, or when the tumblers are all set or gated so that the bar *r* drops into the notches of the tumblers, engages in the groove *u*. As the disk P is rotated so as to bring the stud *p* out of said groove *u*, it rides upon the periphery of the disk, and thereby raises the bar *r* out of the notches in the tumblers, and, as it cannot drop into the notches until the tumblers are again gated or set, it follows that the tumblers may be turned indefinitely in either direction by operating the spindle of the main lock, and the bar *r* will remain elevated. The front plate or cap J of this guard-lock is made to screw in or onto the case, and, as shown in Fig. 5, and by dotted lines in Figs. 1, 2, and 3, it has a stud, *r*, projecting from its inner face at such a point or position that the cap cannot be turned, when the bar *r* is elevated, without striking against the bar *r*, which thus prevents the cap from being removed until the tumblers are gated or set and the bar *r* permitted to fall into their notches. When that is done the bar *r* will fall below the stud *r*, as indicated in Fig. 3, and then the cap J can be unscrewed and removed.

By this arrangement it will be seen that the guard-lock cannot be opened except by a knowledge of the combination on which it is set, and which it is not intended shall be known to any of those in daily attendance.

It will thus be seen that access to the tumblers of the guard-lock, either for learning their combination or tampering with them, is prevented.

As shown in Figs. 5 and 6, the yoke R has a projection, *m*, at its lower end, which, working through an opening in the case of the locks, operates upon the end of the lever F by depressing it when the tumblers are set, and the stud *p* of the yoke enters the groove *u* of the disk P, and is thus made to push the disk *a* of the time attachment over so as to be held by the dog *f*, which throws the pin *c* into position for throwing up the slide-bar E and releasing the dogging-lever I from connection with the train-bolts, as hereinbefore described.

It will thus be seen that by setting and operating the tumblers of the guard-lock B the train-bolts can at any time be released from the action of the dogging-lever I, even though the time attachment should stop or fail to operate at the appointed time.

It is obvious that the slide-bar E, instead of being connected to the bolt of the main lock, may be attached to the train-bolts or to the lever L, and made to operate the same, it only being necessary to allow sufficient play between the end of lever I and the train-bolts for the latter to move far enough to operate the slide-bar E in time for the latter to reach the incline *g* or the pin *c*, by which it is made to ride over or under said incline, as before described. By changing the pivot of the lever I it may be made to operate in much less time, or with a less movement of the slide-bar, and thus the play or space between it and the train-bolts may be lesseened

It will be observed that in this case the time attachment is not connected with the main lock, and has no effect whatever upon it, and that consequently, if desired, it may be dispensed with, and the other devices used without it, in which case the slide-bar E would be connected to the train-bolts or to the elbow-lever L, as above stated. In that case the locking would be effected entirely by the lever I, which, after the time attachment had operated, would be released, when the door could be opened; and in case the time attachment failed to operate the guard-lock would be called into operation, as already described. We prefer, however, to use the main lock for convenience during the day, and also because all safes and vaults are already provided with a main lock, in connection with which the other devices may be applied without dispensing with the main lock already in use.

We do not claim the broad idea of using a guard-lock for releasing the time attachment

in case it should stop; nor broadly the idea of securing the cap or plate of the guard-lock so that it can only be removed by a knowledge of the combination on which it is set, as these features are included in our previously-filed applications.

Having thus fully described our invention, what we claim is—

1. The combination of the main lock A with the slide bar E, the pivoted lever I, provided with the incline *g*, the time attachment T, and disk *a*, provided with the pin *e*, all arranged to operate in connection with the train-bolts of a safe or vault door, substantially as described.

2. The combination of the main lock A and slide-bar E with the pivoted lever I, provided with the incline *g*, all arranged to operate substantially as described, whereby the unlocking of the main lock will cause the lever I to dog the train-bolts, substantially as described.

3. The combination of the main lock A with the slide-bar E, the pivoted lever I, provided with the incline *g*, the time attachment T, disk *a*, provided with the pin *e*, and guard-lock B, with the lever-connection F, all constructed and arranged to operate in connection with the bolt-work of a safe or vault door, substantially as described.

4. The screw-cap J, provided with the projection *v*, in combination with one or more tumblers, and the bar *r*, arranged to operate substantially as described, whereby the cap is prevented from being detached except when the bar rests in the notch of the tumblers, as set forth.

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