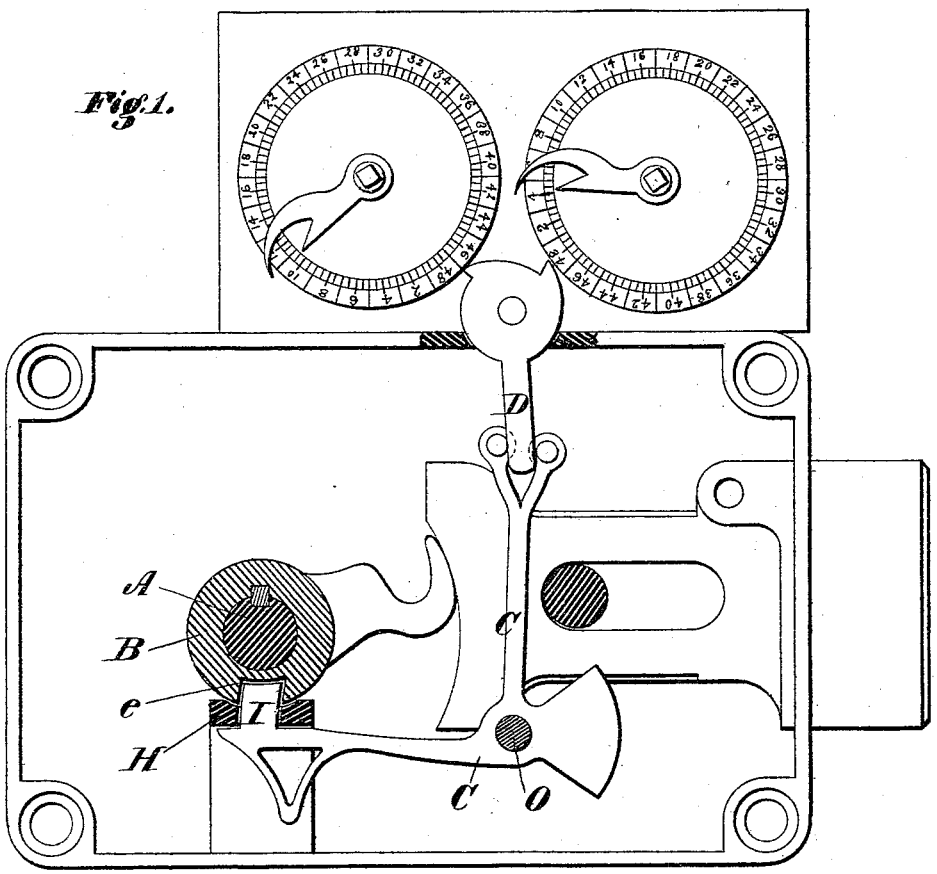
2 Sheets—Sheet 1

J. L. HALL.

Device for Locking the Spindles of Safes.

No. 211,995. **Patented Feb. 4, 1879.**

Fig. 1.



Witnesses:

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Inventor:

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2 Sheets—Sheet 2.

J. L. HALL.

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Fig. 2.

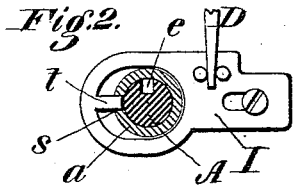


Fig. 3.

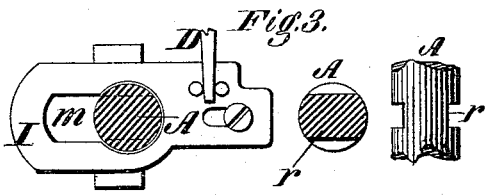


Fig. 4.

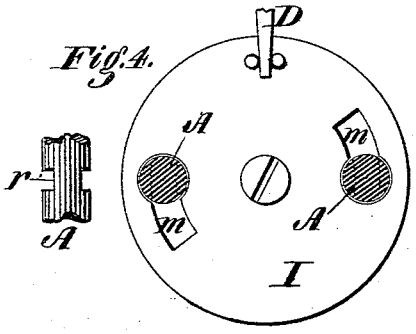


Fig. 5.

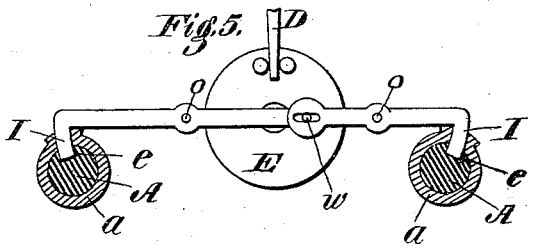


Fig. 6.

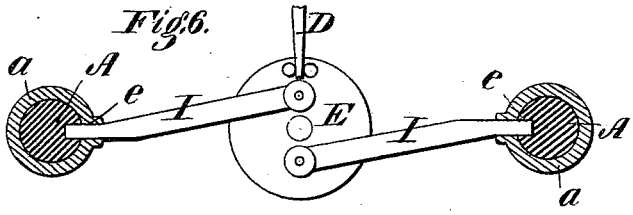
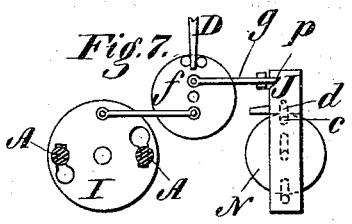


Fig. 7.



Witnesses:

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D. P. Lowe

Inventor:

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UNITED STATES PATENT OFFICE.

JOSEPH L. HALL, OF CINCINNATI, OHIO.

IMPROVEMENT IN DEVICES FOR LOCKING THE SPINDLES OF SAFES.

Specification forming part of Letters Patent No. **211,995**, dated February 4, 1879; application filed April 20, 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 Devices for Locking the Spindles or Arbors of Safes, &c., of which the following is a specification:

My invention consists in the construction and arrangement of suitable mechanism to operate upon and lock or dog the arbors or spindles passing through the door or body of safes, vaults, &c, said mechanism being controlled and operated by a time-lock or time attachment, whether said arbors or spindles be used to operate the tumblers of the lock or the bolt-work of the door, or mechanism operating upon the lock or the bolt-work, as hereinafter more fully described.

Figure 1 is a front elevation of a lock, with the front of the case removed, showing my invention applied to lock or dog the spindle thereof. Figs. 2, 3, 4, 5, 6, and 7 show my invention applied in various modified ways, all as hereinafter more fully explained.

The object of this invention is to afford better protection to bank officers against burglars or bank robbers by giving convincing proof to such burglars and others that a time-lock or time attachment is in operation, rendering the arbors immovable, removing all doubts of a false combination or key, and avoiding the personal danger which such suspicion entails.

In carrying my invention into practice, there are various ways of applying it.

In Fig. 1, A represents the arbor of a lock of any suitable construction, having a collar, B, keyed or otherwise secured thereon, as usual; and C represents an L-shaped lever, arranged to swing or turn on a pivot, O, said lever being balanced thereon, in order to move freely and with but little actuating force. The horizontal arm of this lever C is provided at its outer end with a dog, I, arranged to engage in a notch, *e*, in the arbor A or its collar B, as may be preferred, the dog I passing through a fixed guide, H, by which it is sustained and steadied. The vertical arm of the lever C is connected by a lever, D, or any suitable means, with a time-movement, so that when the time for which the movement is set arrives the vertical arm of the lever C shall be thrown backward, thus throwing down the horizontal arm of the same and disengaging the dog I from the notch in the arbor A or its collar B, and leaving the arbor free to be turned.

Referring to Fig. 2, A represents the arbor, having a notch, *e*, cut in one side, said arbor being in this case encircled by a stationary sleeve or ring, *a*, with an opening, *s*, in one side. In this case the locking-dog I is made in the form of a sliding yoke encircling the arbor and its sleeve *a*, and slotted, so as to permit a to-and-fro movement, there being a short stud, *t*, which is steadied and guided by passing through the hole *s* of the sleeve *a*, so that when the dog I is moved forward this stud will engage in the notch *e* of the arbor when the latter is turned to the proper position, and thus lock it fast.

Fig. 3 shows a similar reciprocating or sliding dog, I, without the stud *t*, but arranged to lock the arbor A, which, in this case, is flattened on its sides, as shown at *r*, by simply moving forward far enough to engage the flattened portion of the arbor between its inner edges, the slot *m* of the dog I being narrowed at its rear portion for that purpose, it being wide enough at its opposite end to permit the arbor to be turned freely.

Fig. 4 shows two arbors, A, with two locking-dogs, I, arranged to lock them both simultaneously. In this case the construction is the same as in Fig. 3, except that the dogs I, instead of being arranged to reciprocate in a right line, are arranged to move in a circular path, the two locking-dogs both being united in one piece of metal in the form of a disk.

In Fig. 5 the two locking-dogs I are arranged or constructed to operate on the principle of a lever, the two being pivoted on pins *o*, and having their inner or adjoining ends slotted to engage with a stud, *w*, on a disk, E, so that by moving the disk both dogs shall be operated simultaneously.

In Fig. 6 the two locking-dogs are represented as connected to a disk, E, by which they are made to slide to and fro, and engage in the notches *e* of the arbors in the same manner that the stud of Fig. 2 does.

In Fig. 7 the same form of locking-dog is shown as in Fig. 4, it being a slotted disk, and this is connected by a rod or link to a

disk, *f*, which also has a catch-bar, *g*, arranged to engage in a notch, *p*, of the bar J, which, when released, serves to connect with and operate the bolt-work of the safe or vault door, the spindle or arbor of the bolt-work being disconnected therefrom so long as the bar J is held up. This bar J and its disconnected spindle or arbor is a well-known device heretofore used on safes, and forms no part of my present invention, except to show how it may be used in connection with my locked arbors.

It will be seen that the disk E of Fig. 5 operates the same as an elbow-lever, and that an elbow-lever might be substituted in its stead. So, too, the disk E in Fig. 6 and the disk *f* in Fig. 7 may be replaced by a straight bar, as they operate on the principle of a simple lever or pivoted connecting-rod, by which the dogs I are connected and moved simultaneously.

It is obvious that any desired number of arbors or spindles may be simultaneously locked or unlocked in this manner, it only being necessary to arrange the locking-dogs I so as to reach and operate upon the arbors wherever the latter may be located, though it is seldom that more than two arbors are used on one safe or vault door. For instance, if a pivoted lever be used, as shown in Fig. 1, two or more dogs, I, may be arranged on the arm C; or, if preferred, they may be arranged on opposite sides of the pivot O, and made to lock a corresponding number of arbors; or, if a sliding dog be used, as shown in Figs. 2 and 3, it may be made of any required length or shape, and thus be made to operate on any desired number of arbors; or, if the dog be made to rotate, as in Figs. 4 and 7, it is only necessary to make it of a size to reach the several arbors, and to locate the slots *m* to correspond with the location of the arbors on the door. The arrangement illustrated in Figs. 5 and 6 will be found most convenient where it is desired to lock several arbors, as the locking-dogs I can be arranged to radiate from the disk E in any direction necessary to bring them in contact with the several arbors. These locked arbors are designed to be used in connection with a time-lock or time attachment, that patented to H. Gross, February 8, 1876, No. 173,121, being well adapted for such use. The lever D (shown fully in Fig. 1 and partially in the remaining figures) represents the lever which is operated by the time mechanism or attachment, and by means of which the time-movement is made to operate upon the locking-dogs or upon the device to which they are connected, in case any is used, the only requisite being that the time mechanism or attachment shall be so connected with the locking dog or dogs as to operate them at the required time.

It is understood that a spring is used in connection with the time attachment to move the locking-dogs when the safe is closed and the arbors are turned into the proper position for the dogs to engage therewith; or, if preferred, the spring may be applied direct to the locking-dogs to throw them into position; and, instead of the time attachment being used to move them to undog the arbor or arbors, magneto-electric force may be used, the locking and unlocking of the arbors being the same, whatever the character of the force used to move the dogging or locking devices.

I am aware that a patent has been granted in which there are shown two bolts for locking a safe-door, pivoted to a disk secured to the spindle which throws the bolts of the bolt-work, and that said bolts are locked fast by the bolt of a key-lock arranged to engage in a notch of said disk.

I am also aware that it has been proposed to arrange a time-lock so that its bolt would bear against a lever, the opposite end of which was to be connected by a link to the disk on the spindle or arbor used to throw the train-bolts of a safe, so that said arbor could not be turned to withdraw the bolts until the bolt of the time-lock had been withdrawn, and therefore I do not claim either of such devices or arrangements; but I am not aware that any one has ever before devised a plan for simultaneously locking the arbor of a lock and of the bolt-work or a series of arbors or spindles; and therefore

What I claim is—

1. In combination with one or more spindles or arbors, A, of a safe or vault, a corresponding dog or dogs, I, and a time attachment or movement, provided with a connecting-lever, D, or its equivalent, the said parts being arranged to operate substantially as described, whereby the arbors are held locked until released by the time movement or attachment.

2. In combination with a series of separate and independently-operating spindles or arbors on safe or vault doors, a corresponding set of locking-dogs, I, arranged to operate simultaneously, substantially as described, whereby the arbors of one or more locks and of the bolt-work may be locked or unlocked simultaneously, as set forth.

JOSEPH L. HALL.

Witnesses:

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CHARLES BIRD.