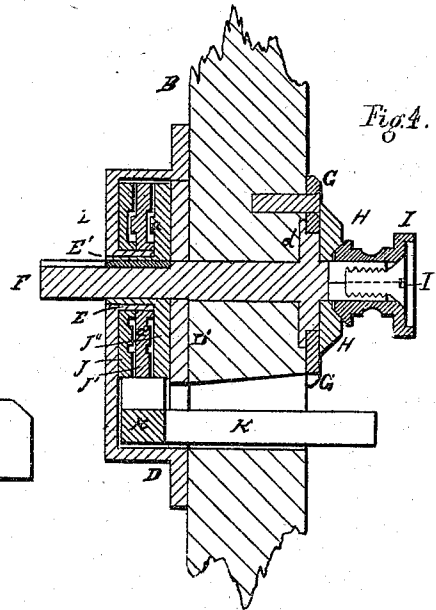
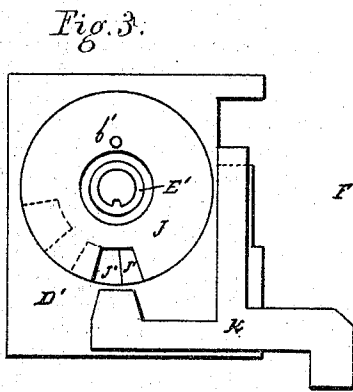
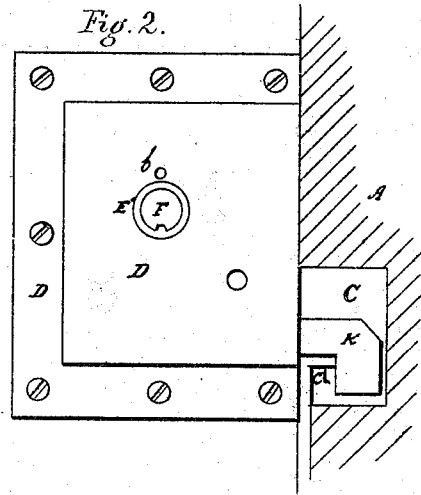
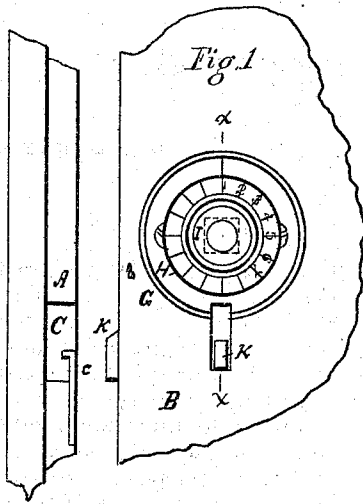


A. D. HOFFMAN.
Combination Locks.

No. 141,876.

Patented August 19, 1873.



WITNESSES—

C. J. Shipley
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INVENTOR—

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UNITED STATES PATENT OFFICE.

AUSTIN D. HOFFMAN, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, OF PART INTEREST TO NATHAN FRIEDMAN AND ABRAHAM LIEBENSTEIN, OF SAME PLACE.

IMPROVEMENT IN COMBINATION LOCKS.

Specification forming part of Letters Patent No. 141,876, dated August 19, 1873; application filed March 21, 1873.

To all whom it may concern:

Be it known that I, AUSTIN D. HOFFMAN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Combination Locks, of which invention the following is a full, clear, and exact description, which will enable others skilled in the art to make and use the said improvements, reference being had to the accompanying drawing forming a part of this specification, and in which—

Figure 1 represents a front elevation of my improved lock applied to a railway freight-car door; Fig. 2, a rear elevation of the same; Fig. 3, a front elevation of the lock when the latter is detached from the door, and when the operating shaft or spindle and its attachments are removed; and Fig. 4, a vertical cross-section in the plane of the line *x x*.

Like letters of reference indicate like parts.

My invention relates to that class of combination locks in which notched tumblers are employed in connection with a graduated face-plate or disk, so that the position of the notches with relation to each other may be regulated for the purpose of locking and unlocking the lock. The object of my invention is to improve the construction and operation of locks of this class, and to render them capable of being applied with advantage to sliding doors—such, for example, as are used on railway freight-cars; and to this end my invention consists in the adjustable graduated disk loosely mounted on the operating-spindle, and arranged between a collar on the spindle and a knob longitudinally adjustable on the spindle, and attached thereto by means of a screw arranged in a depression in the face of the knob and entering the end of the spindle. It also consists in the latch or bolt provided with a handle extending through the door, and with a hook-shaped outer end, and having its inner end constructed and arranged to engage the notches in the tumblers.

In the drawing, A represents the door-jamb of a railway freight-car, and B is the door. C is a mortise in the jamb, and *c* is a plate attached to the jamb rigidly and partly lapping the mortise C, as shown in Figs. 1 and 2. D

B.

is the case of the lock. D' is a plate arranged in the case D and lying on the door. E is a sleeve or tubular projection extending into the case and rigidly attached thereto. F is the operating shaft or spindle, passing freely through the door, the plate D', and the case D. *d* is a collar or annular flange on the spindle F, to limit the rearward movement of the latter, and for the purpose hereinafter mentioned. G is an annular face-plate arranged on the door and lapping a shoulder on the collar *d*, as shown, thereby preventing the spindle F from being drawn from the door, unless the plate G is removed. H is an annular graduated disk resting on the collar *d*. The outer end of the spindle F is square. I is a handle or knob fitted to the square end of the spindle F and arranged thereon. The face of the knob I is cut away, as shown in Fig. 4, and the knob is retained in its position on the spindle by means of a screw entering the face of the knob and passing into the end of the spindle, as shown. The face of the disk H has a beveled depression, and the rear end of the knob I is beveled in a corresponding manner, as shown. This beveled depression receives the rear end of the knob, and is small enough to prevent the latter from contact with bottom of the depression. By tightening the screw which retains the knob upon the spindle the disk H is crowded between the spindle and the collar *d*, and is thus made to move with the spindle; but by loosening the said screw the disk H may be turned independently. In order to prevent this independent movement of the disk H from being made by unauthorized persons without detection, I arrange a suitable seal, I', in the face of the knob, so as to cover the screw-head. The rear end of the spindle F is provided with a longitudinal groove extending to or beyond the plate D'. J, J', and J'' are tumblers, each having a notch sunken into its periphery, as shown in Fig. 3. The tumbler J'' is provided with a sleeve or tubular projection, E', which is rigidly attached thereto, and which has a longitudinal rib projecting into the groove of the spindle F, as shown in Figs. 3 and 4, so that the said spindle and tumbler

will revolve together, and yet be capable of being readily separated from each other. The tumblers J and J' are arranged on the part E. *a* is a pin on the rear face of the tumbler J'', and this pin projects into an annular groove in the front face of the tumbler J', in which groove there is also a pin *a'*, constructed and arranged for contact with the pin *a*, so that the movement of the tumbler J'' will be communicated to the tumbler J' when these pins are in contact, and the movement of the tumbler J' is communicated to the tumbler J in like manner. The pins *a* and *a'* are so arranged that the notches in the periphery of the tumblers may be brought into a straight line. *b* is a hole in the case of the lock, and *b'* is a hole in the tumbler J, and each tumbler is provided with a hole, *b'*. The holes *b* and *b'* are so arranged that, when the notches in the periphery of the tumblers are all in the same line, a pin may be passed through all the said holes. K is the latch or bolt suspended on the plate D', and passing through a vertical slot in the door. Each end of the latch is made rectangular—one to engage the notches in the tumblers, and the other to engage the part *c*, as shown in Figs. 2 and 3. I deem it preferable, to avoid nicety of construction, to bevel the notches of the tumblers and the inner end of the latch, as shown in Fig. 3, and it will be perceived, on reference to said figure, that the latch K cannot be lifted from its engagement with the part *c* unless the notches in the tumblers are all in the same line. In order to arrange the tumbler-notches in a straight line, a pin is inserted into the hole *b* and pressed against the tumbler J. The knob I is then turned in either direction until the said pin enters the hole *b* in the tumbler J. The knob is then turned in the opposite direction until the pin enters the hole in the tumbler J'. The movement of the knob is then again reversed until the pin enters the hole in the tumbler J''. The combination on which the lock is set is ascertained by noting the numbers or space-lines on the disk H which are opposite the index-line at the time the pin enters each hole during the operation above described, and the tumbler-notches may then be arranged in the same straight line by means of the knob alone, in the usual manner, the knob being

turned in same manner as when the combination was ascertained. In order to change the combination the disk H is loosened and turned in the manner hereinbefore described, and the tumbler-notches should be out of the same straight line when the disk H is thus moved, so that an entirely new combination will be set.

It will be observed from the foregoing description that the lock is adapted for use on sliding doors, and that the combination may be changed from the outside without either opening the door, removing the lock, or taking it apart; in other words, the combination is rendered capable of being changed by means of an adjustable graduated disk, and all the means of adjustment are arranged for access on the outside of the door. It will also be perceived that the combination cannot be changed without breaking the seal; that the seal is protected by being arranged in a depression in the face of the knob, and that the combination cannot be "picked up" except from the rear side of the lock. Two or more tumblers may be employed. The lock is simple in its construction and operation, compact, and capable of being cheaply made.

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

1. In a combination tumbler-lock, the adjustable graduated disk H, loosely mounted on the spindle F and arranged between the collar *d* and the knob I, the said collar being rigid on the said spindle, and the knob I being longitudinally adjustable on the spindle and attached thereto by means of a screw arranged in a depression in the face of the knob, and entering the end of the spindle, all substantially as and for the purposes specified.

2. In a combination tumbler-lock, the latch or bolt K, provided with a lifting-arm extending through the case, and having its outer end made hook-shaped, and its inner end constructed and arranged to engage the tumbler-notches, substantially as shown and described, and for the purposes set forth.

AUSTIN D. HOFFMAN.

Witnesses:

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F. F. WARNER.