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REVERSIBLE COMBINATION LOCK.

No. 188,890. Patented March 27, 1877.

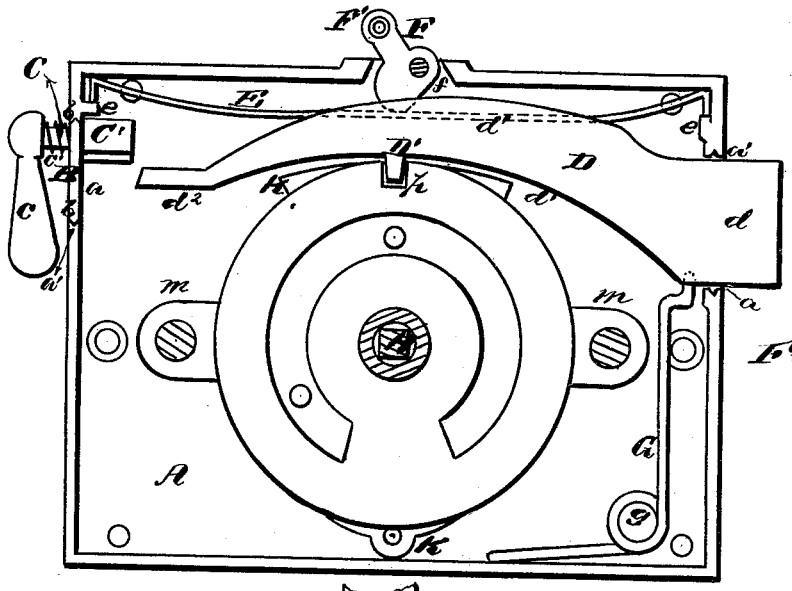

Fig. 1.

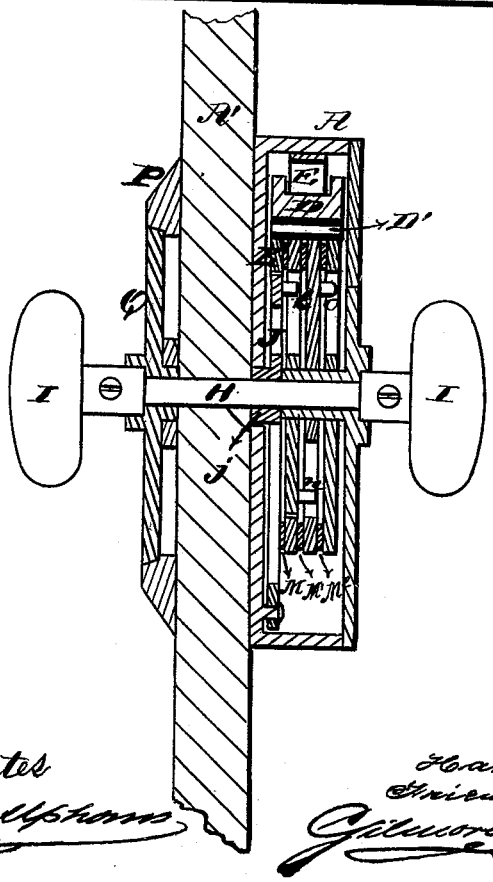

Fig. 2.

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Fig. 3.

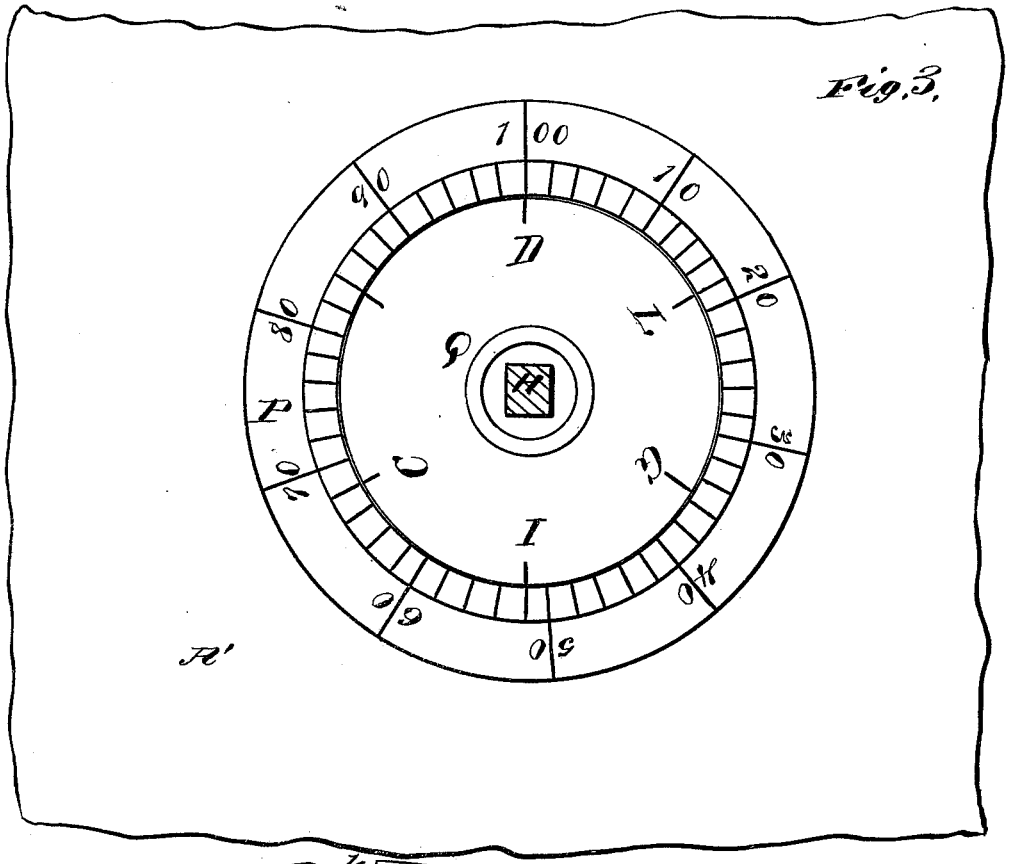

Fig. 4.

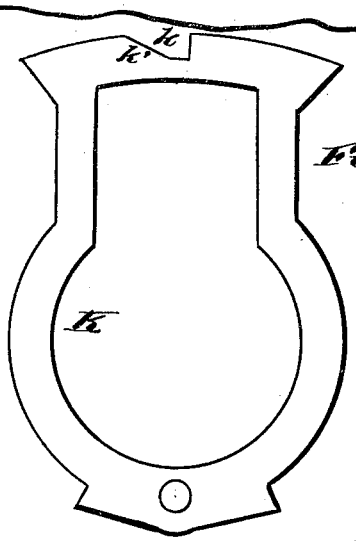

Fig. 5.

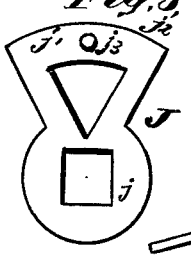

Fig 6

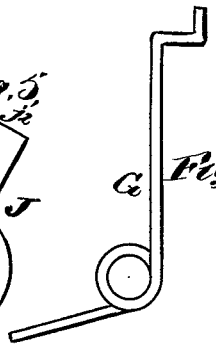

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Fig. 7.

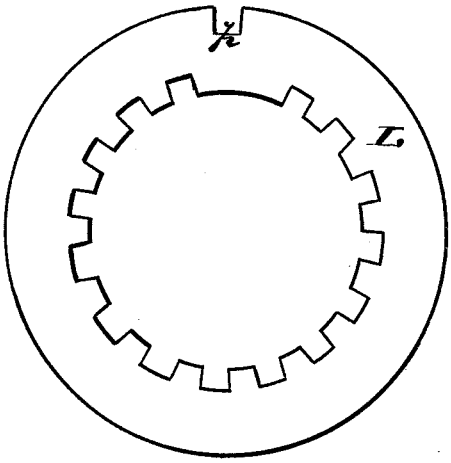


Fig. 8.

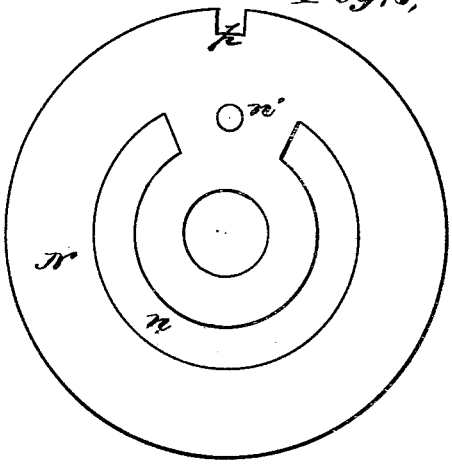


Fig. 9.

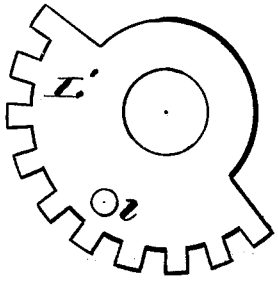


Fig. 10.

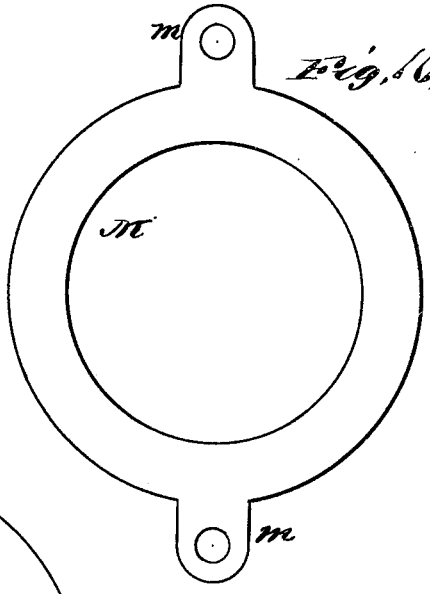
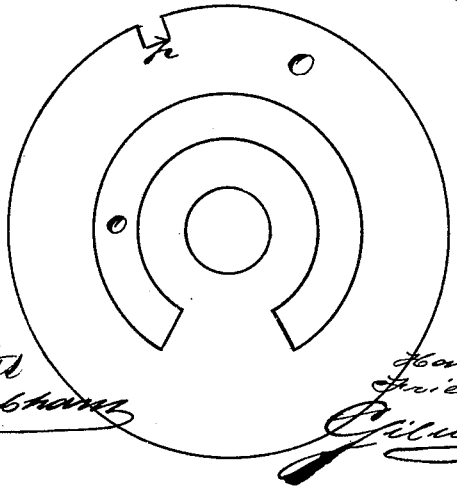


Fig. 11.



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UNITED STATES PATENT OFFICE.

HANSON GOODRICH AND FRIEND J. CHAPMAN, OF McLEANSBOROUGH, ILLINOIS, ASSIGNORS TO THEMSELVES AND WILLIAM B. GARNER, OF SAME PLACE.

IMPROVEMENT IN REVERSIBLE COMBINATION-LOCKS.

Specification forming part of Letters Patent No. **188,890**, dated March 27, 1877; application filed February 10, 1877.

To all whom it may concern:

Be it known that we, HANSON GOODRICH and FRIEND J. CHAPMAN, of McLeansborough, in the county of Hamilton and State of Illinois, have invented a new and valuable Improvement in Combination Door-Locks; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a plan view of our lock with the covering-plate removed, and Fig. 2 is a transverse vertical sectional view thereof. Figs. 3, 4, 5, 6, 7, 8, 9, 10, and 11 are detail views thereof.

This invention is an improvement upon the device secured to F. J. Chapman by Letters Patent, dated October 19, 1875.

The nature of said invention consists, first, in providing each end of a door-lock casing or plate with an opening for a bolt to play through, and combining with said casing a detachable plate, which is adapted to close either of said openings.

It also consists in journaling in said detachable plate a rotating or oscillating locking-cam, adapted to prevent the retraction of said bolt by bearing against the rear end thereof.

It also consists in combining with the spindle of a door-knob a notched oscillating tumbler and a series of notched and curve-slotted combination-wheels.

It consists, finally, in certain additional novel devices, hereinafter particularly described.

In the annexed drawings, A designates an ordinary lock-plate or metallic casing for a door-lock, the same being secured to a door, A′. Each end of said casing is provided, between the middle and the top thereof, with an opening, *a*, which has V-shaped grooves *a′* in its top and bottom. B is a detachable metal plate, provided with V-shaped ridges *b* on its top and bottom, corresponding to said grooves *a′*. Said plate B is adapted to close either of said openings, and by transferring it from one to the other the said casing is fitted for use with a left or a right bolt, as the case may be. In said plate B is journaled a short shaft, C, carrying inside of said casing a cam-faced rotating or oscillating block, C′. Said shaft C is provided with a handle, *c*, and also with a spring, *c′*, arranged between said handle and casing A, and serving to keep said shaft C and block C′ in place.

D designates a bolt, provided with a broad strong outer end, *d*, which plays through either opening *a*, (said bolt being reversible,) a tapering middle part, d^1, which is curved to conform to the shape of the tumbler and combination-wheels, hereinafter described, and a diminished rear end, d^2, which is slightly beveled to engage with the cam C′, above referred to. When said bolt is shot the turning of block or cam C′ in one direction prevents said bolt from being retracted. Turning it in the other direction frees said bolt therefrom. The under side of the middle part d^1 of said bolt is provided with a transverse rib or fence, D′, and the upper side of said bolt is provided with a longitudinal groove, (shown in Fig. 2,) which receives the middle part of a flat spring, E, when the latter is depressed. The ends of said spring are turned downward and bear against small blocks *e e* on the inside of the ends of casing A. F designates a cam, pivoted in an opening, *f*, in the top of casing A, and provided with a handle, F′, whereby it may be turned down to prevent bolt D from rising out of engagement with the tumbler and combination wheels or disks, hereinafter described. The office of spring E is to hold up said cam when said bolt is being used as a latch. It readily yields, however, when manual force is applied to handle F′. G designates a spring, attached at one end to a stud, *g*, on the inside of casing A, and bearing at the other end against a lug on the bottom of the front part of said bolt. Its operation is similar to that of an ordinary latch-spring.

In the accompanying drawing, Fig. 2, H designates a prismatic door-knob spindle, having a knob, I, at each end, and passing through door A′ and casing A. J, Fig. 5, designates

a detachable plate, which consists of an inner disk, *j*, fitting upon said spindle, and a flaring outer extension, j^1, having a curved or segmental edge, j^2. This detachable plate or arm J turns with said spindle inside of a skeleton tumbler, K, Fig. 4, which is pivoted at its bottom to the side of said casing, and communicates oscillating motion to said tumbler. The top of said tumbler is provided with a notch or recess, *k*, which is beveled on one side at *k'*, so as to cause rib or fence D' and bolt D to rise when said bevel engages with said rib.

Detachable plate or arm J is provided with a stud, j^3, on its outer face, which gives motion to a compound wheel consisting of an inner cogged segment, L', Fig. 9, and an internally-geared rim, L, Fig. 7, which fits upon said segment. When said parts L L' are secured together by engaging their cogs and intervening recesses a curved passage or slot is formed, in which said stud j^3 plays. Said compound wheel L L' does not turn until said stud has reached one or the other of the ends of said curved slot or passage. It will then turn with arm or plate J. A fixed anti-friction ring, M, Fig. 10, is interposed between said compound wheel and tumbler K.

Figs. 8 and 11 represent, respectively, two wheels or disks, N and O, provided with slots or channels *n* and *o*, which are concentric with their respective peripheries. In channel or slot *n* works a stud, *l*, on the outside of segment L', and in channel or slot *o* works a similar stud, *n'*, on the outside of disk N. These combination-wheels, L, N, and O, are each provided with a similar recess, *p*, and these three recesses must be brought to register with the notch in the tumbler already described before rib D' can fall into them, so that the door-knob spindle H can operate the bolt D to withdraw the same. The number of said combination-wheels may be increased or diminished, and they may all be made in one piece each, like N and O, or in two pieces, like L L', or some in one piece and some in two pieces. Fixed smooth annular rings M^1, M^2, &c., similar to ring M, already described, alternate with said combination wheels or disks. Said rings M, M^1, M^2, &c., are secured in place by means of perforated opposite lugs *m m*, through which pass studs or pins fixed to said casing A.

When rib or fence D' rests in the notches or recesses of said wheels or disks and said tumbler, as described, the said bolt D is operated, like the latch-bolt of an ordinary door, by turning either one of the door-knobs above described. The cam C' enables the said bolt to be effectually locked from the inside, even when the combination-wheels and tumbler are set to open it.

P designates a fixed annular indicating plate or ring, suitably graduated, and secured to the outside of the door; and Q designates a second graduated indicating-plate, turning with the door-knob spindle within said ring. When these plates indicate the proper combination the bolt, if not locked by cam C', may be withdrawn into said casing A. All of the foregoing parts will operate equally well in case said bolt D is reversed. The curved slots or channels in the several combination-wheels may be of different lengths. More than one of said slots or channels may be made in the same wheel.

What we claim as new, and desire to secure by Letters Patent, is—

1. In combination with reversible bolt D, provided with recessed portion *d'*, spring E, interposed between the bolt and cam F, substantially as described, and for the purpose set forth.

2. The combination of cam-faced block C', shaft C, and handle *c* with latch-bolt D, substantially as set forth.

3. The combination of detachable plate B with casing A, having an opening at each end, and with a locking-cam journaled in said plate, whereby said cam is adapted to be used with a reversible bolt, substantially as set forth.

4. The combination of recessed oscillating tumbler with one or more recessed combination-wheels and a reversible bolt, having a rib which enters such recesses only when they all coincide, substantially as set forth.

In testimony that we claim the above we have hereunto subscribed our names in the presence of two witnesses.

HANSON GOODRICH.
FRIEND J. CHAPMAN.

Witnesses:
W. F. HALL,
M. M. SIMS.