2 Sheets--Sheet 1.

S. HIPP, T. WEHAGEN & C. NICKEL.

Combination-Lock.

No. 162,551. Patented April 27, 1875.

FIG. 1.

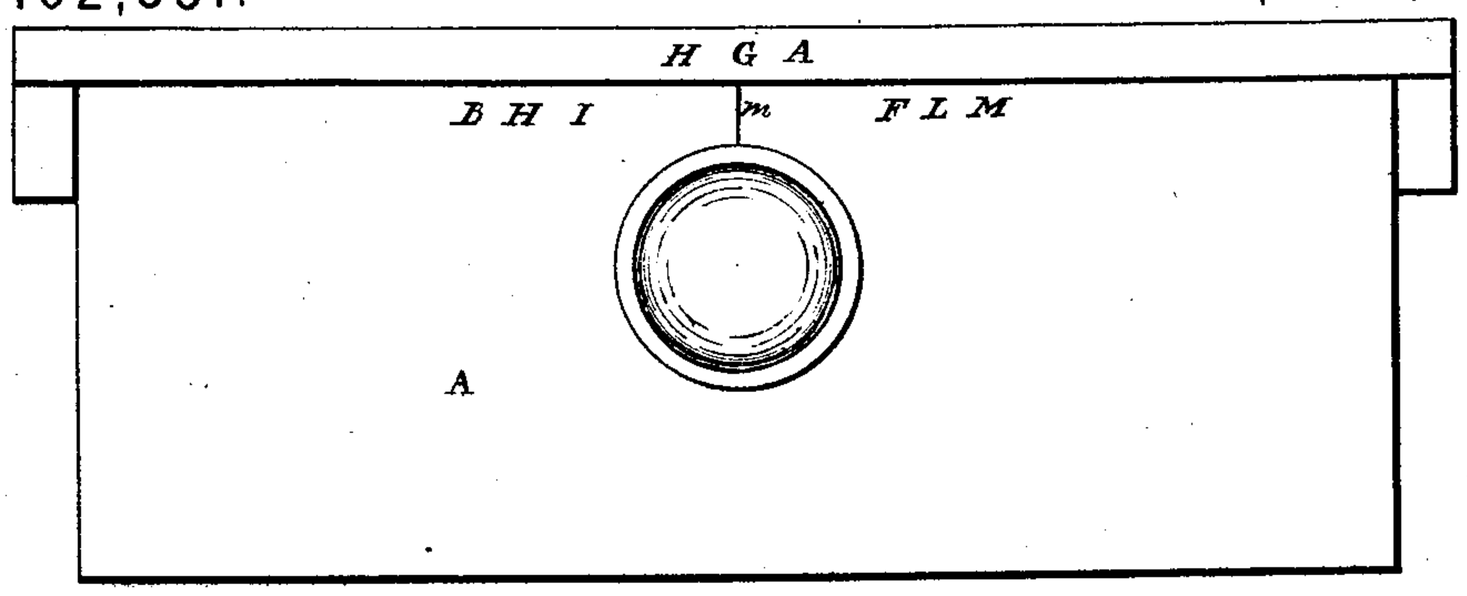

FIG. 2.

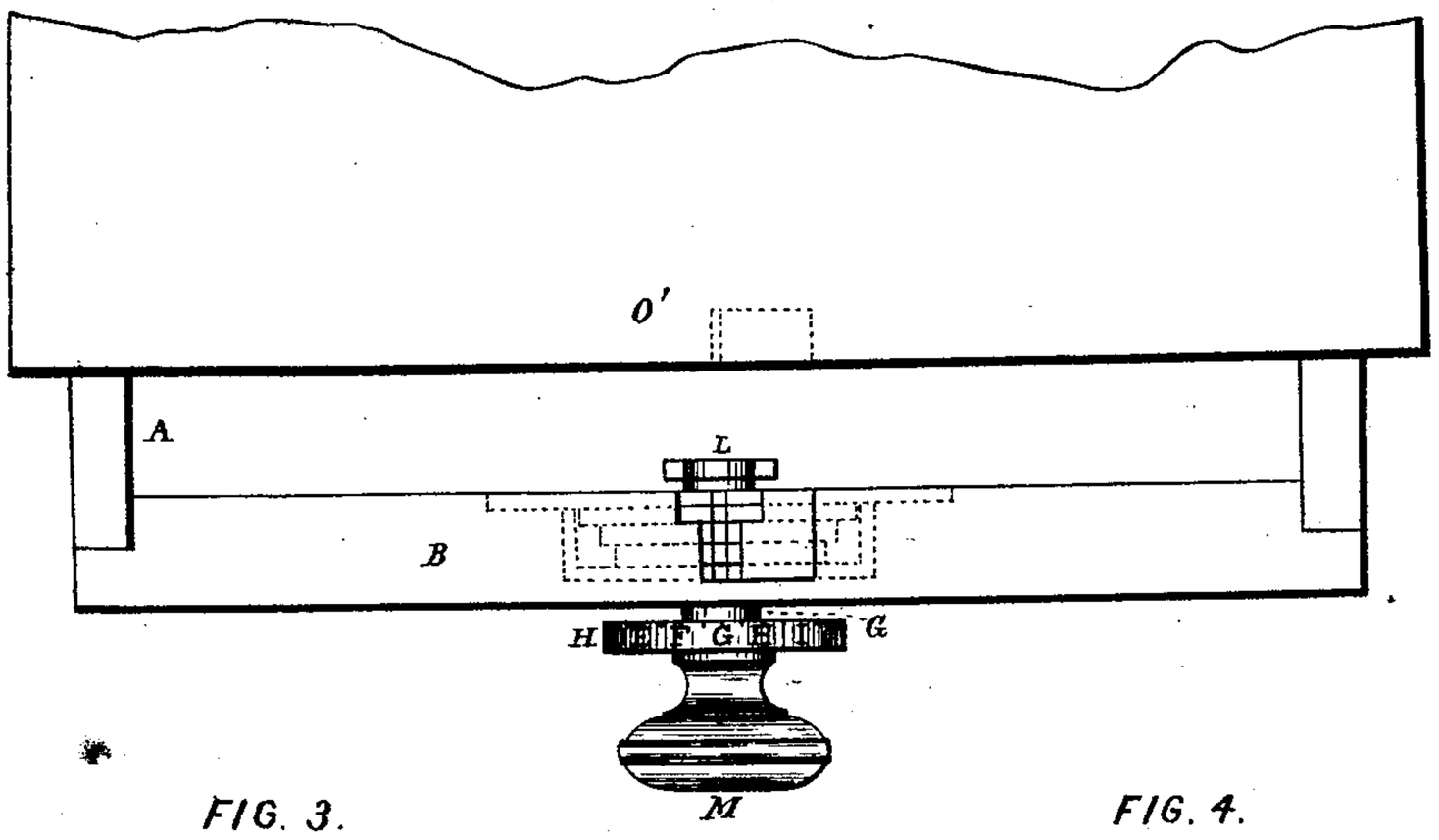

FIG. 3.

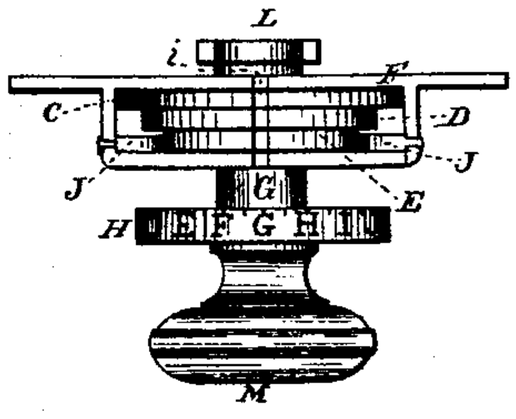

FIG. 4.

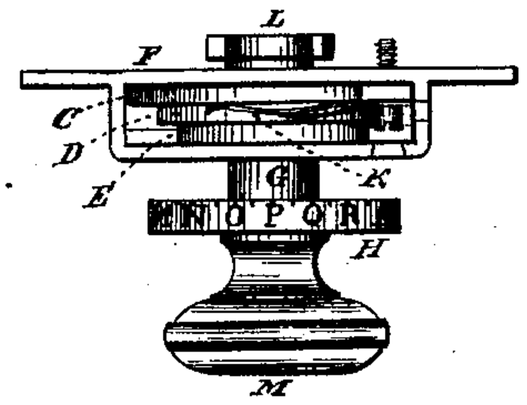

FIG. 5.

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FIG. 6.

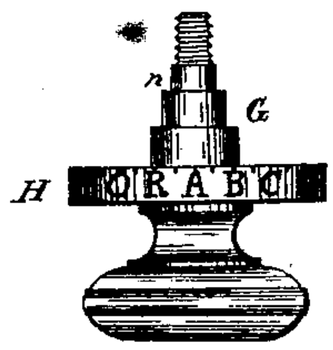


FIG. 7.

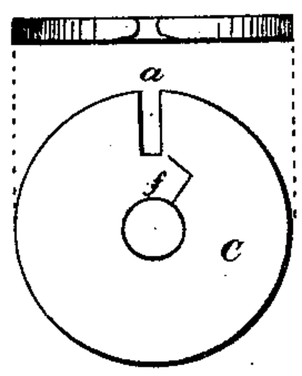


FIG. 8.

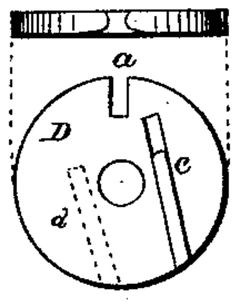


FIG. 9.

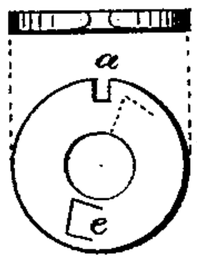


FIG. 10.

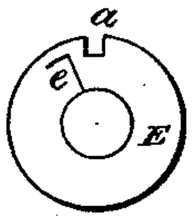


FIG. 11.

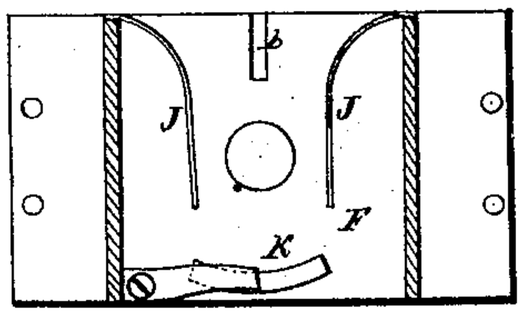


FIG. 12.

FIG. 13.

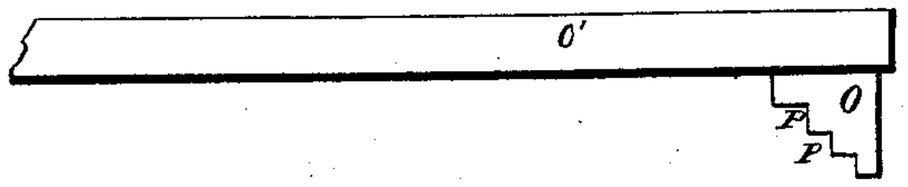
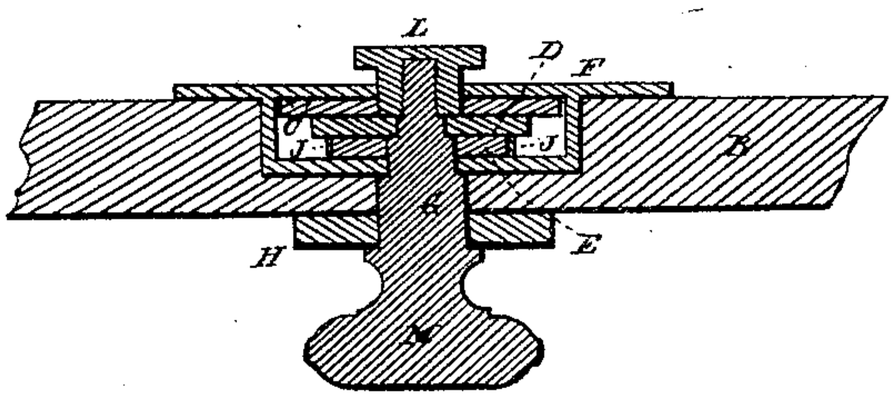


FIG. 14.



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UNITED STATES PATENT OFFICE.

SAMUEL HIPP, THEODORE WEHAGEN, AND CHARLES NICKEL, OF CLEVELAND, OHIO.

IMPROVEMENT IN COMBINATION-LOCKS.

Specification forming part of Letters Patent No. **162,551**, dated April 27, 1875; application filed March 25, 1875.

To all whom it may concern:

Be it known that we, S. HIPP, T. WEHAGEN, and C. NICKEL, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Safety Drawer-Locks, of which the following is a full and and complete description, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a front view of a drawer having thereon a lock. Fig. 2 is a top view. Figs. 3 and 4 are detached views of the lock. Fig. 5 is a view of the back of the lock. The rest of the figures represent detached sections, to which reference will be made.

Like letters of reference refer to like parts in the several views.

This invention is a combination-lock for drawers, &c.; and the object thereof is to provide a lock simple in construction, and easy of manipulation, and at the same time a secure fastening for the drawer, but which cannot be unlocked without a knowledge of the combination of letters governing the movements of its mechanism. Of the construction and operation of the invention the following is a more full description.

In the drawings, A represents a drawer, to the front end B of which the lock is secured. The internal movements of the lock consist of the wheels C D E, Figs. 3 and 4, detached views of which are shown in Figs. 7, 8, and 9. Said wheels are arranged in relation to each other in the order as shown in Figs. 3 and 4, within a frame, F, all of which have the spindle G, Fig. 6, as a common axis, having its bearing in the sides of the frame F, referred to. In the periphery of each of the wheels is cut a notch, *a*, Fig. 7, the purpose of which will presently be shown; also, on the spindle is tightly fitted an index-wheel, H, on the edge of which are arranged letters of the alphabet. To said wheel reference will hereinafter be made. On each side of the carrying-wheel D is secured a spring, *c*, Fig. 8. The dotted lines *d* indicate the spring on the opposite side. On the inner side of the tumbler-wheels E C is made a dent, *f e*, Figs. 7 and 9. Said dents are so arranged in respect to the springs on the sides of the carrying-wheel D that when the several wheels are placed together, as shown in Figs. 3 and 4, the springs will catch in the dents when the carrying-wheel D is turned for adjusting the tumbler-wheels C and E, in order to bring into range the notches *a* in the several wheels, as and for a purpose hereinafter shown. The tumbler-wheels C and E are loose upon the spindle; but to prevent them from moving too easily thereon, the periphery of the tumbler-wheel E is embraced by the springs J J, Fig. 11, between which the wheel revolves. The tumbler-wheel C is restrained from moving too freely by a spring, K, pressing upon the side of the wheel. The applications of the springs to the wheels will be readily understood on examination of Figs. 3 and 4. The carrying-wheel D is fastened to the spindle by means of the sleeve-nut L on the end of the spindle, which, on being screwed up, forces the wheel hard against the shoulder *n*, Fig. 6, thereof.

It will be seen that the sleeve of the nut passes through the tumbler-wheel C, and upon which the wheel turns, instead of turning directly upon the spindle, as does the tumbler-wheel E; also, by means of the nut, the index-wheel H and the wheels C D E are held in connection with each other and in the frame. A detached view of the nut is shown in Fig. 12.

The practical operation of the above-described lock is as follows: In order to set the lock so that the combination of letters may be right for locking and unlocking, the carrying-wheel D must be set to some one of the letters on the index-wheel H; for illustration, let it be the letter G. To this end the index-wheel H must be turned by the knob M until the said letter G comes to the index-line *m*, Fig. 1. The nut L is now loosened, and the carrying-wheel D turned until the notch *a* in its periphery comes in line with the letter G and the notch *i* in the frame. The carrying-wheel must now be fastened in this relation by screwing up the nut. The letter G is now the primary one of the combination. The knob is now turned to the right until the notch *a* of the tumbler-wheel C comes in open relation to the notch *i*. This will bring the letter A of the index-wheel H under the line

m, referred to. The knob is now turned to the left until the notch *a* of the tumbler-wheel E comes in open relation to the notch *i*. This relation of the tumbler-wheel E to the notch will bring the letter H on the index-wheel under the index-line *m*. The knob is again turned to the right until the letter G (the primary one of the combination) comes again to the index-line, as when set for this letter, as above described. This will make all the notches of the wheels in open relation to each other and to the notch *i*, as will be seen in Figs. 2 and 3. The drawer can now be drawn out or pushed in, for the lock is now unlocked. The combination of letters will read H G A.

The drawer is locked, when pushed in, by turning the knob in either direction. This will bring the catch O, Fig. 13, depending from the top O′ of the drawer or counter, into the notches of the wheels, and when one or more of them are turned they will come on the inner side of the shoulders P of the catch, which will prevent the drawer from being pulled out. Any other combination of the letters may be used; for instance, let H be the primary letter for the carrying-wheel D, and let the drawer be supposed to be pushed in and locked. Now, on turning the knob to the right until the letter B on the index-wheel comes to the line *m*, the notch in the tumbler-wheel C will present itself to the notch *i*. This when done, the knob must now be turned to the left until the letter I comes to the line *m*. This turn will present the notch of the tumbler-wheel E to the notch *i*. Again the knob must be turned to the right until the primary letter H comes to the line *m*. All the notches of the wheels and notch *i* of the frame will be in line, so that the catch O can pass through them on pulling out the drawer.

Any other three of the letters may be used for a combination, first taking one of them for the primary one for the carrying-wheel D, which must be set to such letter, and is done by unscrewing the nut to allow the wheel D to turn on the spindle, so that the primary letter assumed on the index-wheel will come to the line *m*, and the notch in the carrying-wheel D in line therewith, which will also be in line with the notch *i*. To know what the other two letters will be for the combination, the knob must first be turned to the right until the notch in the tumbler-wheel C comes into line with the notch *i* of the frame. Whatever letter on the index-wheel comes to the line *m* will be the second one in the combination. The knob must now be turned to the left until the notch in the tumbler-wheel E comes into line with the line *m* and notch *i*. Whatever letter now presents itself to the line *m* will be the third one in the combination. These letters must be remembered by the person to unlock the drawer, and used in their order.

The combination may be worked by first turning the knob to the left, bringing the notch in the tumbler-wheel E into position first, then turning the knob to the right to bring the notch of the tumbler-wheel C into line, and then turning the carrying-wheel to the left to bring its notch into line either way will unlock the lock.

The tumbler-wheel C is turned by the spring *c* in the side of the carrying-wheel D, by its catching in the dent *f* of the wheel. The shape of the dent is such as to allow the spring to catch therein, when the carrying-wheel is turned in one direction only. The tumbler-wheel E is carried in a similar way by a spring, *d*, catching in the dent *e* when the wheel D is turned in one direction only; hence, for this reason, is required the reverse movement of the knob to operate the wheels, to bring their notches into line for unlocking the lock.

The relative position of the dents and springs in respect to each other is such as to insure a correct and timely movement of the wheels for an adjustment of the letters and notches.

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

1. The spindle G, carrying-wheel D, springs *c d*, and nut L, in combination with the notched tumbler-wheels C E, dents *e f*, and frame F, in the manner substantially as described, and for the purpose set forth.

2. Index-wheel H, spindle G, wheels C D E, nut L, and frame F, in combination with the catch O, provided with shoulders P P, substantially in the manner as described, and for the purpose set forth.

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Witnesses:
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