T. FOX.

TUMBLERS FOR PERMUTATION LOCKS.

No. 190,571. Patented May 8, 1877.

Fig. 1.

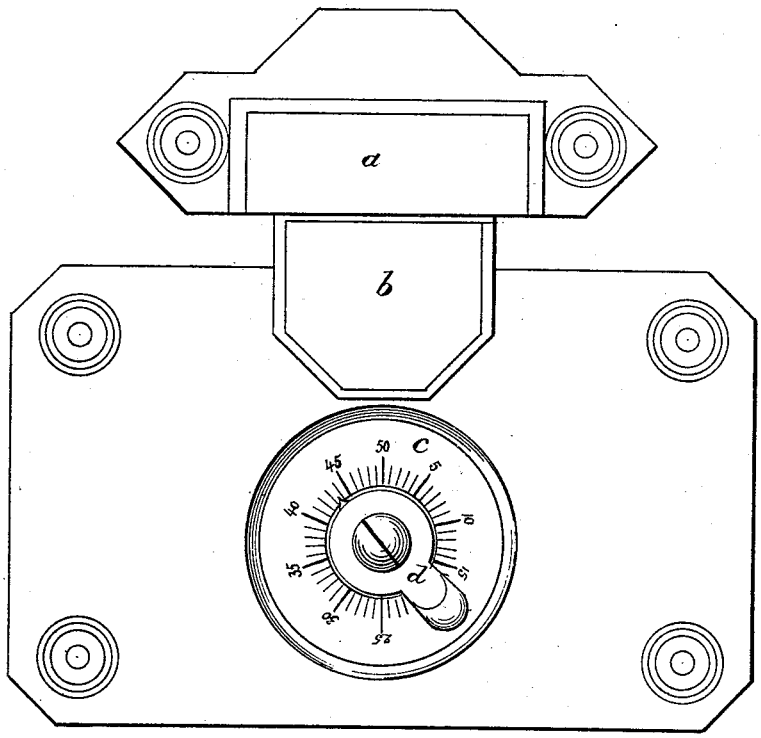


Fig. 2.

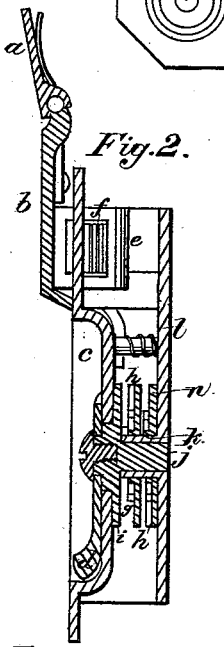


Fig. 4.

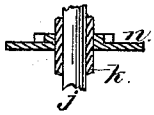


Fig. 5.

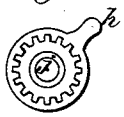


Fig. 6.

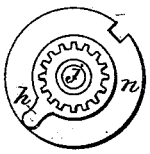
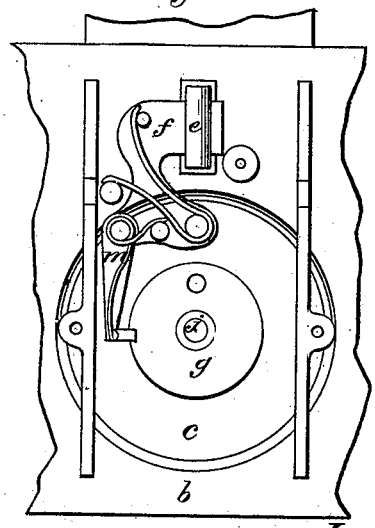


Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS FOX, OF BAY CITY, MICHIGAN, ASSIGNOR OF ONE-HALF HIS RIGHT TO JAMES JOSEPH FITZGERRELL.

IMPROVEMENT IN TUMBLERS FOR PERMUTATION-LOCKS.

Specification forming part of Letters Patent No. **190,571**, dated May 8, 1877; application filed September 28, 1876.

To all whom it may concern:

Be it known that I, THOMAS FOX, of Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Trunk-Locks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in permutation-locks; and consists in the construction and arrangement of the various parts composing the tumblers of such locks, as hereinafter fully set forth and claimed.

To enable those skilled in the art of manufacturing locks to comprehend my invention, I will describe its construction, as follows:

Figure 1 is a face view of the lock as shown from the outside when the lock is in place. Fig. 2 is a vertical section through the center of the lock, showing a section of the tumbler-wheels; Fig. 3, a back view of the lock, with the back and one tumbler-wheel removed; Fig. 4, a section of one of the outside tumbler-wheels, with sleeve and shaft; Fig. 5, a cogged carrier-plate; Fig. 6, a side view of tumbler-wheel, with cogged hub and cogged carrier-plate in place.

In the drawings, *a* represents the upper portion of the hasp; *b*, the lower portion of the hasp; *c*, the recessed dial-plate; *d*, the finger-lever, provided with an index-pointer; *e*, the hasp-staple; *f*, the spring-bolt; *g*, the center tumbler-wheel. *h* is the cogged carrier-plate; *i*, the driving-wheel; *j*, the shaft; *k*, the sleeve; *l*, the back plate.

I construct my lock with the sleeve *k* and back plate *l* combined, and dressing the outside of the sleeve and the inside of the back plate. I then place the tumbler-wheel *n* around the sleeve with its cogged hub upward. I then place on this the cogged carrier-plate *h*, in such a position as I desire, to make up the combination. I then place on the same sleeve a thin washer, which has one side of its opening flatted to prevent its turning, thereby preventing motion from being conveyed from one tumbler-wheel to another by friction. I then place on the same sleeve the center tumbler-wheel *g*, which is provided with a post, extending each way, of sufficient length to engage with the fingers of the carrier-plates *h*, but not long enough to bind on the driving-wheel *i*. I then follow with a washer and carrier-plate, as before described, their relation to the center-wheel being the same. The next, which is the driving-wheel *i*, I construct in connection with the shaft *j*, and place the shaft *j* inside the sleeve *k*. The driving-wheel has a projection corresponding with the thickness of the dial-plate. This being put in place I secure my index-pointer and finger-lever with a screw to the shaft. Each of the tumbler-wheels and the driving-wheel have a notch in the periphery, one side of the notch in the driving-wheel being cut away to form an inclined plane, for the purpose of raising the hook *m* by a reverse motion of the operating or finger lever *d*. If the finger-lever be turned in either direction until the notch in the bottom tumbler-wheel *n* is directly in line with the hook *m*, and then reversed, the center-wheel *g* may be rotated a sufficient distance to place its notch in line with the hook *m*. Again, reversing the motion of the lever *d*, the notch in the driving-wheel will be brought under the hook *m*, which, acted upon by a spring, will drop into all the notches simultaneously. Then by rotating the driving-wheel to the right it will draw back on the hook *m*, transmitting the power by elbow-joint to the spring-bolt *f*, drawing it out from the staple *e*, thereby unlocking the lock and allowing the staple *e* to spring out.

It will be seen that, should the carrier-plate be changed to any other position on the cogged hub of the tumbler, the combination would be changed, the same being true of either of the carrier-plates, thereby securing a great many changes.

I am aware that tumbler-wheels with notches in their periphery are in common use in locks of this class, and that spring-bolts with elbow-joints and hooks or dogs are also used; therefore,

What I claim, and desire to secure by Letters Patent, is—

The tumbler-wheel *n*, provided with the cogged hub, in combination with the carrier-plate *h*, having internal cogs and a projecting finger, substantially as described.

In testimony whereof I have hereunto affixed my signature this 13th day of September, 1876, in the presence of two witnesses.

THOMAS FOX.

Witnesses:
E. E. BRIGGS,
A. H. WHIPPLE.