EDWARD W. BRETTELL.

Improvement in Permutation Wheels for Locks.

No. 115,814. Patented June 13, 1871.

Fig. 1

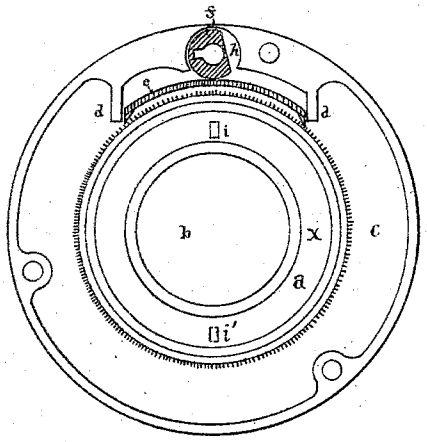


Fig. 6



Fig. 2

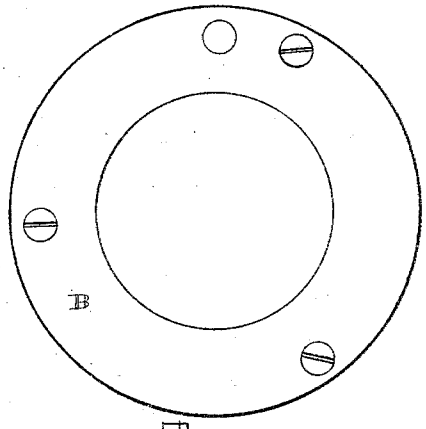


Fig. 3

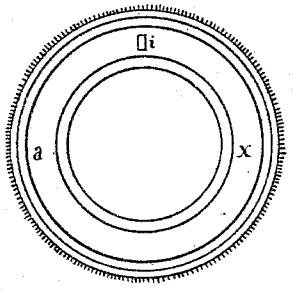


Fig. 4

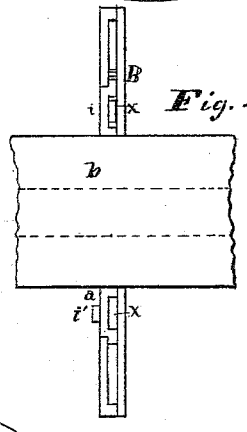
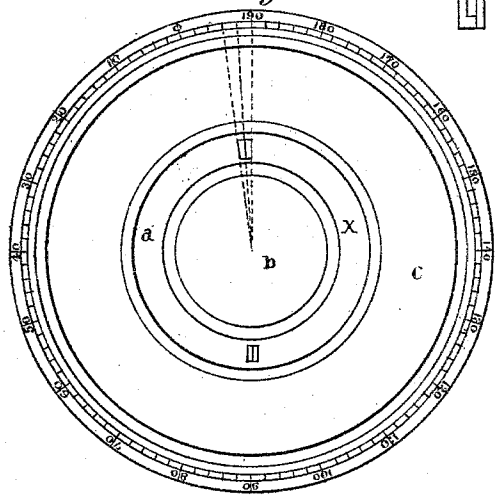


Fig. 5



Witnesses:

Ernest L. Meyer
Henry Clay

Inventor:

E. W. Brettell

AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

EDWARD W. BRETTELL, OF ELIZABETH, NEW JERSEY.

IMPROVEMENT IN PERMUTATION WHEELS FOR LOCKS.

Specification forming part of Letters Patent No. 115,814, dated June 13, 1871.

I, EDWARD W. BRETTELL, of the city of Elizabeth, in the State of New Jersey, have invented certain Improvements in Permutation Wheels for Locks, of which the following is a specification:

The improvement relates to securely connecting together the two parts of the wheel by which the relation of the pointer to the numbers on the dial is changed at pleasure; and consists in holding the cam by means of a recess or box bored into the outer ring of the wheel, thereby dispensing with the bearings or journals upon the sides of the cam; also in forming a crab-spring with bearing-points at each end, in combination with the inner ring and a cam or its equivalent.

Figure 1 is a view of the wheel with the cap removed. Fig. 2 is a view of the cap. Fig. 3 is a view of the inner ring. Fig. 4 is a sectional view of the wheel. Fig. 5 is a view of the wheel surrounded by the index figures of the dial, and Fig. 6 is a view of the flat cam.

The wheel is formed by two concentric rings, the inner one, *a*, turning upon a shaft, *b*, its circumference being fitted to and turning in the inside edge of the outer ring *c*, and is held in place by the cap B. The outer edge of the inner ring *a* is toothed or milled. Between guides *d d* formed in the ring *c* is laid the stiff crab-spring *e*. The ends of the spring may be sharp, or flat and serrated, with sharp-edged teeth; sharp ends are preferred. Above the middle of the crab-spring *e* and in the ring *c* is bored a recess or box, *h*, for the reception of the cam *f*. This recess serves to hold the cam in its place, thereby dispensing with journals or bearings upon said cam. Through the center of the cam is a hole to receive a feathered key. This cam is thus a ring, having a piece cut off the edge, which, when the flat piece is turned next the spring *e*, releases it from pressure on the inner ring *a*, the edge of the circular recess or box, in which the cam lies loose without journals, being cut away to allow the action of the cam upon the spring.

A ring with a projection on its edge would do as well for a cam as the device shown.

In my improvement there are three points of contact, and resistance increases when attempts are made to force a change of position in turning from the right or the left.

In the recess *x* in the wheel *a* there is the pin *i*. Usually this pin projects through from the back, the pins being opposite each other on front and back. Then, when the pins of a series of these wheels touch each other, the radiating lines from the center point to numbers on the dial are some distance from each other. I place the pins upon opposite sides of the wheel, in opposite radial lines from the center or shaft. In Fig. 5 two pins on one side are shown as radiating to two numbers each; by proper adjustment the other two can be made to radiate to the intervening numbers. The pressure in moving the wheels is divided, one-half on opposite sides of the shaft, by this alternation of the pins.

What I claim as my improvement, and desire to secure, is—

1. The flat cam *f*, in combination with the ring *c* of the wheel, having the recess or box *h*, substantially as and for the purpose set forth.

2. The crab-spring *e*, having bearing-points at each end, in combination with the inner ring *a* and cam *f* or its equivalent, substantially as and for the purpose set forth.

E. W. BRETTELL.

Witnesses:
W. M. GOODING,
EDWARD GEDDES.