

I. W. Lamb.

Permutation Lock.

N^o 92,844.

Patented Jul. 20, 1869.

Fig. 1

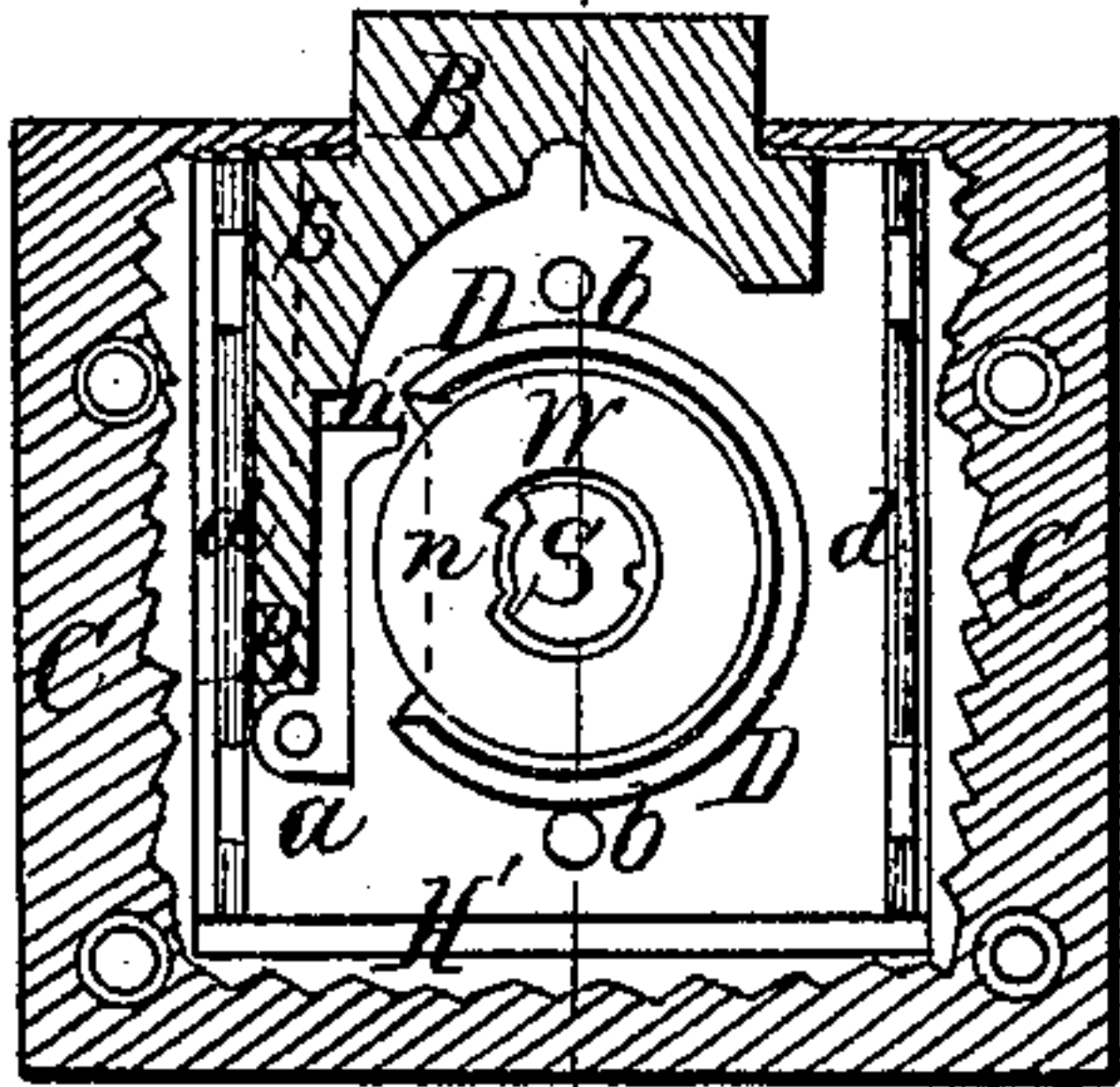


Fig. 2

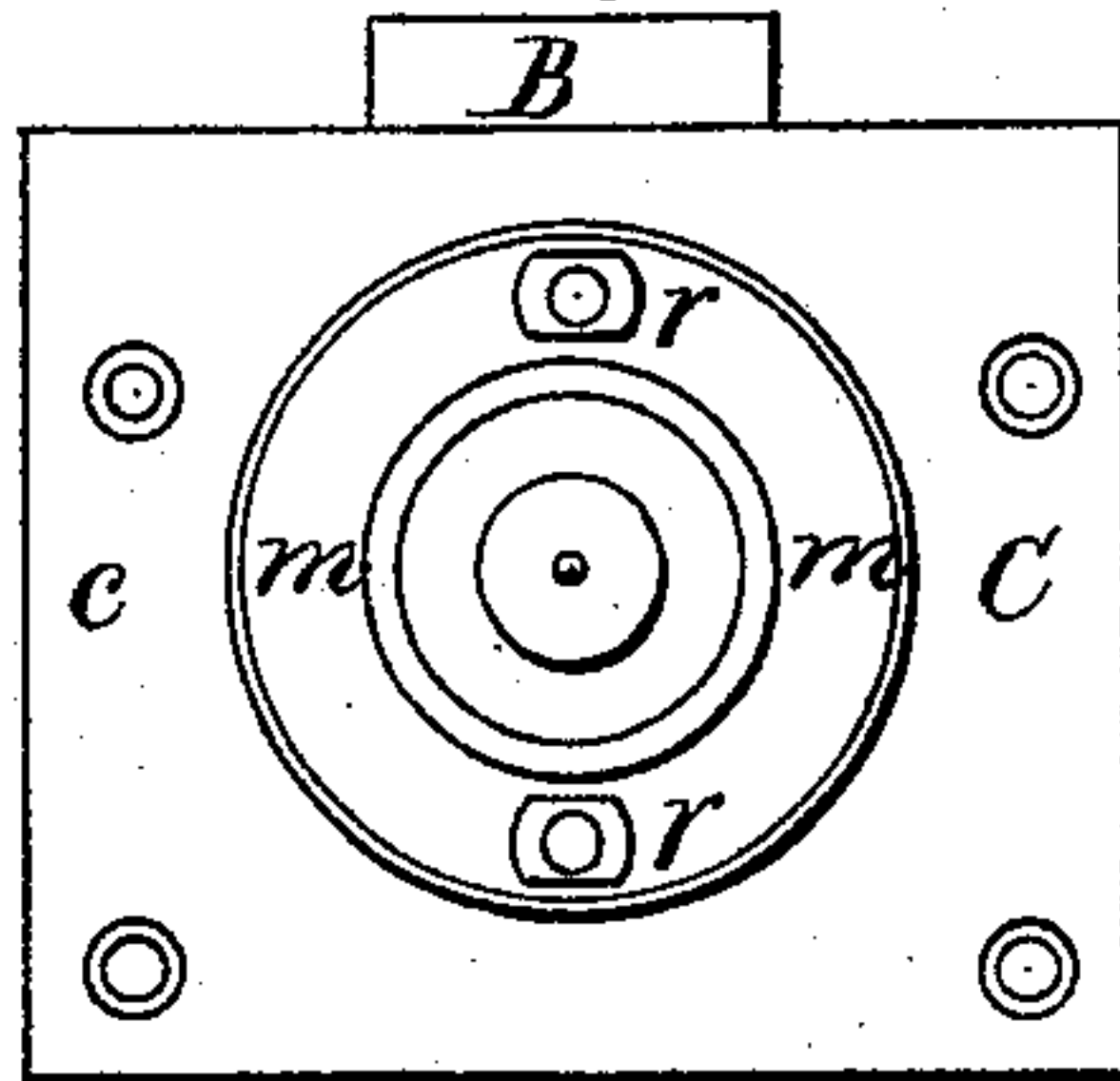


Fig. 3

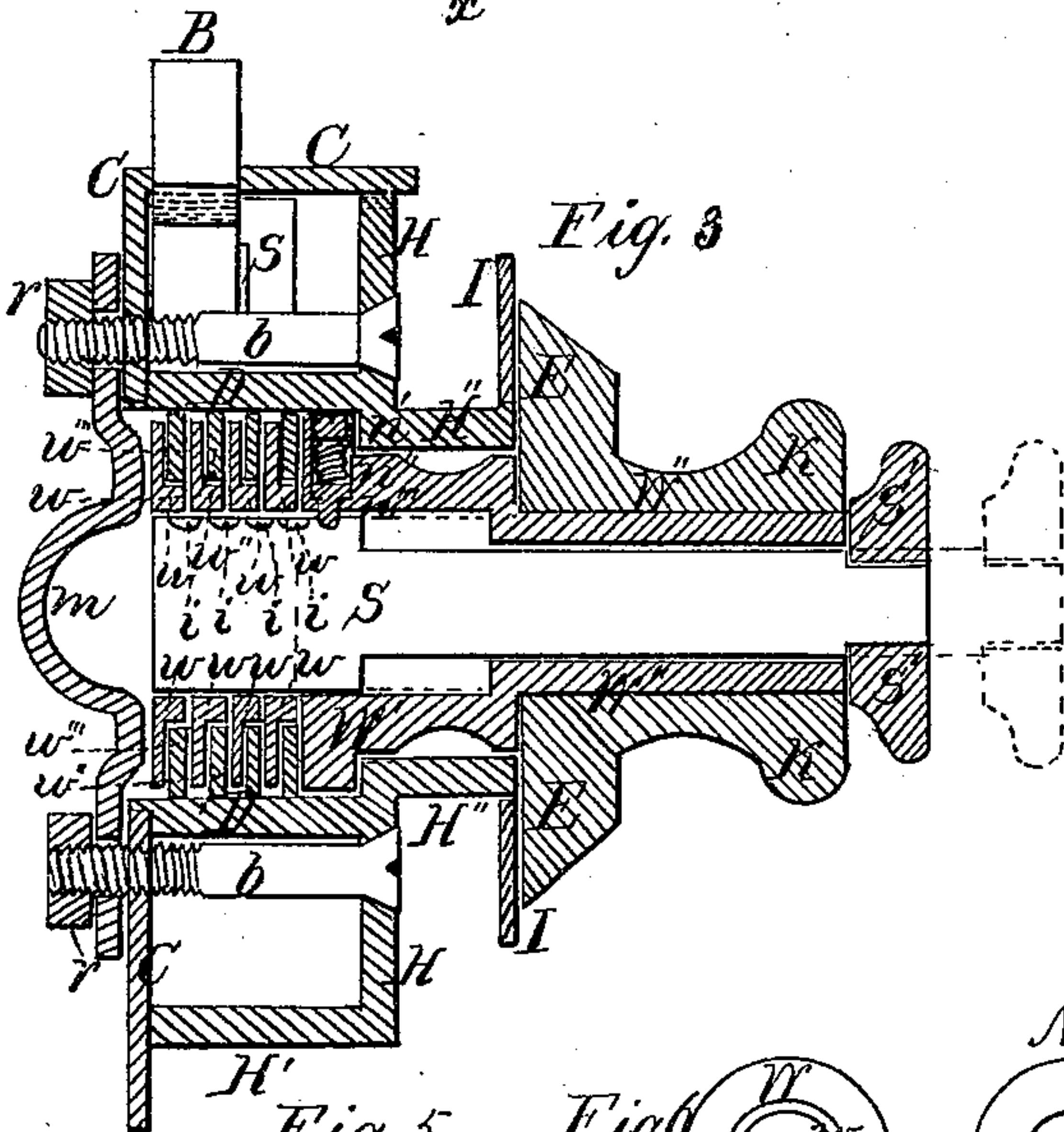


Fig. 4

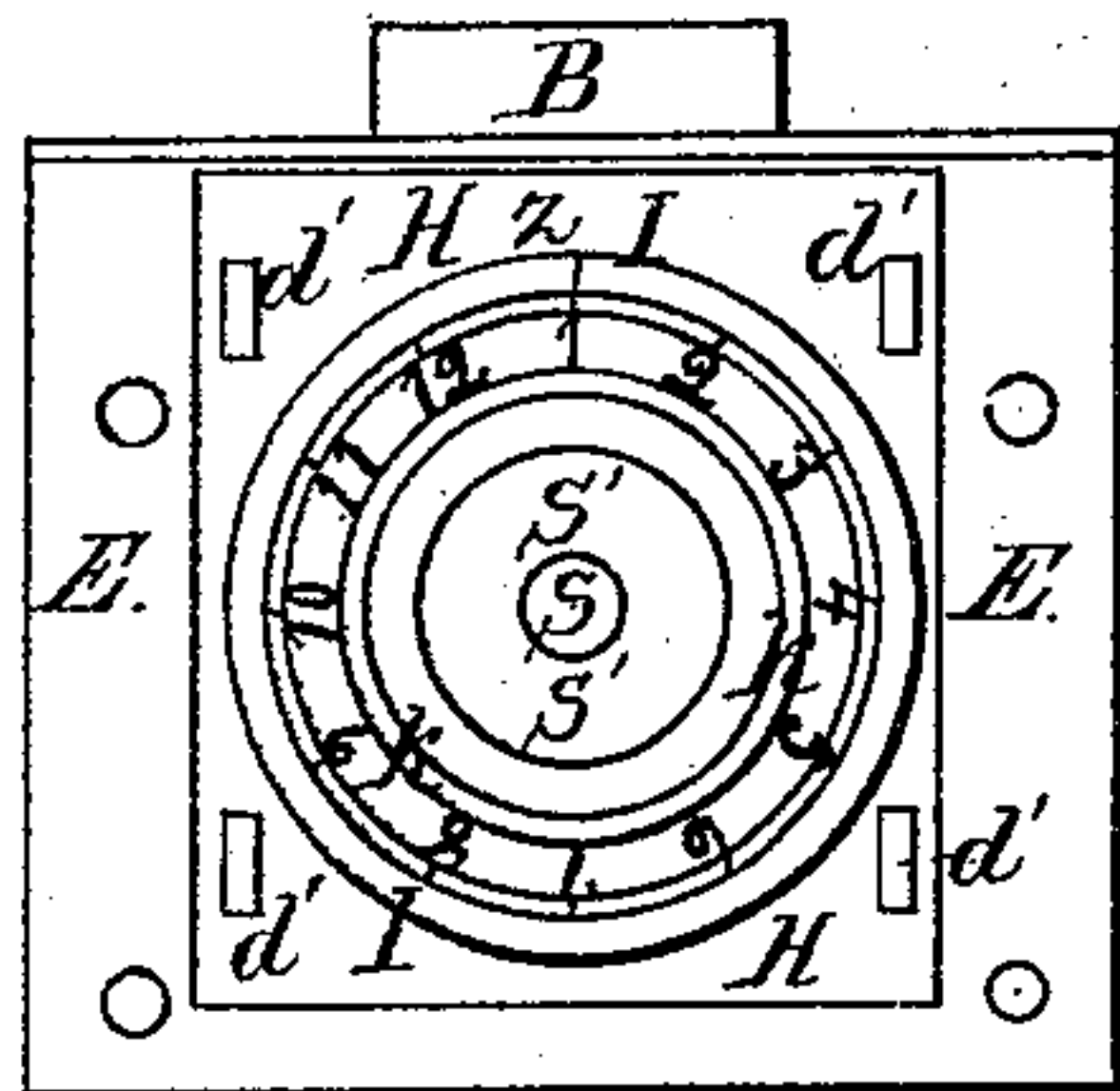


Fig. 5

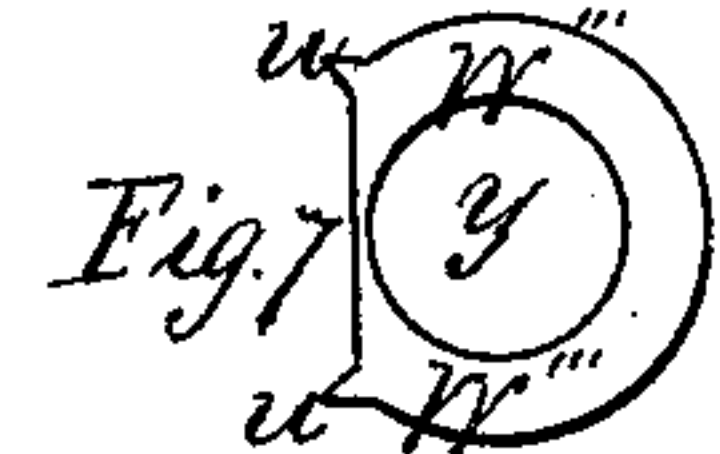
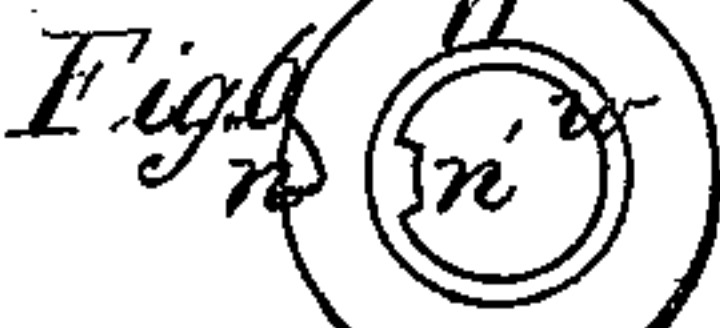
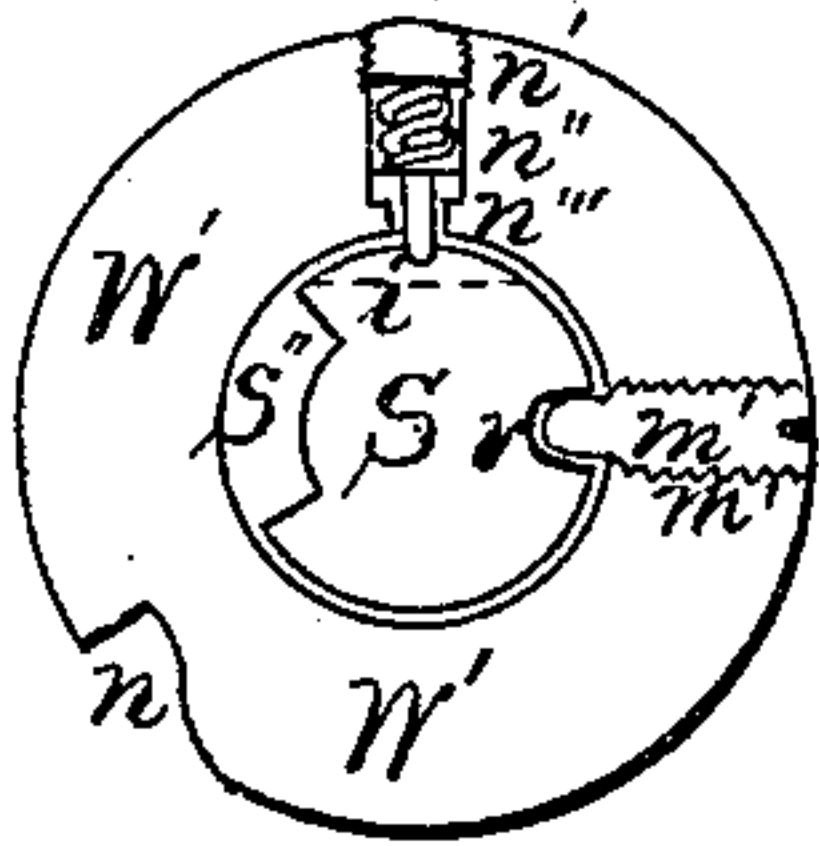
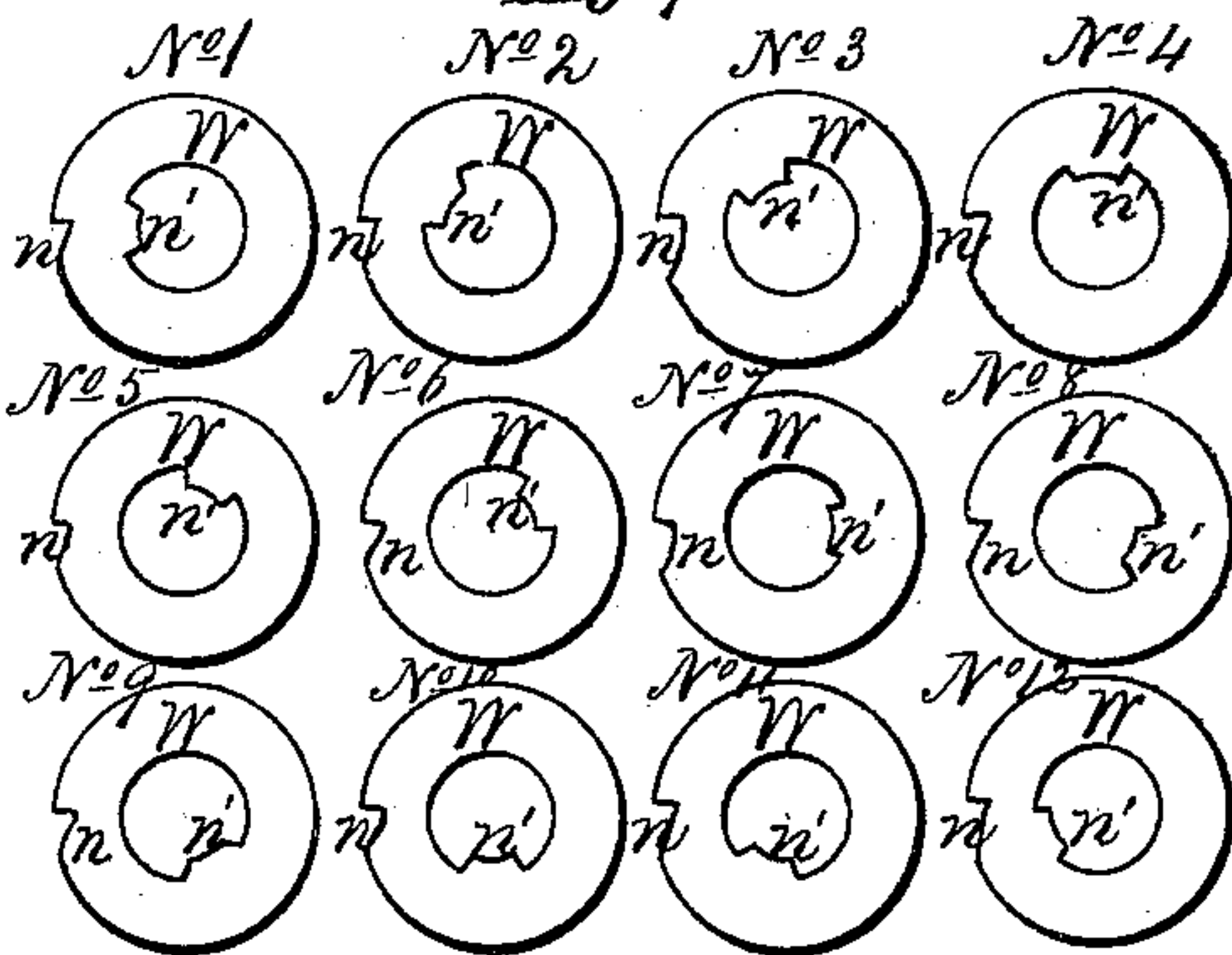


Fig. 9



Witnesses

*Belle Woodworth
Ursula Simmons*

Inventor

*Isaac W. Lamb
Salem Michigan*

United States Patent Office.

ISAAC W. LAMB, OF SALEM, MICHIGAN.

Letters Patent No. 92,844, dated July 20, 1869.

IMPROVEMENT IN COMBINATION-LOCKS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, ISAAC W. LAMB, of Salem, in the county of Washtenaw, and State of Michigan, (post office, Northville, Michigan,) have invented a new and useful Improvement in Permutation-Locks; and I hereby declare that the following is such a full, clear, and exact description thereof as will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, in which—

Figure 1 is a rear elevation of one of my improved locks, representing a portion of the back case broken away to show the position of the parts.

Figure 2 is also a rear elevation of the lock.

Figure 3 is a vertical section of the lock, drawn on the line *x* of fig. 1, being enlarged to show more clearly the smaller parts.

Figure 4 is a front elevation of the lock.

Figure 5 is a section of the drive-wheel *W* and the rear end of the spindle *S*, showing the manner of connecting the two together, and is on the same enlarged scale as fig. 3.

Figure 6 is a front elevation of one of the wheels or tumblers.

Figure 7 shows the form of the washers.

Figure 8 is a side elevation of one of the wheels, showing the hub on which it turns.

Figure 9 shows the relative position of the outer notches, *n*, and the inner projections *n'* of the several wheels, as seen from the back side, they all being rear elevations.

Similar letters of reference indicate corresponding parts in the several figures.

The design of my invention is to produce a simple and convenient permutation-lock that shall be suitable for drawers, cupboards, and other places, although some portions of the invention are equally well adapted for safes, vaults, and such other places as require the strongest locks.

C C C is the back of the case.

B is the bolt to which, at the lower end, is pivoted the dog *a a'*.

D is a cylinder containing wheels *W* and washers *W''*.

W' is the drive-wheel, and has attached to it a tube, *W''*, that extends forward through the knob *K*.

S is a stem or spindle, for operating the wheels or tumblers *W*, and it extends through the drive-wheel *W'* and the tube *W''*, and has a small knob, *S'*, attached to its front end.

By means of the knob *S'* the spindle *S* may be drawn out to the position shown by the dotted lines, when the inner end will be entirely out of all the wheels *W*.

K is the principal knob. It is formed in one piece with the dial *E*, and is secured to the tube *W''* by a suitable set-screw, not shown. By turning the knob *K*, the drive-wheel *W'* is turned also.

A screw-pin, *m'*, (see fig. 5,) passes through the wheel *W'* into a recess, *v*, cut in the spindle *S*, so that the spindle and wheel *W* will turn together. The said recess *v* extends lengthwise along the spindle *S*, far enough to permit the spindle to be drawn out a distance equal to the combined thickness of all the wheels and washers in the cylinder *D*.

i i i i, (see fig. 3,) are small notches cut in the spindle *S*. A small pin, *n''*, is pressed into the notches *i*, by means of a spring, *n'*, the said spring being retained in place by the small screw *n'*.

The screw *n'*, spring *n''*, and pin *n'''*, are all contained within a hole drilled in the wheel *W'*, as seen in figs. 3 and 5.

H, *H'*, *H''*, and *H'''*, together with the tube *D*, are all one piece, and form the front portion of the case of the lock. *H''* forms a cylinder, and is designed as a bearing for the wheel *W'*.

Two side-pieces, *d d*, seen in figs. 1 and 4, connect the front and rear parts of the case together, they being riveted into the part *C* of the case, and fit in slots *d'*, of the part *H*, and one of them forms a guide for the bolt *B*.

Two screws, *b b*, seen in fig. 3, hold the parts of the case together, the plate *C C* being tapped for the screws.

m is a cap, designed to secure the wheels *W*, and retain them within the cylinder *D*.

Two nuts, *r r*, working on the screws *b b*, secure the cap *m* in place.

I is a plate or ring, to be secured to the outside of the drawer, door, or other article to which a lock may be fitted. A small mark, *z*, fig. 4, on the same, forms an index or point to which the figures of the dial are to be turned in opening the lock.

The wheels *W* have each a hub, *w*, on their front side. Such hubs, when in the cylinder *D*, turn within the holes *y* of the washers *W''*, (see fig. 7,) such washers forming bearings for the wheels *W*, so that the said wheels may be made somewhat smaller than the cylinder *D*, and yet be retained in proper position by the washers. The washers are made so large as to fit the cylinder very exactly.

By this arrangement, having the hubs of the wheels turn in the washers, I secure a good smooth bearing for the wheels, notwithstanding the wide opening in the cylinder *D*, on the side next the dog *a a'*, and also without using the spindle *S* for a bearing, as is commonly done by others.

I change the combinations by placing the wheels *W* in the lock in different order. I use solid wheels, with fixed notches *n* and projections or notches *n'*, they being similar in this respect to those explained in the Letters Patent granted to me, December 17, 1867.

Other varieties of wheels may be used, however, in carrying out the improvements claimed by me in the present case.

The operation of my lock is as follows:

Any wheels desired are placed in the cylinder D, a washer being placed in before each wheel. Suppose the wheel next the cap *m* to be No. 8, suppose the next wheel to be No. 6, the next No. 5, and the last one to be No. 4. The spindle S is pushed in, as in fig. 3, the notches or projections *n'* of the wheels, being all in the recess S", that is cut in the spindle S.

Now turn the knob K to the right until the figure 8 on the dial is up to the point *z*. (See fig. 4.) The notch *n*, of the wheel No. 8, will now be opposite or next to the end *a'* of the dog *a a'*.

Now draw out on the small knob S' until the spindle S is drawn out of the wheel No. 8. The spring-pin *n''*, operating in the notches *i i i i* of the spindle, enables the operator to feel when the spindle is drawn out a distance equal to the thickness of a wheel.

After drawing the spindle S out of the back wheel, turn the knob K until figure 6 on the dial comes to the mark. The wheel No. 8 will not turn. Now the notch *n*, of wheel No. 6, is opposite *a'* of the dog. Draw out the small knob again until the spindle comes out of wheel No. 6. Turn the knob K again until figure 5 on the dial comes opposite the mark, and wheel No. 5 will be in place. Now draw out the knob S' again. Turn the knob K again until figure 4 on the dial is opposite the mark, and draw out again.

The spindle and small knob are now in the position shown by the dotted lines in fig. 3. The notches *n* of all the wheels W are now opposite *a'* of the dog.

Now turn the knob to the right, and as soon as the notch *n* of the drive-wheel W' comes opposite the part *a'* of the dog, the spring *s* will throw the dog into the

notches *n*, and as the knob K is turned on to the right, the dog *a a'* and bolt B will be drawn back and unlocked.

To lock the bolt, it is only necessary to turn the knob to the left, and the bolt will be thrown out. Continue to turn to the left, and at the same time press in gently on the small knob S', and as the spindle turns, the recess S" will come on a line with the projection *n'* of the wheels, one by one, and as soon as that occurs, the spindle will enter the wheels, one by one, until it is again in the position shown in fig. 3.

For bank-locks, I make the spindle S in two parts, the head, or part that turns the wheels, being a sleeve, and free to slide out and in on the spindle S, but turning with it, a coiled spring on the spindle holding the head back in place. Yet the spring, being elastic, would allow the spindle to be pushed in without pushing in the said head, even though the recess S" of the head should not be opposite the projections *n'* of the wheels, thus protecting the lock against injury.

This plan for protecting the lock is fully described in my patent, granted December 17, 1867, and need not be further explained here.

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

The combination of the dial E with the tube W", drive-wheel W', and spindle S, substantially as and for the purpose herein explained.

ISAAC W. LAMB.

Witnesses:

BELLE WOODWORTH,
URSULA SIMMONS.