

(Model.)

A. S. BOICE.
PERMUTATION LOCK.

No. 372,512.

Patented Nov. 1, 1887.

Fig. 1.

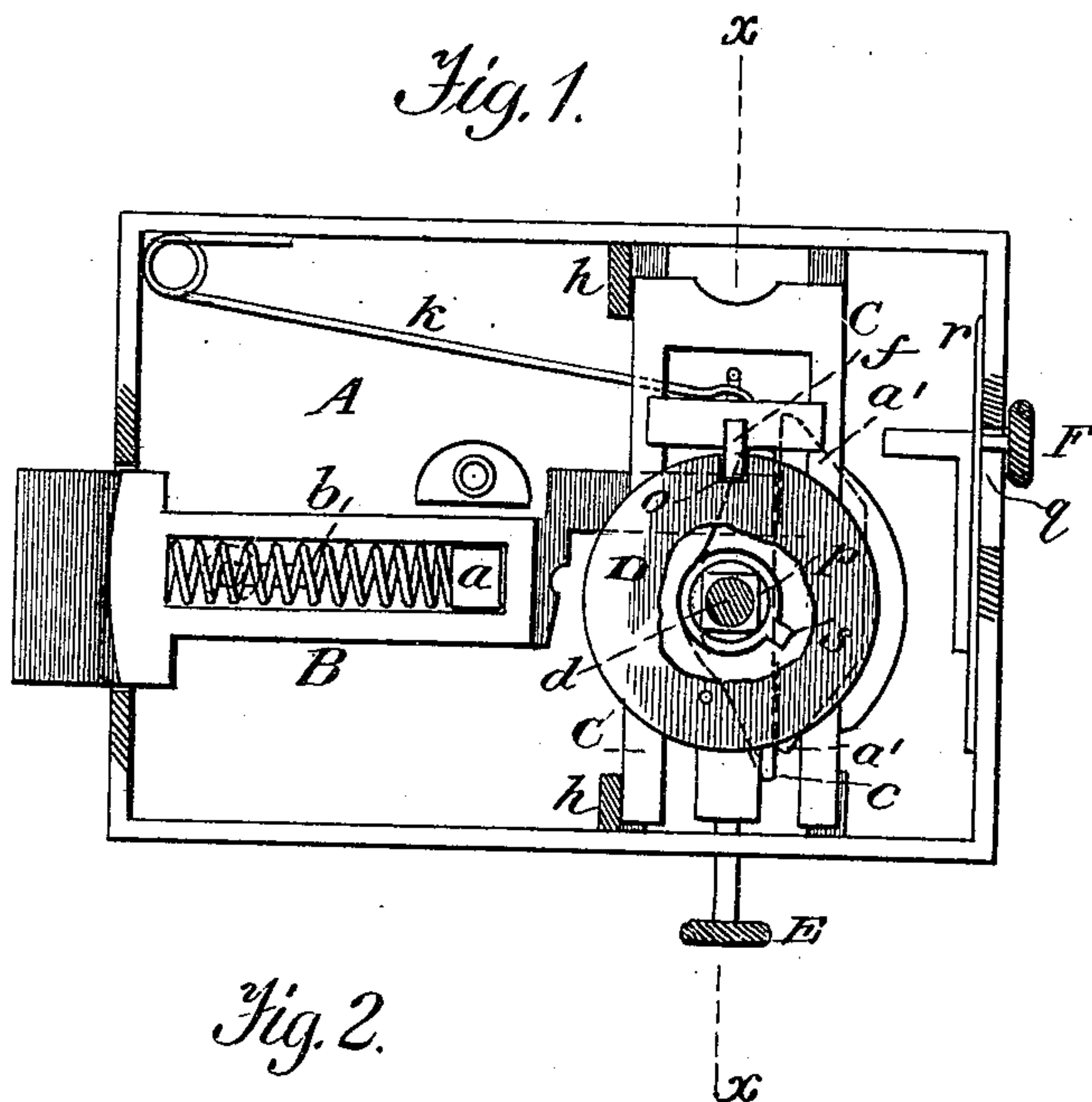


Fig. 2.

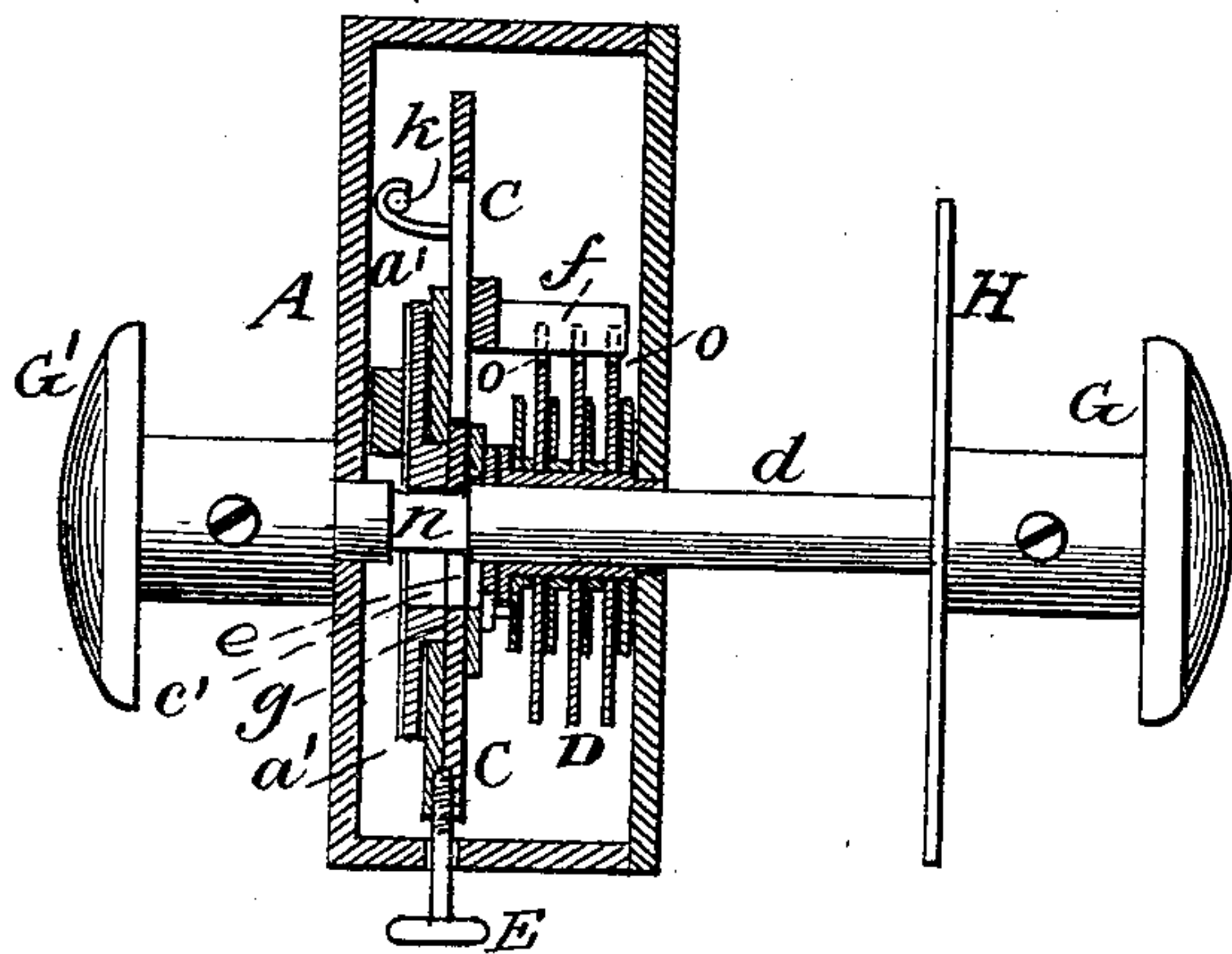


Fig. 3.

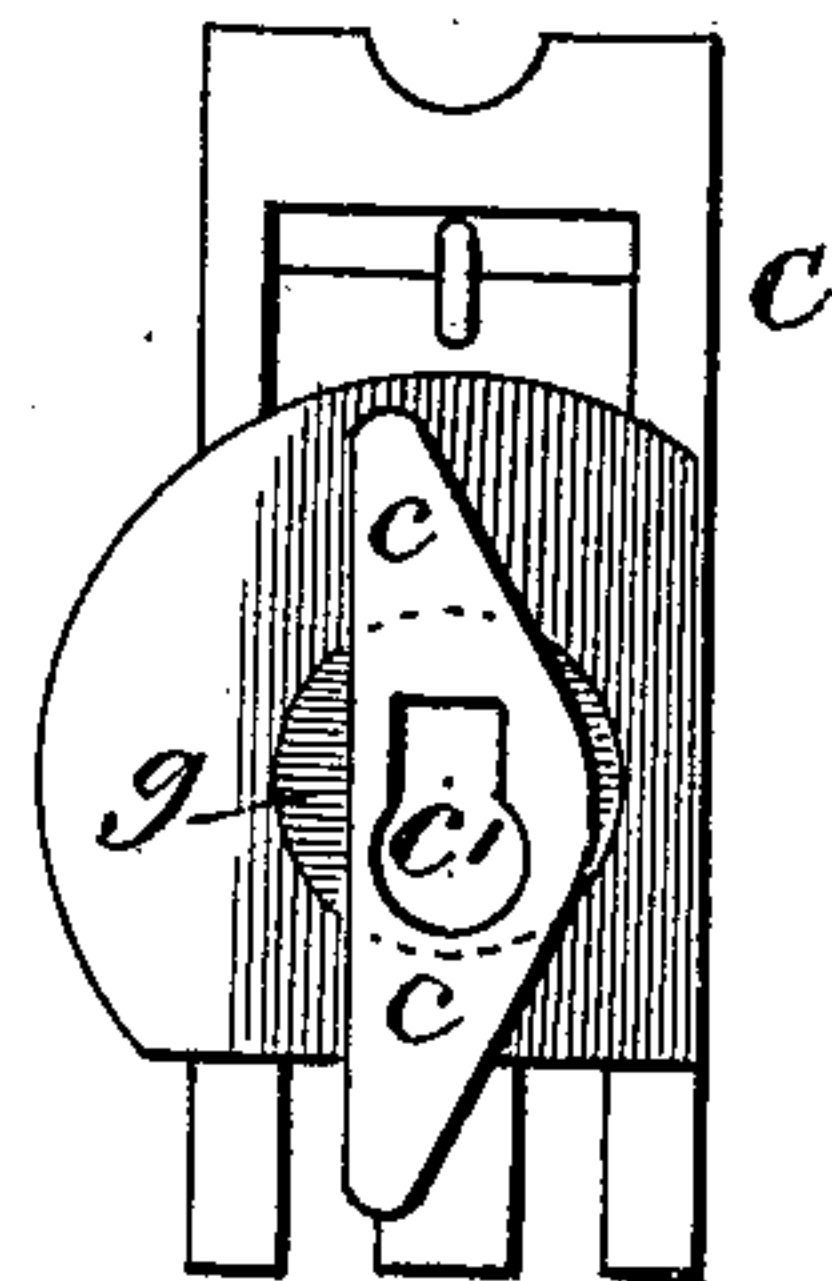
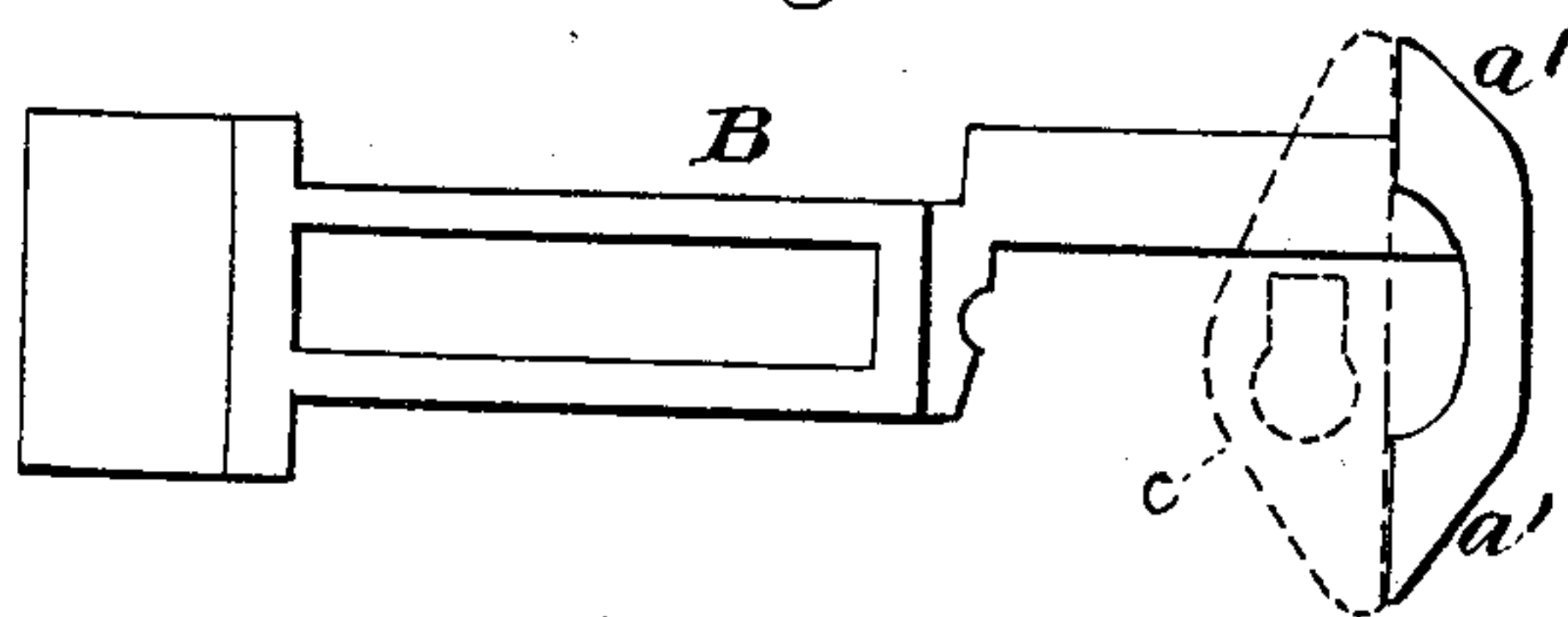


Fig. 4.



Witnesses.
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Att'y

UNITED STATES PATENT OFFICE.

ALVIN S. BOICE, OF NEW RICHLAND, MINNESOTA.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 372,512, dated November 1, 1887.

Application filed July 30, 1887. Serial No. 245,679. (Model.)

To all whom it may concern:

Be it known that I, ALVIN S. BOICE, a citizen of the United States, residing at New Richland, in the county of Waseca and State of Minnesota, have invented certain new and useful Improvements in Combination-Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to combination-locks; and it consists in certain improvements in the construction of the same, as hereinafter described and claimed. In my device the tumblers are placed on a sleeve on the spindle of the door-knobs, the said spindle having engagement with the tumblers and passing through a sliding plate which carries a spring-catch, which closes in the notches of the tumblers when the combination is on, and may be readily raised to throw the combination.

In the accompanying drawings, Figure 1 represents an interior view of the lock. Fig. 2 is a section taken on line *xx* of Fig. 1. Fig. 3 illustrates the sliding catch which connects with the tumblers when the combination is on. Fig. 4 is a plan view of the locking-bolt.

A designates the casing of the lock, and B the main bolt, which is slotted, and in its normal position is pressed forward by a spring, *b*, which rests against a stud, *a*, fixed to the casing and extending into the slot of the bolt. The rear part of bolt B is formed, substantially as shown, with the vertical part *a'* in position to be pressed rearward by the lever *c*, actuated by the knob-spindle *d*, so that the bolt B may be retracted by turning the door-knob in either direction.

C indicates a vertical plate, having an elongated aperture, *e*, for the knob-spindle *d*, which passes through it, and provided with a projecting catch, *f*. To the rear of plate C, a cam-lever, *e*, is secured by a swivel-joint, *g*, the lever having an aperture, *e'*, for the spindle *d*. The aperture *e'*, as will be seen, is elongated, the upper part being rectangular and the lower part round, for the purpose hereinafter stated. The plate C is placed in position adjacent to the part *a'* of the bolt B, and has a limited sliding movement vertically in guides *h*. A spring, *k*, bearing down on a projection of the plate, serves to press the catch

f into the notches of the tumblers when the combination is on. That part *n* of the spindle *d* which is in contact with lever *e* when the combination is on is made square in section to fit the upper rectangular part of the aperture *e'* in the lever, the bolt A being retracted through said lever.

D indicates the tumblers, which are usually three in number, with intervening washers, and provided with notches *o* to receive catch *f*. The tumblers are placed on a sleeve or arbor, *p*, on the knob-spindle, and engagement between the spindle and the first tumbler is effected through a small arm, *s*, projecting from a flange on the spindle. The several tumblers are constructed to engage one with another, and the combination is formed by turning the knob-spindle to the left and right, alternately, until the several notches *o* in said tumblers are brought in line under the catch *f*, which is sprung into them, when the lock works from the knob-spindle like any ordinary lock.

E indicates a knob on the end of a vertical rod extending from the lower end of the plate C through the casing, as shown, and the plate being raised by pressing upward the knob E, the catch *f* is also raised from connection with the tumblers and the cam-lever *e* from engagement with the knob-spindle, the latter then being in the circular portion of the aperture *e'*. The combination is thus readily thrown by a person within turning the door-knob to the right or left, the tumblers being rotated by the spindle *d*.

F indicates a knob to a small bolt or stud, *q*, retained by a spring, *r*, and movable along a slot in the casing, the bolt being used as a night-lock by setting it in line with the bolt B. A small knob passing through a slot in the casing is usually attached to the bolt B, so that it may be moved from the inside without using the door-knob.

In addition to the dial H of the outer door-knob, G, a small dial may be applied and used in connection with the inside knob, G', so that the combination may be formed from either the outside or the inside.

I claim—

1. The combination, with the knob-spindle having a rectangular portion, *n*, a plate, C, carrying a catch, *f*, and cam-lever *e*, having aperture *e'*, of the lock-bolt adapted to engage the

cam-lever, the knob-spindle, and a series of tumblers, substantially as and for the purposes described.

2. The combination, with plate C, provided with catch *f*, and a vertical rod having a knob, E, and cam-lever *c*, having a swivel-connection with the plate, of the lock-bolt, adapted to engage said cam-lever, the knob-spindle *d*, and tumblers, substantially as set forth and described.

In testimony whereof I have affixed my signature in presence of witnesses.

ALVIN S. BOICE.

Witnesses:

J. F. HINDMAN,
N. L. PETERSON,
LEWIS M. PASCHALL.

Correction in Letters Patent No. 372,512.

It is hereby certified that the residence of the patentee in Letters Patent No. 372,512, granted November 1, 1887, upon the application of Alvin S. Boice, for an improvement in "Permutation-Locks," was erroneously written in the grant "New Richmond, Minnesota," whereas said residence should have been written *New Richland, Minnesota*, and that the Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 6th day of December, A. D. 1887.

[SEAL.]

D. L. HAWKINS,
Acting Secretary of the Interior.

Countersigned:

BENTON J. HALL,
Commissioner of Patents.