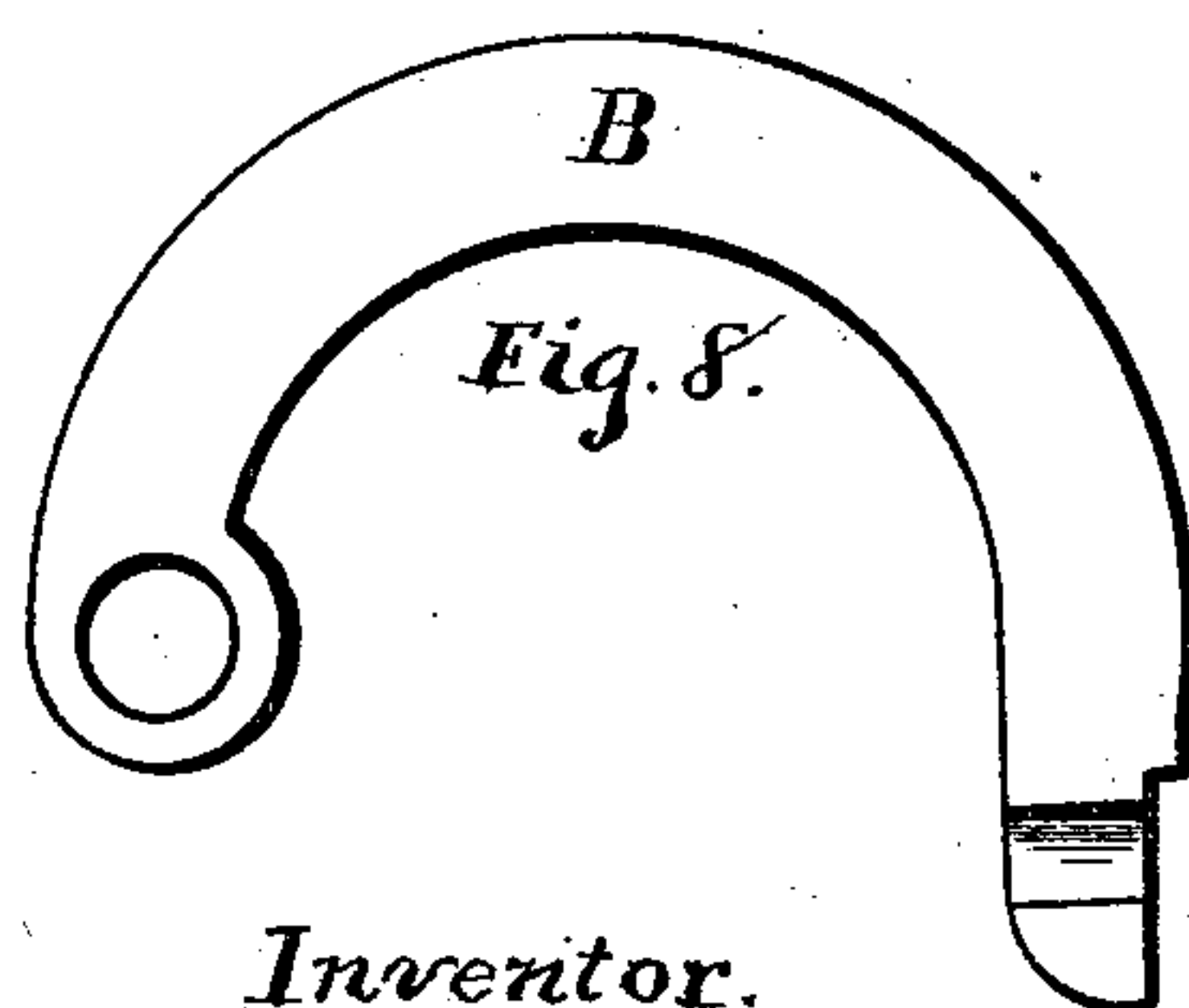
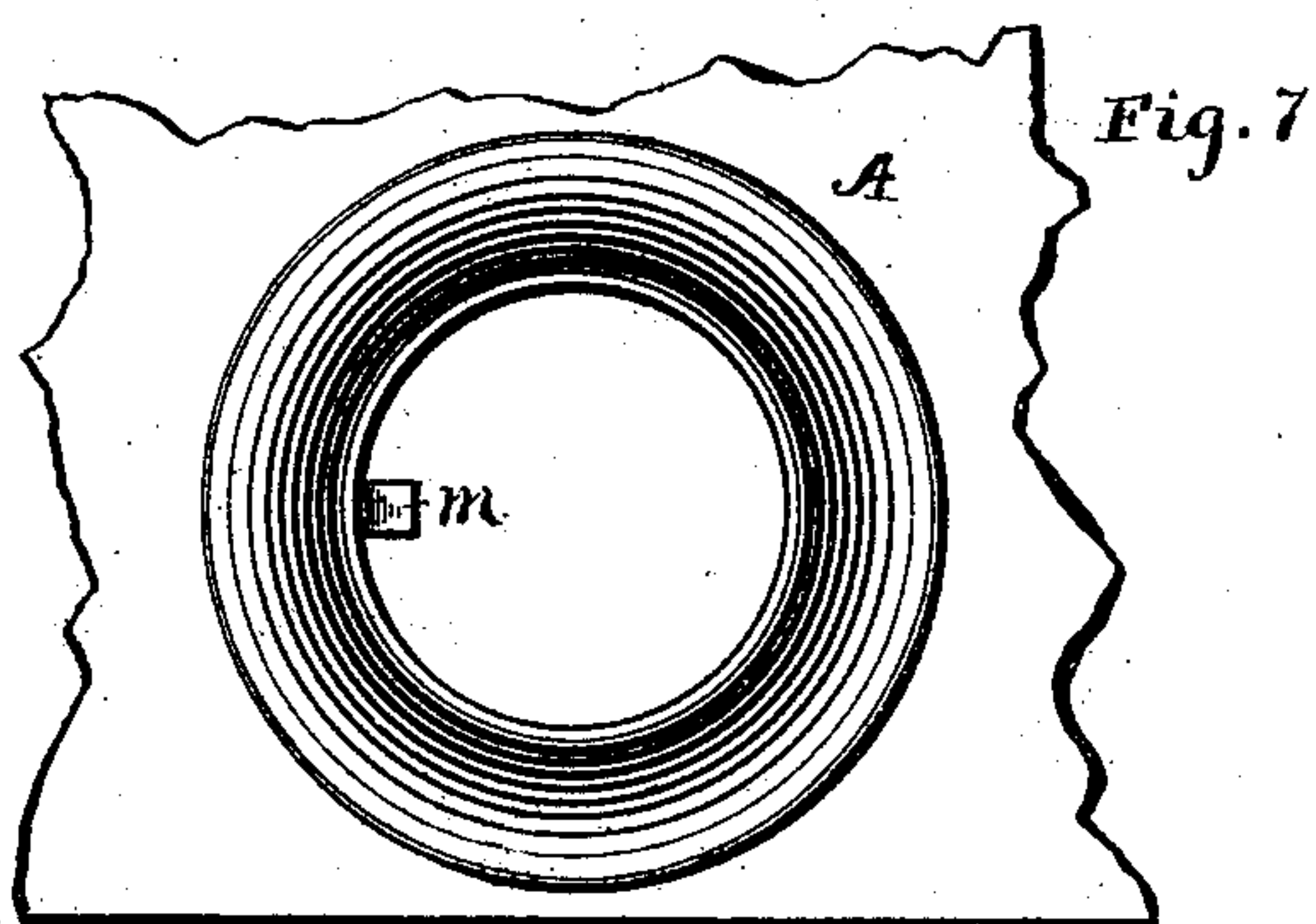
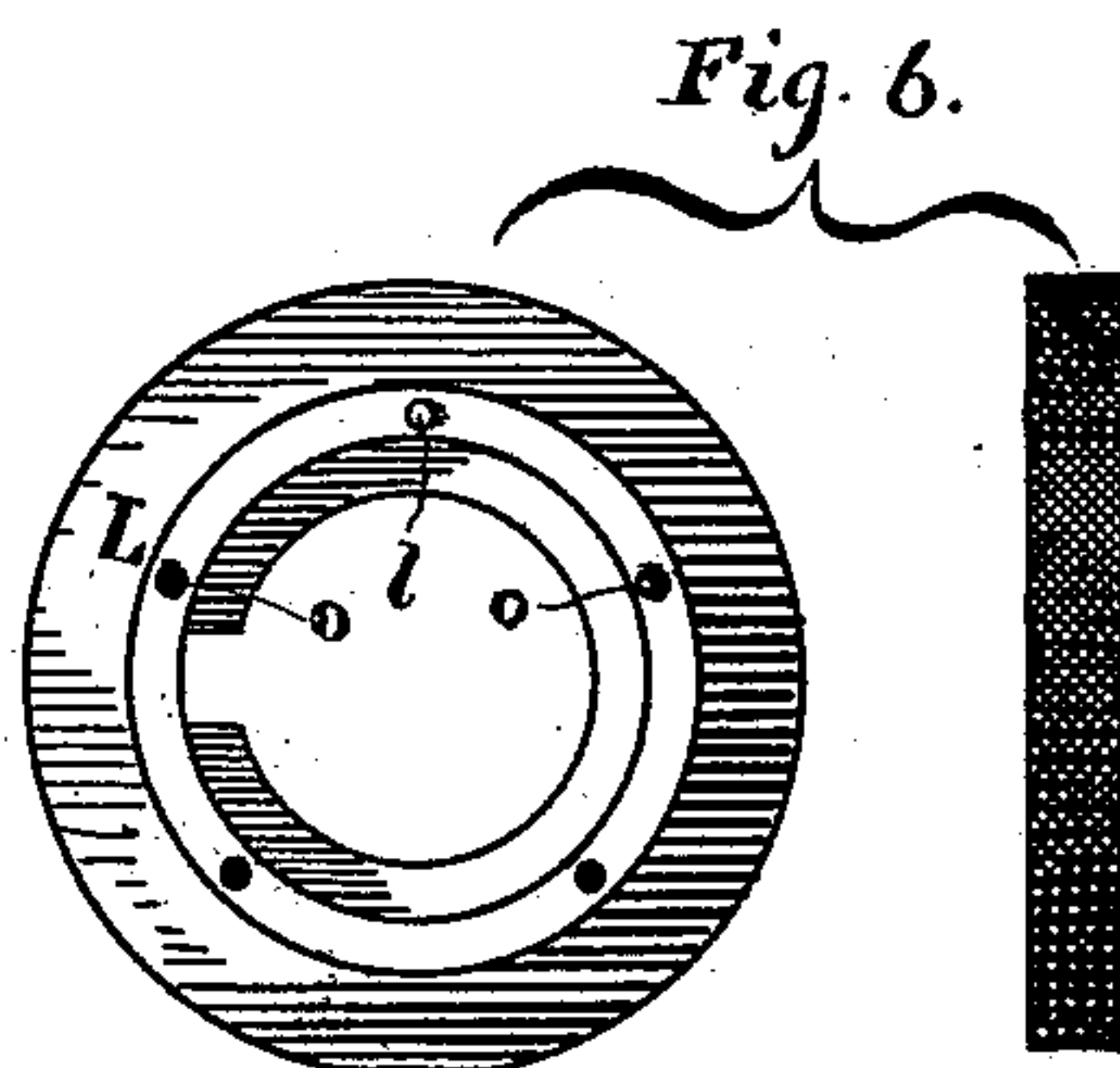
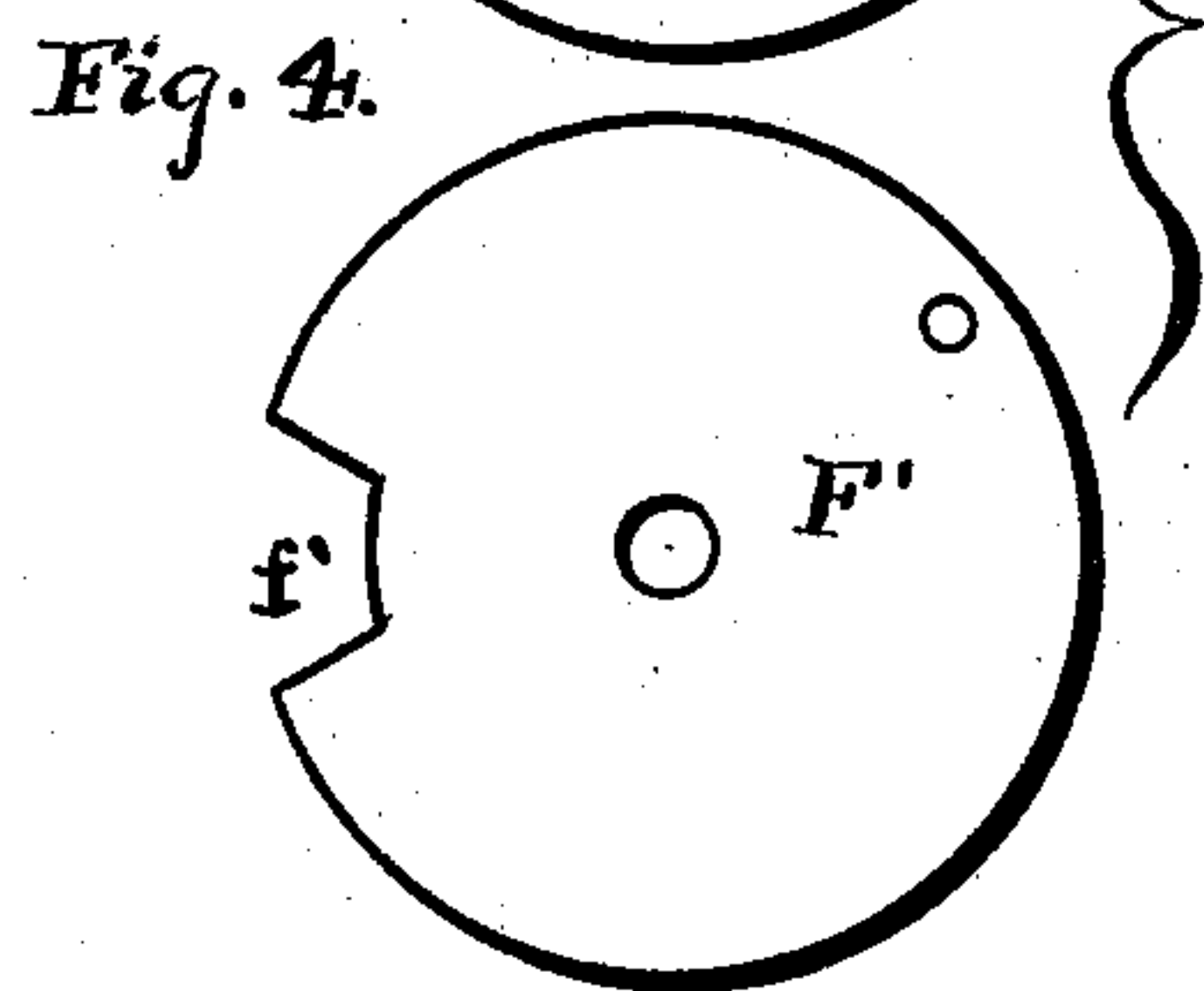
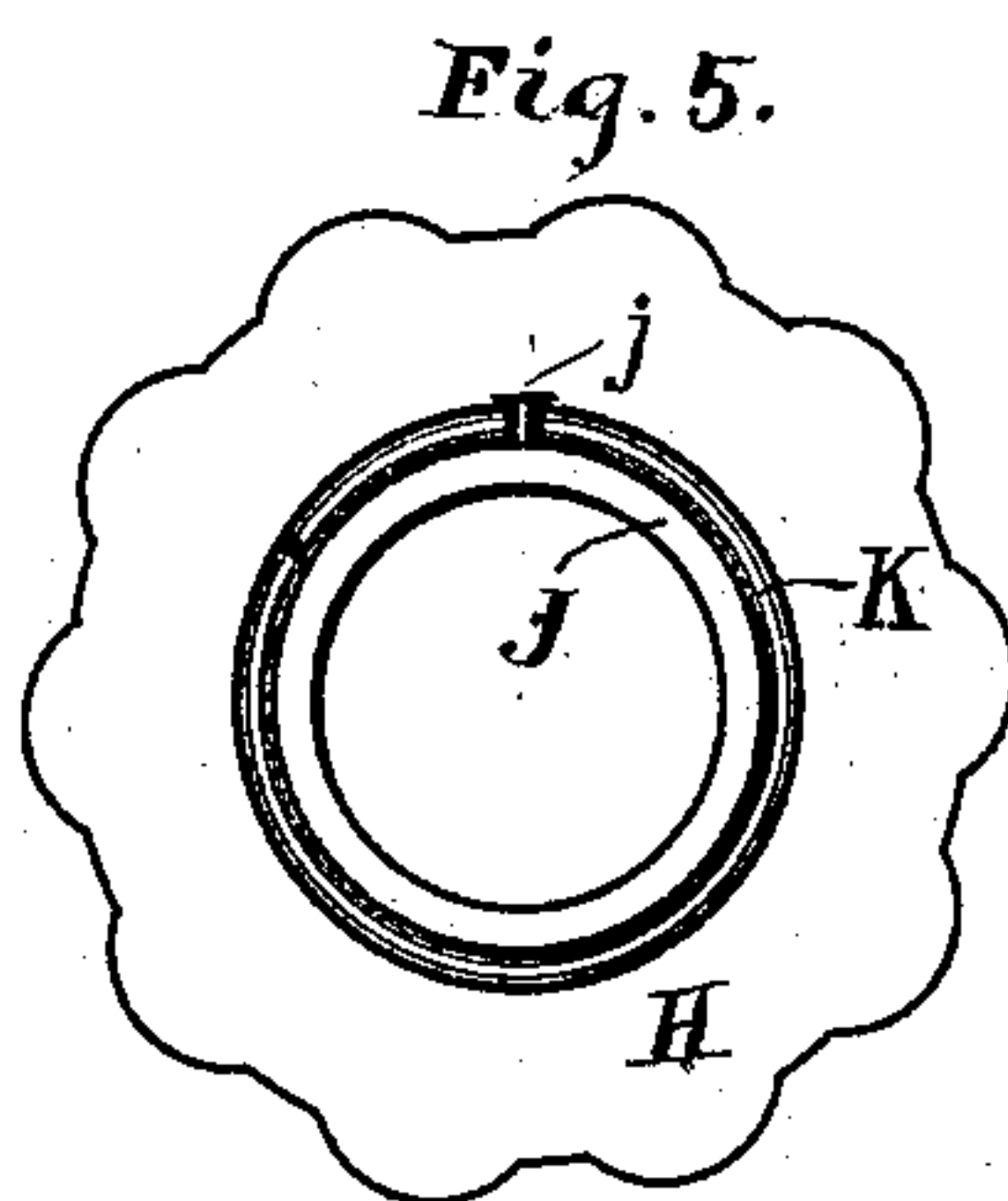
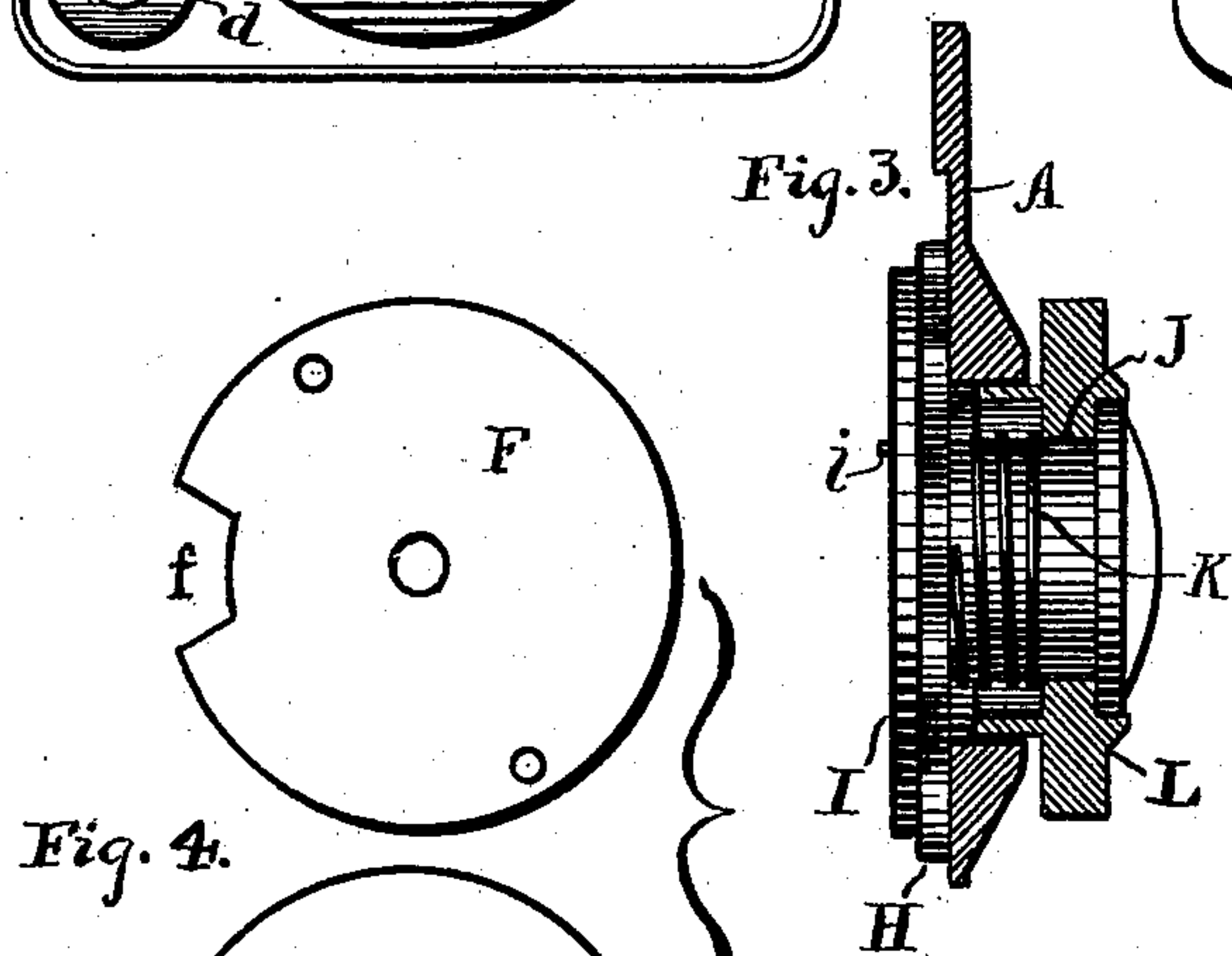
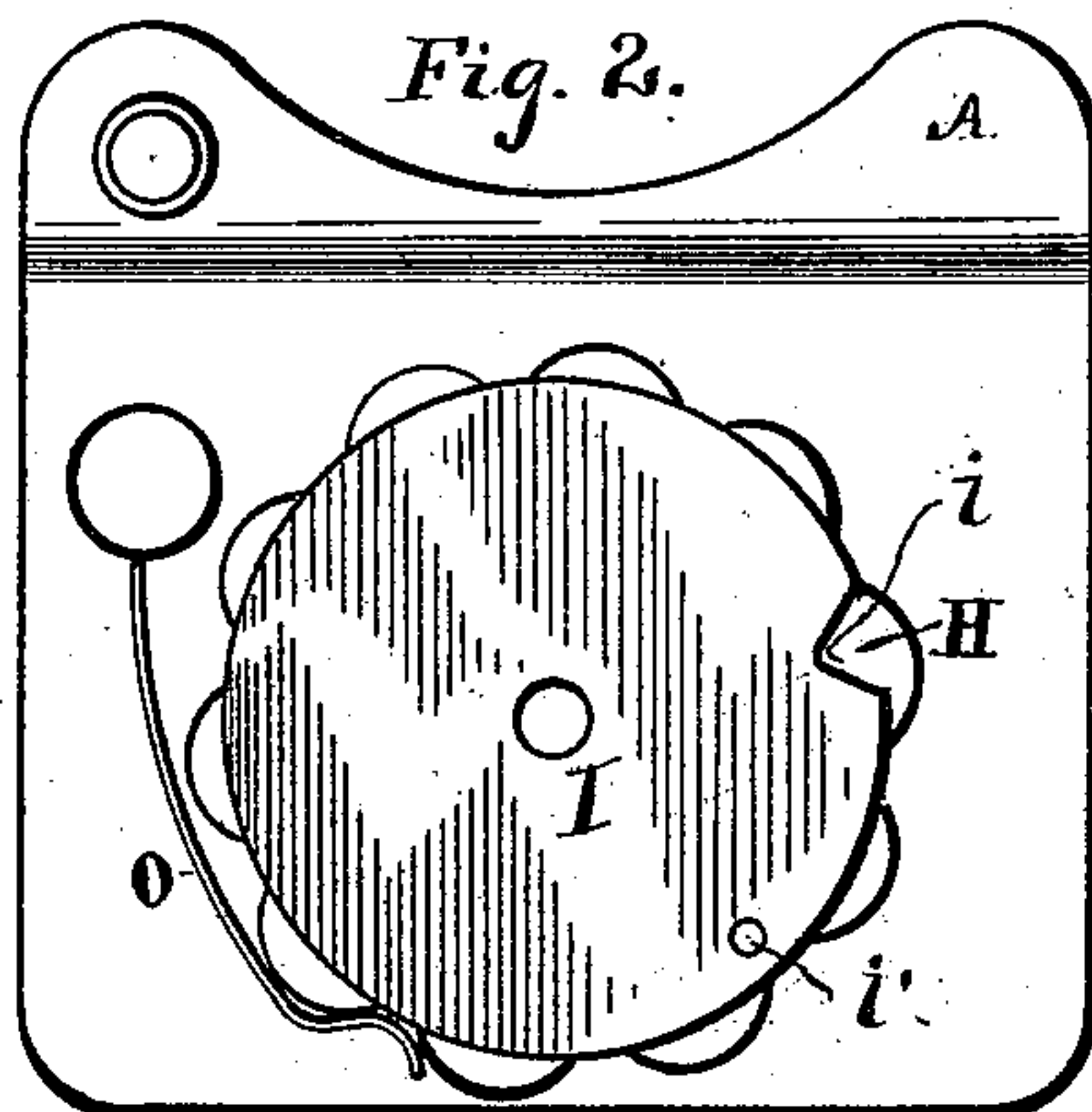
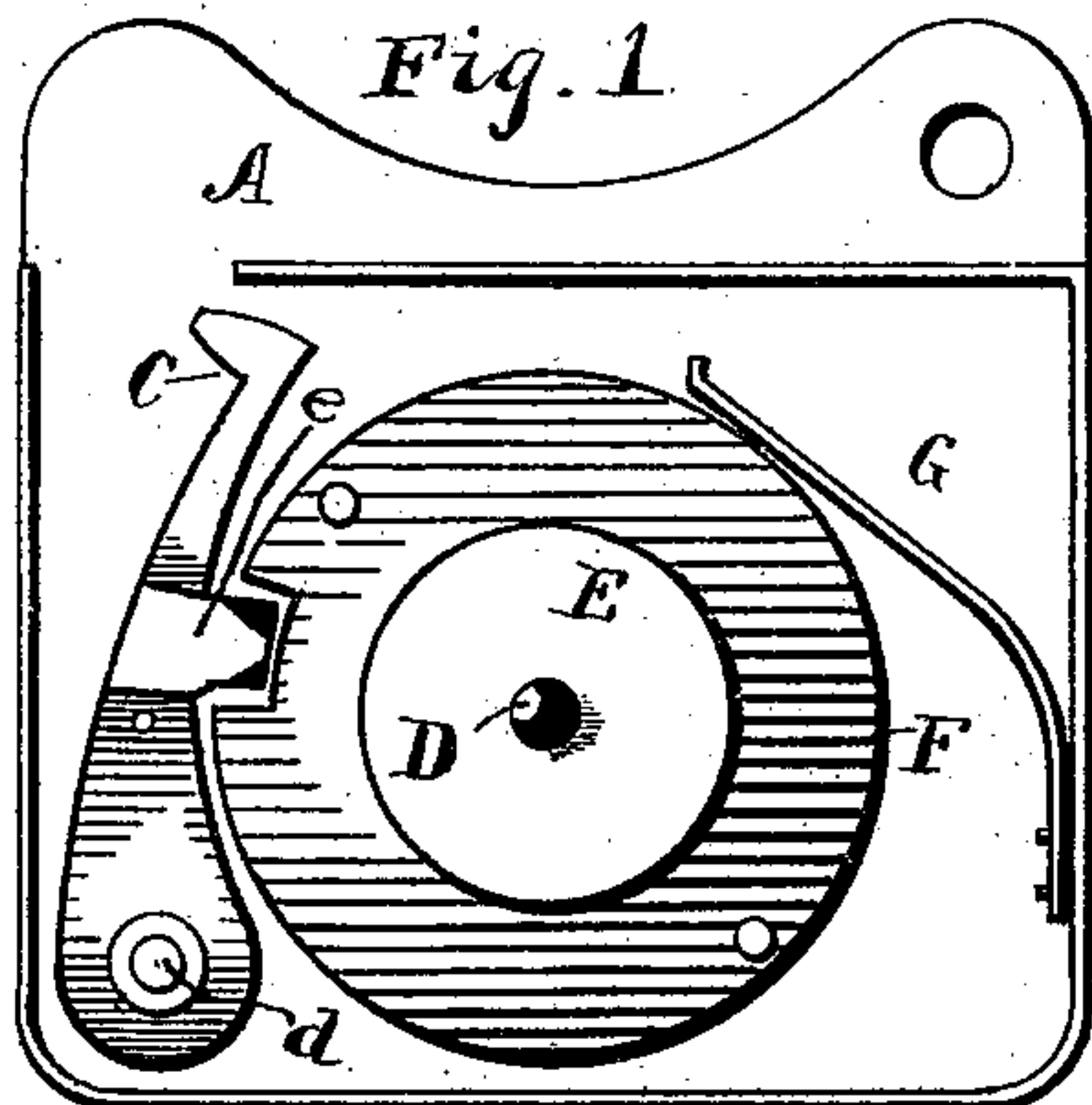


(No Model.)

W. S. CHEDISTER.
PERMUTATION LOCK.

No. 555,474.

Patented Feb. 25, 1896.



Witnesses:
E. L. Belcher.
C. M. Catlin.

Inventor.
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By
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his attorney.

UNITED STATES PATENT OFFICE.

WINFIELD S. CHEDISTER, OF NEWARK, NEW JERSEY.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 555,474, dated February 25, 1896.

Application filed August 16, 1894. Serial No. 520,470. (No model.)

To all whom it may concern:

Be it known that I, WINFIELD S. CHEDISTER, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Permutation - 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.

I am familiar with permutation click-locks in which the unlocking is accomplished by means of movements regulated in accordance with sound indications. One of the features of such locks is a click device for producing the sound, the number of clicks corresponding to the particular combination or permutation for which a given lock is set.

My present invention relates to such locks; and it consists in the improved construction and combination of parts substantially as hereinafter described and claimed. In a common form of lock of this type as heretofore constructed it has been customary to have the tumbler connected with the bolt of a spring-operated tumbler, by reason of which the said tumbler would be thrown when the right combination had been found, and the fact would thus be made known to any person who was trying to pick the lock. In some constructions the action of the spring-tumbler would even throw out the bolt or permit it to be thrown out, thus making it certain or possible for an accidental discovery of the combination to cause the opening of the lock.

In my improvements (which I show in connection with a padlock) I dispense with the spring-actuated tumbler, or, rather, I combine the tumbler and the bolt into one piece, the same not being actuated by a spring, but being withdrawn after the right combination has been found by reason of the fact that there is a bevel upon the bolt where it engages with the hasp—that is to say, by virtue of the form of the bolt where it engages with the hasp the latter can be pulled out to remove the padlock, although neither the hasp nor the bolt is automatically thrown out. In this way the person who is manipulating the lock legitimately can draw the hasp at the proper time, but anybody else will not be in-

formed of the open condition of the lock either by a clicking of the tumbler when thrown by a spring or by the throwing of the bolt and the release of the hasp.

I have illustrated my invention in the accompanying drawings, in which—

Figure 1 is an elevation of the padlock with the front thereof removed, some of the mechanism being also taken away. Fig. 2 is an elevation of the parts removed in Fig. 1, the same being an interior view. Fig. 3 is an elevation and part section of the parts appearing in Fig. 2 and of other parts connected therewith. Fig. 4 shows elevations of permutation-rings forming parts of my apparatus. Fig. 5 is a detail of my click-wheel. Fig. 6 is a detail of the key which I employ in connection with my lock. Figs. 7 and 8 are detail views.

The same letters refer to the same parts throughout the description.

At A is shown the casing of my padlock, the hasp of which appears at B.

At C is shown the bolt of my padlock, that part of it which enters the foot of the hasp being beveled, as shown, so as to permit the bolt to be forced back when the hasp is withdrawn, provided there is no resistance elsewhere to the backward movement of the bolt. The foot or lower end of the hasp is provided with a slit *c* for receiving the end of the bolt.

The bolt is formed in one piece with the lock-tumbler, and the letter C may designate the whole piece constituting a combined bolt and tumbler, the same being pivoted at *d* and provided with a lug *e*, which forms a bit for entering the notches in the permutation-rings when they are brought to the proper position.

From the rear of the casing a shaft or rod D projects into the interior of the lock, the said shaft being surrounded by a hub E and the said hub forming the bearing around which rings F F' are adapted to be turned. If preferred, the rings may rotate around the shaft and the part E may be a fixed collar, between which and the back of the casing the rings are held from longitudinal movement along the shaft. This is, in fact, the construction which is illustrated in the drawings.

The rings F and F' are the permutation-rings of my lock, the outer ring, F, being provided with two pins upon its outer surface,

one of which extends through to the inner side of the ring and there co-operates under the proper conditions with a single pin projecting from the outer surface of the ring F'.

5 The peripheries of these rings are pressed upon by a spring G to prevent them from being thrown too far when they are operated.

Above the ring F is a click-wheel H, which has on its inner side a ring I provided with a notch *i* and supplied with a pin *i'*. It will be observed that the upper or outer portion of the bit or lug *e* is formed to correspond in shape to the notch *i*, so that the bolt cannot be withdrawn, as will appear hereinafter, until the notches in the permutation-rings have been brought into line with each other and with the notch in the ring *i*, nor until all these notches are in line just behind the lug *e*.

The click-wheel is mounted upon a hollow hub J, having an opening large enough to surround the shaft D. Near the upper end of the hub J is a pin *j*, between which and the click-wheel is held a spiral spring K. The key of the lock is shown at L in the form of a sort of button surrounding the hub J and provided with a milled edge by means of which it can readily be turned. The key is provided with a notch which is adapted to embrace the pin *j* upon the hub and to cause the turning of the hub and the click-wheel every time the key is turned. On the lower rim of the key is a pin *l*. All this portion of the apparatus—namely, the hub J, the spiral spring K, and the smaller cylindrical portion of the

key—stands within an opening of cylindrical form in the outer casing of the lock. A lug *m* projects into the said opening from the lower inner edge thereof and stands in the path of the pin *l* when the key is pressed inward against the resistance of the spring K. At other times the pin *l* does not come into contact with the lug or projection *m*, but rides freely above or outside the same.

The click-spring which co-operates with the click-wheel for making the sounds is shown at O.

It will be understood that the permutation-rings are provided with notches *f f'*, which, as has been said, must come into line with the notch *i* at a point behind the lug or bit *e* before the bolt can be withdrawn. Under other conditions the said lug bears upon the peripheries of the rings and holds the bolt out into engagement with the hasp.

55 In operating the lock the key is first pressed inward against the resistance of the spring K and is turned, say, to the right until the pin *l* is brought against the lug or projection *m*. Here the key is brought to a full stop, marking the unison or starting point for the combination of the particular lock which is being operated. Up to this point no attention is paid to the clicks of the click apparatus, although the same has been operated by the movement already described. The combination of the lock illustrated is represented by

the number 262. From unison the key is turned to the left two clicks, the pressure upon the key having first been relieved. Then the key is turned six clicks to the right and afterward two clicks to the left. When this has been done, a pull upon the hasp will force in the bolt by acting upon the bevel and will thus permit the release of the hasp.

It will be understood that the key acts first upon the click-wheel and the ring I connected therewith. The pin *i'* on the ring I is, of course, moved with the said ring, and it acts upon one or the other of the pins upon the outer surface of the ring F to move the said ring. This ring in turn, by means of the pin which projects from its inner surface, acts to move the ring F' when the said pin strikes the pin upon the outer surface of the ring F'. In this way the rings are moved to the position desired for permitting the opening of the lock.

As a means for changing the combination, I make screw-holes in the rim upon the under side of the button or key, as shown at *o o* in Fig. 6, the pin *l* being put into one or the other of these holes, according to the combination desired.

The notch in the ring I is beveled to correspond to the shape of the upper or outer portion of the bit or lug *e*. By reason of this construction the said bit or lug is thrown out of engagement with the notch and with the rings when the apparatus is to be turned for locking purposes.

Obviously, the arrangement of the pin *l*, acting as a catch, and the lug or projection *m*, acting as a detent, may be altered without departing from the principle of my invention. For example, the said lug or projection may be replaced by a pin, properly disposed, and the position of the parts referred to may be changed. Other changes may be introduced into the details of my invention without affecting its general features.

What I claim is—

1. In a permutation-lock, a permanently-attached key and a click-wheel operated thereby, the said key carrying a catch and being pressed outward by a spring in combination with a detent on the casing of the lock, the engagement of the catch and detent marking the unison or starting point for the combination, as and for the purpose set forth.

2. In a permutation-lock, a permanently-attached key operating by means of a pin or catch in combination with a detent upon the casing of the lock as a unison device, the said pin or catch being changeable in position, as and for the purpose set forth.

In testimony whereof I have signed my name, in the presence of two witnesses, this 10th day of August, A. D. 1894.

WINFIELD S. CHEDISTER.

Witnesses:

C. L. BELCHER,

G. H. STOCKBRIDGE.