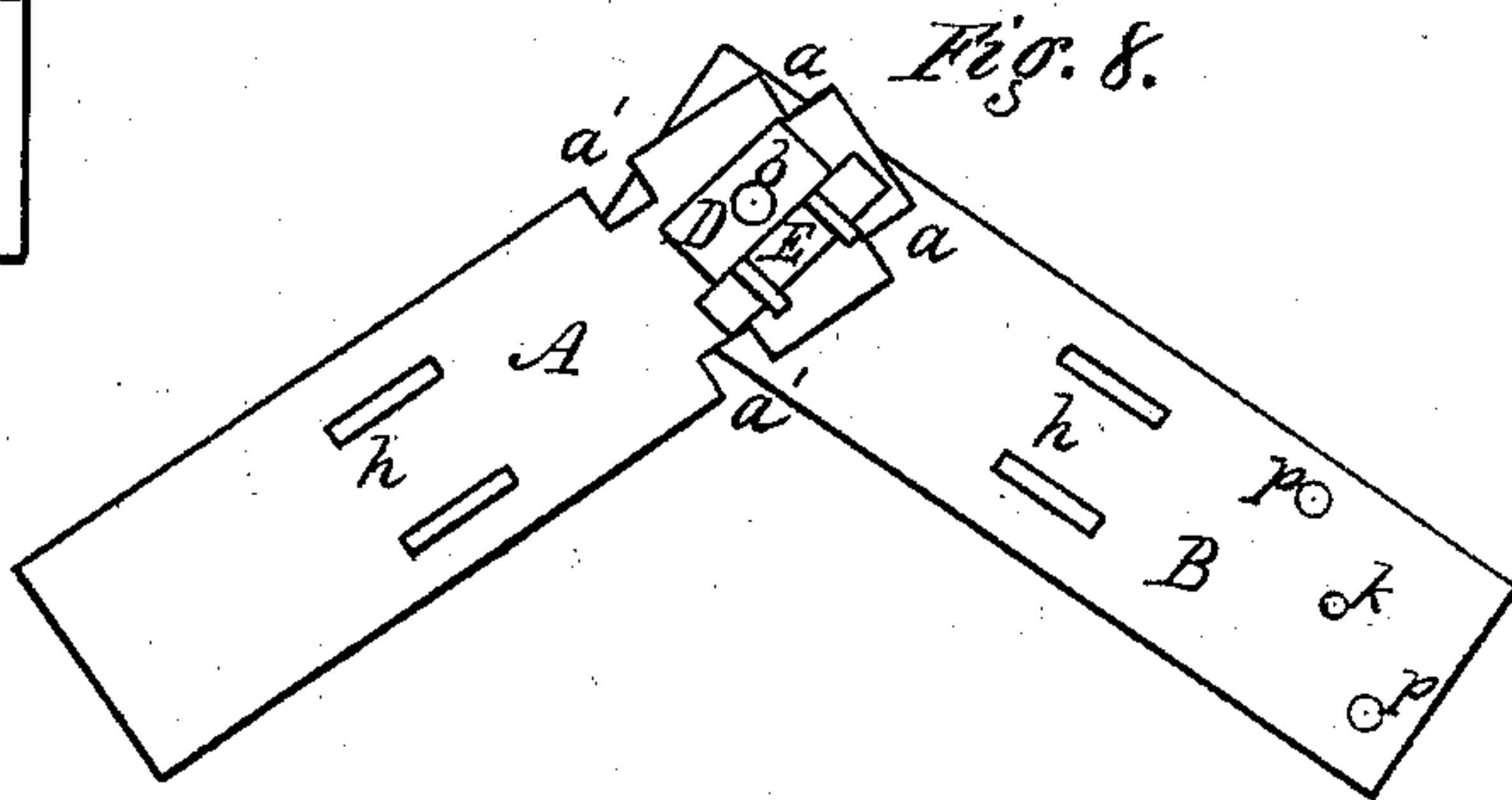
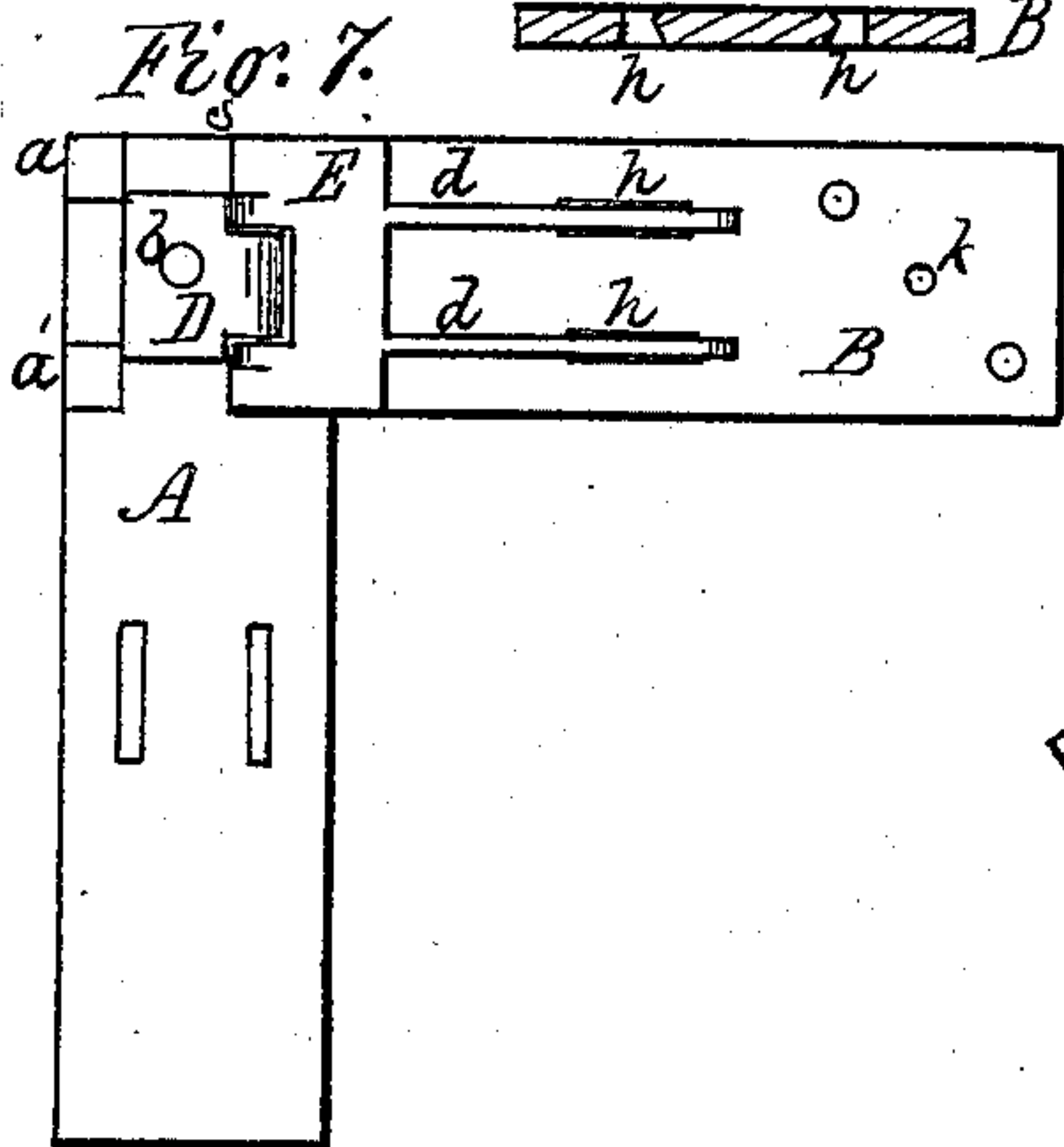
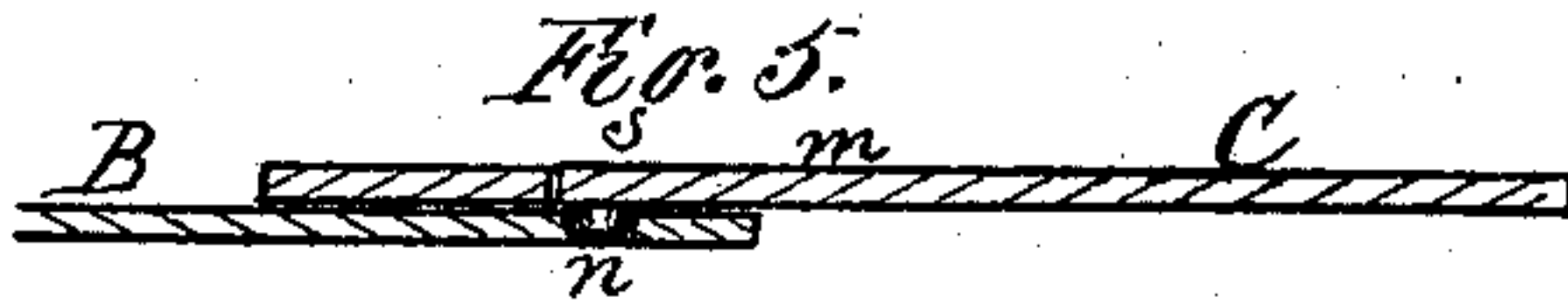
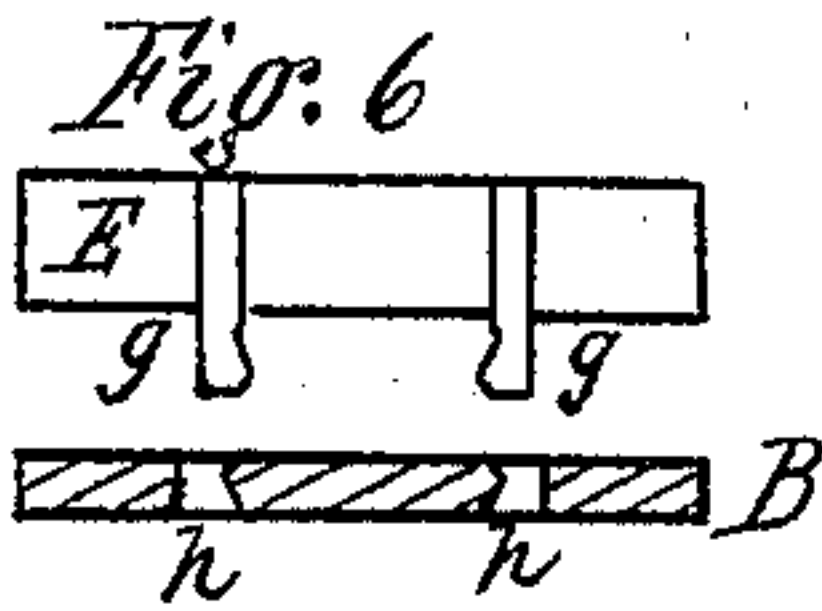
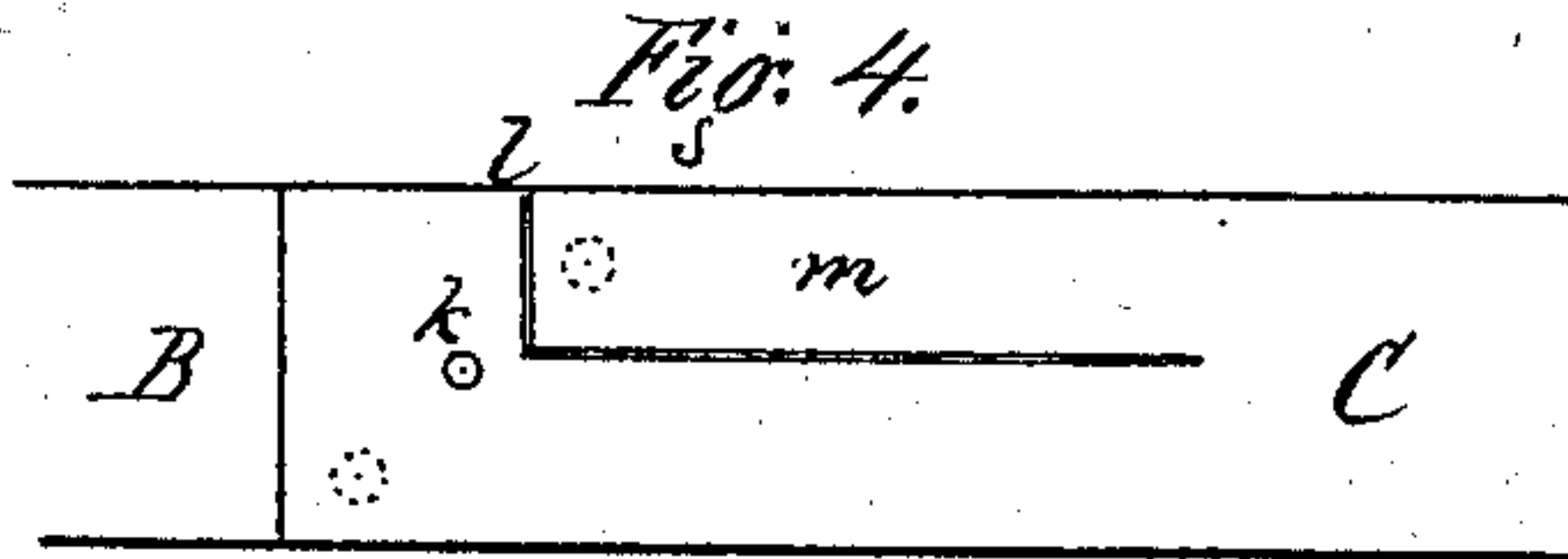
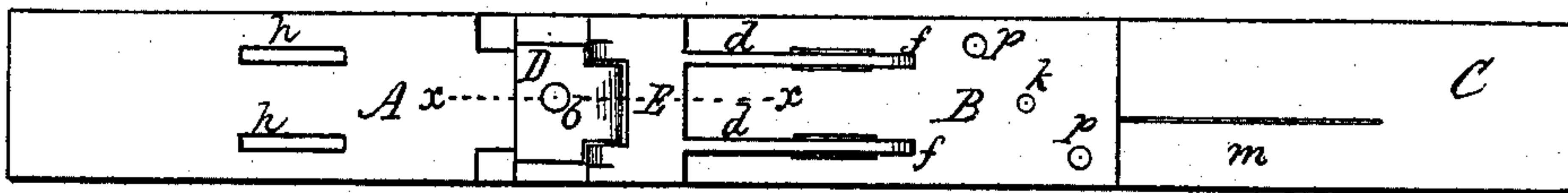
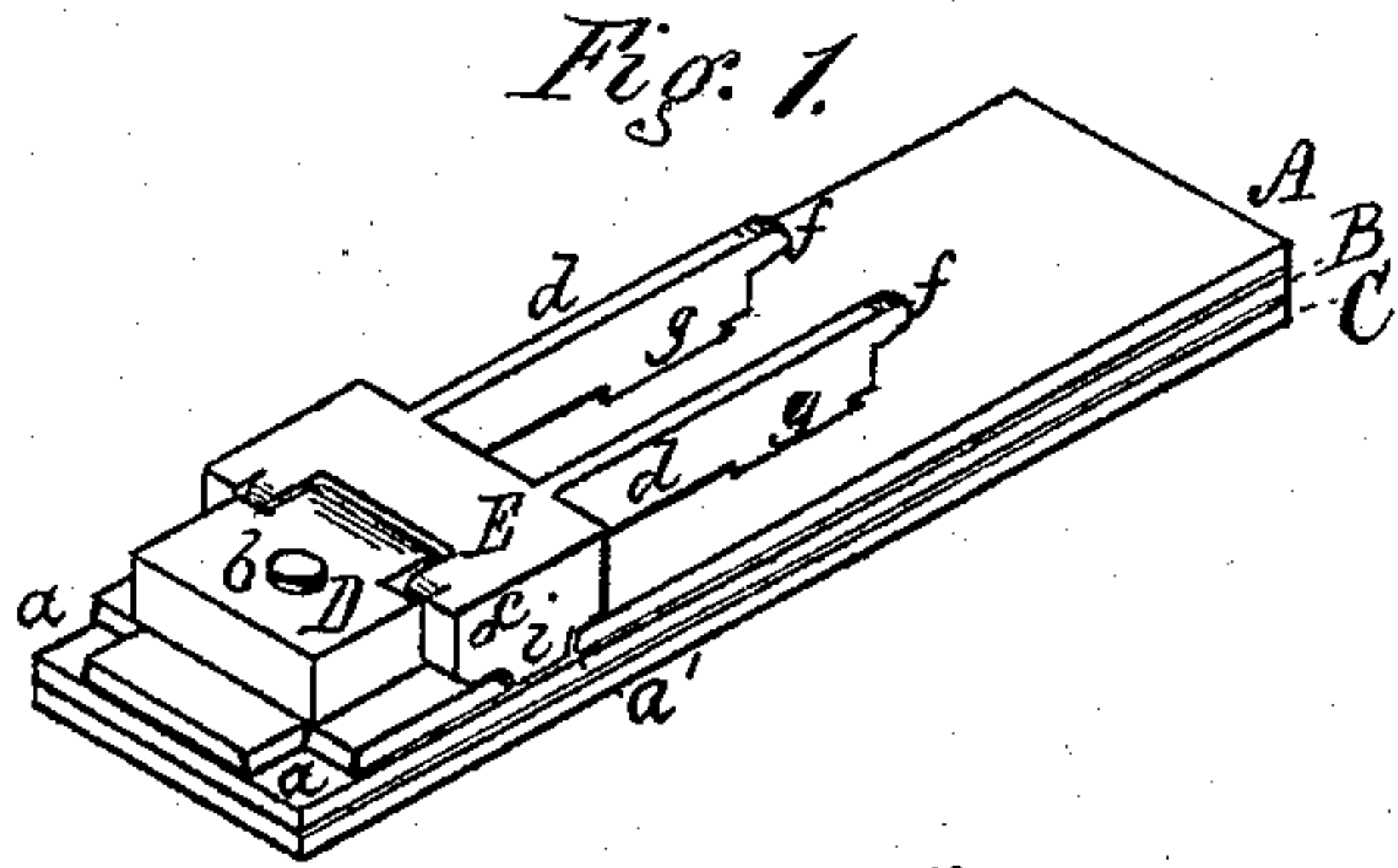


C. M. HEFFRON.

Combined Rules, Squares, and Bevels.

No. 138,152.

Patented April 22, 1873.



Witnesses
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UNITED STATES PATENT OFFICE.

CASSIUS M. HEFFRON, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN COMBINED RULES, SQUARES, AND BEVELS.

Specification forming part of Letters Patent No. **138,152**, dated April 22, 1873; application filed February 21, 1873.

To all whom it may concern:

Be it known that I, CASSIUS M. HEFFRON, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement, consisting of a Combined Rule, Square, and Bevel; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same.

My invention consists of a combined rule, square, and bevel, constructed and arranged substantially as hereinafter described.

In the drawing, Figure 1 is a perspective view of the device folded up; Fig. 2, a plan of the same opened and arranged as a rule; Fig. 3, a section in line *x x* of Fig. 2; Fig. 4, a plan of one joint of the rule, looking on the opposite side from Fig. 2; Fig. 5, a section of Fig. 4; Fig. 6, a diagram, showing the locking device; Fig. 7, a view of the device arranged as a square; Fig. 8, a view of the same arranged as a bevel.

A B C represent the several lengths or sections of the device, which are jointed together so as to be extended or folded up, at pleasure. The primary length A has four notches, *a a a' a'*, at one end, while the others are made straight from end to end. These notches are made angular or inclined at their edges, for the accurate fitting of the locking-offsets, as hereinafter described. The part B is pivoted to A by a screw-stud, *b*, the upper end of which is threaded, as shown. On this screw screws a nut, D, which clamps the two parts in place. To the nut D is hinged a block, E, as shown at *c*, so that said block may be turned up or down, at pleasure. To the block E are attached two spring-arms, *d d*, provided with lugs *f f*, which form finger-holds, and also with projections on the under side, which form catches *g g*. Slots *h h* are cut through the lengths A B equidistant from the axis *b*, and so arranged that the catches *g g* will strike into them when said parts are extended lengthwise or set at right angles. The inner edges of both the catches *g g* and the slots *h h* of the part B are beveled, as shown in Fig. 6, so that when they strike together they will lock, and prevent accidental displacement. The lower edges of the catches *g g* and the upper edges of the slots *h h* in part B are also beveled in

such a manner that when they strike it will cause the arms *d d* to expand so as to properly spring into their places.

Instead of the arrangement above described, a single arm, *d*, might be used, and a single notch, *a*, on each of three sides might be employed in place of the four notches *a a a' a'*, the effect being the same in either case.

The block E is provided with an angular offset, *i*, on each side, which offsets *i i* strike into the corresponding notches *a a'* of the length A when the arms *d d* are turned down, and thereby hold the parts in place when extended lengthwise or set at right angles. This is shown clearly in Fig. 1. The angles of the notches *a a'* and the offsets *i i* are made to fit with each other accurately, to hold the parts properly in place.

Thus arranged, the device can be folded for pocket use, as in Fig. 1; extended in a straight length to form a rule, as in Fig. 2; set at right angles to form a square, as in Fig. 7; or set at any desired angle to form a bevel, as in Fig. 8.

In forming a rule the parts are swung into a straight length, the spring-arms *d d* turned down to engage with the slots *h h*, and the offsets *i i* then engage with the extreme notches *a a*.

In forming a square the spring-arms *d d* are turned down in the same manner; but the offsets *i i* engage with one extreme notch, *a*, and with one inner notch, *a'*. The position of the square can be changed to the opposite side by engaging with the opposite notches *a a'*, if desired.

In forming a bevel the spring-arms *d d* and the offsets *i i* are not used; but the block E is turned up, and the parts are held simply by the clamping action of the nut D, which is turned down on the screw *b*. Any desired angle of the bevel can be produced.

An essential feature in my improvement is the arrangement of the nut D, block E, and the spring-arms *d d* and the offsets *i i*, connecting, respectively, with the slots *h h* and notches *a a'*; and these parts serve to lock the device in the form of either a rule or a square. The clamp consists of the nut D and screw *b*, and serves to form the bevel, which cannot be secured by the other parts alone. In the combining of these two features lies a principal

part of my invention. A mere lock or a mere clamp would not meet the conditions of the case.

The part C is pivoted to the part B by a pivot, *k*, as shown. Any desired number of extensions may be used to make the rule of greater or less length, and they turn or fold in on their axes in compact form. The part C is slitted in from the side, as shown at *l*, and is then slitted at right angles or longitudinally, as shown at *l'*, a suitable length. The strip *m* thus formed is bent inward sufficiently to form a spring, and is armed with a small stud, *n*. Holes *p p* are formed in the length B equidistant from pivot *k*, and so located that the stud *n* will strike into them when the length C is fully opened or closed. This forms a lock to the parts B C in either position.

In passing around from one hole, *p*, to the other the stud *n* simply rides over the surface of metal, and when the hole is reached the natural elasticity of the spring *m* will force the stud in place. In opening or closing the pressure of the finger is sufficient to release the stud from its socket without raising the spring; and the stud, if desired, may be formed a little conical or angular to facilitate the releasing movement. The device thus formed is automatic in action.

This device constitutes one feature of my invention. It avoids the use of extra springs, catches, and other attachments which have heretofore been used, and presents a flat surface without projections.

Having thus fully described my invention, I do not claim, broadly, an adjustable rule and square, as I am aware that the same is not new; but

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

1. In combination with the parts A B provided with the notches *a a'* and slots *h h*, made in the angular or bevel form described, the combined clamping and locking device, consisting of the nut D, the block E with offsets *i i*, and the spring-arms *d d*, the latter provided with the bevel-catches *g g*, the whole arranged to operate in the manner and for the purpose specified.

2. In combination with the parts B C, the spring *m* formed from the part C by slitting, as described, and armed with a stud, *n*, which strikes into sockets formed for its reception in part B, substantially as specified.

C. M. HEFFRON.

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