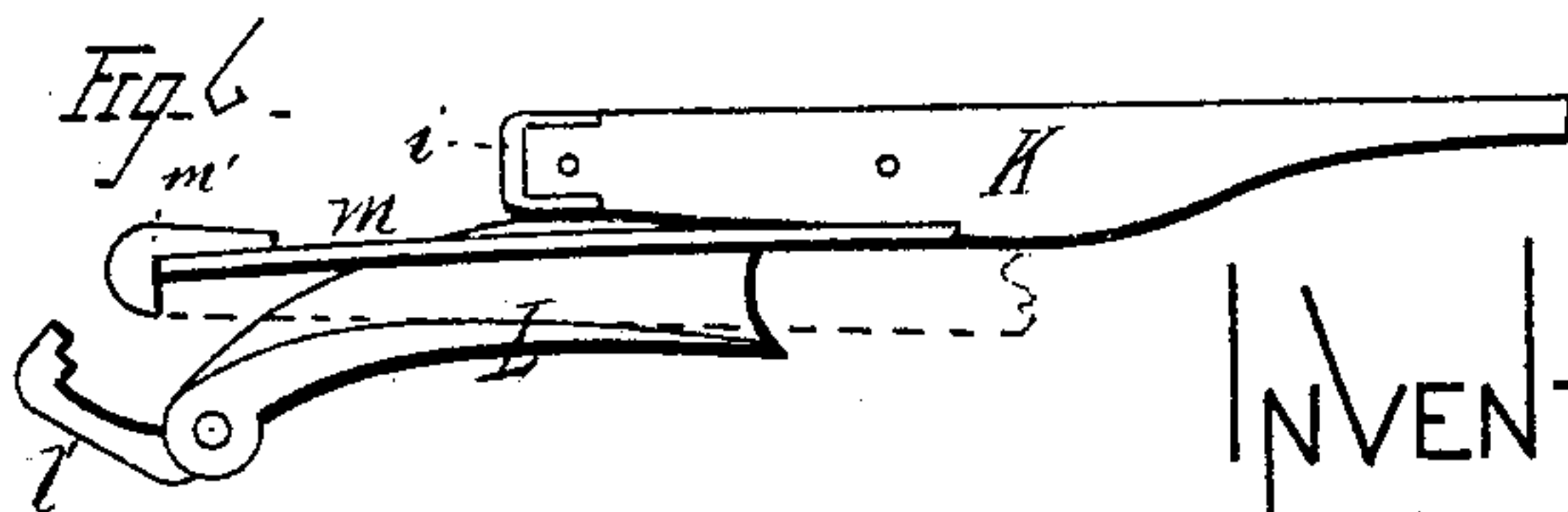
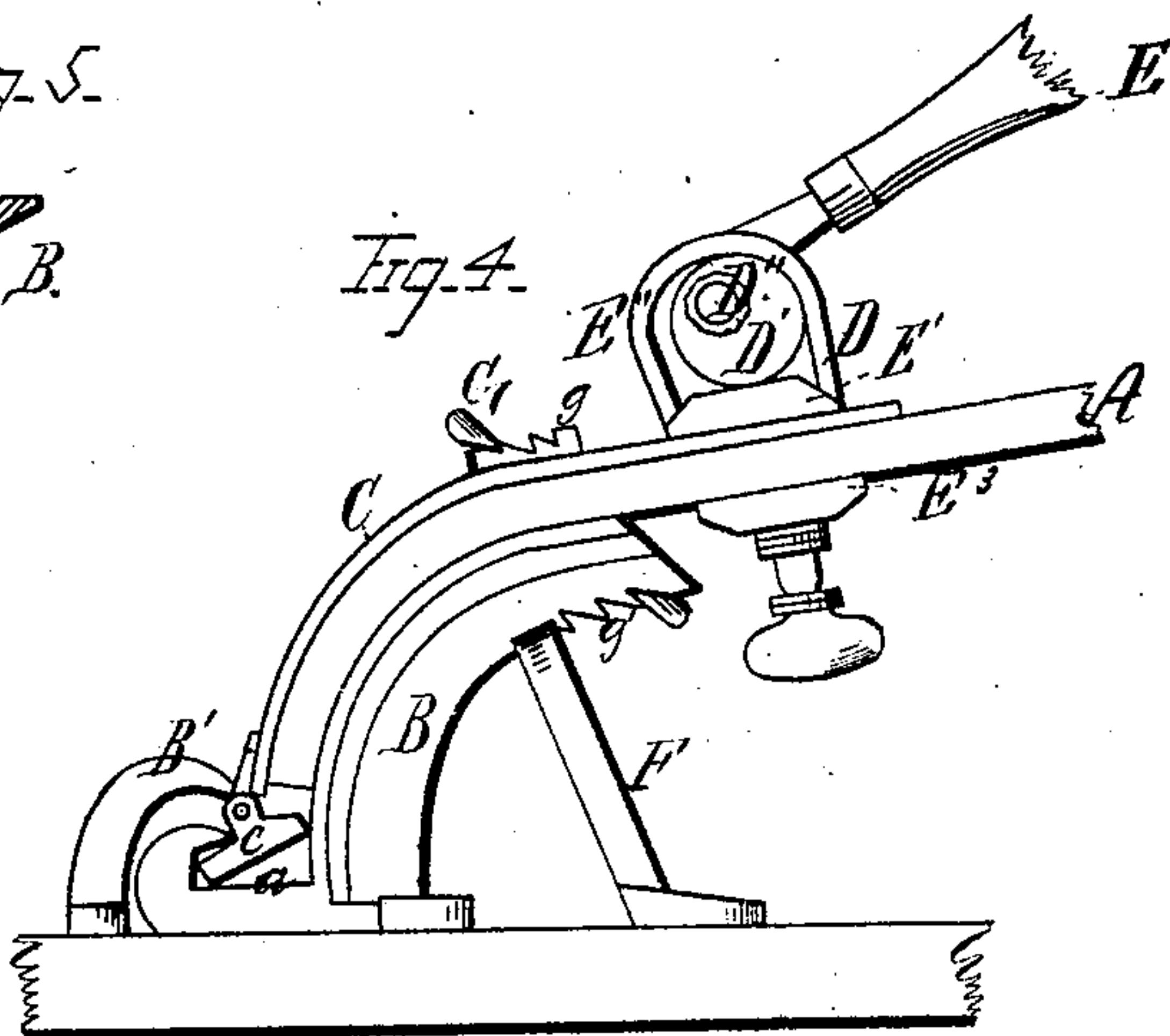
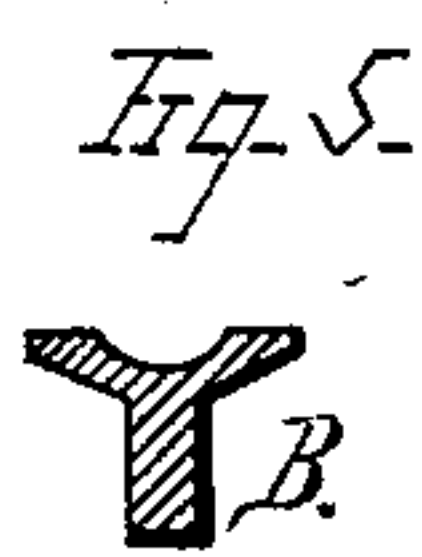
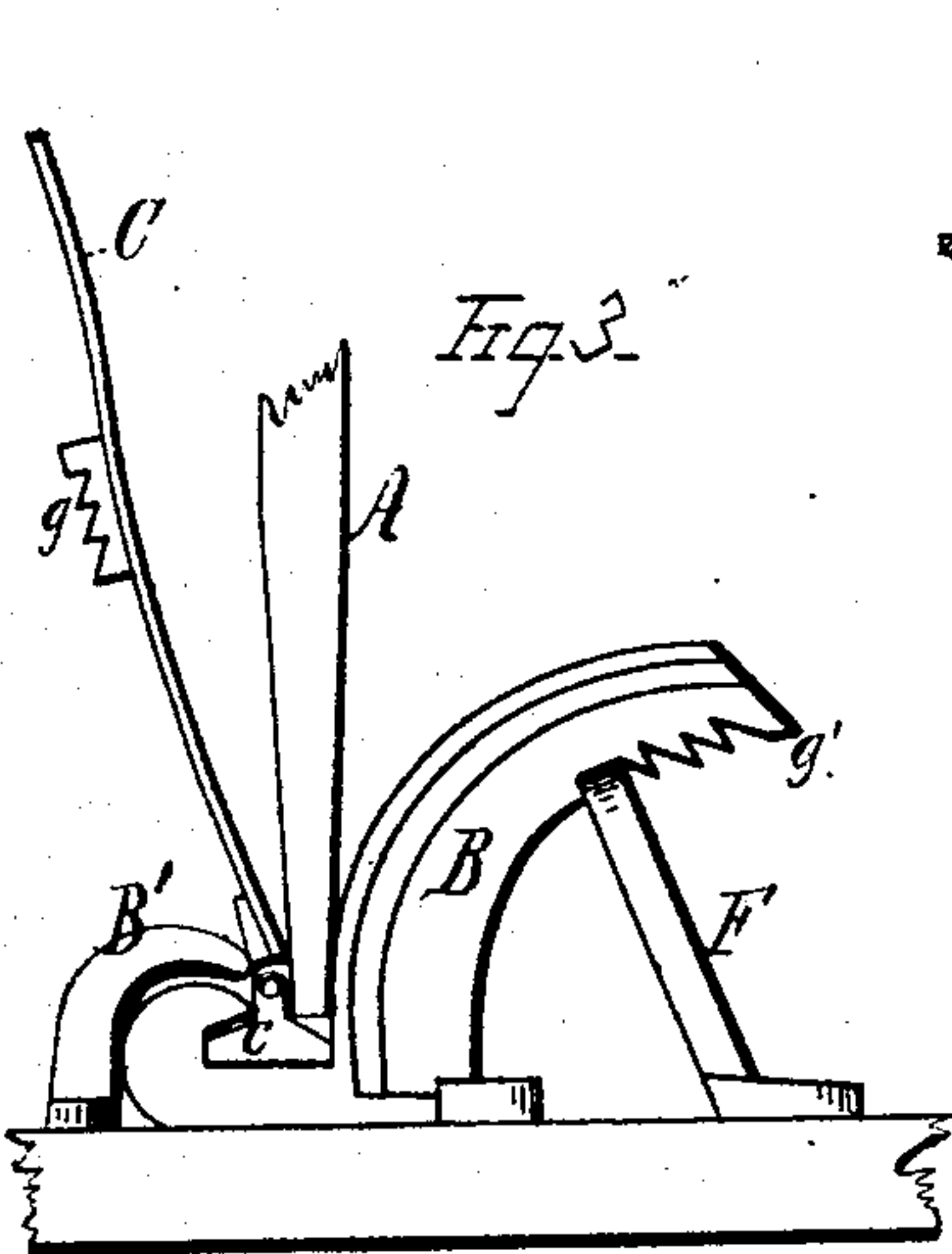
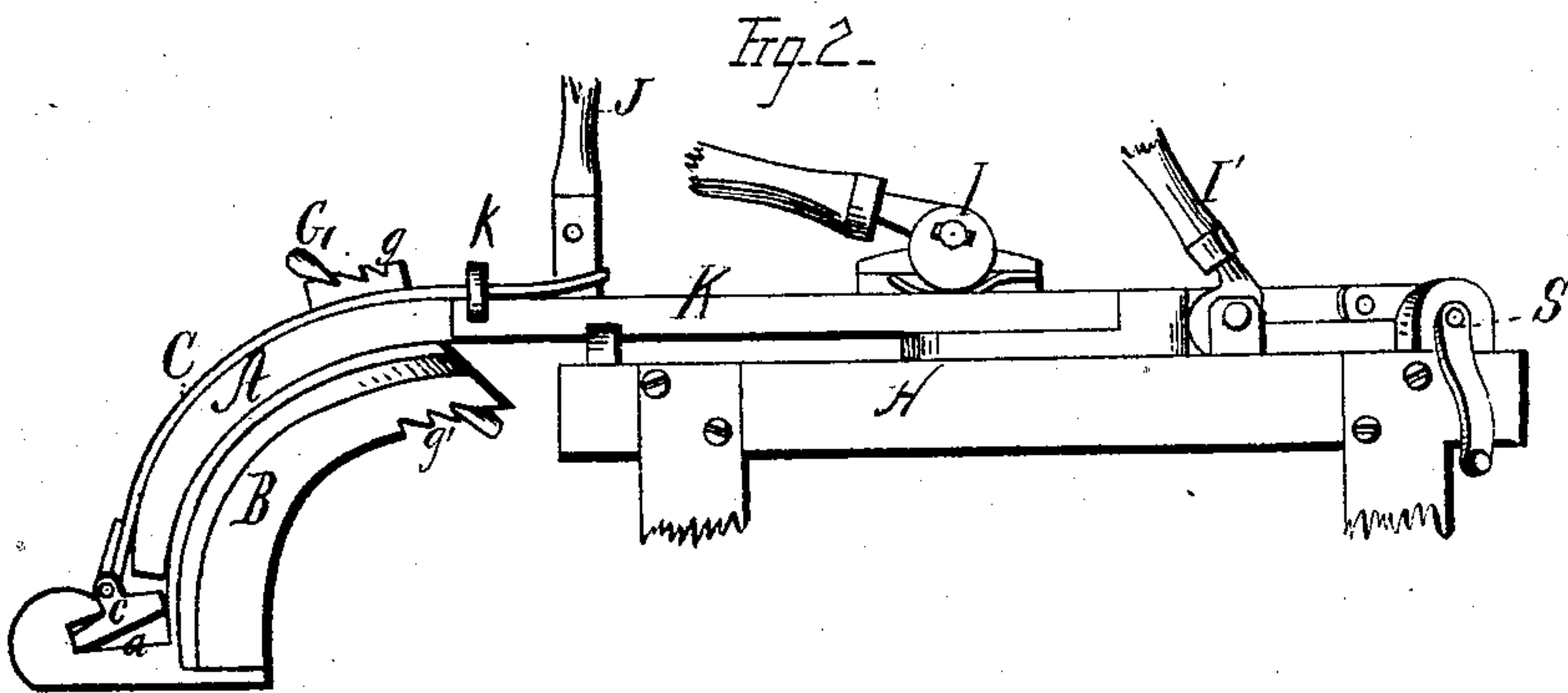
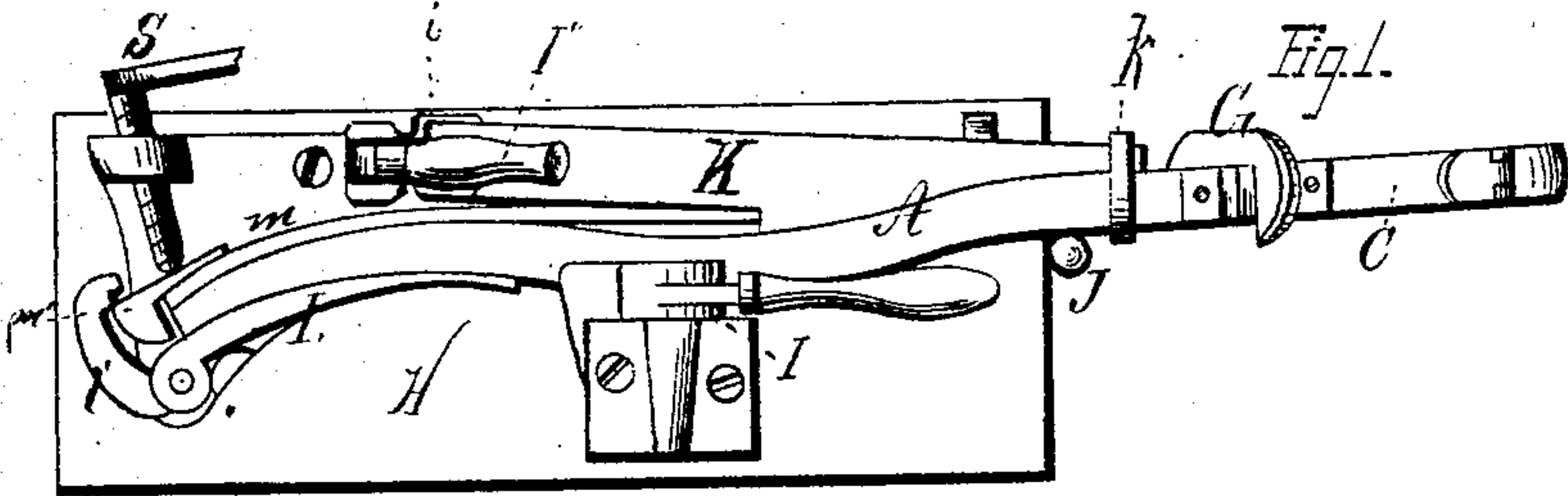


H. HANNA.
Machines for Bending Wood.

No. 145,416.

Patented Dec. 9, 1873.



WITNESSES.

W. S. Newman,
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INVENTOR

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Attys

UNITED STATES PATENT OFFICE.

HIRAM HANNA, OF COLUMBUS, OHIO.

IMPROVEMENT IN MACHINES FOR BENDING WOOD.

Specification forming part of Letters Patent No. 145,416, dated December 9, 1873; application filed May 27, 1873.

To all whom it may concern:

Be it known that I, HIRAM HANNA, of Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Machines for Bending Wood; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in machinery for bending and forming thills and poles for carriages and wagons.

In the drawings, Figure 1 is a plan view of my invention as operating and forming the body and point of a thill; Fig. 2, a side elevation of the same; Fig. 3, a side elevation of my device for shaping the heel of the thill as before operating; Fig. 4, the same as operating and secured by clamps; Fig. 5, a sectional view of the heel-former, showing my gutter or groove; Fig. 6, a view of the body-former with its attached strap and clutch-head.

The following is a description of my invention with its operation: After being properly steamed and prepared, the pattern A is placed upright, resting upon its heel in the heel-former B, as shown in Fig. 3. Here the strap C is firmly clamped to the thill A by means of the eccentric clamp D, as shown in Fig. 4. In this clamp the eccentric D', turning on the axis D'', is operated by the handle E, depressing or raising the plate E', which is hung upon the eccentric by the yokes E''. The thill is compressed between the plates E' E''. The strap C is provided with the foot-piece c, hinged upon it. This foot-piece rests in the beveled opening a of the heel-former B. The object of beveling this opening a of the heel-former is to allow the foot-piece c to accommodate itself more readily to its relative position therein when the heel of the thill A is being bent on the former B. F is a brace, which supports the heel-former while the thill is being bent over it.

The operation and construction of the machine are as follows: First, to form the heel of the thill, the heel-former B is first placed in position in the supports B' and against the brace F. The heel c of the strap C is placed

in the beveled opening a of the heel-former B. The properly steamed and prepared thill A is then placed in the position shown in Fig. 3. The self-adjusting strap C is securely clamped to it by the eccentric clamp D. The thill, with the strap C clamped to its upper side, is then gradually bent over the former B, and, when bent properly in position, the removable clamp G is placed in position (see Fig. 4) in the gear-bars g g'. The eccentric clamp is now removed, and the thill is thus securely clamped between the strap C and over the former B. The clamping-edges of this removable clamp G are placed right and left, to more securely engage in the teeth of the gear-bars g g'. The former B is grooved on its face, (see Fig. 5,) to lessen the friction and tendency of the thill, while being curved into position, to spread. Second, to form the body, the thill, with the heel-former B attached, is removed from the supports B' F, and placed in position on the table H, and the stationary eccentric clamp I' pressed down tight against the thill A, to hold it firmly in position. The hand-lever J is then placed against the body of the thill, and the thill by this means pressed in position against the body-former K, and held in this position by means of a small adjustable clamp, k. This forms the body. To form the point, to the body-former K is attached the point-former L, (see Fig. 6,) which is constructed of stout metal, something in the form of a curved trough, with a hinged latch, l', at its end. A strap, m, with a clutch-head, m', is also attached to the body-former, and forms a part of this point-former. While the thill is on the table, and after the body has been shaped, the point still remains straight in the point-former, in the position shown in dotted lines, Fig. 6. The rapid screw S (or an eccentric may be used instead) is then brought to bear against the end m' of the strap, and the point of the thill forced around against the point-former L, the hinged latch l', brought around into position over the end of the thill, engaging over the clutch-head m' of the strap m, thus holding the parts L and m of the point-former together, with the thill held in the desired position between them. I' is a levered eccentric, which engages against the end i of the body-former K. The object of this eccentric lever is, after the point of the thill has

been formed by pressing it against the end of the body-former, forcing the latter back, and by this means still further clamping the thill into proper position, and taking out any slack that may have been therein, and making a much better curved point to the thill. The rapid screw S is then returned, the clamp I and eccentric lever I' loosened, and the thill, with the point-former, body-former, and heel-former attached, removed from the table, which is easily done, as the parts are only placed on the table between suitable guides and stops, and are not stationary, and the thill placed away to thoroughly cool and dry.

Duplicate parts of the different formers and attachments are provided, so that the operation of forming the thills into shape can be gone through while one set of formers remain on the thill until it is dry, when they may be removed and used again. The faces of these formers may also be grooved, like the one shown in Fig. 5.

By the use of this self-adjusting strap C, which is used in bending the heel of the thills, having a foot-piece which fits into the beveled opening of the overhanging projection of the heel-former, so that the foot-piece is inclined to slip toward the former and hug the timber, which acts as a lever, taking the slack out of the strap, at the same time assisting the upsetting of the timber, and not allowing it to bend imperfectly, and by making the face of the heel and other formers concave, (see Fig. 5,) the timber to be bent has not more than one-half the usual friction; consequently the timber upsets a great deal easier, which saves labor, also breaking of straps and timber, and the thill sets sooner to the form by its being open between the former and timber, and the sooner it sets the better the shaft holds its shape.

I am aware that the faces of the opening of the overhanging projection of the heel-former and the corresponding portions of the foot-piece of the heel-strap have been made straight;

but when thus constructed they are liable to many objections, which objections are overcome by beveling these parts, as clearly set forth and described above.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The beveled opening *a*, formed in the hooked end of the heel-former B, substantially as and for the purpose described.

2. The heel-strap C, provided with the beveled hinged foot *c*, substantially as and for the purposes described.

3. The combination of the beveled opening *a*, formed in the hooked end of the heel-former B, with the heel-strap C, provided with the hinged bevel-foot *c*, substantially as and for the purposes described.

4. The notched bars *g g'* on the heel-strap C and former B, substantially as and for the purposes described.

5. The adjustable clamp G, in combination with the notch-bars *g g'* and heel-former B, arranged and operating substantially as and for the purposes set forth.

6. The combination of the heel-former B, hinged heel-strap C *c*, and eccentric clamp D E, &c., arranged and operating substantially as and for the purposes described.

7. The combination of the body-former K, provided with an attached point-strap, *m*, and clutch-head *m'*, point-former L, hinged latch *l'*, levered eccentric I', and rapid screw S, all arranged and operating substantially as and for the purposes set forth and described.

In testimony that I claim the foregoing I have hereunto set my hand this 14th day of May, 1873.

HIRAM HANNA.

Witnesses:

LEVERETT L. LEGGETT,
EDM. F. BROWN.