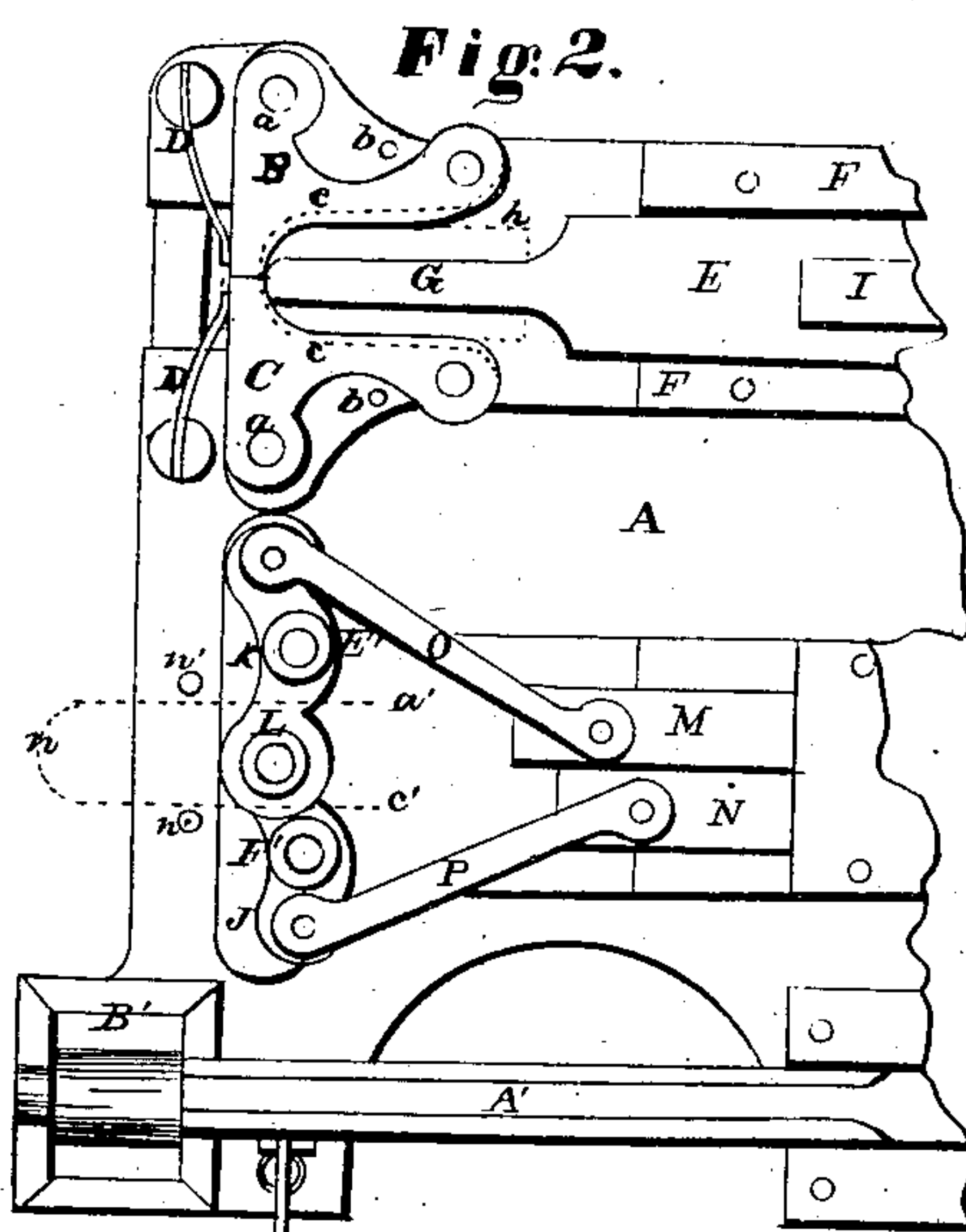
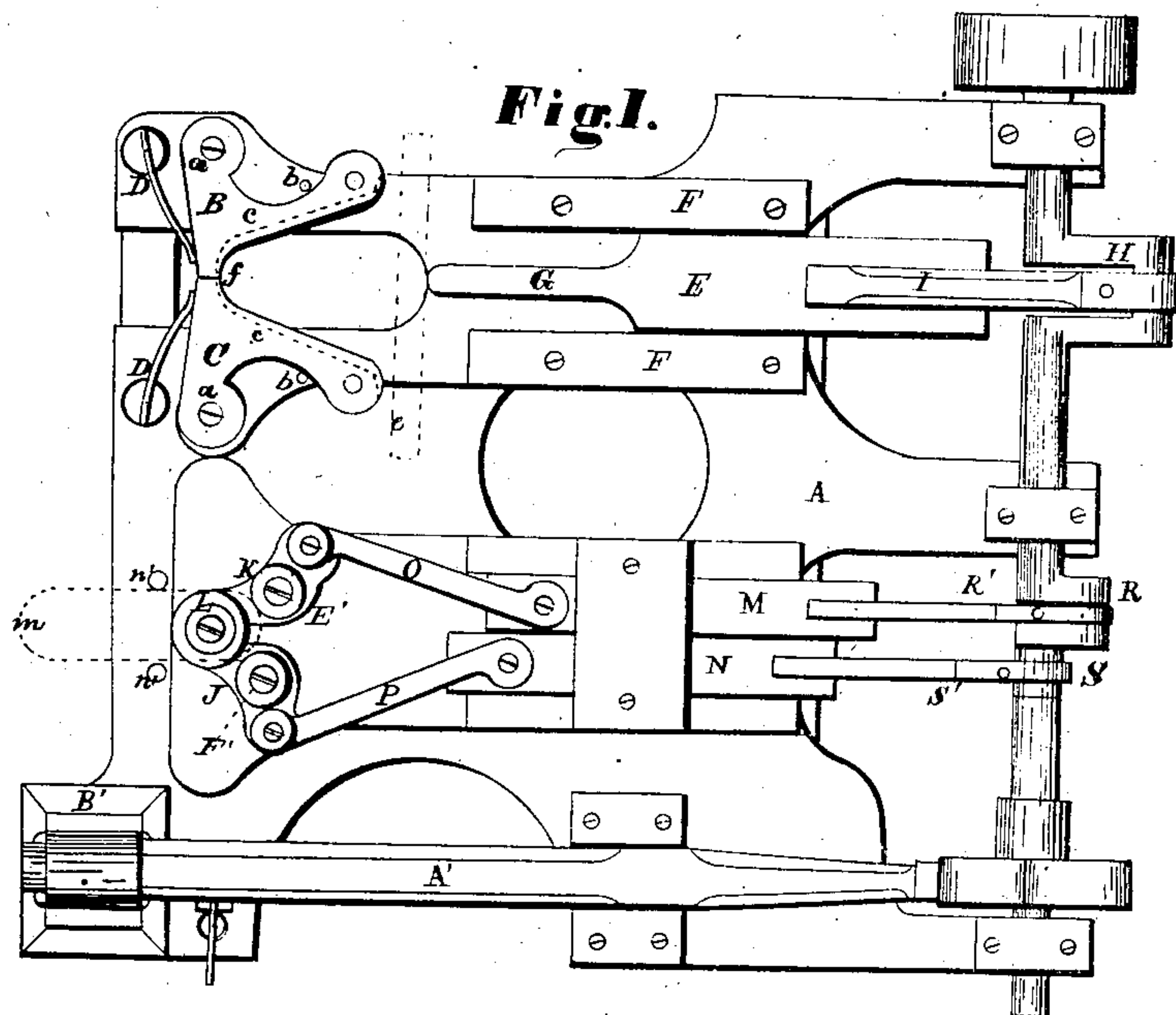


F. LEONARD.
Chain Machines.

No. 140,583.

Patented July 8, 1873.



Witnesses.

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C. Kendall

Inventor.

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Fig. 3.

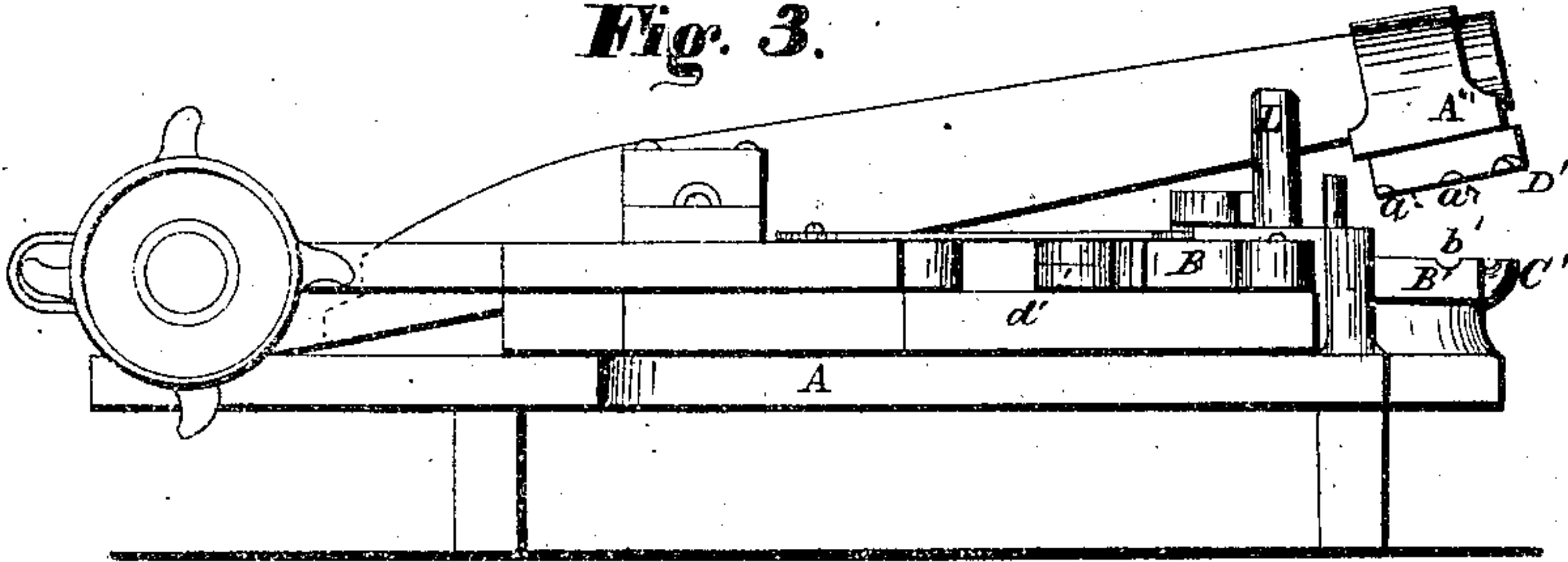


Fig. 4.

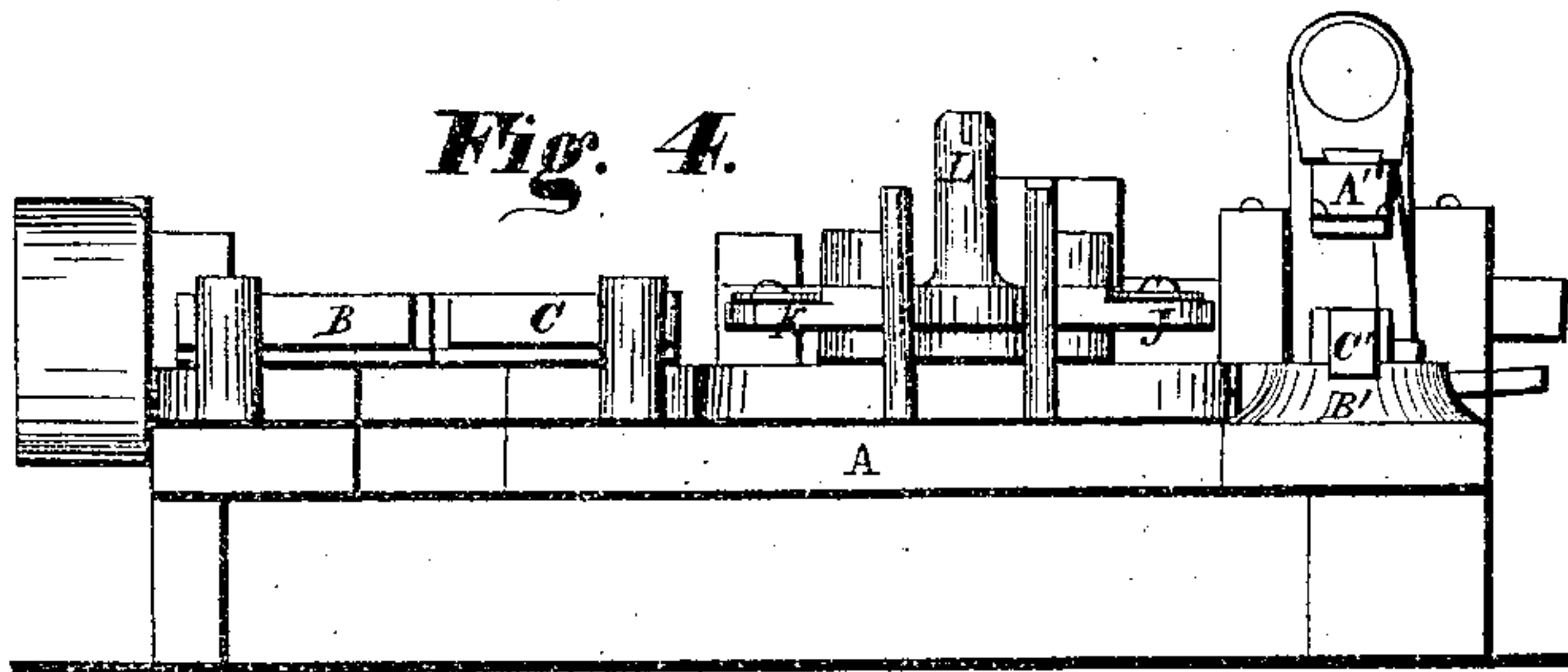


Fig. 5.

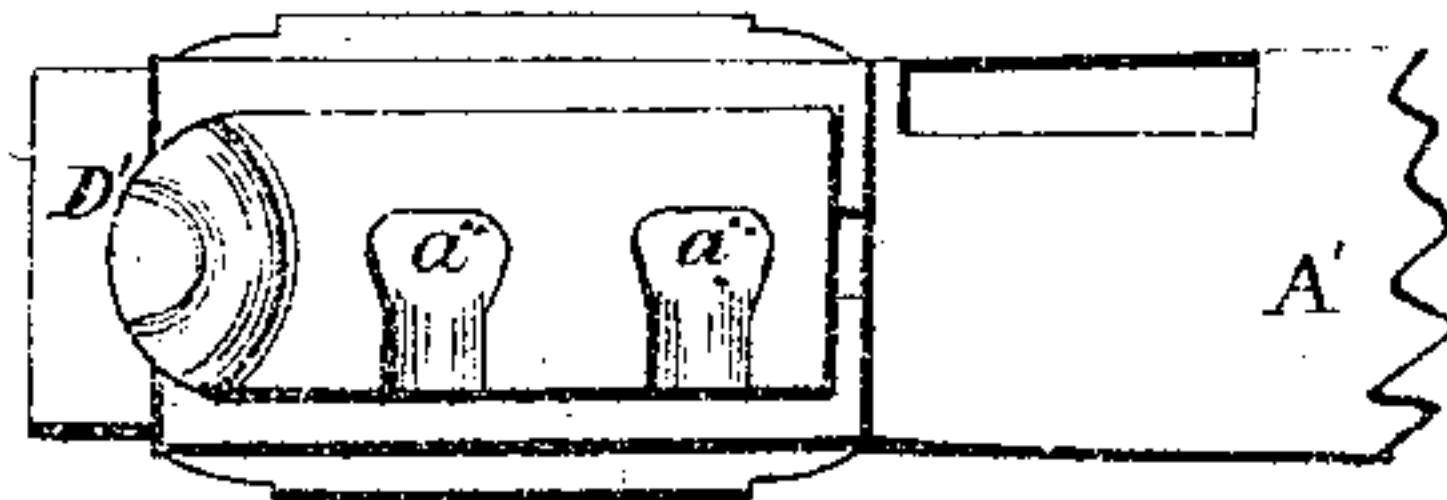


Fig. 6.

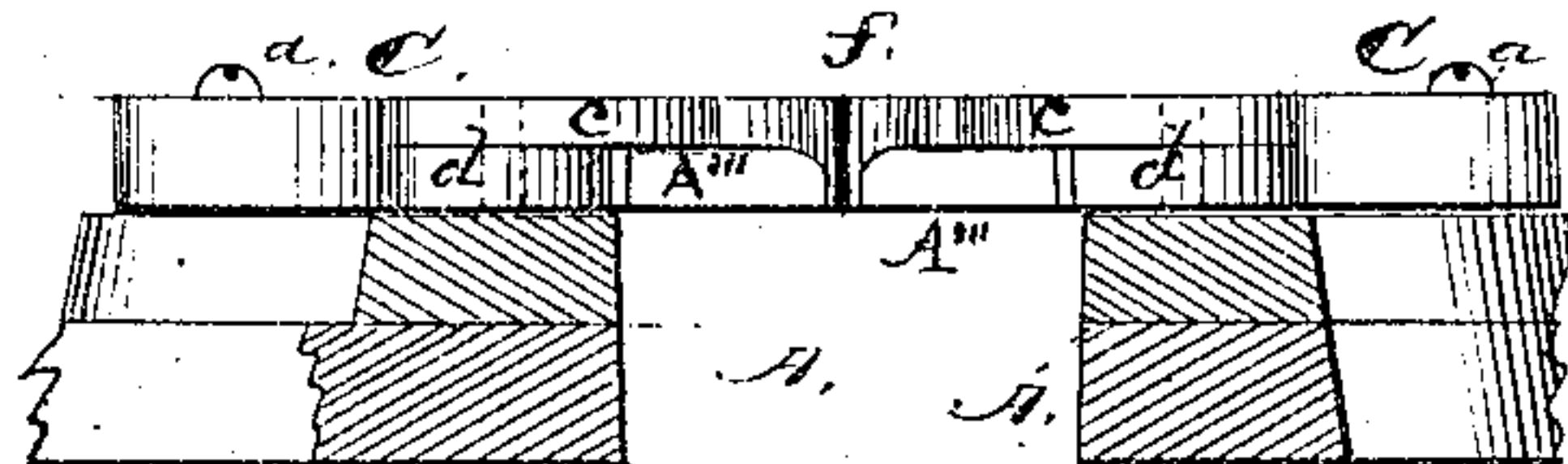


Fig. 7.

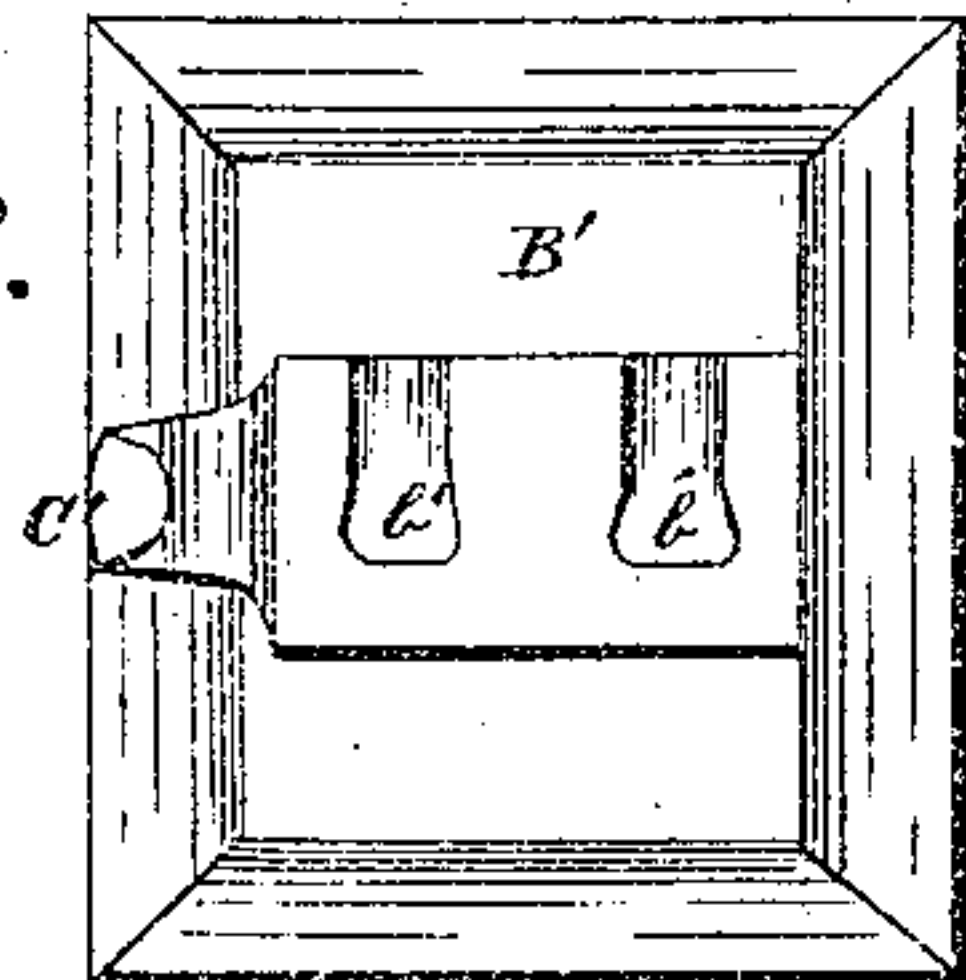
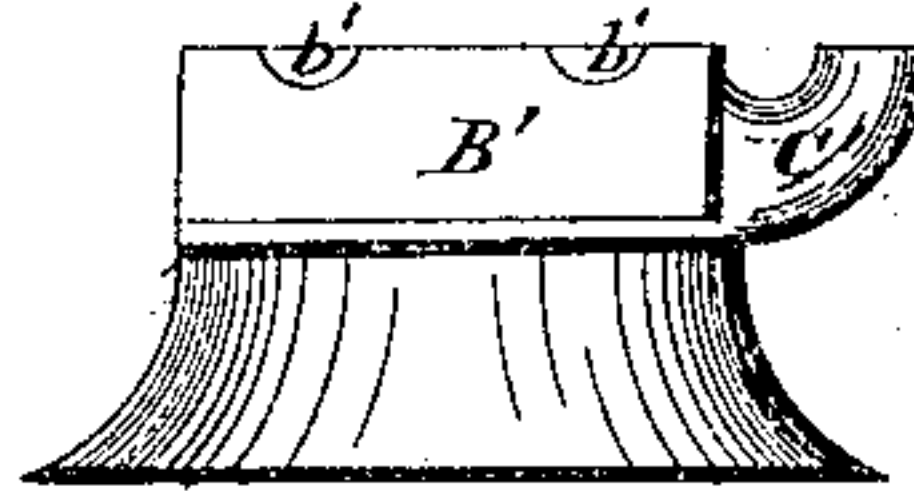


Fig. 8.



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UNITED STATES PATENT OFFICE.

FRANKLIN LEONARD, OF CLEVELAND, OHIO.

IMPROVEMENT IN CHAIN-MACHINES.

Specification forming part of Letters Patent No. 140,583, dated July 8, 1873; application filed April 25, 1873.

To all whom it may concern:

Be it known that I, FRANKLIN LEONARD, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Link-Machine, of which the following is a description:

Figure 1 is a plan view of the machine. Fig. 2 is a detached section of a plan view. Fig. 3 is a side elevation. Fig. 4 is a front elevation. Figs. 5, 6, 7, and 8 are detached sections.

Like letters of reference refer to like parts in the several views.

The first part of this invention relates to a machine for making links for chains; also, for railway-car couplings, &c.; and the object thereof is to facilitate the bending of the metal into shape for the links. The second part of the invention relates to a trip-hammer arranged in connection with the bending devices, and which co-operates therewith for scarfing and welding the ends of the link together by means of dies in the face of the hammer and block; all of which is constructed, arranged, and operated as follows:

In the drawings, A represents the bed-plate of the machine, on the front end of which is pivoted, at the points *a*, a pair of arms or compressors, B C', Figs. 1 and 2, the inner lower edges of which are shouldered or rabbeted out, as seen in Fig. 8, at A'', leaving a projecting flange, as indicated by the dotted lines *c*, Figs. 1 and 2. Under the inner end of each of the arms is a friction-roller, *d*, Fig. 3, the purpose of which will presently be shown. The relative position that the two arms hold in relation to each other, as shown in Fig. 1, is maintained by the springs D, the arms being restrained from further separation by pins *b*. Directly in front of the two arms referred to is arranged a slide, E, secured in place by guides or ways F. The front end of said slide terminates in a bill, G, which is of about the length and thickness of the inside of a link and around which the link is formed, as will hereinafter be shown. A reciprocating movement is imparted to the slide by the crank H, to which it is connected by a pitman, I, as shown in the drawing. J K, Fig. 1, are, also, a pair of arms, one end of each of which is pivoted to a post, L, Fig. 4. whereas each opposite end,

respectively, is attached to slides M N by links O P, said slides being connected to cranks R S by pitmen R' S', as shown in Fig. 1, whereby they are operated.

A'', Fig. 1, is a trip-hammer operated in the ordinary way. In the face of said hammer are prints or dies *a''*, Fig. 5, of a shape proper to form the scarf on the ends of a link, for lapping said ends for the purpose of being welded; also, in the face of the block B' are sunk dies or prints *b'* corresponding to the prints *a''* in the face of the hammer, as seen in Figs. 6 and 7. Projecting from the front side of the block is a curved rounded horn, C', Fig. 7, and from the end of the face of the hammer slightly projects a corresponding horn or form, D', Fig. 5, the purpose of which will presently be shown.

The practical operation of the above-described machine is as follows: A bar or rod of the proper length of which to make a link is laid across the front of the arms B C in the position indicated by the dotted lines *e*, Fig. 1. The bar when in this position is forced forward between the two arms B C by the bill G of the slide. The rollers *d*, under the free ends of the arms, allow the rod to bend and advance without dragging, as the rollers turn in consequence of the pressure upon them, and thereby avoid much frictional resistance upon the rod. When the center of the rod has reached the bottom of the arms at the point *f* the continued advancement of the bill causes the two arms to approach each other, thereby forcing the ends of the rod close against the sides of the bill, as shown in Fig. 2 by the dotted lines *h*. During this bending of the rod it is prevented from springing upward by the flange of the rabbet indicated by the dotted lines *c*, Fig. 2, projecting from the inner sides of the arms, and under which and in the rabbet A''' the rod was held down while being bent. On the reverse action of the bill the two arms spread open by the action of the springs D, which allows the partially-formed link to fall therefrom to the floor. The open ends of the link are now partially flattened or scarfing by placing them under the hammer in the scarf prints or dies *b'* referred to. The two open ends are now bent and lapped upon each other by the arms J K, Fig. 2, by inserting

said ends between the standard L and the rollers E' F' and inside of the studs *n'*, as indicated by the dotted lines *n*. The two arms as they are now drawn forward to the position shown in Fig. 1 force the two ends of the rod around the standard and cause one to lap over onto the other (as indicated by the dotted lines *m*) by means of the rollers, the tendency of which (on the movement of the arms) is around the standard.

It will be observed that the arm K moves in advance of the arm J, the result of which is to bend its end *a'* of the link around first, which is immediately followed by the arm J, which carries its end *c'* of the link around the standard and laps it upon the already bent end *a'*. In order that the end *c'* shall lap fully onto the end *a'* the arm J is carried a little further around the standard than is the arm K by virtue of a little difference in the length of the cranks, and which also rolls both ends of the link hard around the standard, thereby completing the lap for being welded. The two ends of the link are reheated and the welding effected by inserting the horn C' in the link or hanging the link thereon. The two ends are thereby brought directly under the hammer by which the welding is completed. The rounding shape of the horn preserves the shape of the link while being hammered, and the hollow character of the hammer at that part D' thereof retains the roundness of the iron of which the link is made while being welded.

I am aware that the combination of devices similar to the vibrating arms B C, springs D, and bill G are old, but what distinguishes my improvement therein is the rabbeting of the said arms so as to form a shoulder or flange, *c*, as before described, whereby the partially-formed link is prevented from springing or moving out of line while being bent, and allowing the bent rod or bar to be readily freed and discharged from the arms when open.

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

1. In link-machines, the vibrating arms B C having shoulders or rabbets A''', rollers *d*, as arranged in combination with the springs D and sliding bill G, operating conjointly substantially as and for the purpose set forth.

2. The horn C' and corresponding section D', constructed as described, in combination with the scarf dies or prints *b'* and *a''* of the block and hammer, co-operating substantially as and for the purpose described.

3. The arms J K and rollers E' F', as arranged in combination with the post or standard L, studs *n'*, constructed and operated in the manner substantially as described, and for the purpose set forth.

FRANKLIN LEONARD.

Witnesses:

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