

(No Model.)

3 Sheets—Sheet 1.

P. F. TAPPENDORFF.
SAW SHARPENING TOOL.

No. 547,971.

Patented Oct. 15, 1895.

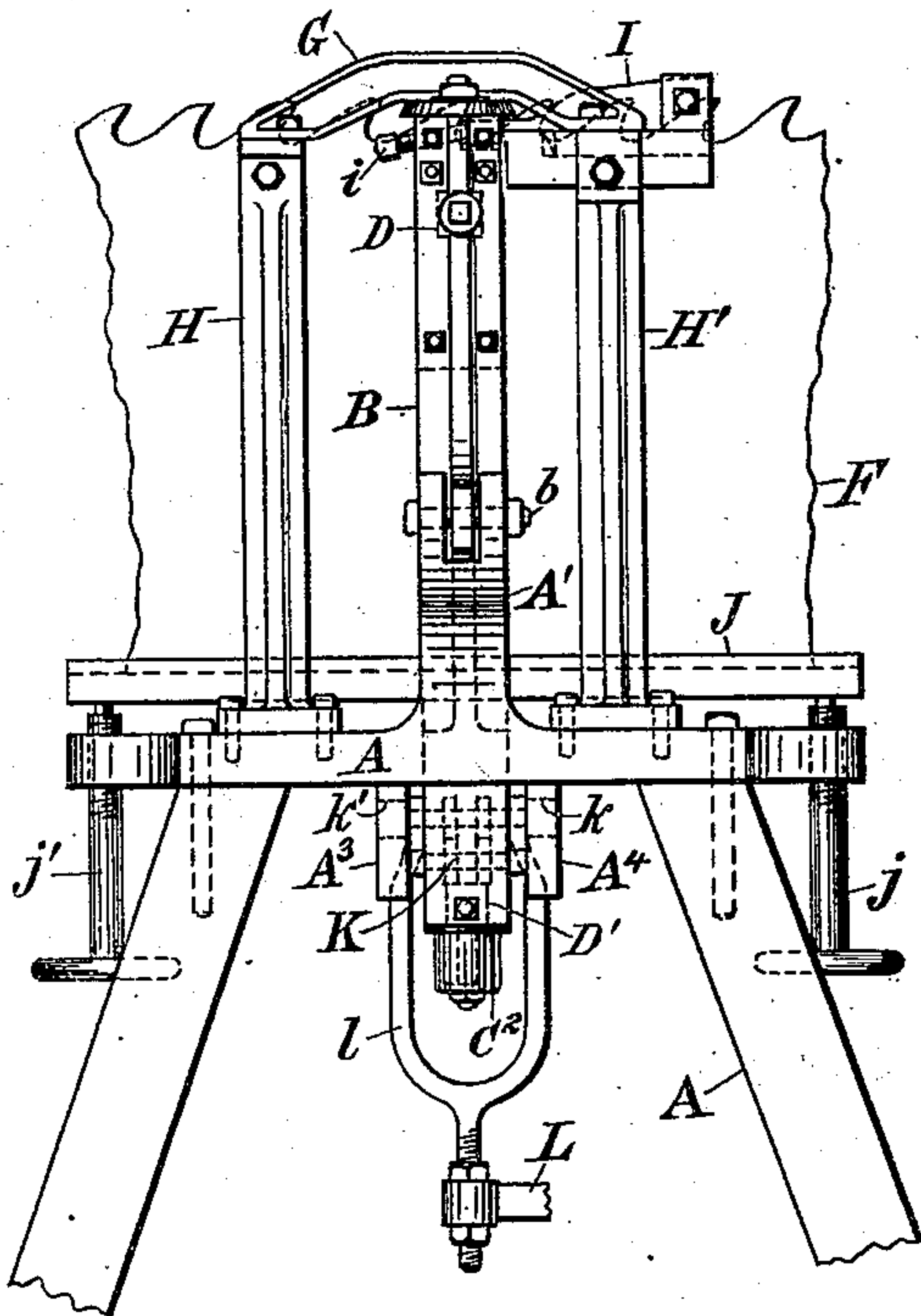


Fig. 1.

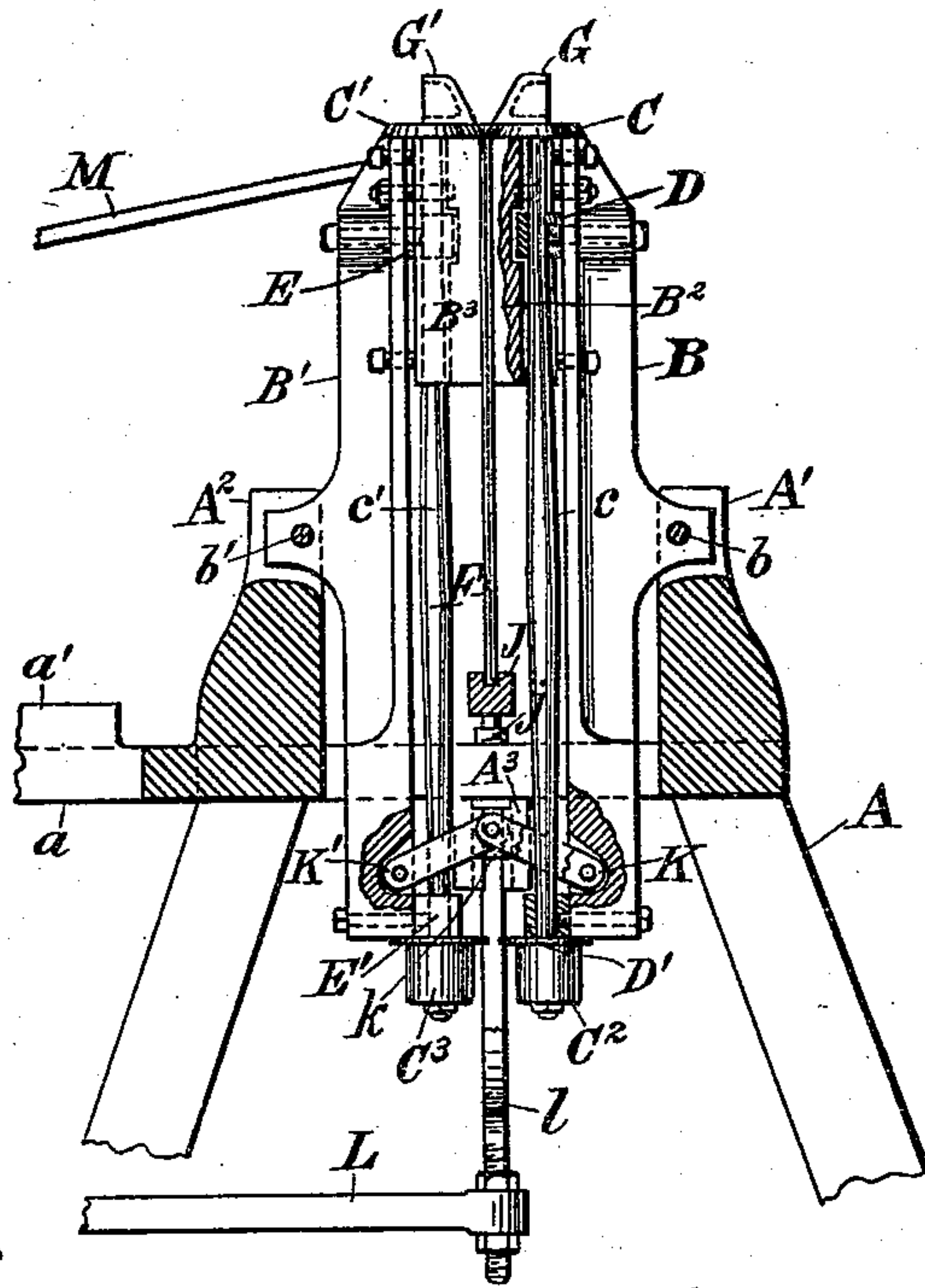


Fig. 2.

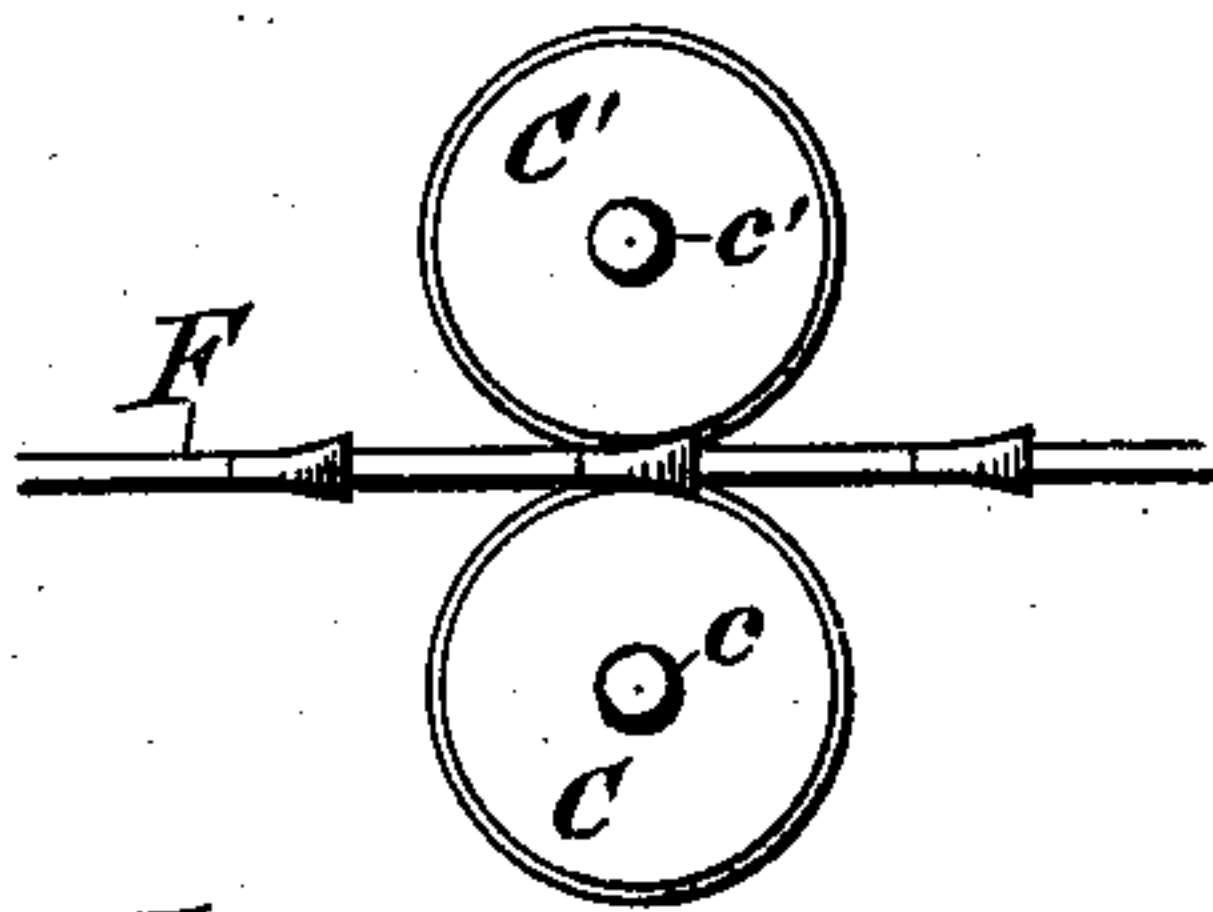


Fig. 4.

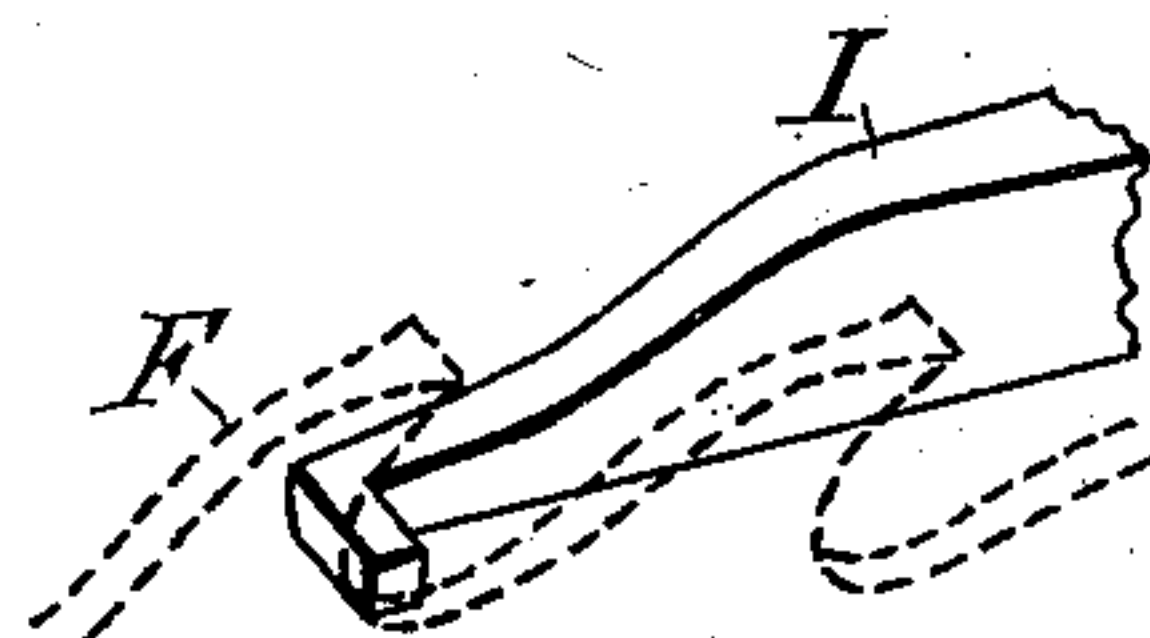
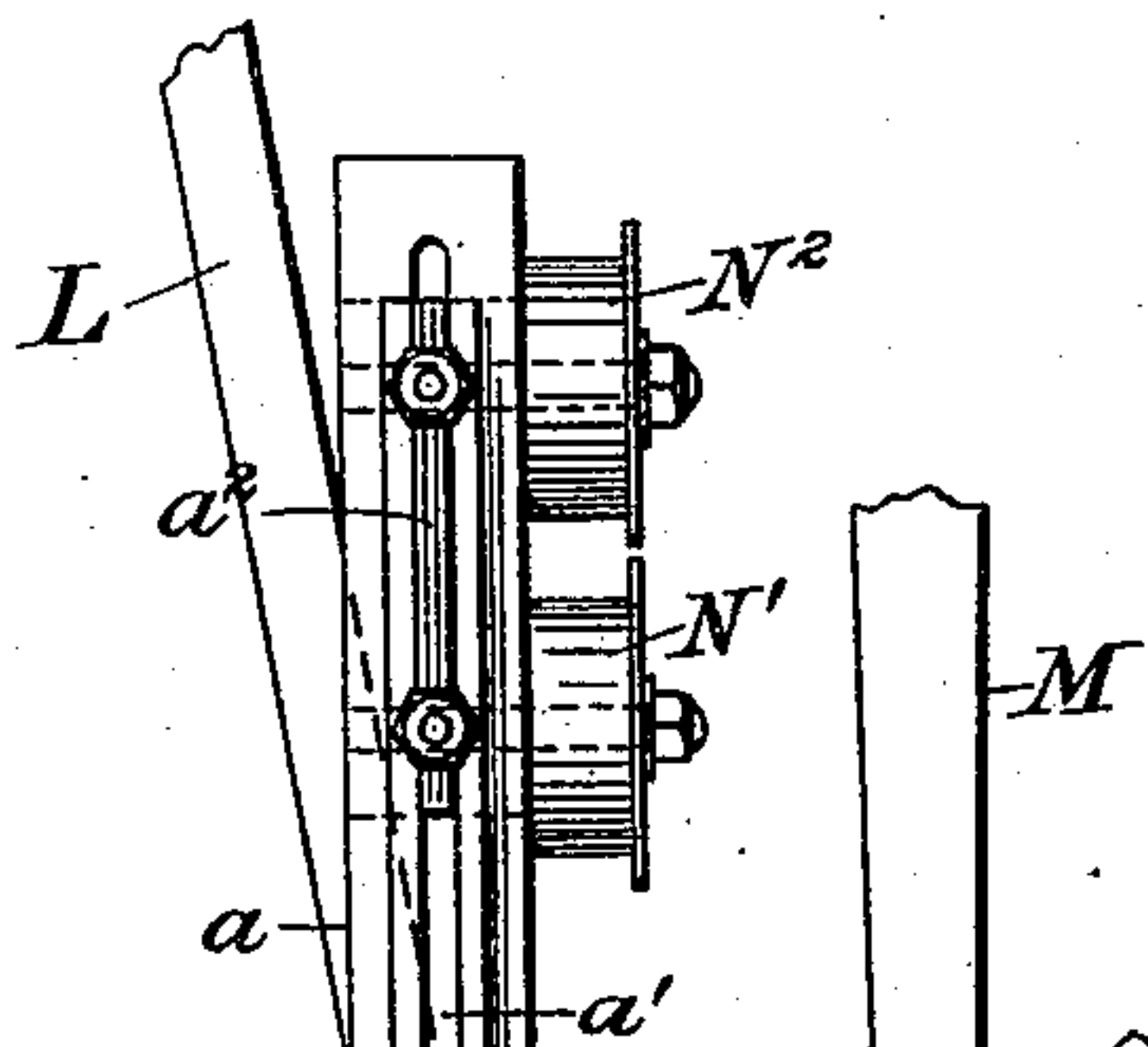


Fig. 5.

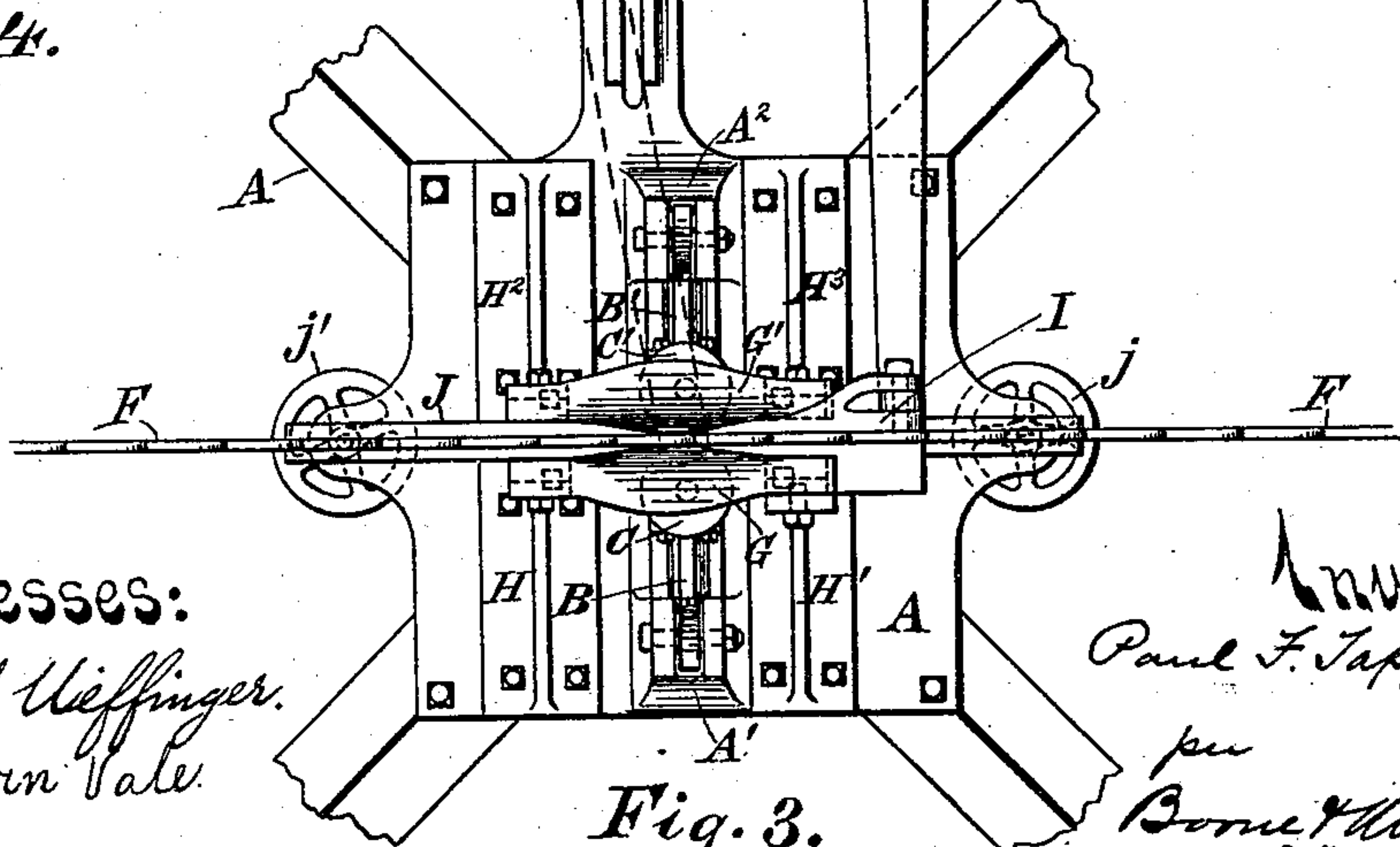


Fig. 3.

Witnesses:
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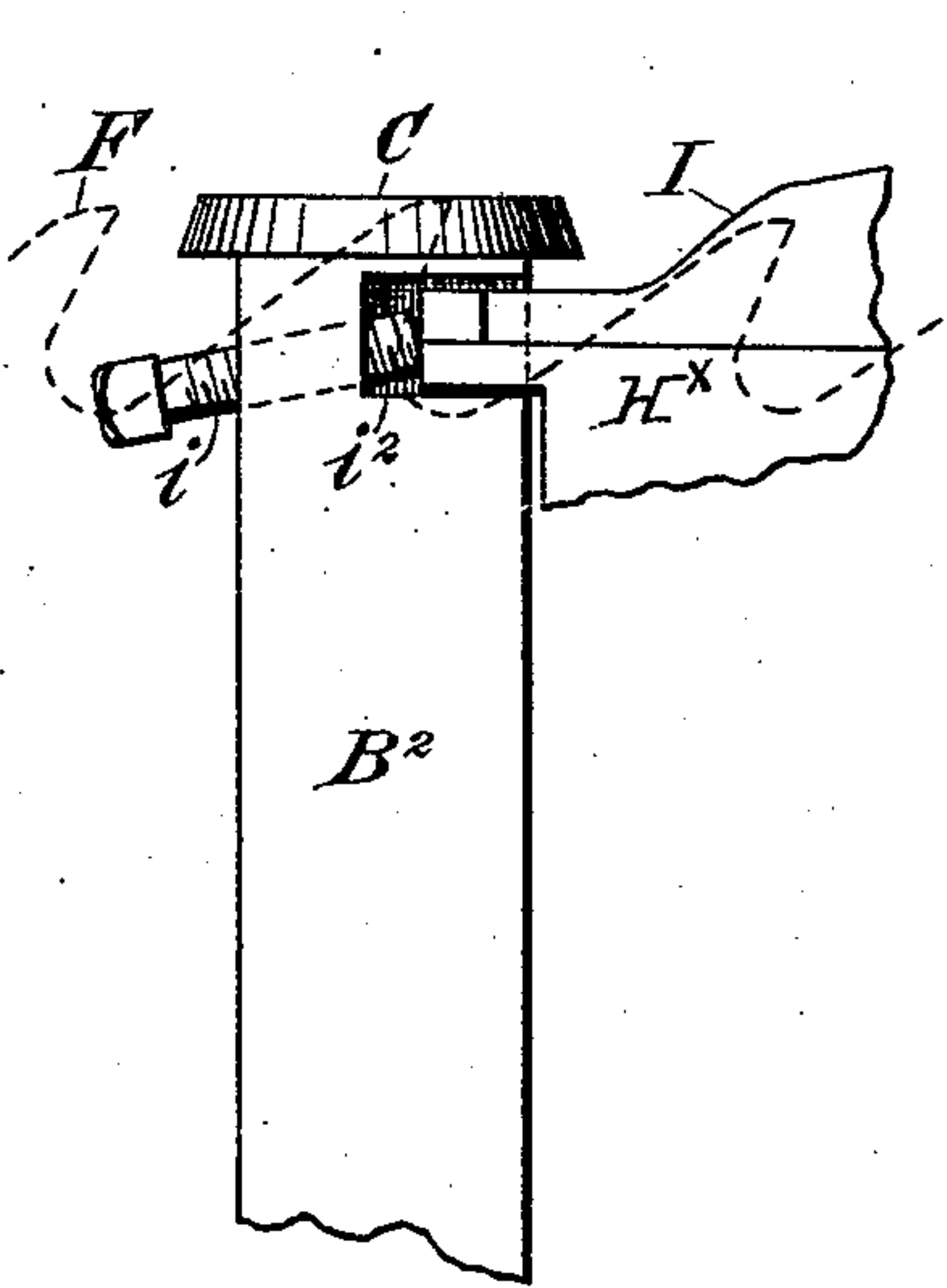


Fig. 7.

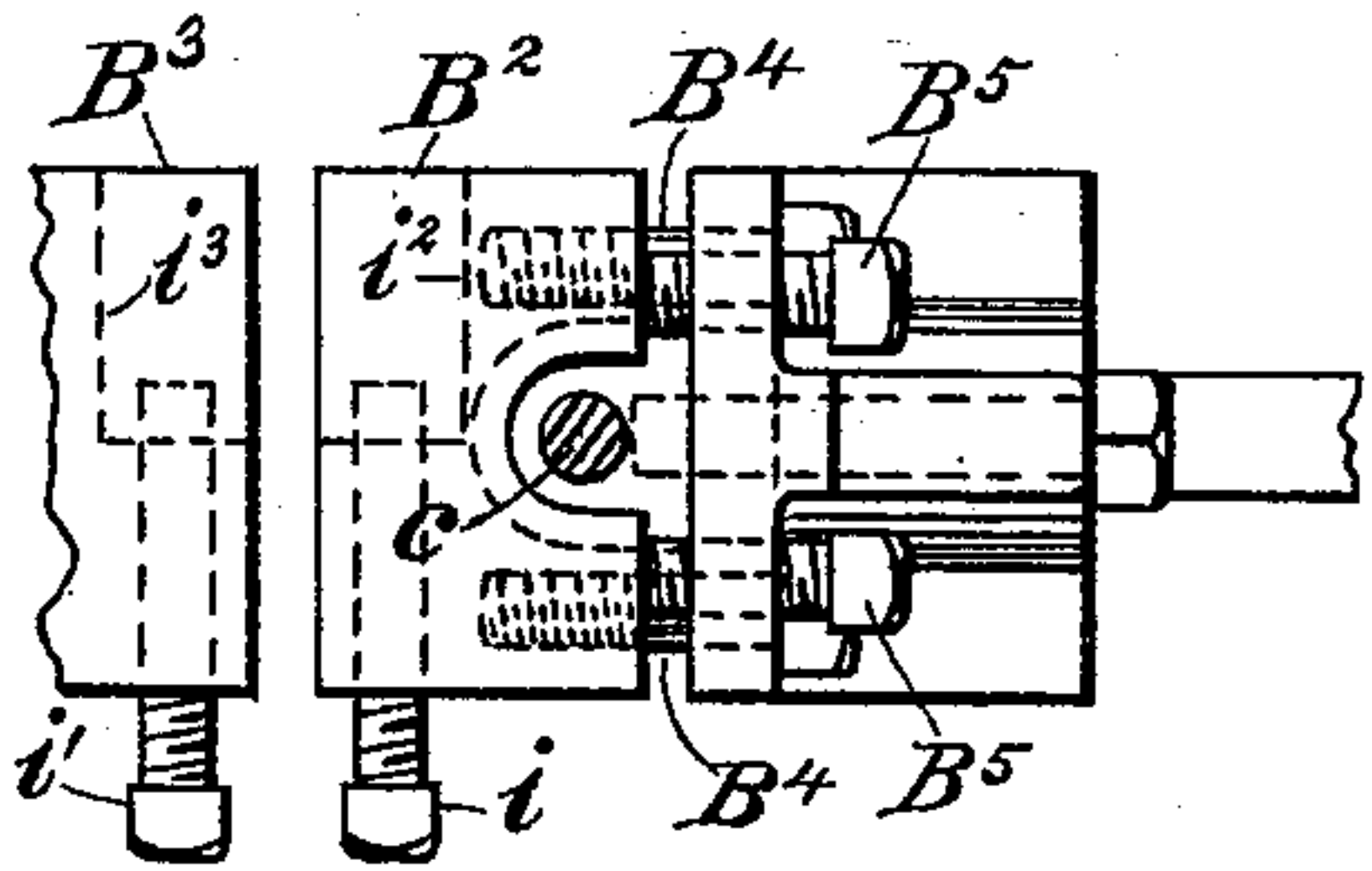
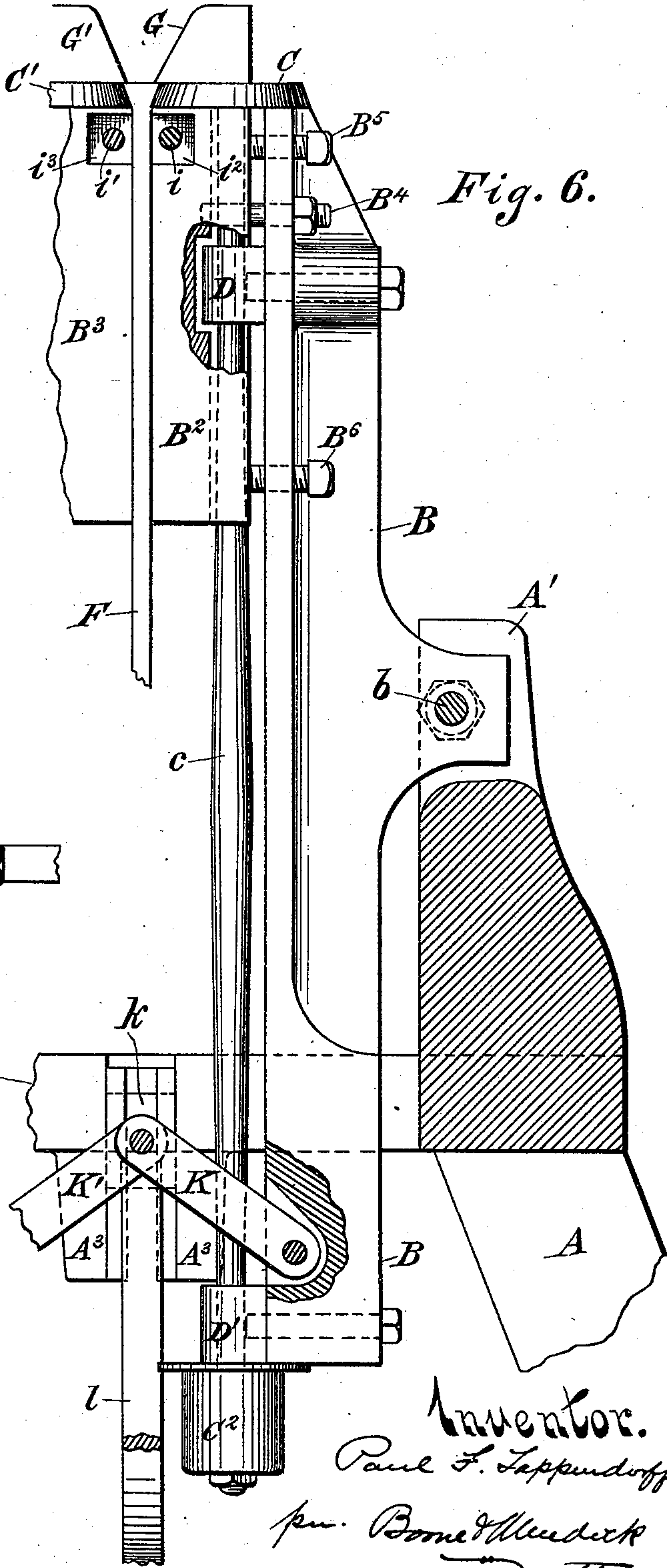


Fig. 8.



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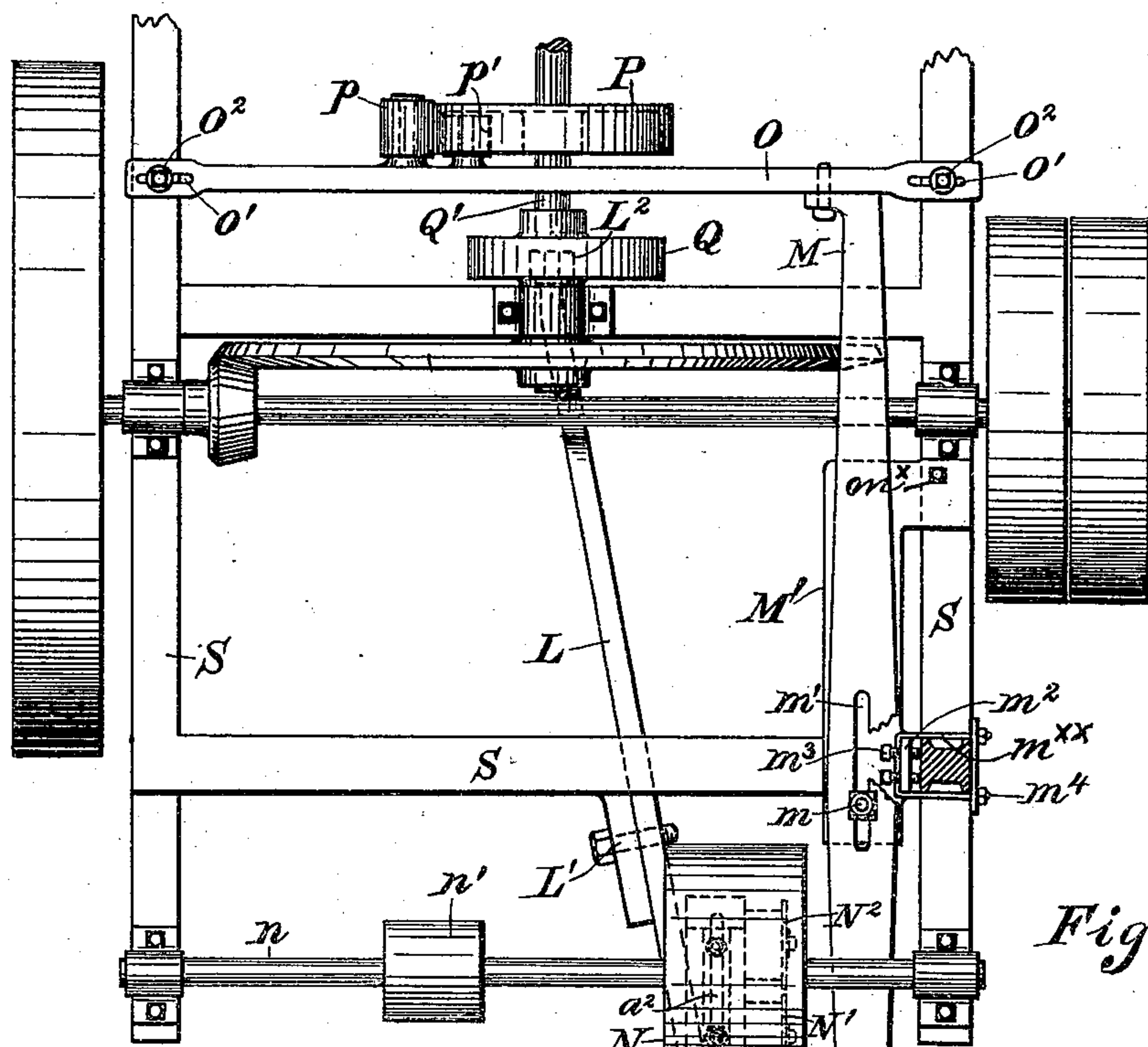


Fig. 9.

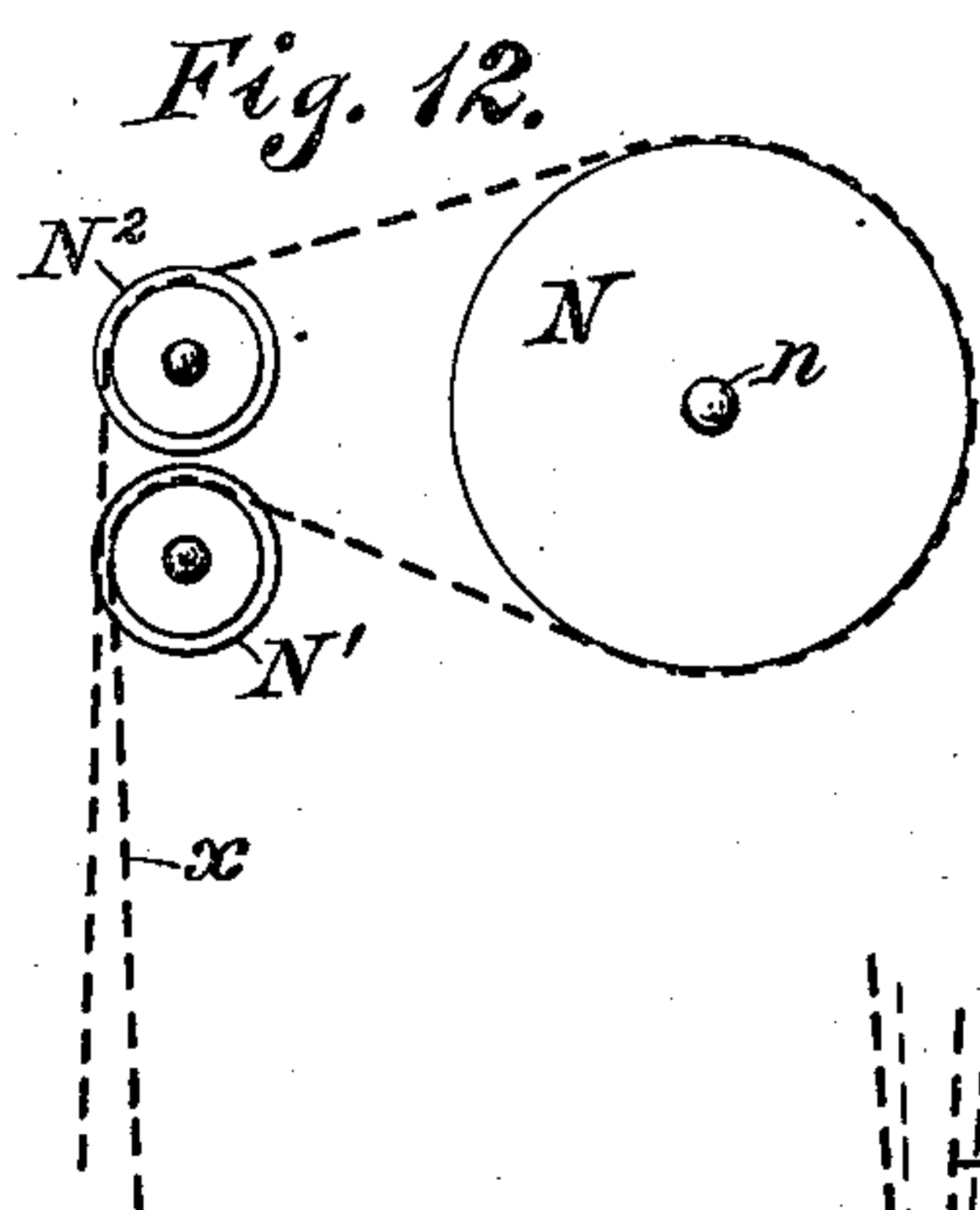


Fig. 12.

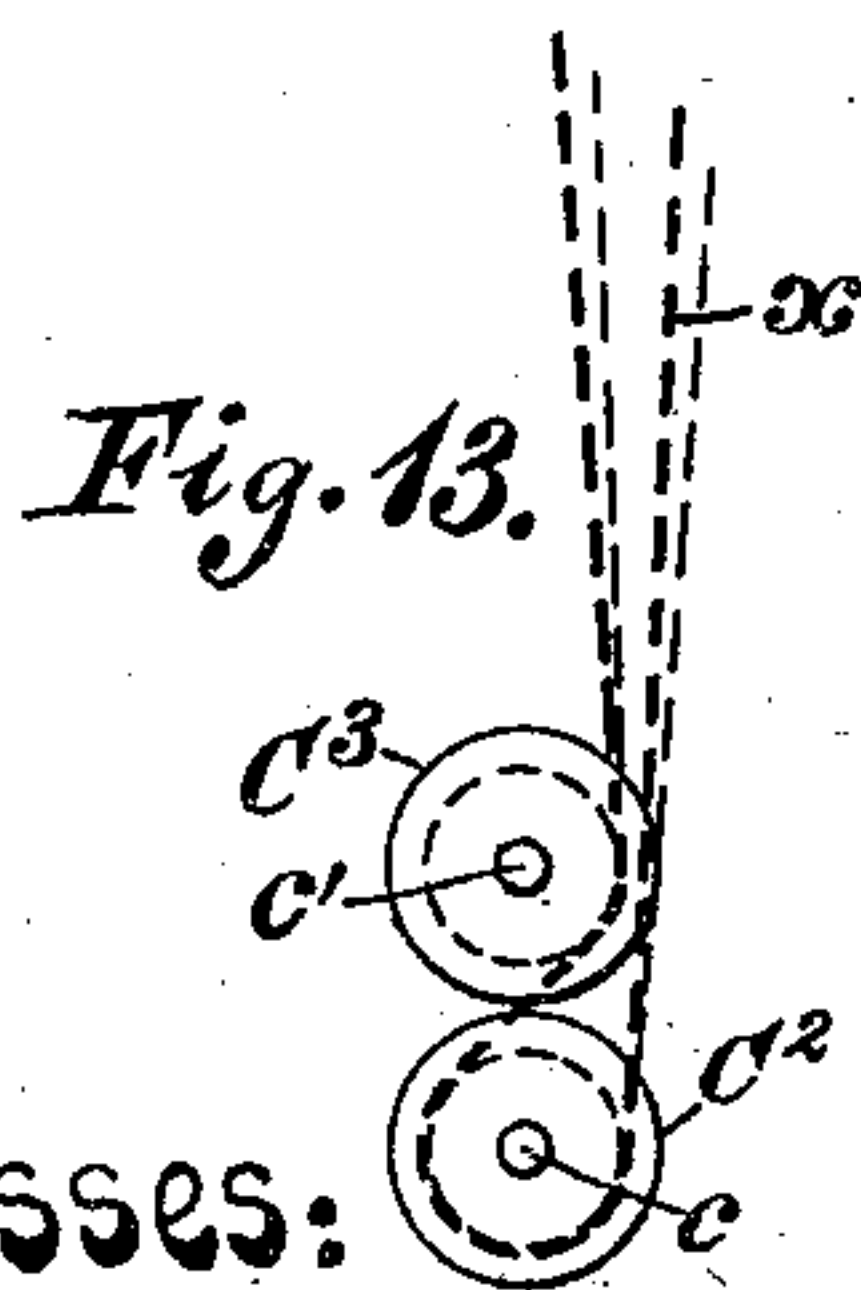
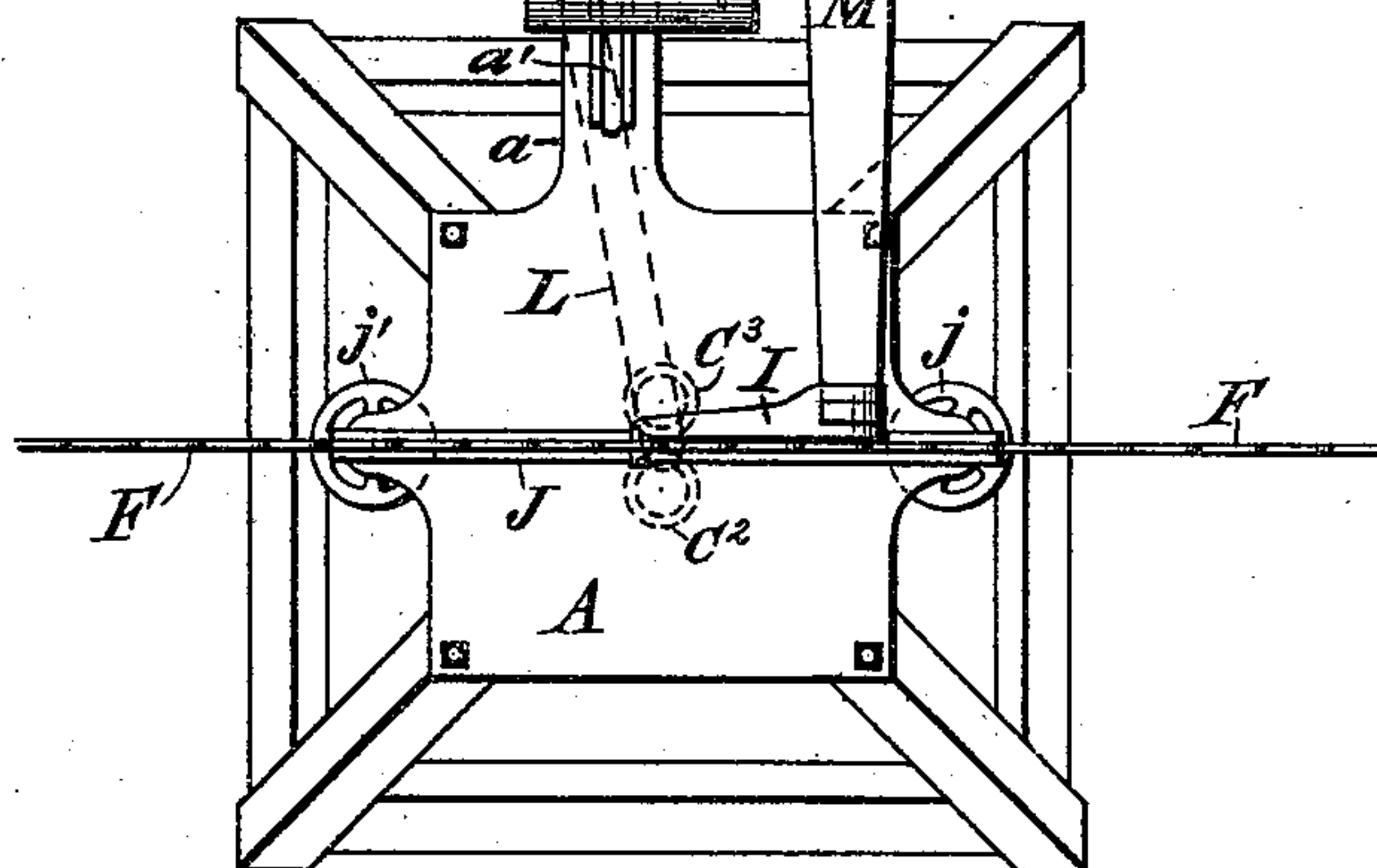


Fig. 13.

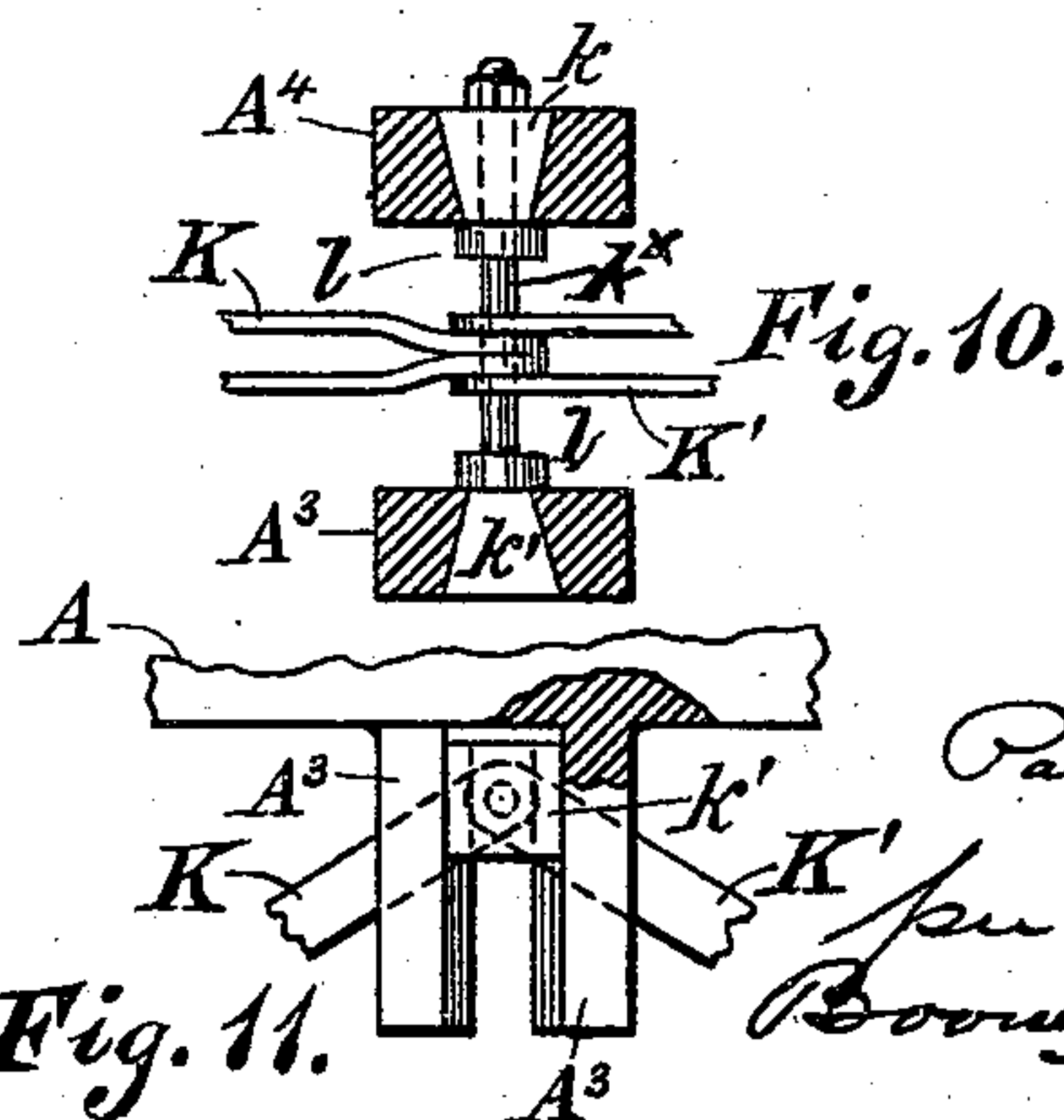



Fig. 10.

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UNITED STATES PATENT OFFICE.

PAUL F. TAPPENDORFF, OF SCOTIA, CALIFORNIA.

SAW-SHARPENING TOOL.

SPECIFICATION forming part of Letters Patent No. 547,971, dated October 15, 1895.

Application filed June 8, 1895. Serial No. 552,130. (No model.)

To all whom it may concern:

Be it known that I, PAUL F. TAPPENDORFF, a citizen of the United States, residing at Scotia, in the county of Humboldt and State of California, have invented certain new and useful Improvements in Saw-Sharpener Tools; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

This invention relates to improvements in saw-sharpening tools, and more particularly to side-dressers; and it consists in the novel construction and arrangement of the parts whereby each tooth is successively treated to receive on either side an under cut and back cut to prevent it becoming wood-bound, whereby the saw is automatically advanced one tooth at a time intermittingly and whereby the depth of the cut of the grinder may be regulated.

In the drawings, Figure 1 is a front elevation of this invention, showing a section of the saw in grinders. Fig. 2 is a side elevation of the same, the supporting-brackets and table being partly cut away to show the construction of the swinging arms and the operative parts thereof. Fig. 3 is a plan view of the invention as shown at Fig. 1. Fig. 4 is a detail showing in plan the two grinders as operating against the sides of the saw-teeth. Fig. 5 is a detail of the feeding-finger, showing in dotted lines cutting-edge of the teeth of a saw. Fig. 6 is an enlarged detail of one of the swinging frames, showing a part of the saw being operated upon. Fig. 7 is an enlarged detail of one of the grinders, showing its relative position to the clamps and feed-regulating devices. Fig. 8 is an enlarged detail in plan, showing the mounting of the clamps and arbor for the grinders. Fig. 9 is a plan view of the table of this invention, showing its connection with the driving mechanism of a grinder or gummer. Fig. 10 is a detail in plan of the toggle and its mountings, by which the swinging frames are operated. Fig. 11 is a side elevation of the same. Fig. 12 is a diagram showing the means of transmitting the driving-power to the rotary grinders. Fig. 13 is a detail in plan of the driving-pulleys on the lower ends of the grinder-arbors, showing the manner of mounting the belt thereon.

Heretofore the grinding of the teeth of saws, particularly of band-saws, has been accomplished by means of a hand-tool in which a file was held in a guide which run on the side of the saw-blade and was thrown forward and backward by the operator, grinding the sides of the teeth. While this method of grinding gave to the teeth the desired undercut shape from the top of the tooth to the blade of the saw, it had the defect that the sides of the teeth were straight in the line of the cut, which immediately caused them to be wood-bound in the event of the squared cutting-edge becoming worn and blunted. To overcome this defect and at the same time to expedite the operation of sharpening the sides of the teeth is the principal object of this invention.

This side-dresser I work in conjunction with the usual grinder or gummer, taking my motive power therefrom. In sharpening a band-saw this side-dresser is placed on the rear of the grinder-table, as the most convenient location and one which permits the attachment of the driving mechanism most conveniently. The table A is mounted on legs, and is provided with the guide-posts H H' to receive the saw. Extending between the guide-posts on either side of the saw are the flared guides G G', which receive and guide the saw between the said posts and prevent any injury to the small grinders, as herein-after set forth. Directly beneath the opening between the guides G G' is the bed-guide J, which is provided to receive the lower edge of the saw. This bed-guide is mounted on the top of the set-screws j j', by means of which it is raised and lowered to suit the varying widths of different saws. On either side of the runway thus formed for the saw are the swinging frames B B'. These frames are provided with a web on the back, an extension of which is inserted in the slots provided to receive them in the brackets A' A², where they are pivotally mounted at b b'. The lower ends of the said frames extend through a slot in the table A, which acts as a guide for maintaining the alignment. The abutting faces of the swinging frames are slotted to receive the outer and lower ends of the toggle-levers K K', where they are pivotally secured to the ends of the swinging frames. Through the junction of the toggle-levers passes a bolt k^x, having the square bev-

eled head k' , which operates in the outwardly-beveled slot in the bracket $A^3 A^3$, as shown at Figs. 10 and 11 of drawings. At the opposite end the bolt is provided with a nut after passing through the bushing k , which is similar in shape to the head k' . By means of this construction any wear may be taken up by tightening the nut on the head of the bolt, and thus secure perfect adjustment. To this bolt are engaged the ends of the yoke l , substantially as shown. The lower end of this yoke is threaded to receive two nuts, the one above and the other below the end of the lever L , by means of which the rising and falling motion hereinafter described is imparted to the center of the toggle-levers, which convert the motion sidewise to spread and contract the swinging frames $B B'$. The lever L extends backward under the gummer-table to the cam Q in a groove in the face of which the end of the said lever rests, being provided with the friction-roller L^2 . This lever is fulcrumed on the frame S of the gummer, a bracket L' being provided therefor. When, now, the end L^2 of the lever resting in the slot in the cam Q is raised, the end of the lever connected directly with the toggle-levers $K K'$ is depressed, spreading the lower ends of the swinging frames $B B'$ and bringing the upper ends together because of the fulcrumed construction at $b b'$ in the brackets $A' A^2$. This action of the swinging frames is simultaneous with the fall of the grinder of the gummer, and as the action is reversed the upper ends of the swinging frames are spread apart as the grinder of the gummer is raised, in which position the saw being treated is shifted to the succeeding tooth, as will be hereinafter described.

Carried on the faces of the two swinging frames B and B' are the arbors c and c' , which are mounted in the journal-boxes $D D'$ and $E E'$. At the upper ends of these arbors are mounted the small grinders $C C'$, while at the lower ends are mounted the pulleys $C^2 C^3$. The peripheries of the grinders $C C'$ are beveled to the lines of the undercut of the teeth of the saw, as shown at Fig. 6 of drawings. The pulleys $C^2 C^3$ are driven by a belt, which is run on them, as shown at Fig. 13 of the drawings. This belt is trained to the pulleys $C^2 C^3$ from the pulley N on the frame of the grinder under the idlers $N' N^2$, carried on the extension a of the table A . In passing from the idlers to the pulleys $C^2 C^3$ the belt forms a quarter-turn. The idlers $N' N^2$ are mounted in a frame a^2 (shown at Fig. 3 of the drawings) and are secured to the extension a by means of bolts passing upward through the slot a' and there fastened by nuts which clamp downward on the said extension. By means of this construction any slack in the belt may be taken up by the adjustment of the idlers. It will be observed that by the training of the belt X on the pulleys $C^2 C^3$, as shown, a considerable spread is permitted in the said pulleys, as by the falling away of the

pulley C^3 the belt becomes slack and permits the pulley C^2 to move in the opposite direction, permitting of driving these pulleys and rotating the grinders $C C'$ constantly, whether contracted or spread apart.

Mounted on the face of the swinging frames $B B'$, directly below the grinders, are the regulating-clamps $B^2 B^3$, which in this instance are used to regulate the forward throw of the grinders. The faces of the clamps abutting the frames are provided with channels for the passage of the arbors carrying the grinders. The clamps are secured to the swinging frames by the bolts B^4 , as shown in Fig. 6. The forward adjustment of the clamps is regulated by the screws $B^5 B^6$, which, when the screws B^4 are eased up, may throw the clamps forward, so as to regulate the depth of the cut of the grinders. By means of these clamps a uniform cut of the grinders is insured.

Thus far the grinding mechanism has been described, which it is obvious may be used without any automatic feed for the saw-teeth, which operation can be performed by hand, if desired. Further, while I have described the motive power as emanating from the driving mechanism of a gummer, it will be observed that any independent mechanism might be used. That which I prefer is the automatic feeding mechanism shown in the drawings, by means of which the teeth are advanced in succession and regulated in their position while being treated by the side-dressers. This feeding mechanism consists in the lever M , the slide-bar O , the cam P , and the finger I . The lever M is mounted on the angle-plate M' , where it is fulcrumed on the bolt m , which extends through slots in both the said lever and angle-plate, as shown at Fig. 9. This angle-plate is pivoted, as at m^x , to the frame S of the gummer, and has near its free end an upward extension m^2 , compassed by a stirrup m^{xx} , also embracing a vertical piece of said frame, and through the extension m^2 , above the stirrup m^{xx} , pass set or adjusting screws m^3 , bearing against said vertical piece, and upon the outer ends of said stirrup fits a yoke-plate m^5 , held against said vertical piece by nuts m^4 , fitted upon said stirrup and against said plate or yoke. By means of these set-screws and the nuts on the ends of the stirrup the angle-plate may be thrown backward and forward for adjustment of the throw of the lever M , as will be seen on the drawings. At its rear end the lever M is attached to the slide-bar O , which operates on the guide-bolts $O^2 O^2$ when thrown backward and forward by the cam P . This is accomplished by the connection with a flange on the face of the cam which the two friction-rollers $p p'$ enfold. On the forward end of the said lever is carried the finger I . (Shown at Figs. 1, 3, 5, 7, and 9.) This finger is loosely and pivotally mounted on the said lever, its forward end being adapted to rest over the teeth and ride the same, sinking into the gullets. The finger rides on guide-plate H^x , provided for it

and secured to the guide-posts H'. The guide-plate extends forward between the clamps B² B³ into recesses i² i³, formed in them, as shown at Fig. 7, in which the finger comes at rest against the ends of the set-screws i i'. By means of these set-screws the advance of the finger may be regulated to the exact position to which it is desired to bring the teeth between the small guides directly above. The operation of this feeding device is simultaneous with that of the gummer, the cam P and sliding bar O being parts of the gummer. In its operation the forward end of the lever is thrown backward and forward, the end of the finger traveling backward over the inclined surface of the back of the next succeeding tooth and sinking into the gullet in front of it, where it rests against the face of the tooth to advance it between the small grinders until it strikes against the set-screws i i' in the clamps B² B³.

In their operation the grinding mechanism and the feeding mechanism alternate by reason of the cam Q and cam P being adjusted to operate upon the lever L and lever M alternately. Thus the small grinders are brought together upon the opposite sides of the teeth, while the finger I is carried back to catch the succeeding tooth, and as the finger is advanced the small grinders are spread apart, automatically repeating the operations until every tooth is sharpened.

The small grinders are beveled upward on their peripheries, as shown at Figs. 4, 6, and 7. This gives to the teeth of the saw the desired under-cut, as shown in Fig. 6, where the grinders are shown as operating against a tooth of the saw F. To produce the back or hollow cut, the flared cutting-edge of the saw is fed by the feeding mechanism to a position in advance of the center line drawn between the centers of the grinders. When in this position, the grinders are brought together and they will cut away the side of the tooth to the forward cutting-edge and give to the side the desired back or hollow cut. The clamps B² B³ regulate this cut by being advanced to strike the sides of the saw as the grinders touch the forward edge of the tooth. In this way is produced a tooth which will not become wood-bound, as above described.

To protect the small grinders and to guide the saw I have provided the upward flared guides G G', which are secured stationary to the top of the posts H H' H² H³.

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

1. In a saw dressing machine, the combination of the grinders, the pivoted supports therefor and means for driving or rotating said grinders, and mechanism for alternately spreading apart the upper and lower ends of said supports automatically, substantially as set forth.

2. In a saw dressing machine, the combination of the bevel-faced, rotary grinders, the

pivoted supports therefor, the toggle-lever connection between the lower ends of said supports, the yoke connected to the said toggle-lever connection and a cam, and lever actuated by said cam and connected to said yoke to alternately spread the upper and lower ends of said supports, substantially as set forth.

3. In a saw-dressing machine, the combination of the bevel-faced grinders and means for rotating the same, the pivoted supports for said grinders and means for actuating said supports or levers, and the regulating clamps for the grinders adjustably held upon said supports, substantially as set forth.

4. In a saw-dressing machine, the combination of the rotary bevel-faced grinders, their supporting pivoted frames or levers, means for automatically spreading the upper and lower ends of said levers apart, alternately, and the simultaneously actuated feeding lever having a pivoted finger to engage the teeth of the saw being dressed, substantially as specified.

5. In a saw-dressing machine, the combination of the rotary bevel-faced grinders, their pivoted supporting levers or frames provided with journal-boxes for the arbors or shafts of said grinders, means for automatically spreading apart the upper and lower ends of said supporting levers or frames, and the flared guides arranged above the said grinders and the bed-guide or run-way for the saw, substantially as set forth.

6. In a saw-dressing machine, the combination of the rotary bevel-faced grinders, their pivoted supporting frames or levers, means for automatically spreading the upper and lower ends of said levers or frames alternately, the feeding lever automatically and simultaneously actuated with the actuation of said supporting levers or frames, and carrying a pivoted finger to engage the saw teeth being dressed, and the adjustable clamps having recesses provided with stop or set screws to limit the movement of said finger, substantially as specified.

7. In a saw-dressing machine, the combination of the bevel-faced grinders adapted to be rotated, their pivoted, supporting levers or frames, means for automatically spreading apart the upper and lower ends of said levers or frames alternately, the feeding lever automatically and simultaneously actuated with the actuation of the said levers or frames and having a pivoted finger to engage the saw-teeth being dressed, and the supporting bracket or plate for said feeding lever, pivoted in position and adjustable, substantially as set forth.

In testimony whereof I have hereunto signed my name in the presence of two witnesses.

PAUL F. TAPPENDORFF.

Witnesses:

CHAS. J. ARMBRUSTER,
E. F. MURDOCK.