

No. 619,869.

Patented Feb. 21, 1899.

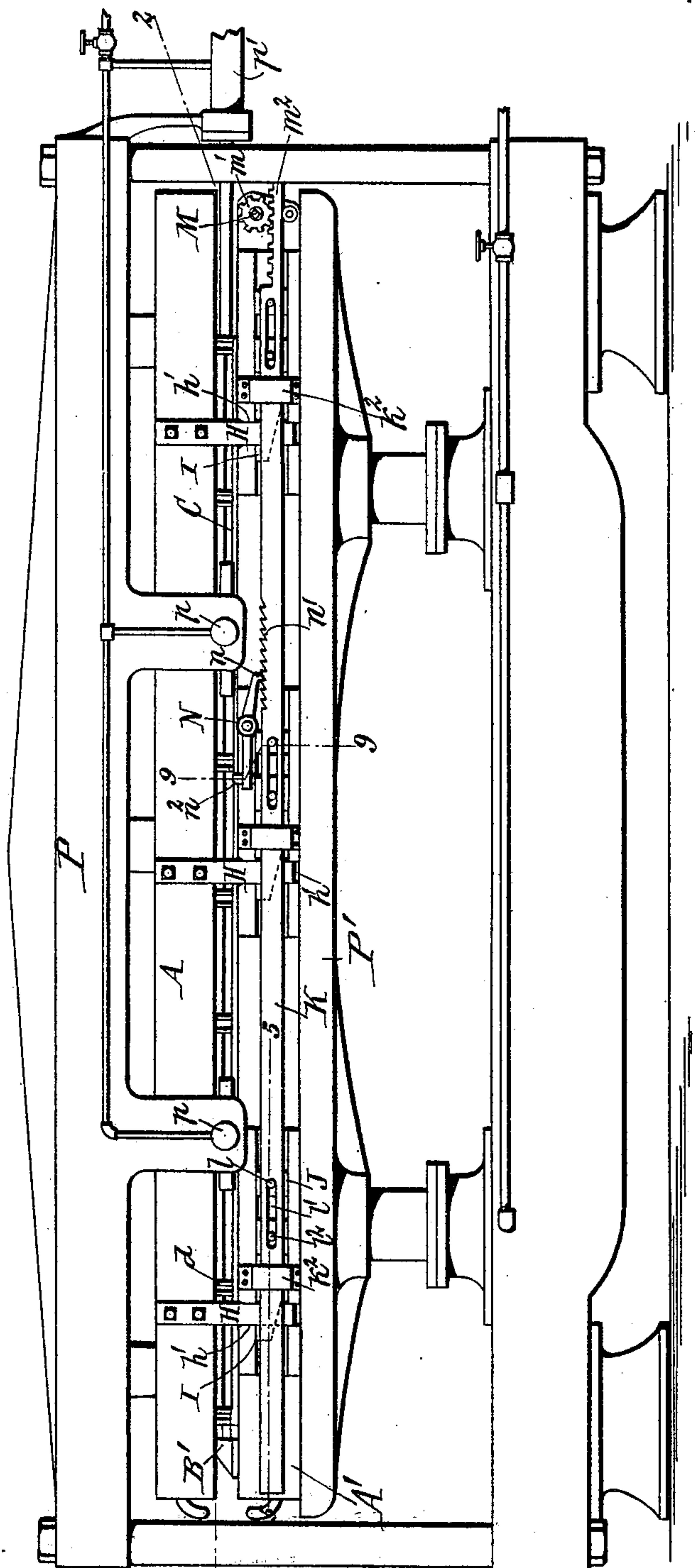
F. J. CRONIN.
CLAMP.

(Application filed Apr. 11, 1898.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



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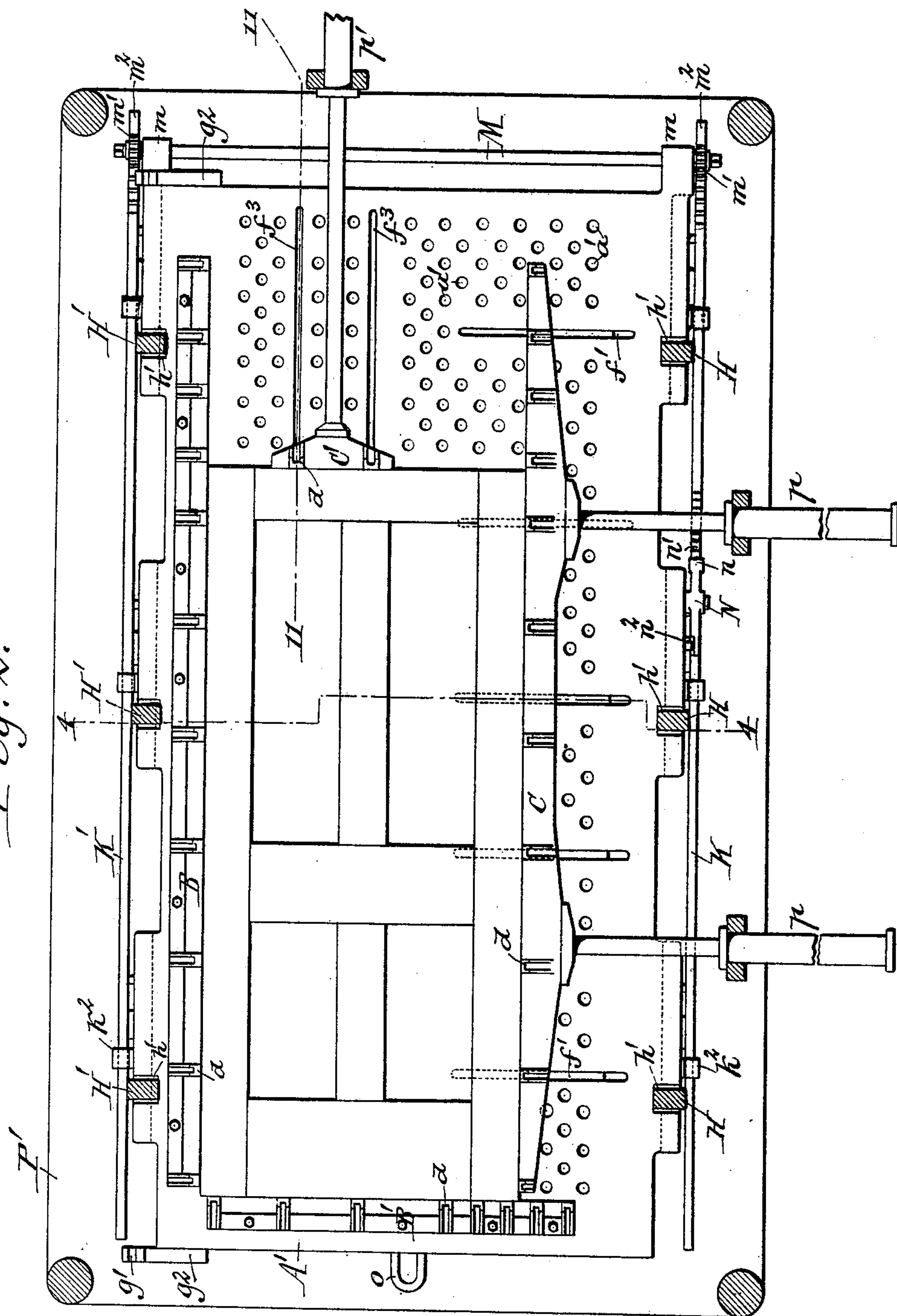
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Fig. 2.



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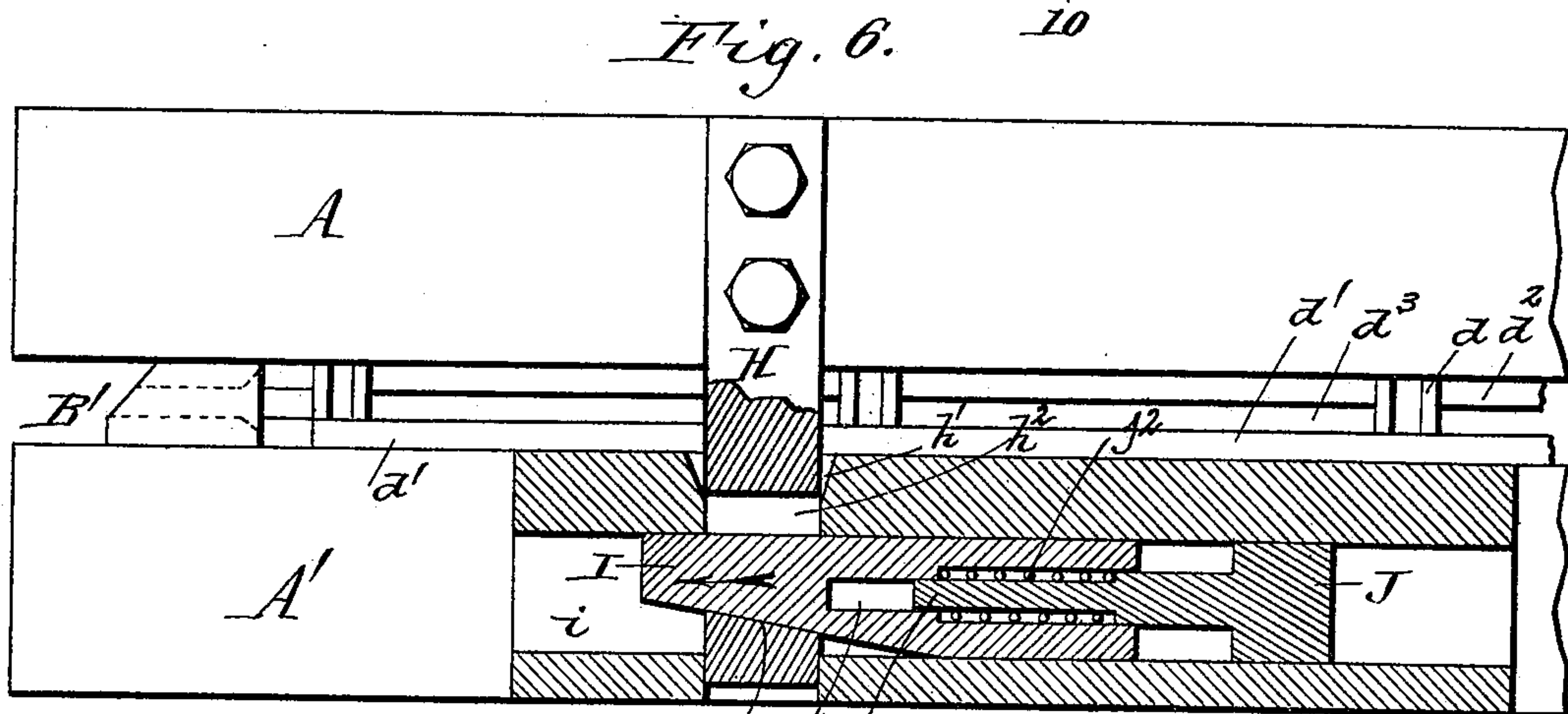
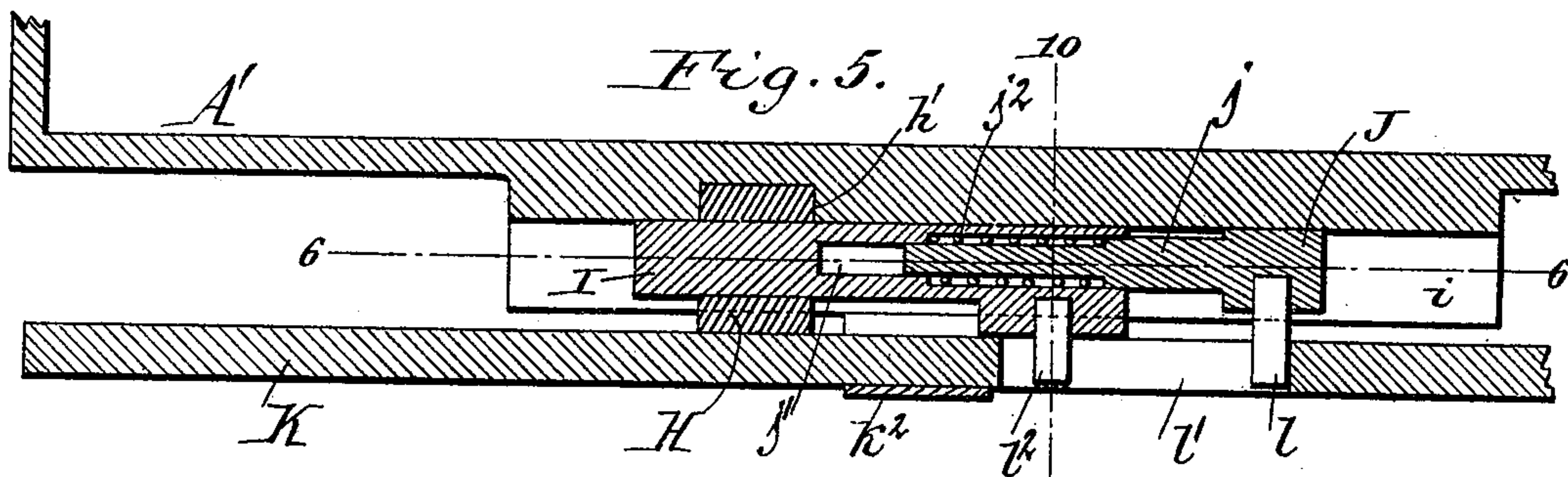
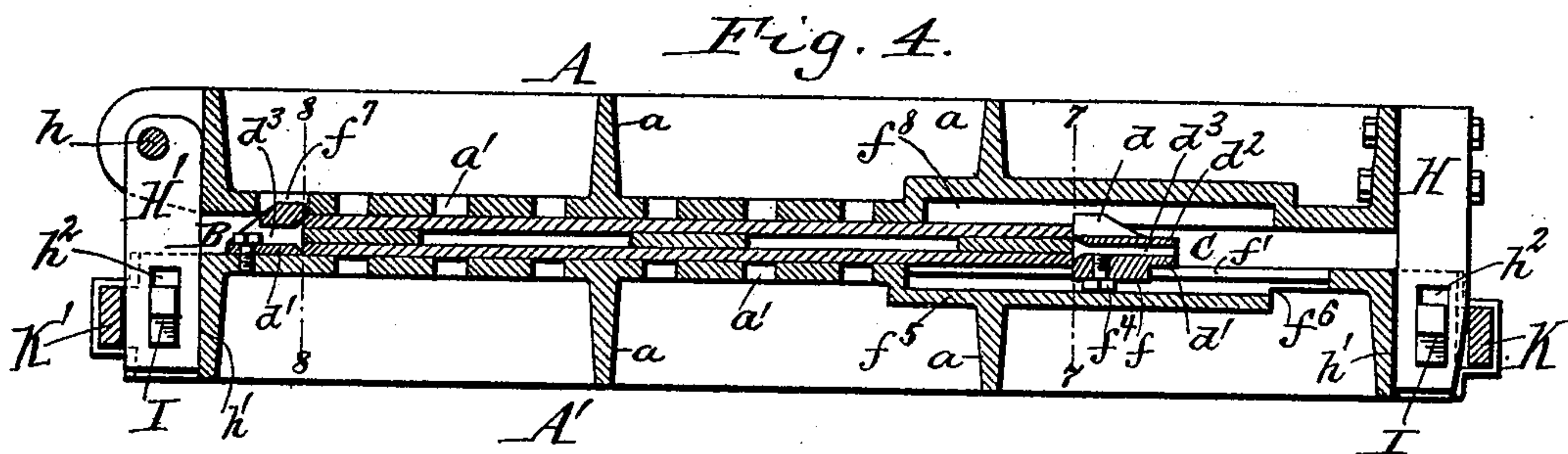
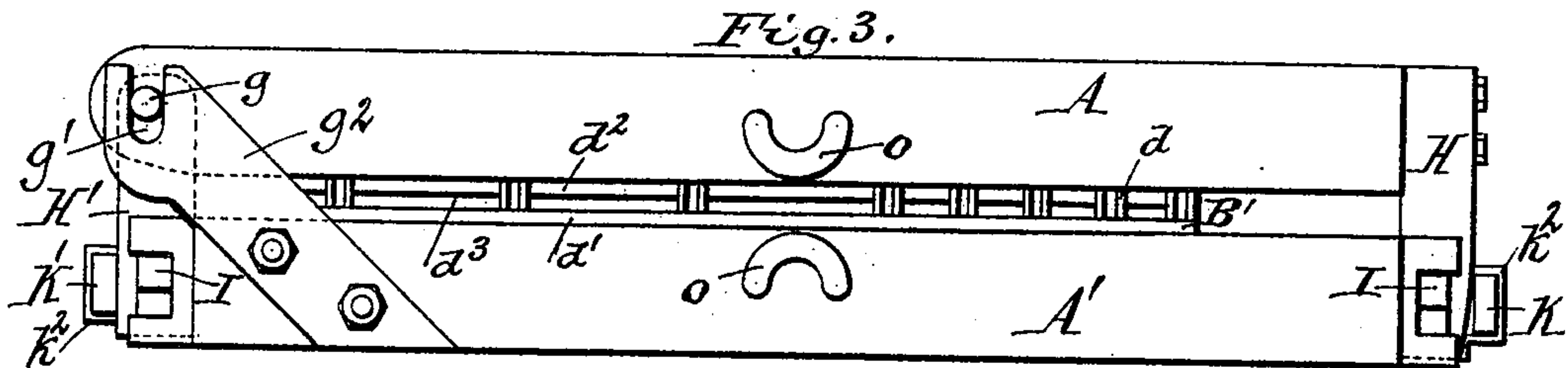
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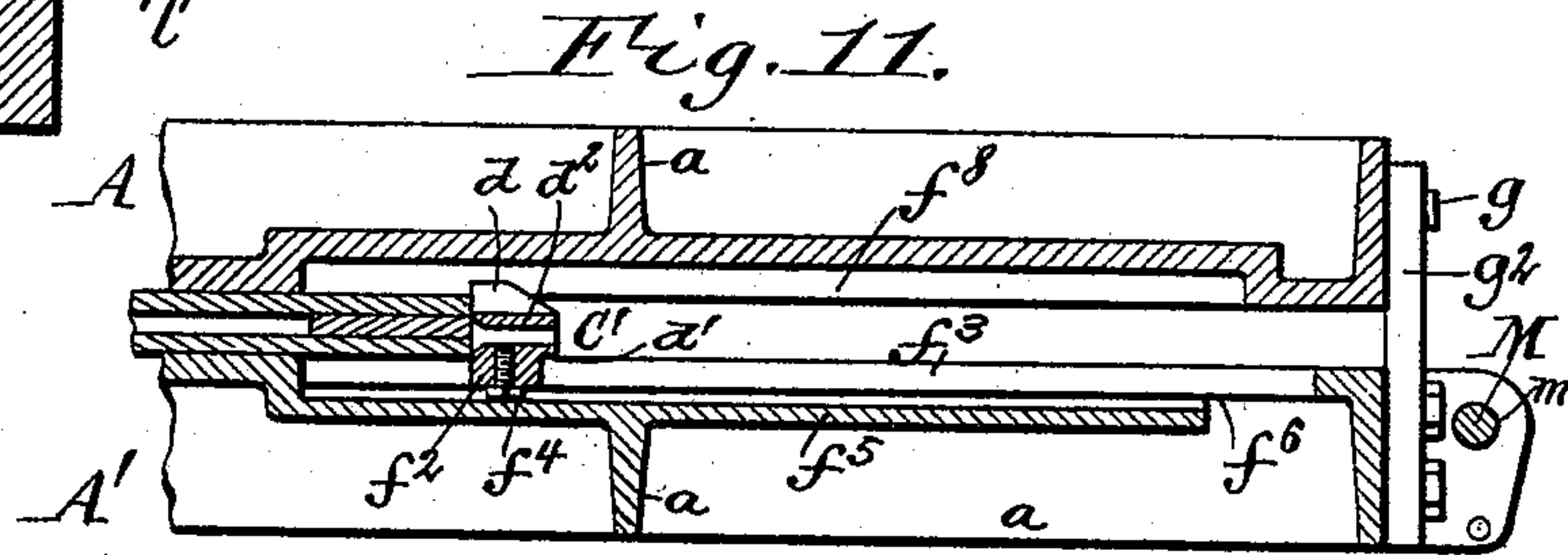
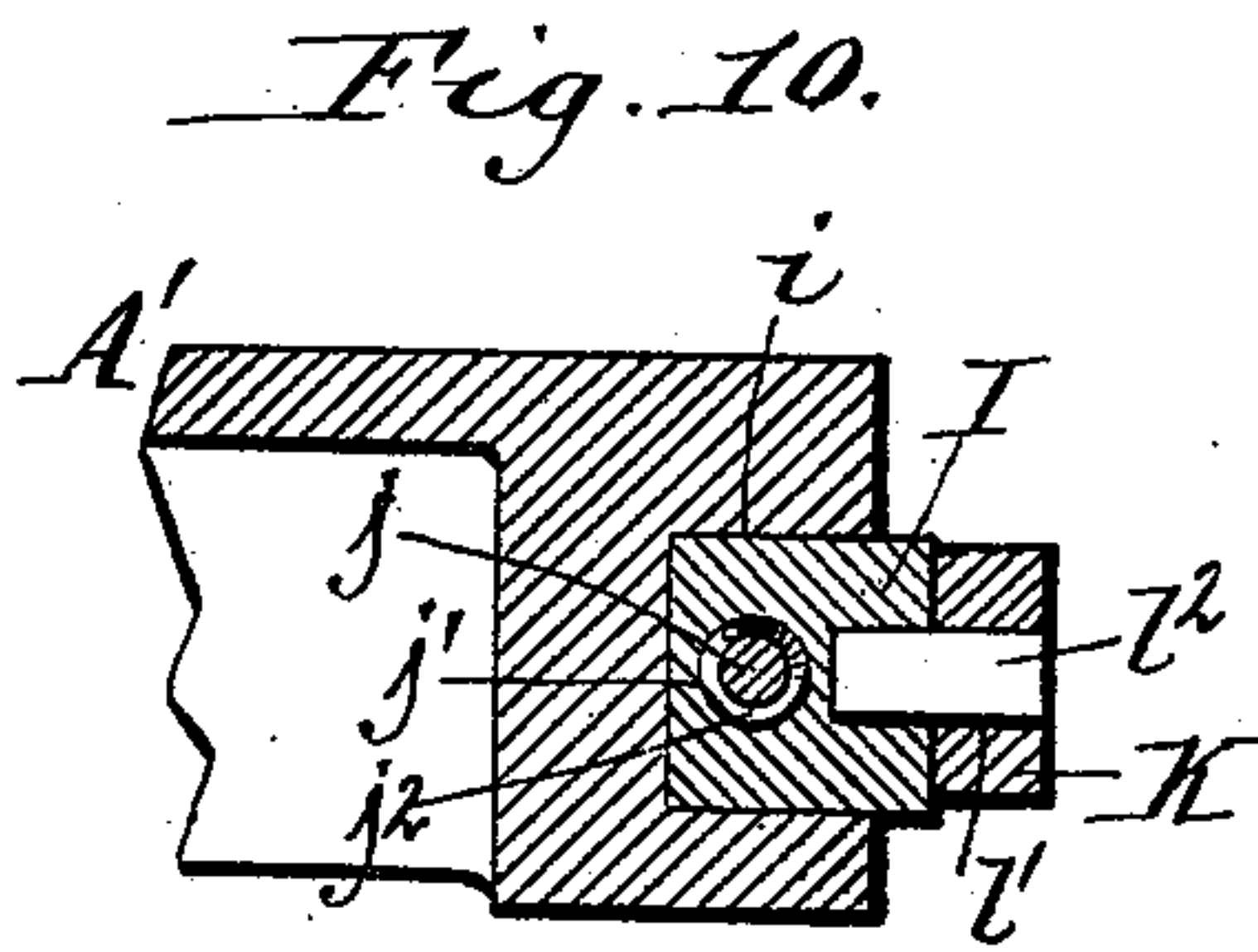
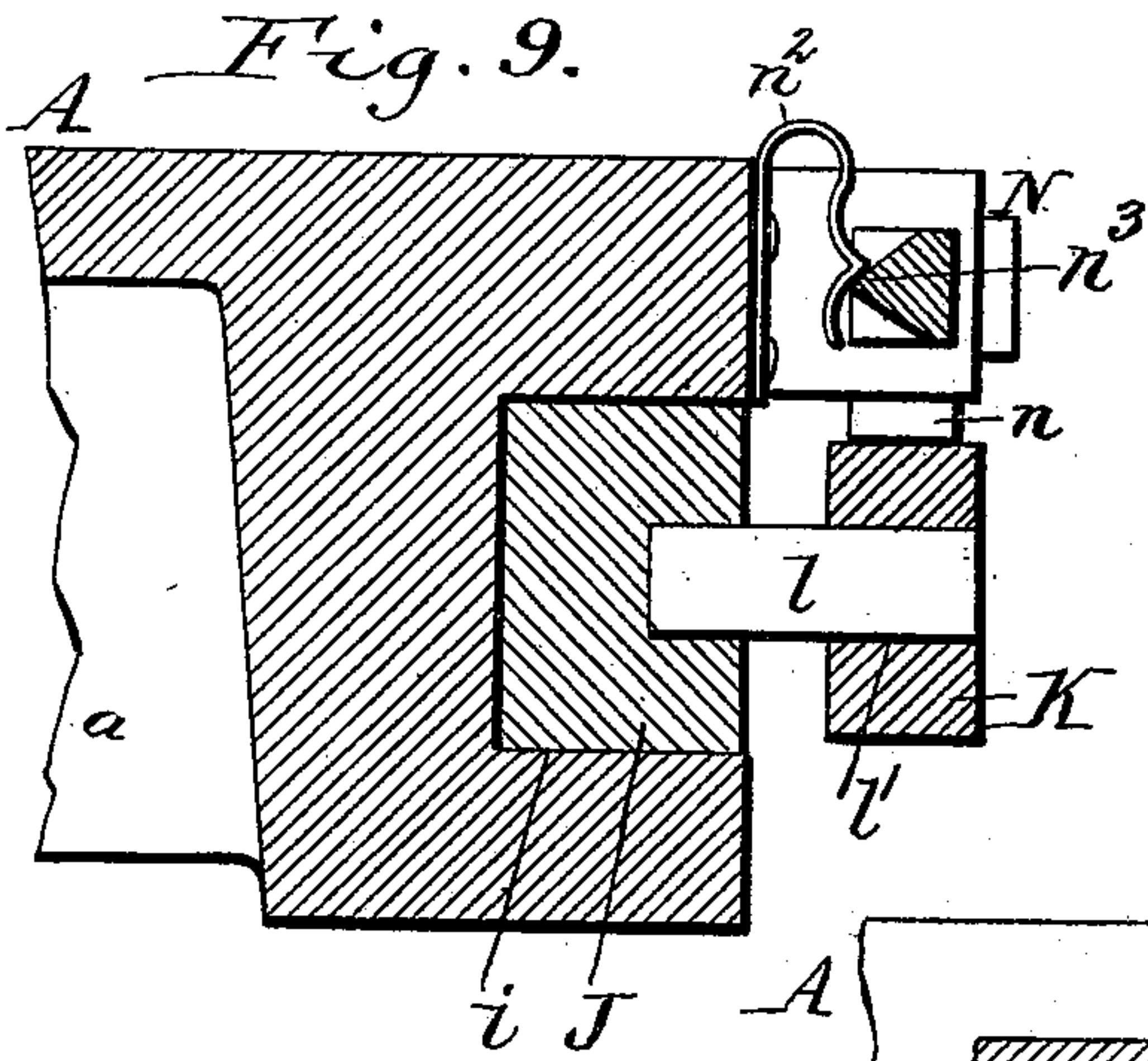
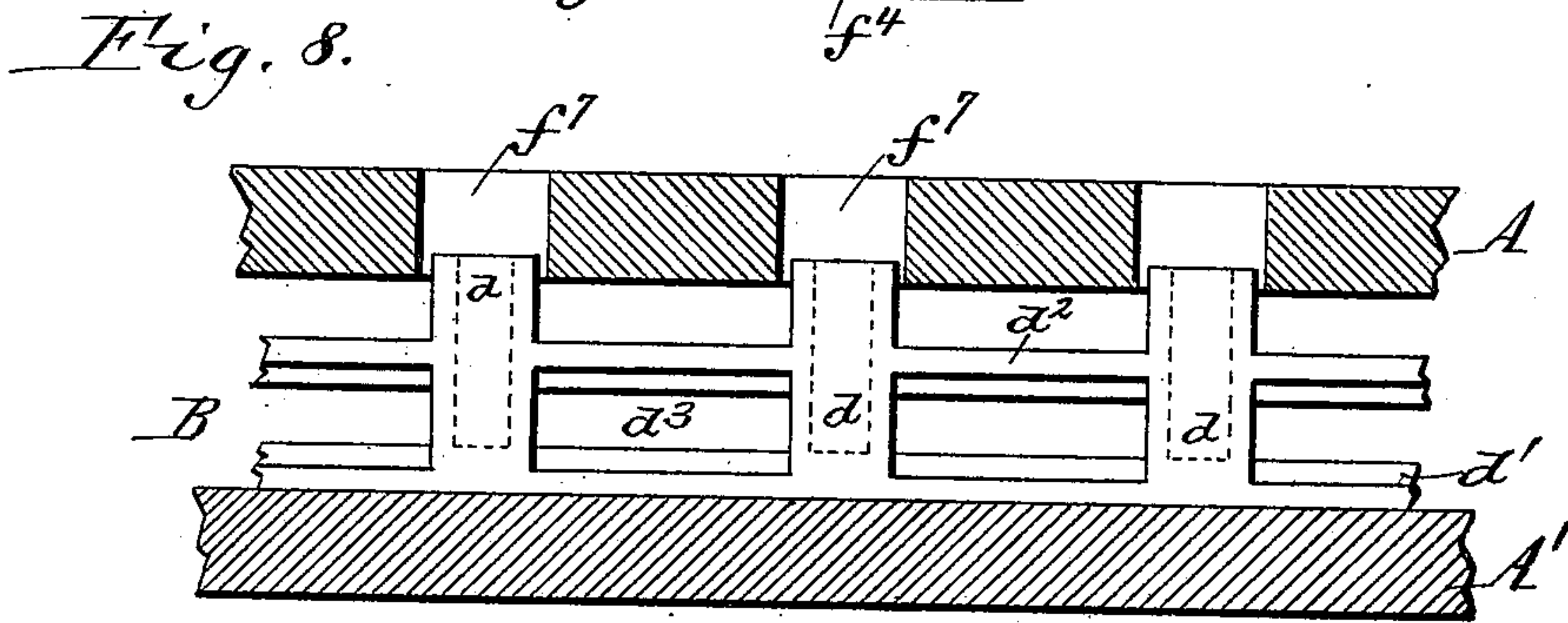
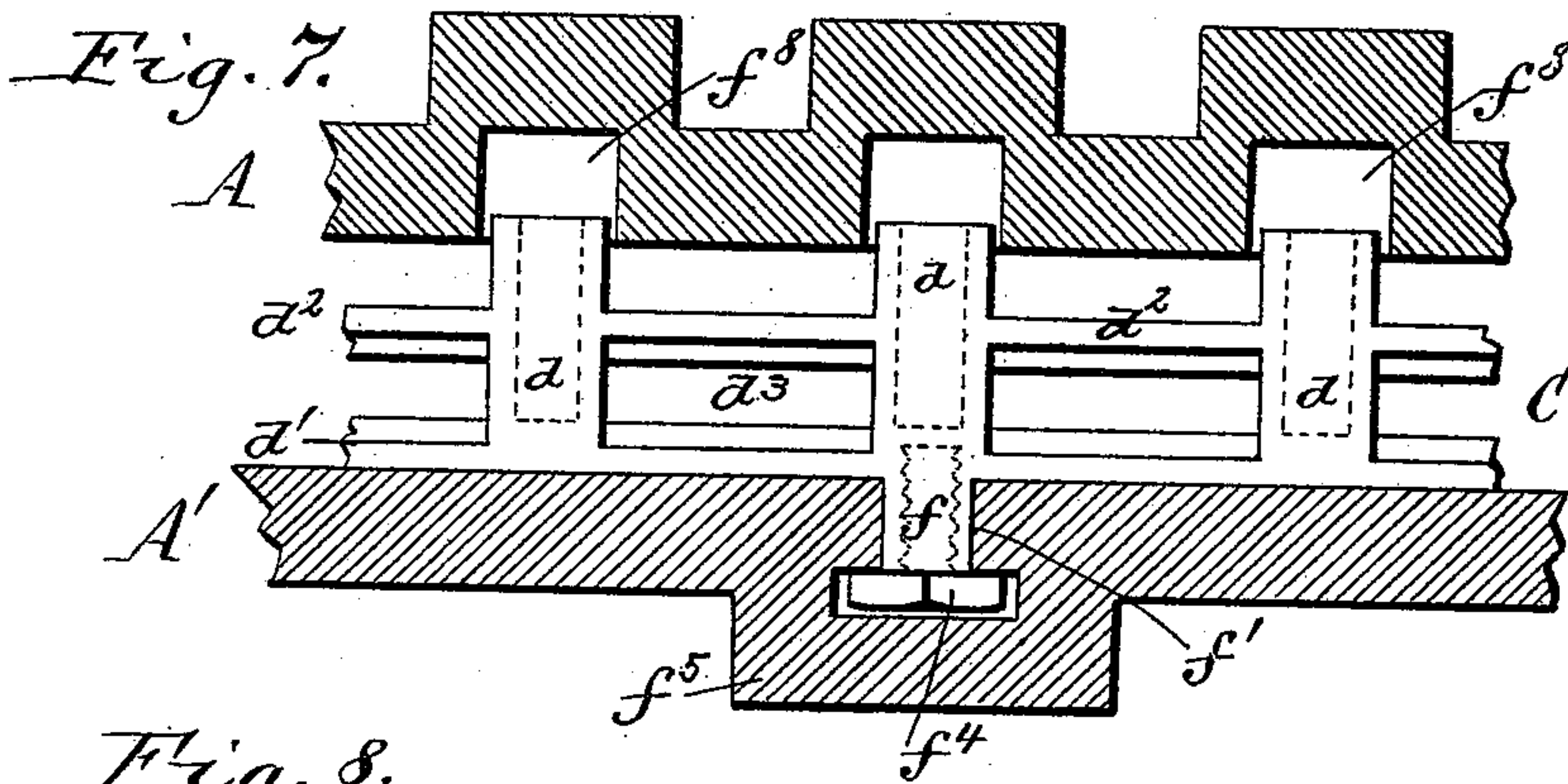
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4 Sheets—Sheet 4.



Henry L. Deck,
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UNITED STATES PATENT OFFICE.

FREDERICK J. CRONIN, OF BUFFALO, NEW YORK.

CLAMP.

SPECIFICATION forming part of Letters Patent No. 619,869, dated February 21, 1899.

Application filed April 11, 1898. Serial No. 677,112. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK J. CRONIN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Clamps, of which the following is a specification.

This invention relates to a clamp or holder which is more particularly designed for securely holding together the parts of composite articles until the glue connecting the parts is dry.

The object of this invention is to provide a convenient clamp for this purpose in which the slack between the parts of the clamp is automatically taken up and held in a locked position as the parts of the clamp are pressed together, thereby enabling the operation of clamping to be effected expeditiously and reducing the cost proportionately.

In the accompanying drawings, consisting of four sheets, Figure 1 is a side elevation of my improved clamp arranged in a hydraulic press and clamping a composite door. Fig. 2 is a horizontal section in line 2 2, Fig. 1. Fig. 3 is an end view of the clamp on an enlarged scale. Fig. 4 is a vertical transverse section, on an enlarged scale, in line 4 4, Fig. 2. Fig. 5 is a horizontal longitudinal section, on an enlarged scale, in line 5 5, Fig. 1. Fig. 6 is a vertical longitudinal section in line 6 6, Fig. 5. Figs. 7 and 8 are fragmentary vertical longitudinal sections, on an enlarged scale, in lines 7 7 and 8 8, Fig. 4, respectively. Fig. 9 is a fragmentary vertical transverse section, on an enlarged scale, in line 9 9, Fig. 1. Fig. 10 is a fragmentary vertical transverse section in line 10 10, Fig. 5. Fig. 11 is a fragmentary vertical longitudinal section, on an enlarged scale, in line 11 11, Fig. 2.

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

A A' represent the upper and lower platens or plates of the clamp, which are pressed with their opposing flat faces against opposite sides of a door or other article and which are preferably arranged horizontally one above the other during the clamping operation. Each of the platens is preferably strengthened by ribs *a*, arranged on the back thereof, and is provided between the ribs with ventilating-openings *a'*, which permit free access of the

air to the flat side of the door for drying the glue-joints on the same. The door is assembled on the lower platen while the upper platen is raised and the door is engaged with one of its longitudinal edges against a stationary abutment B and with one of its transverse edges against a stationary abutment B', while the other longitudinal edge of the door is engaged by a longitudinal follower C and the other transverse edge thereof is engaged by a transverse follower C'. Each of the abutments and followers consists, essentially, of a number of upright bearing posts or blocks *d*, a lower bar or rail *d'*, connecting the lower ends of the blocks, and an upper bar or rail *d''*, connecting the central portion of the blocks, thereby forming open spaces *d'''* between the rails and posts, which permits the air to reach the joints in the edges of the door for the purpose of facilitating drying of the glue which connects the adjacent parts of the door. The stationary abutments are rigidly secured to the face of the lower platen by bolts *e*, passing through the lower rails thereof. The longitudinal follower C is guided on the lower platen so as to move transversely thereon by means of depending lugs *f*, formed on the lower rail thereof and engaging with transverse slots *f'* in the lower platen. The transverse follower is guided on the lower platen so as to move lengthwise on the same by means of depending lugs *f''*, arranged on the lower rail thereof and engaging with longitudinal slots *f'''* in the lower platen. The followers are prevented from becoming detached from the lower platen by means of retaining-bolts *f''''*, secured to the depending lugs thereof and engaging with their heads against the under side of the lower platen on opposite sides of the respective guide-slots, as shown in Figs. 4, 7, and 11. In order to prevent the lower platen from being weakened by the guide-slots *f'''*, this platen is provided with depressed portions *f''''*, which connect the lower platen on opposite sides of the guide-slots, as shown in Fig. 7. Each of the depressed portions is cut away at one end, as shown at *f'''''*, Figs. 4 and 11, to permit of attaching the retaining-bolt *f''''* to or removing the same from its respective guide-lug. In order to enable the bearing-blocks *d* to be made high enough so as to permit of clamping thick doors as well as thin doors, the upper platen

is provided with openings f^7 , which receive the bearing-blocks of the stationary abutments, and with grooves f^8 in its face for the reception of the bearing-blocks of the followers. The platens of the clamp are pivotally connected along the rear longitudinal sides thereof by longitudinal pintles or pins g , secured to the ends of the upper platen and engaging with upwardly-opening notches or sockets g' , formed in arms g^2 , which are secured to the ends of the lower platen.

H represents a number of front coupling-bars whereby the front longitudinal sides of the platens are connected, and H' represents a number of rear coupling-bars whereby the rear longitudinal sides of the platens are connected. The front coupling-bars are rigidly secured with their upper ends at the front longitudinal side of the upper platen, and the rear coupling-bars are pivoted with their upper ends by longitudinal pins h to the rear longitudinal side of the upper platen. The coupling-bars engage with sockets h' in the longitudinal edges of the lower platen and are adapted to be connected with the lower platen by means of take-up bars or wedges I, which are mounted on the lower platen. Each of the take-up wedges is guided in a longitudinal way i , which is arranged on the adjacent outer side of the lower platen and which intersects the adjacent socket h' at right angles. Each take-up wedge is adapted to engage with its front end in an eye h^2 , formed in the lower end of the adjacent coupling-bar. The lower side of the eye of the coupling-bar, which side constitutes the bearing face or shoulder thereof, is inclined and engaged by the inclined lower side of the take-up wedge, as shown at h^3 , Fig. 6, so that upon moving the wedge forward in the direction of the arrow in said figure when the platens are pressed against opposite sides of the door the slack between the platens is taken up.

J represents guide-blocks which slide lengthwise in the guides i in rear of the wedges, and each of which is provided with a guide-stem j , arranged in a socket j' in the rear end of the adjacent wedge.

j^2 represents springs whereby the wedges are moved forward automatically and take up the slack between the platens. One of these springs surrounds each of the guide-stems j and bears with its ends against a shoulder on the stem and a shoulder in the socket of the wedge.

K K' represent front and rear shifting-bars, whereby the front and rear wedges are shifted into an operative or inoperative position and which are guided lengthwise on the front and rear sides of the lower platen by guide straps or loops k^2 . Each of the guide-blocks J is provided with an outwardly-projecting pin l , which engages with the rear end of a longitudinal slot l' in the adjacent shifting-bar, and the corresponding wedge is provided with a similar pin l^2 , which engages with the front portion of the respective slot l' .

Upon raising the upper platen its front coupling-bars are disengaged from the frame-sockets, but the rear coupling-bars remain hanging in the rear sockets of the lower platen. While the upper platen is raised and the door is being assembled on the lower platen, the shifting-bars are both drawn rearwardly sufficiently, so that the front ends of the wedges are out of the paths of the coupling-bars, in which position of the wedges the guide-pins l^2 of each wedge and guide-block bear, respectively, against the front and rear ends of the adjacent slot of the shifting-bar, and each wedge-spring is expanded to its full extent. After the door has been assembled on the lower platen, the upper platen is lowered upon the door, during which movement the front coupling-bars engage with the front sockets in the platen, and the hinge-pintles of the upper platen adjust themselves in the notches of the hinge-arms on the lower platen according to the thickness of the door. The shifting-bars are now moved forwardly, so that the front ends of the wedges engage with the eyes of the coupling-bars and bear with their inclined under sides against the inclined lower sides of the eyes. The forward movement of the shifting-bars is continued independent of the wedges after the forward movement of the latter has been arrested, whereby the guide-blocks are moved closer to the wedges and the take-up springs are compressed. The longitudinal movement of the shifting-bars is preferably effected simultaneously by a transverse shaft M, journaled in bearings m at one end of the lower platen and provided at opposite ends with gear-wheels m' , which engage with gear-racks m^2 on the adjacent ends of the shifting-bars. The shaft is turned for moving the shifting-bars backward or forward by means of a crank or handle applied to either of its ends, which latter are made flat-sided for this purpose.

N represents a detent-pawl whereby the shifting-bars are held against backward movement after the proper tension has been placed upon the take-up springs. This pawl is pivoted on the front side of the lower platen and provided on its rear arm with a hook or catch n , which is adapted to engage with one of a number of ratchet-teeth n' on top of the front shifting-bar. As the shifting-bars are moved forwardly the hook of the detent-pawl rides over the inclined front sides of the teeth of the front shifting-bar and then engages with the abrupt rear side of one of them for holding the shifting-bars and connecting parts against backward movement. The detent-pawl is yieldingly held with its hook in or out of engagement with the ratchet-teeth of the front shifting-bar by a spring n^2 , secured to the front side of the lower platen and engaging with a tapering portion n^3 on the rear arm of the detent-pawl. When the spring n^2 engages with the upper side of the tapered portion n^3 on the detent-pawl, the latter is held

with its hook in an elevated inoperative position, and when the spring engages with the lower side of the tapering portion the pawl is held with its hook in an operative position in engagement with the ratchet-teeth of the shifting-bar. After the platens have been locked together with the door between them the same are placed in a press, whereby the platens are pressed powerfully against opposite sides of the door. As the platens approach each other under the pressure of the press the coupling-bars of the upper platen move downwardly in the sockets of the lower platen, thereby producing a slack between the coupling-bars and the wedges. This slack is taken up automatically by the springs, which move the wedges forward in the eyes of the coupling-bars as the slack forms, thereby holding the platens securely in place and preventing them from receding from each other when the pressure of the press against the same is removed. Each wedge is moved forward automatically independent of the other wedges, which permits doors of uneven thickness to be pressed without affecting the locking or take-up mechanism. After the platens of the clamp have been pressed together by the press the followers are pressed against the edges of the door so as to compact the parts of the door edgewise. When the door has been sufficiently pressed in the clamp, the latter, with the door in the same, is removed from the press and stored in a drying-room or other place until the glued joints of the door are perfectly dry. For this purpose each of the platens is provided with a loop or hanger for receiving a hook whereby the clamp may be suspended. When the door has been dried in the clamp, the detent-pawl is disengaged from the teeth of the front shifting-bar and both shifting-bars are drawn backwardly for disengaging the wedges from the coupling-bars, thereby permitting the upper platen of the clamp to be raised for removing the finished door and assembling another in its place.

The press whereby the door is pressed in the clamp may be of any suitable construction, that shown in the drawings being constructed as follows:

P represents the upper or stationary head, and P' the lower or movable table of a hydraulic press, between which the clamp is placed.

p p' represent hydraulic jacks provided with rams or plungers, which bear, respectively, against the longitudinal and transverse followers of the clamp when the latter has been elevated into the proper position by the table p'.

My improved construction of clamp enables the operation of pressing doors, &c., to be effected expeditiously and uniformly, inasmuch as the operation of taking up the slack is effected automatically, thereby reducing the cost of producing the article.

I claim as my invention—

1. The combination with two opposing clamping-platens, of a coupling bar or member arranged on one of the platens and provided with a bearing-shoulder, a take-up wedge or member arranged on the other platen and bearing with its incline against the shoulder of the other member, and an automatic shifting device whereby one of said members is constantly moved forward on the other member and said incline is caused to take up the slack between the platens as the latter are pressed together, substantially as set forth.

2. The combination with two opposing clamping-platens, of a coupling-bar arranged on one of the platens and provided with a bearing-shoulder, a wedge arranged on the other platen and having its incline engaging with the shoulder of the coupling-bar, and a spring whereby the wedge is constantly moved forward and caused to slide with its incline lengthwise over the shoulder of the coupling-bar for taking up the slack between the platens as the latter are pressed together, substantially as set forth.

3. The combination with two opposing clamping-platens, of coupling-bars arranged on one of said platens and provided with bearing-shoulders, supporting-bars movably mounted on the other platen, and wedges movably connected with said bars and engaging with their inclines against said bearing-shoulders, substantially as set forth.

4. The combination with two clamping-platens, of coupling-bars arranged on one of the platens, wedges movably arranged on the other platen and adapted to engage with said coupling-bars, shifting-bars connected loosely with said wedges, and springs which tend to move the wedges forward on the shifting-bars, substantially as set forth.

5. The combination with two clamping-platens, of coupling-bars arranged on one of said platens, wedges movably arranged on the other platen and engaging with the coupling-bars, guide-blocks also movably arranged on the other platen, springs interposed between the wedges and the guide-blocks, and shifting-bars provided with slots which receive pins or projections on the wedges and blocks, substantially as set forth.

6. The combination with the upper and lower clamping-platens, of coupling-bars arranged on opposite sides of the upper platen, wedges movably arranged on opposite sides of the lower platen and adapted to engage with said coupling-bars, shifting-bars also arranged on opposite sides of the lower platen and connected with said wedges, and a shaft journaled transversely on the lower platen and provided with gear-pinions engaging with gear-racks on the shifting-bars, substantially as set forth.

7. The combination with the upper and lower clamping-platens, of coupling-bars arranged on opposite sides of the upper platen,

wedges movably arranged on opposite sides of the lower platen and adapted to engage with said coupling-bars, shifting-bars also arranged on opposite sides of the lower platen
5 and connected with said wedges, a shaft journaled transversely on the lower platen and provided with gear-pinions engaging with gear-racks on the shifting-bars, and a detent-pawl pivoted on the lower platen and engaging
10 with teeth on one of the shifting-bars, substantially as set forth.

8. The combination with two opposing clamping-platens which are loosely hinged together on one side, of loose coupling-bars
15 pivoted to one of the platens on the same side on which the hinge is located, rigid coupling-bars secured to the opposite side of the same platen, take-up wedges mounted on the other platen and bearing with their inclines
20 against shoulders on said bars, and automatic shifting devices whereby said wedges are constantly moved forward for taking up the

slack between the platens as the latter are pressed together, substantially as set forth.

9. The combination of two portable clamp-
25 ing-platens which are adapted to bear against the opposite flat sides of the article to be pressed, a coupling device connecting said platens, stationary abutments and movable
30 followers arranged on one of said platens and bearing against the edges of the article to be pressed, pressure devices which are adapted to bear against the flat outer sides of the platens but which are disconnected there-
35 from, and pressure devices which are adapted to bear against said followers but which are wholly disconnected from said followers and platens, substantially as set forth.

Witness my hand this 5th day of April, 1898.

FREDERICK J. CRONIN.

Witnesses:

CARL F. GEYER,
THEO. L. POPP.