

No. 625,872.

Patented May 30, 1899.

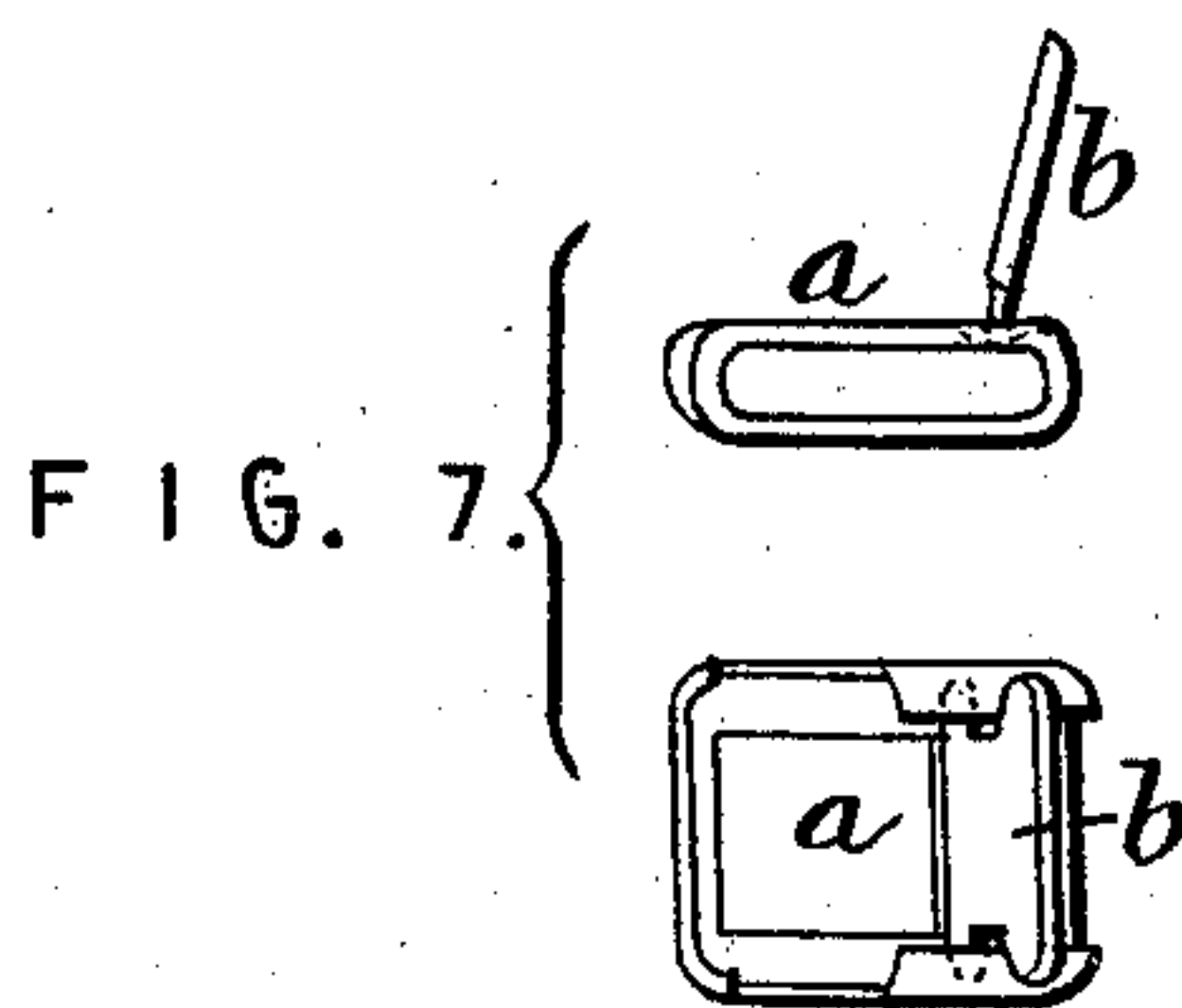
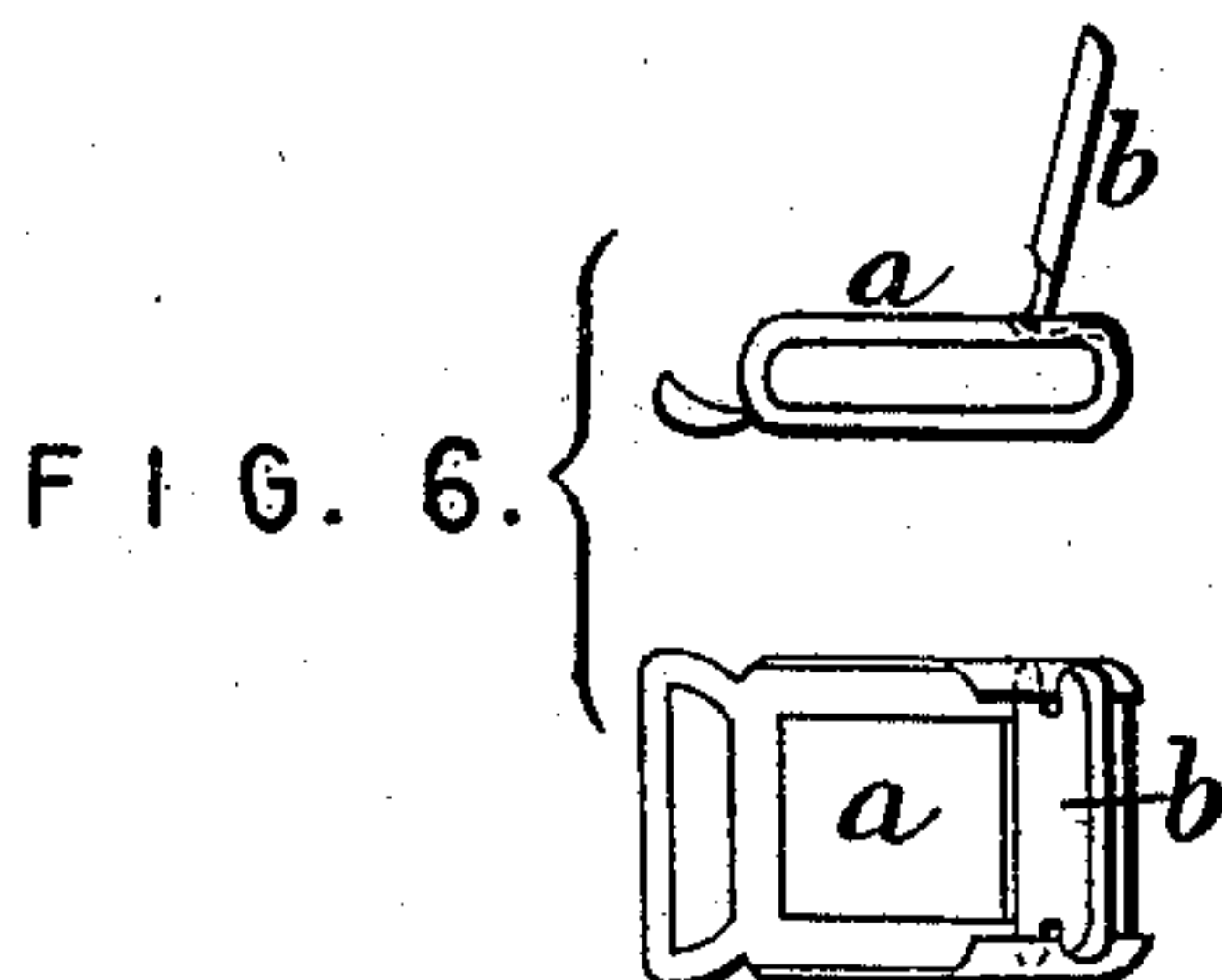
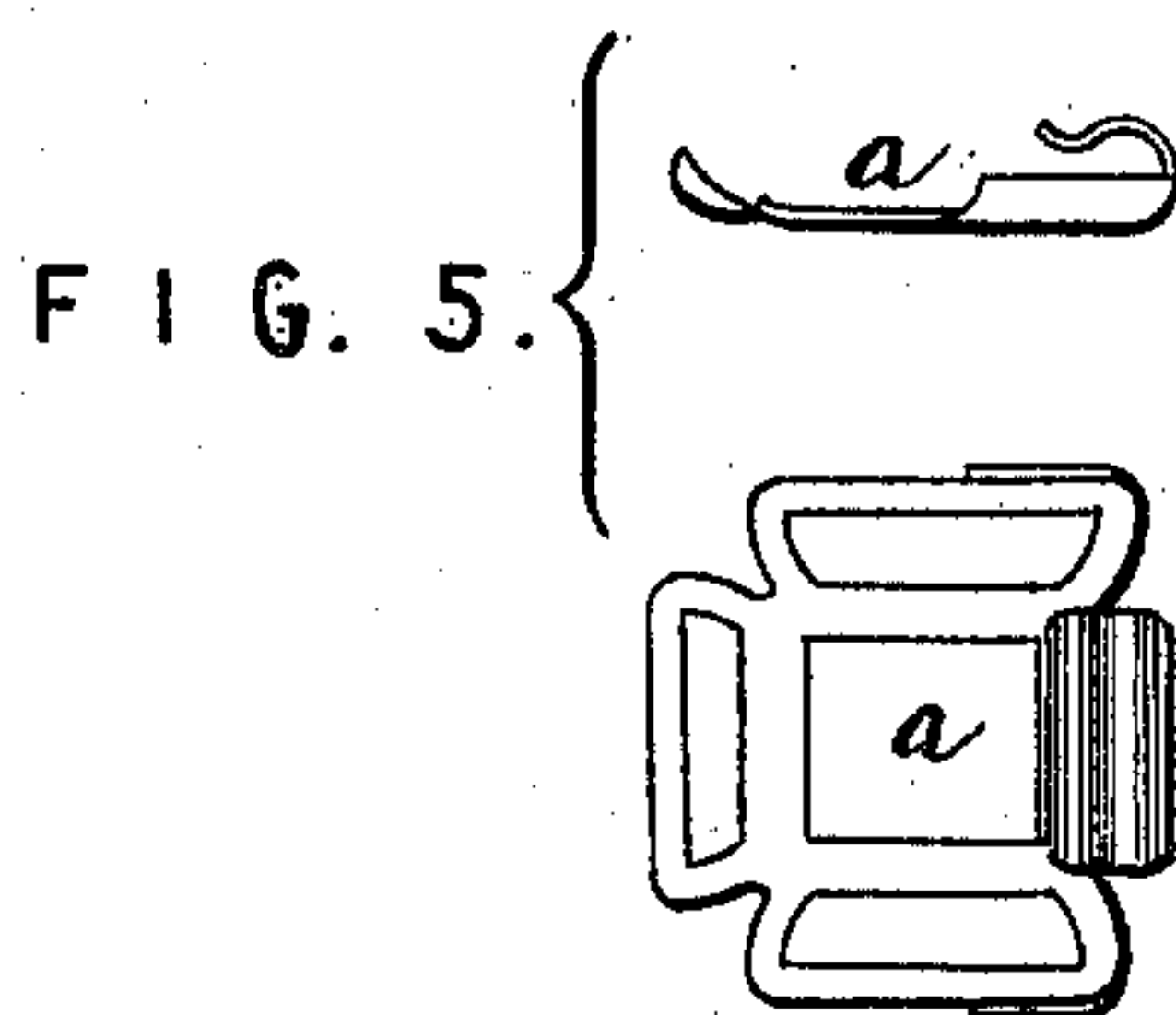
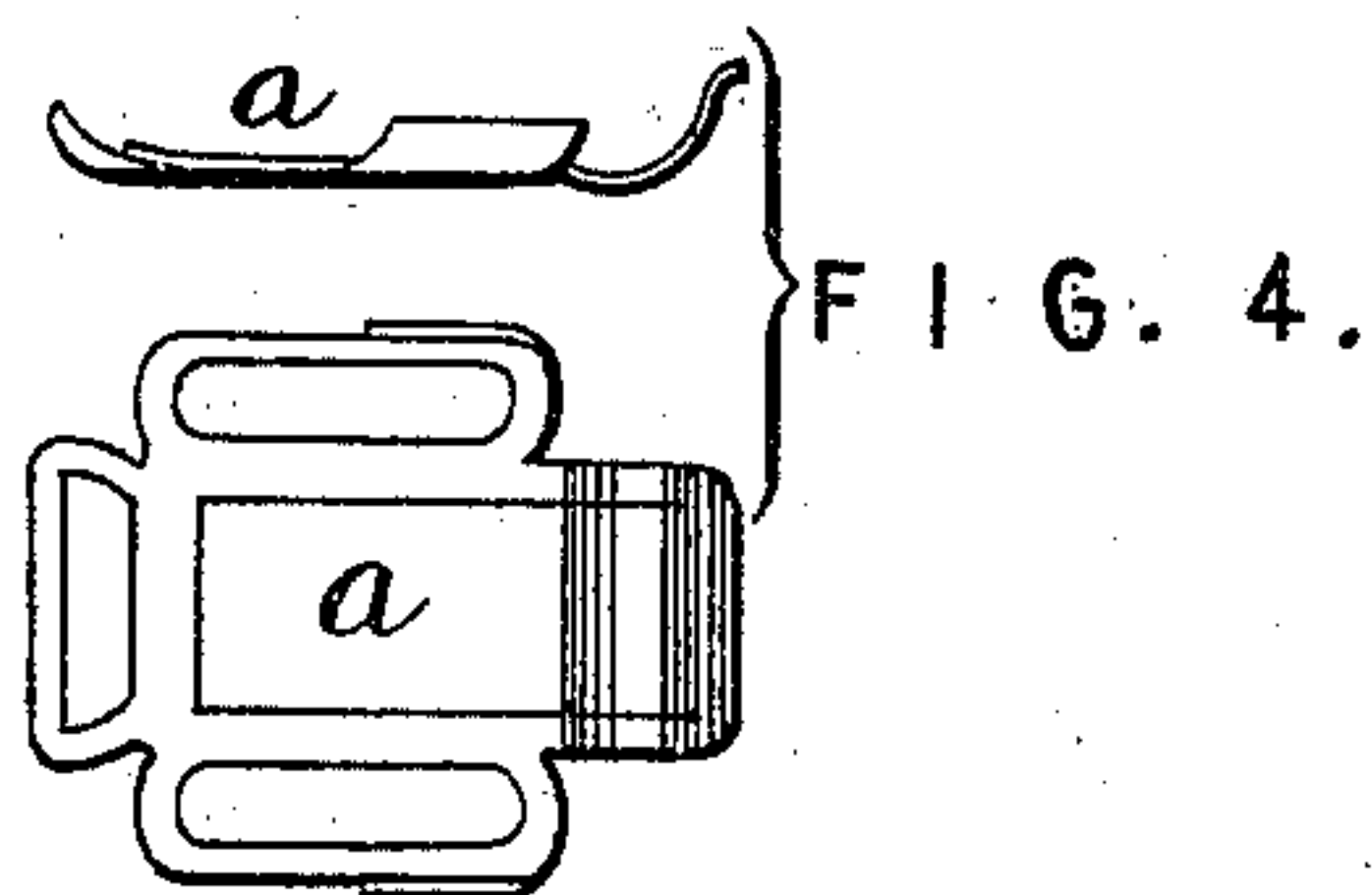
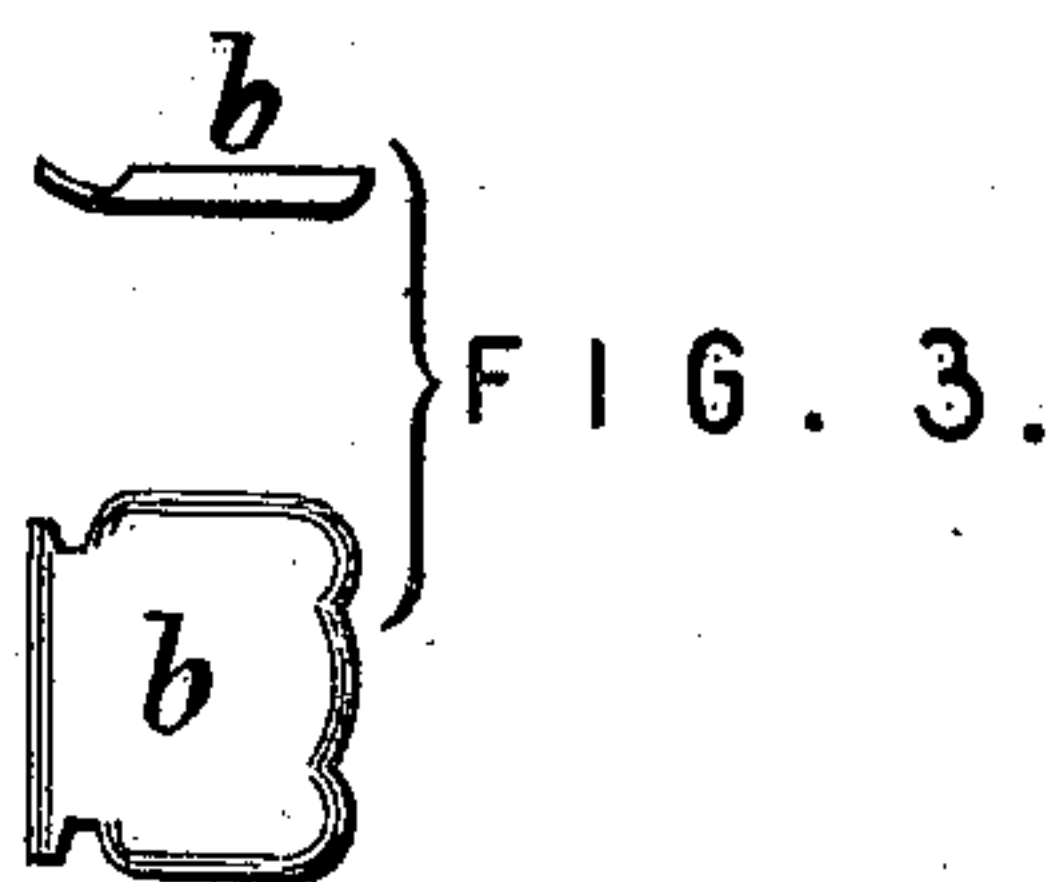
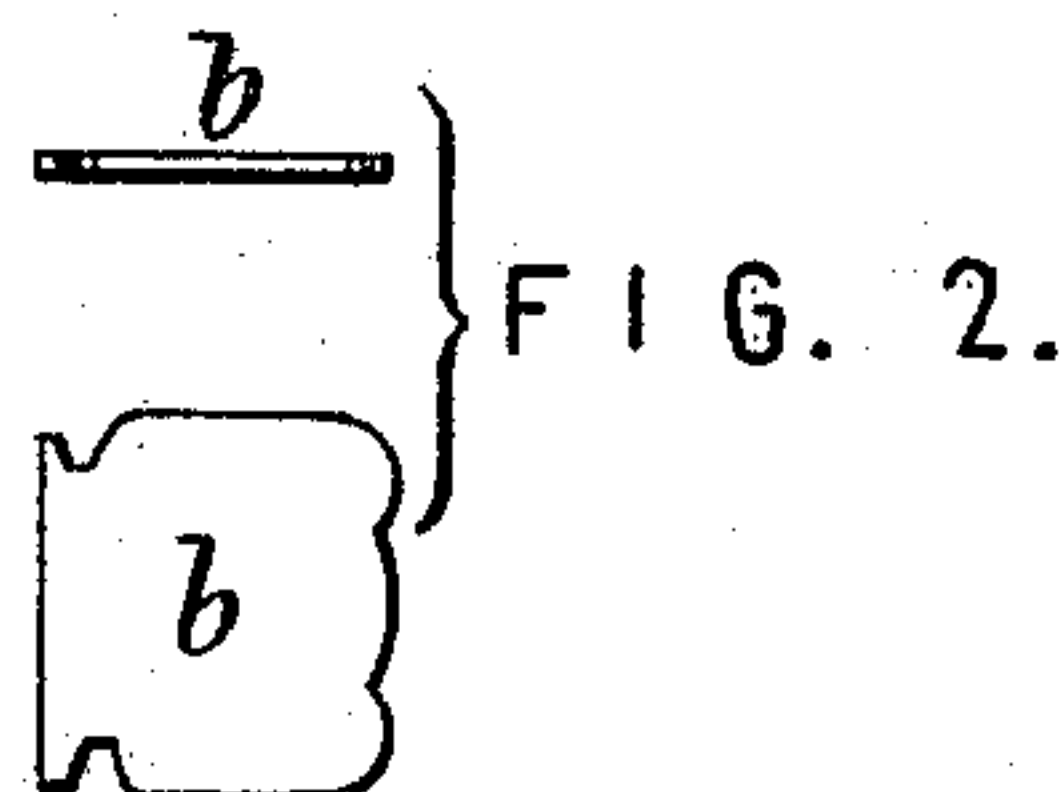
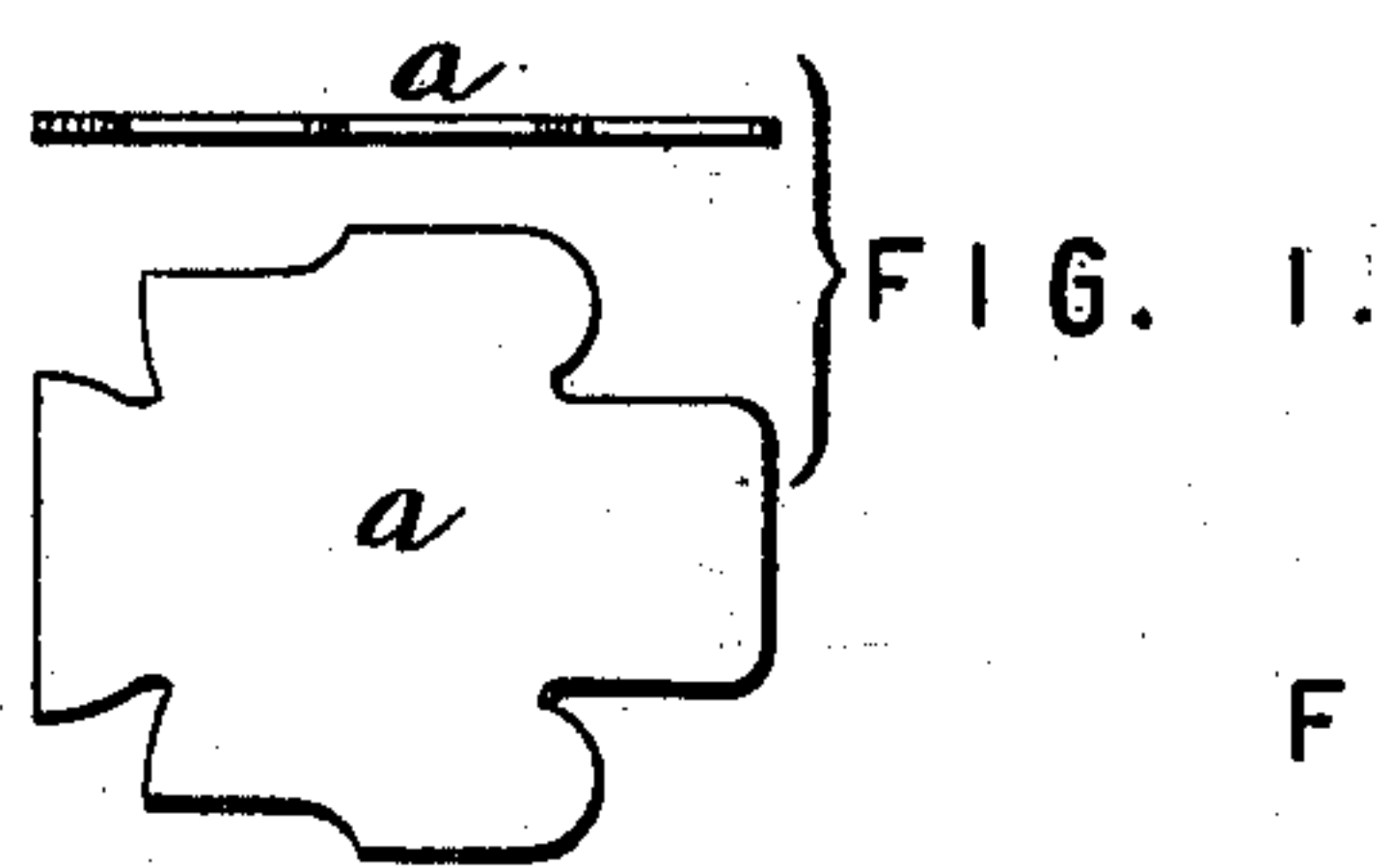
T. L. CARBONE.

APPARATUS FOR MAKING SHEET METAL BOXES.

(Application filed Apr. 16, 1898.)

(No Model.)

8 Sheets—Sheet 1.



Witnesses

W. B. Tucker
N. C. Coombs

Inventor

T. L. Carbone

By

James L. Norris

Att'y

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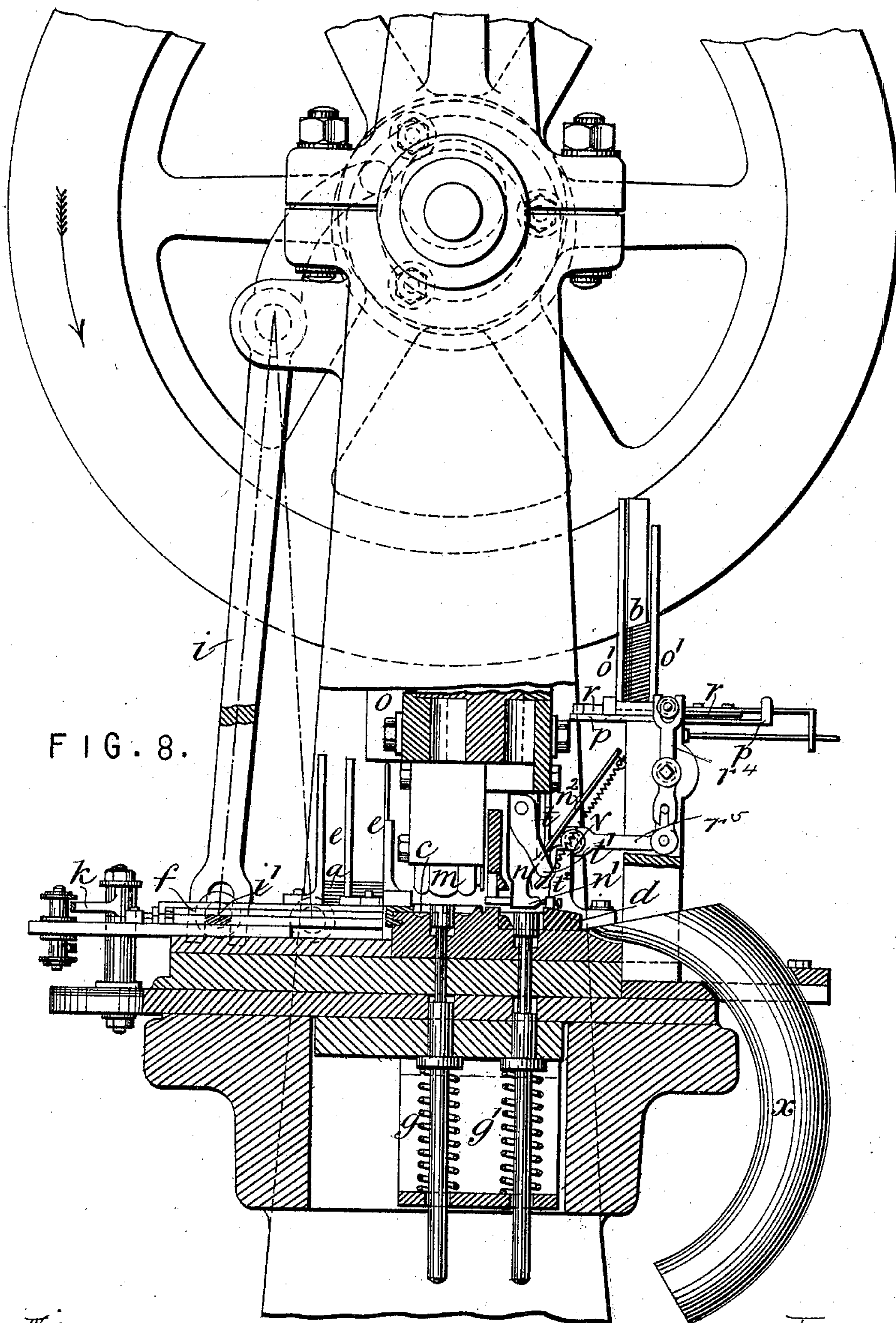
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Witnesses
W. B. Keefe
T. Coombs

Inventor
Tito L. Carbone
By *James L. Norrie*

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FIG. 12.

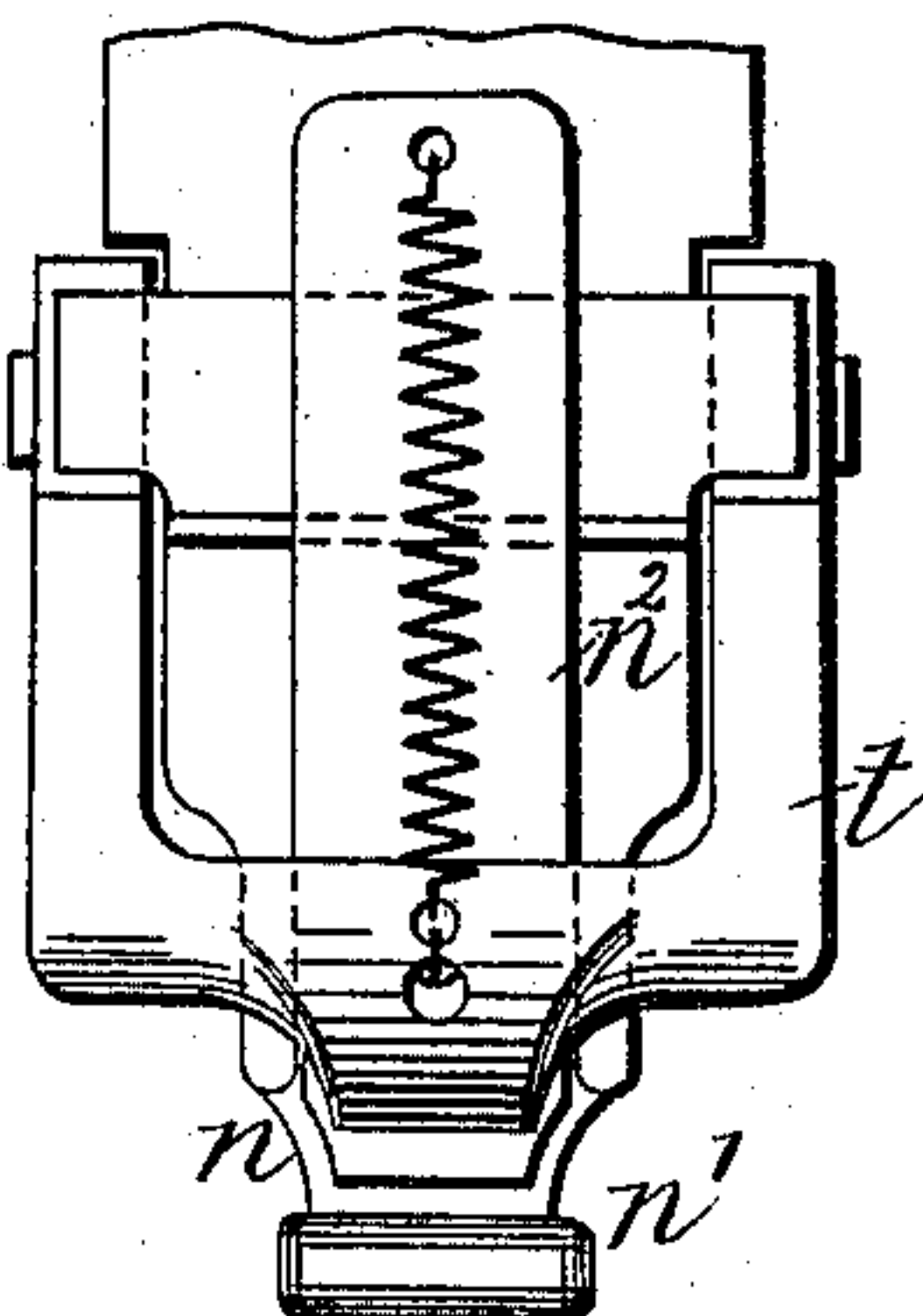
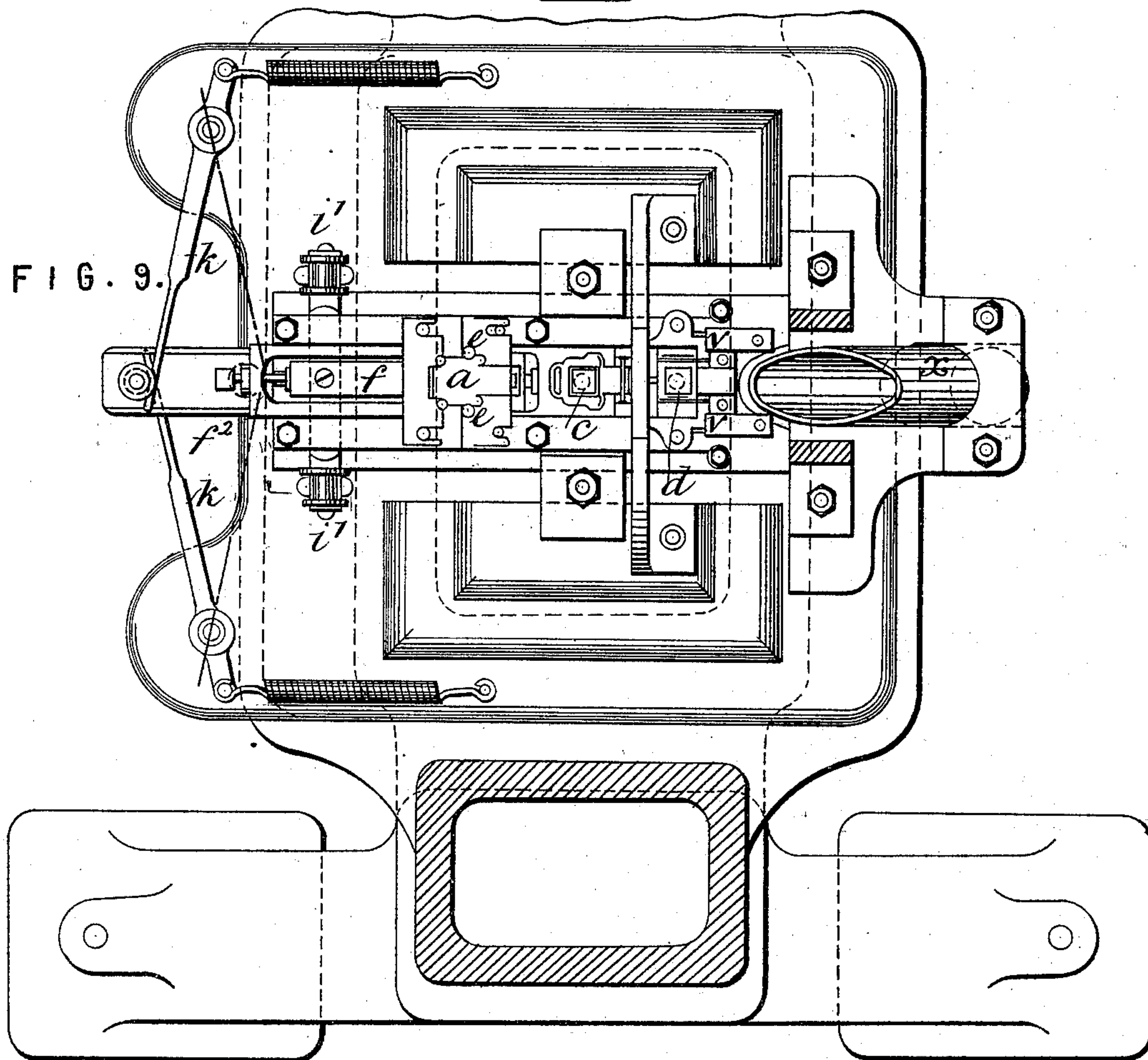


FIG. 9.



Witnesses

J. B. Keefe
T. Carbone

Inventor

Tito L. Carbone

James L. Norris

Att'y

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8 Sheets—Sheet 4.

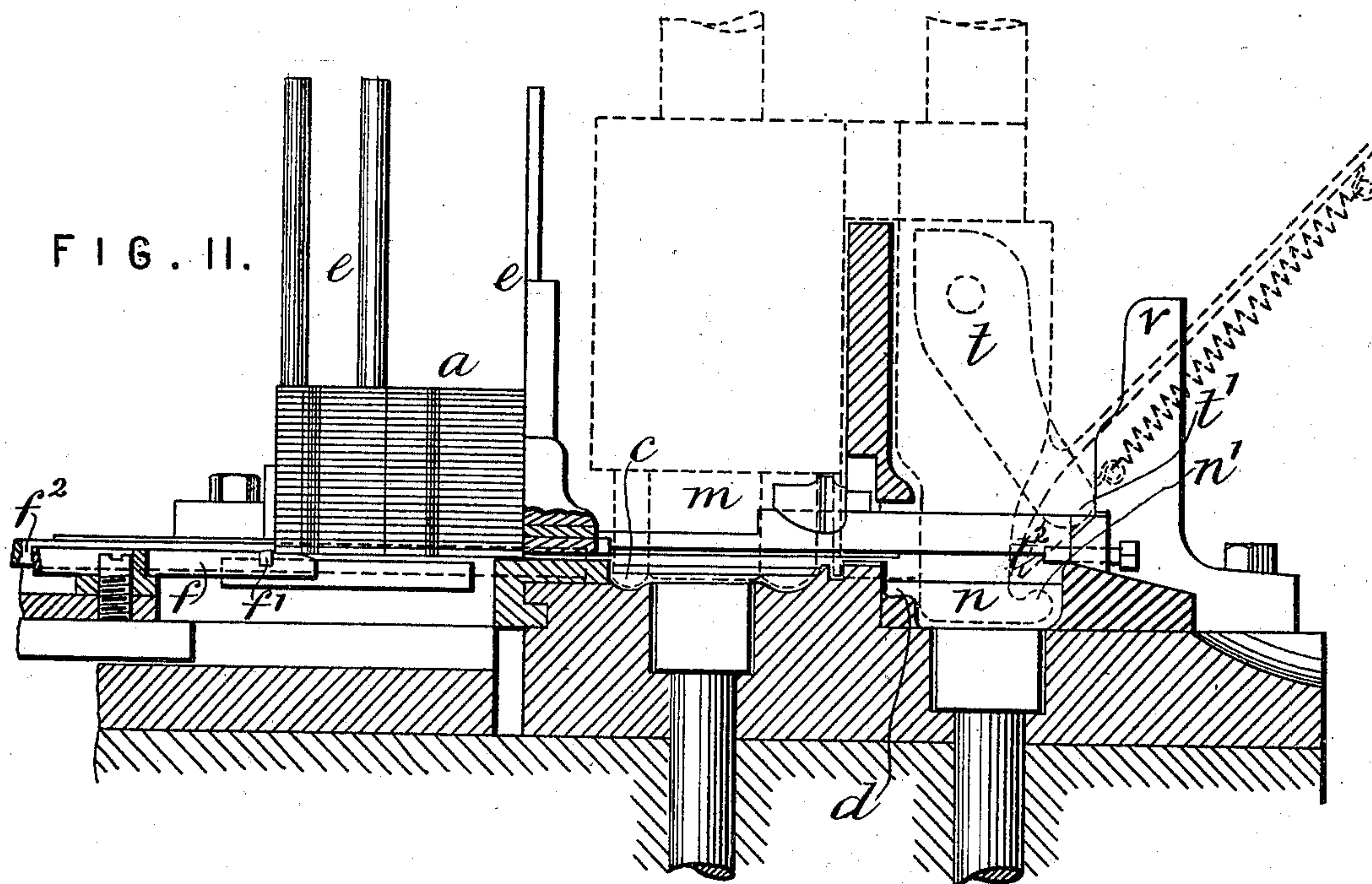
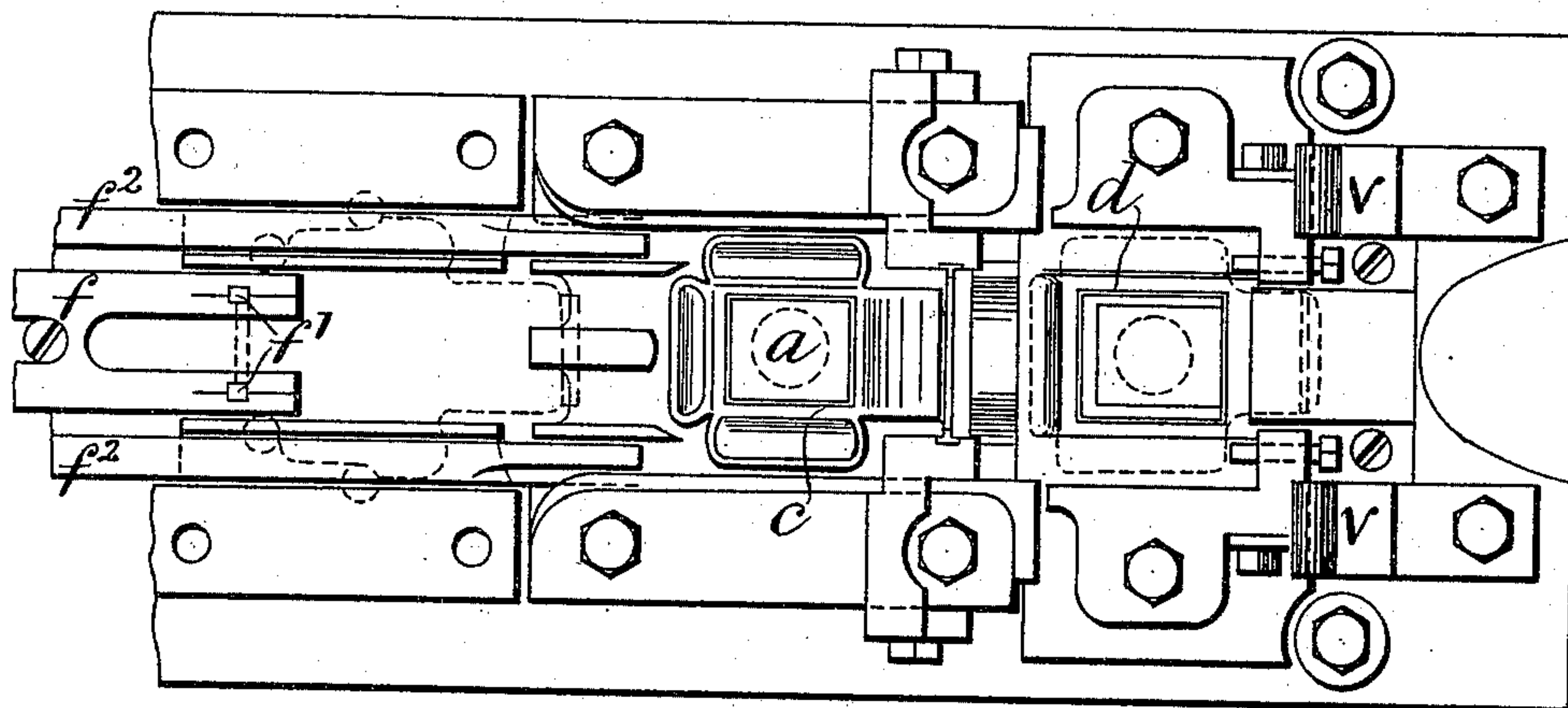


FIG. 10.



Witnesses

J. B. Keefe
R. Coenraets

Inventor

Tito L. Carbone

By

James L. Norris

Attorney

No. 625,872.

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T. L. CARBONE.

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8 Sheets—Sheet 5.

FIG. 19.

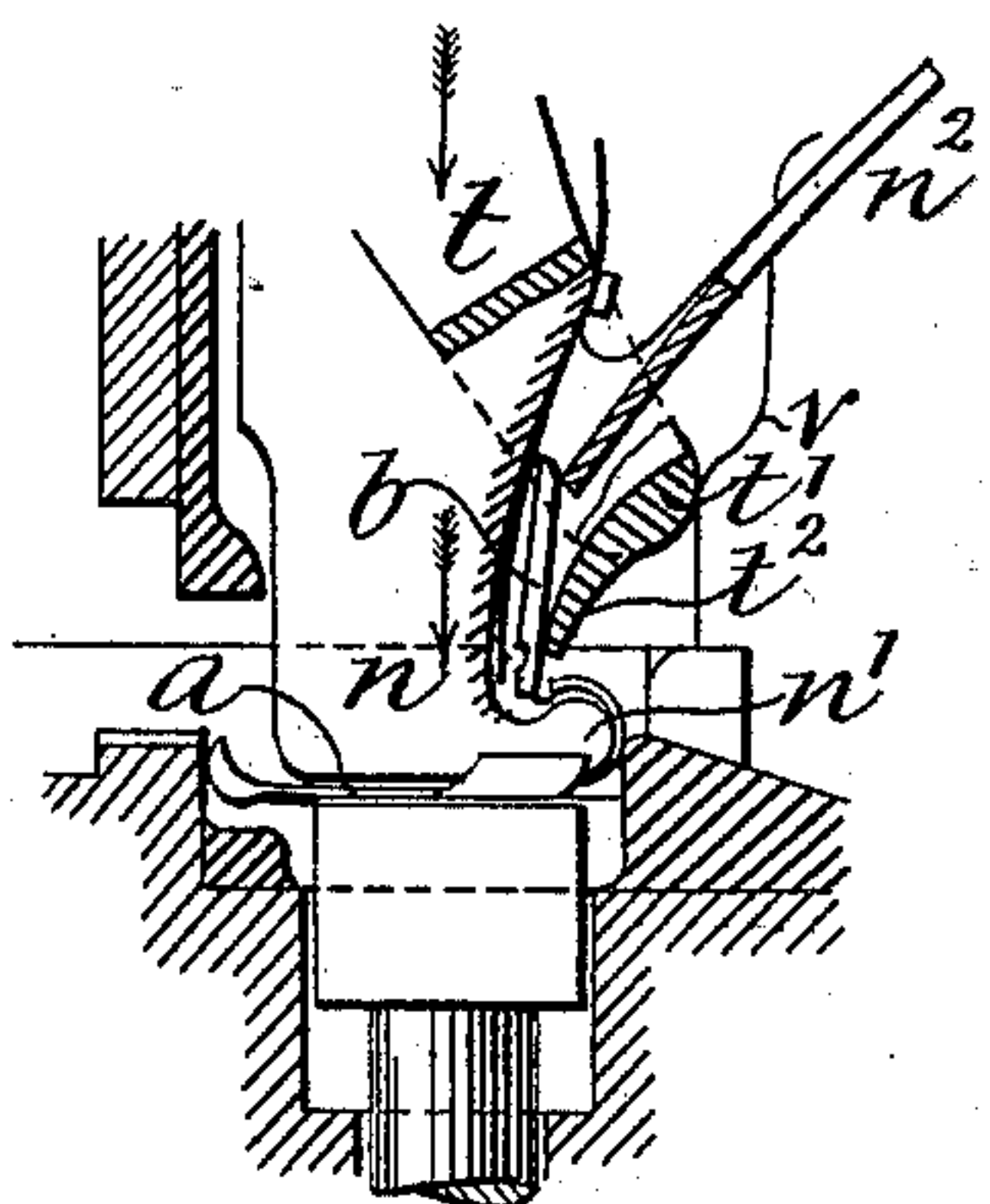


FIG. 20.

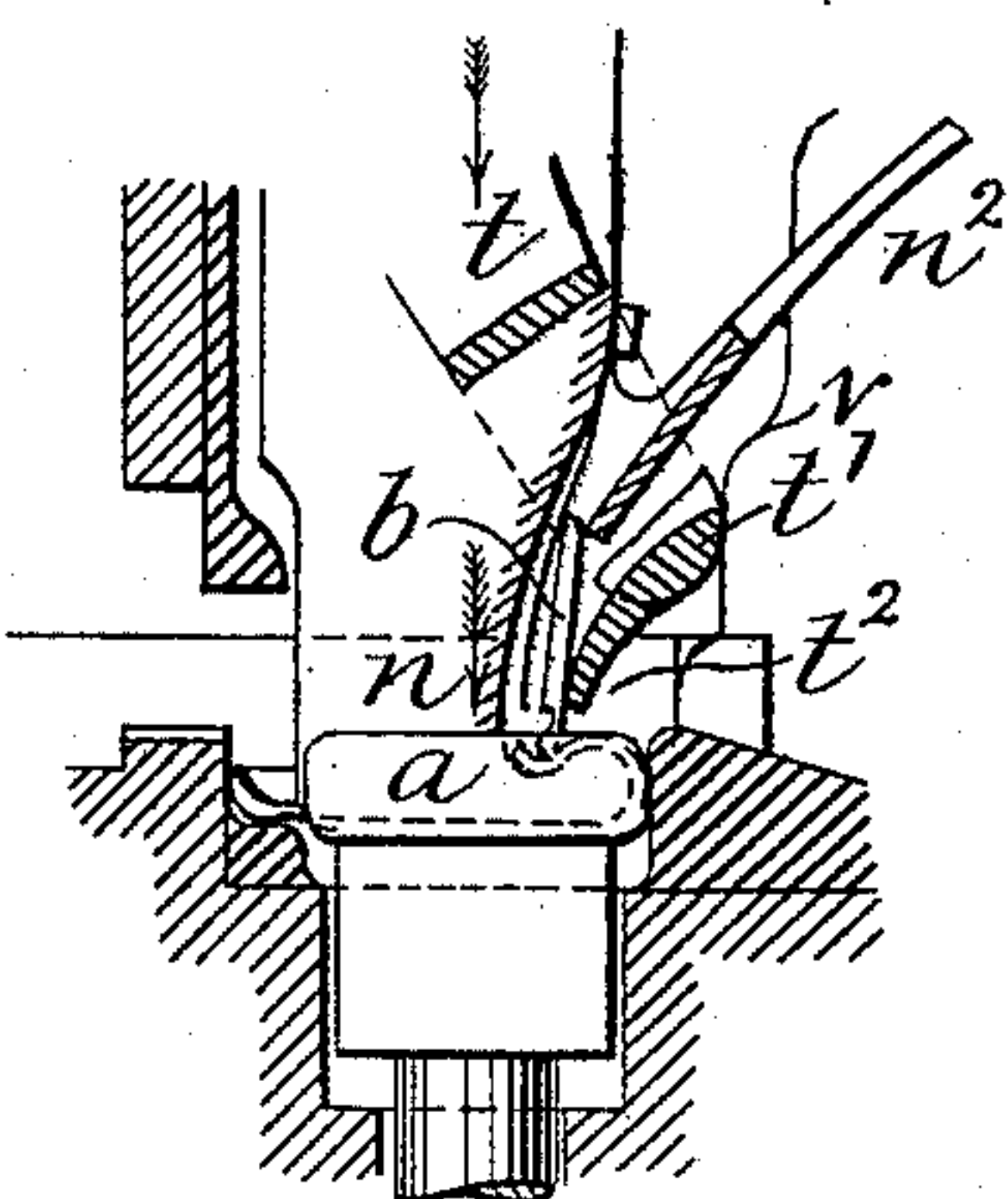


FIG. 21.

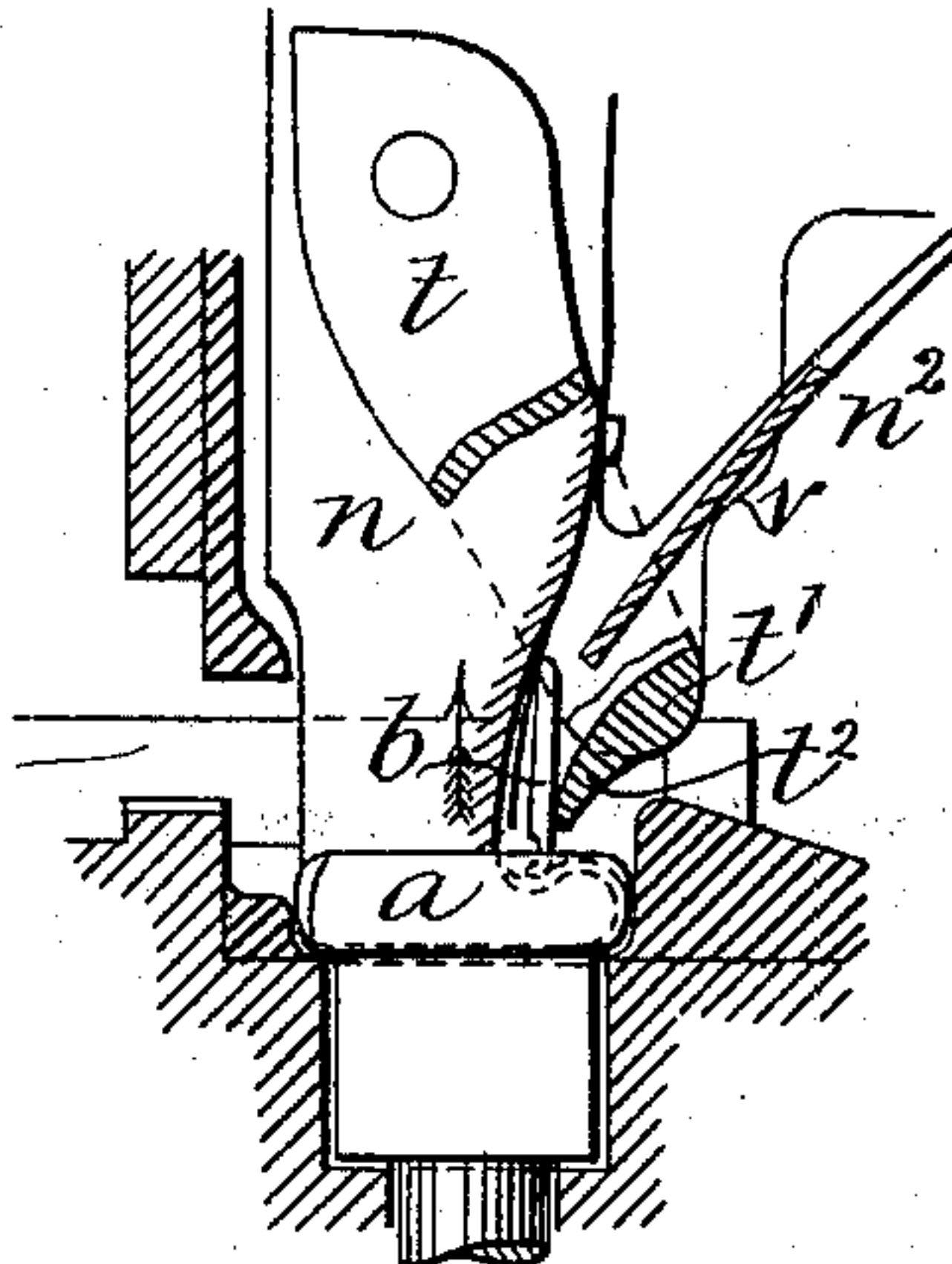


FIG. 13.

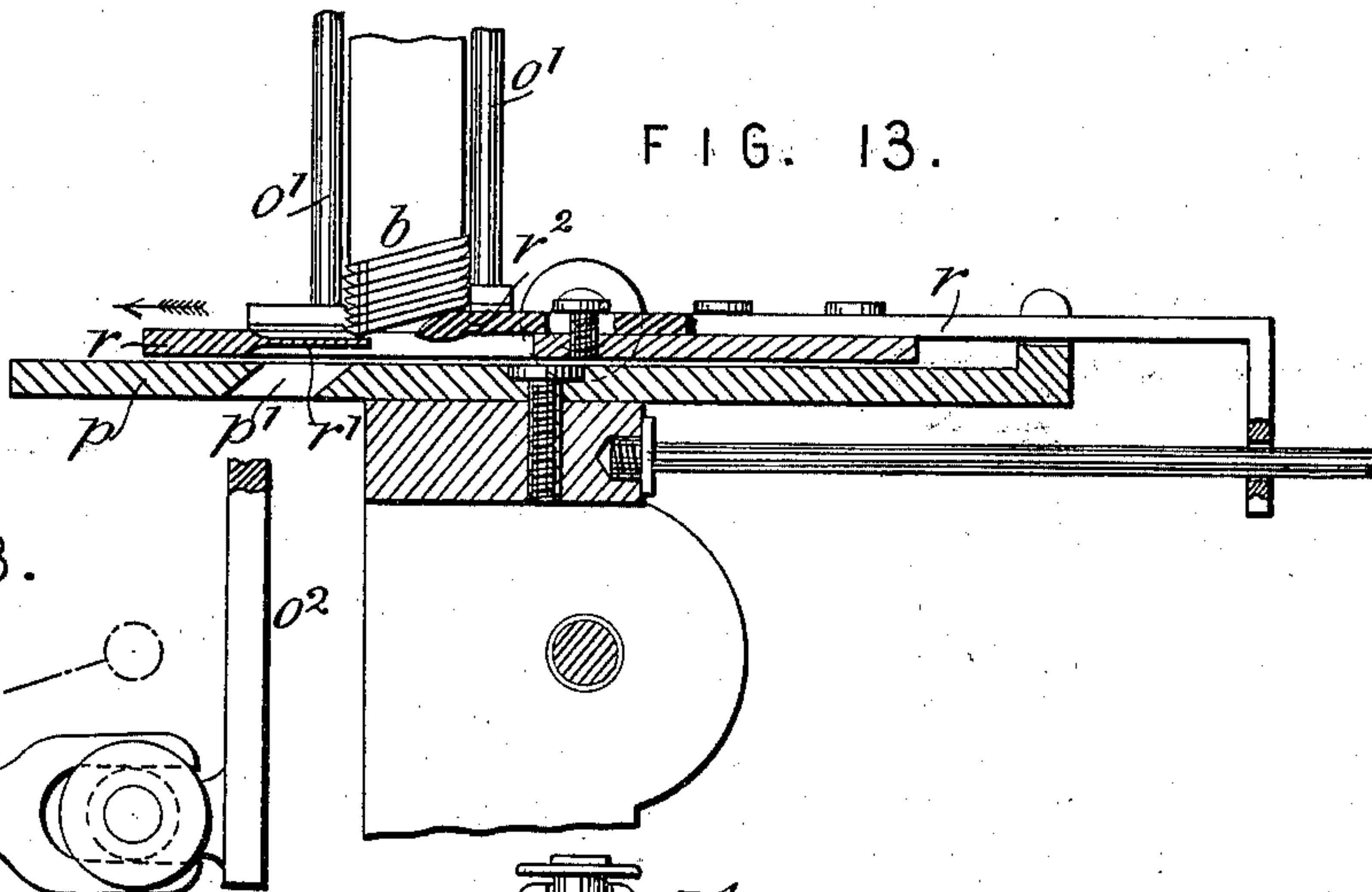


FIG. 23.

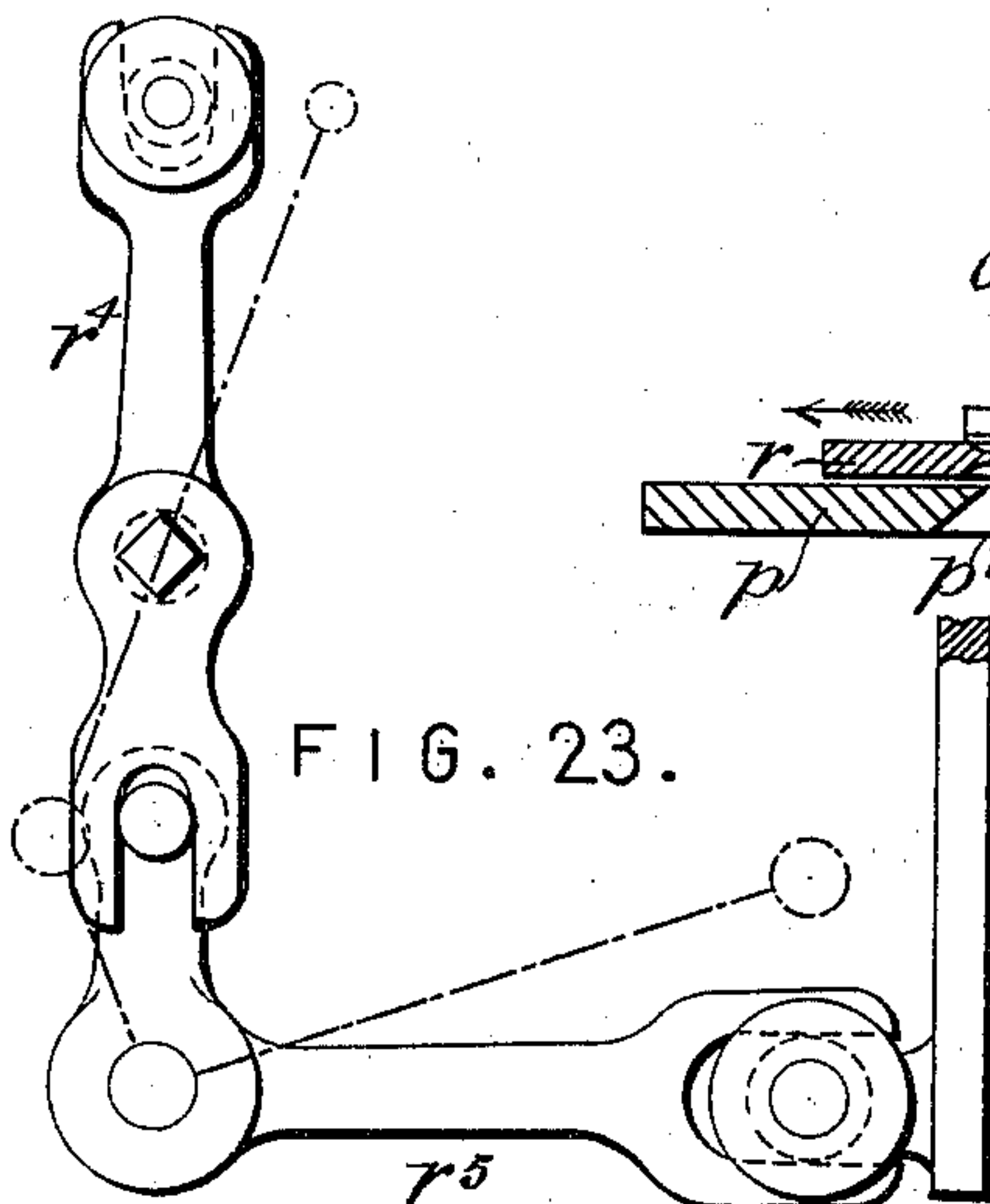
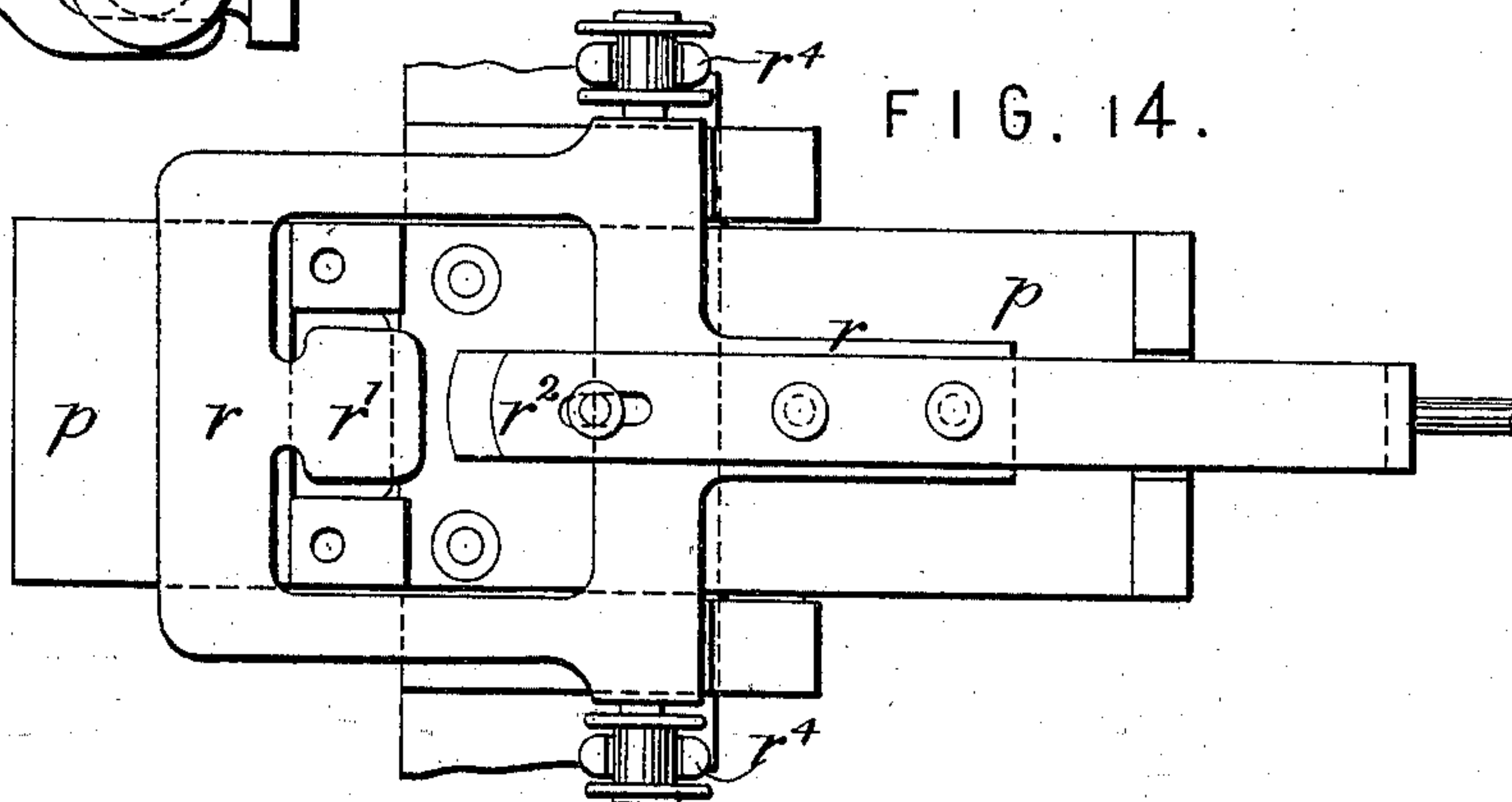


FIG. 14.



Witnesses
[Signature]
[Signature]

Inventor
Tito L. Carbone
By *[Signature]*
James L. Norrie

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Patented May 30, 1899.

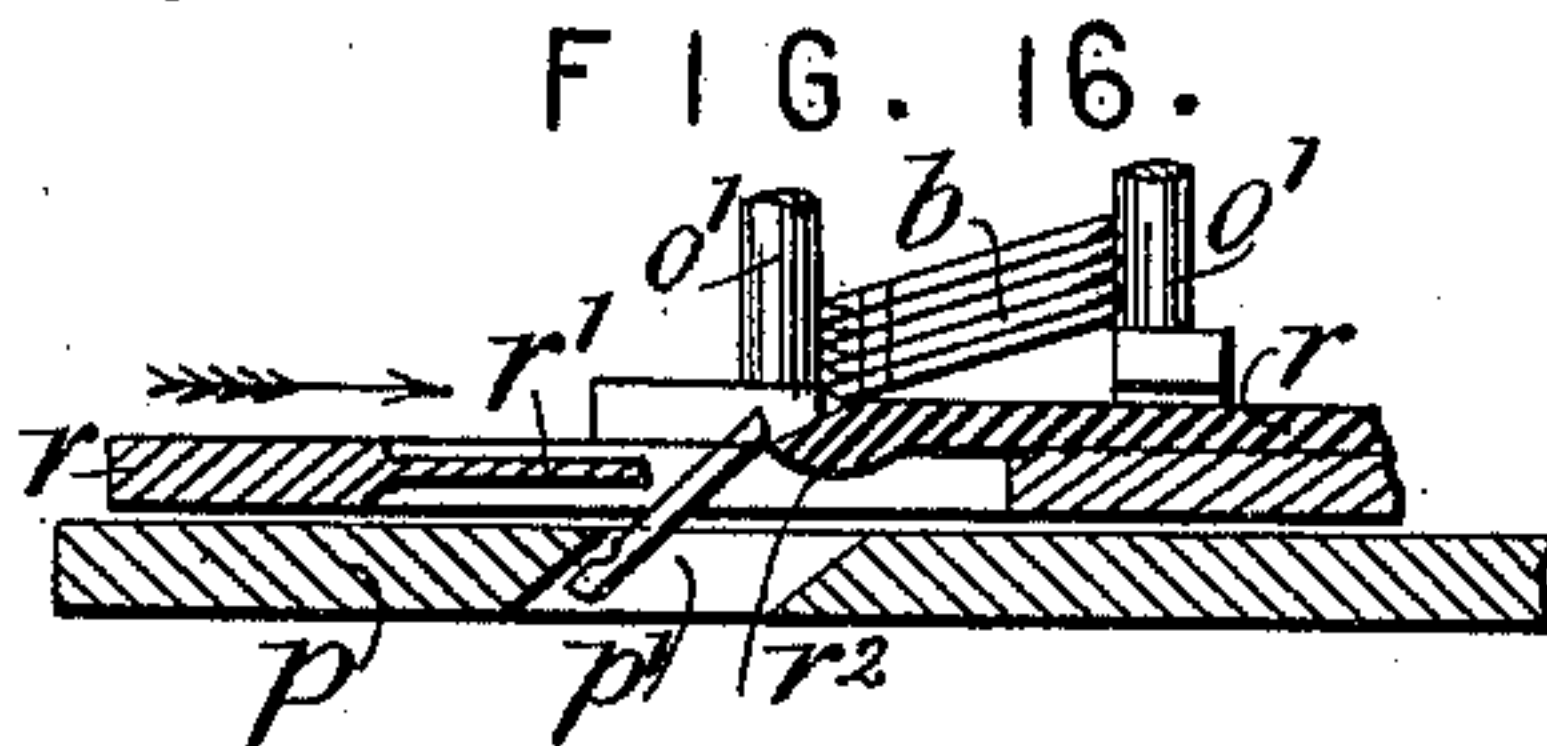
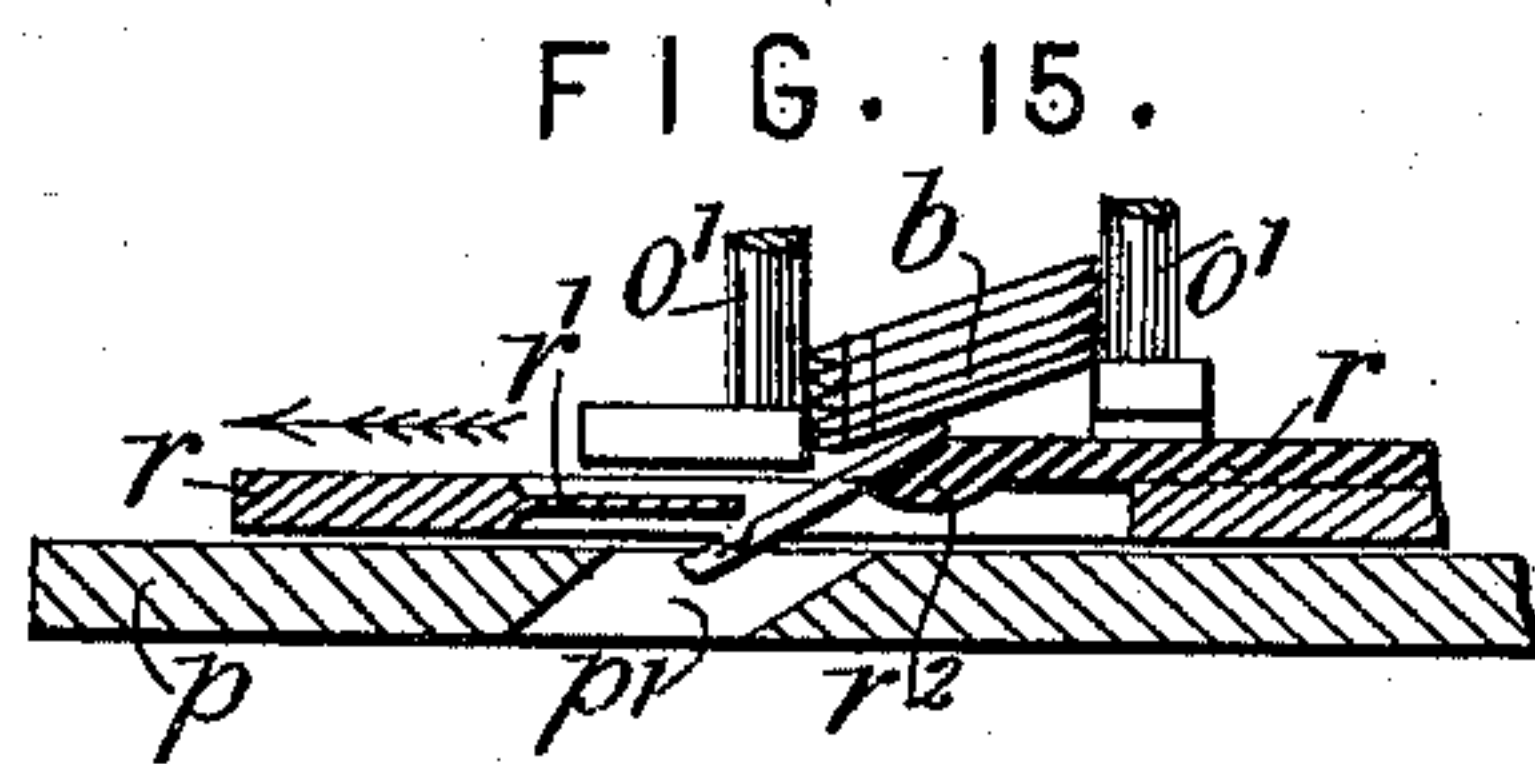
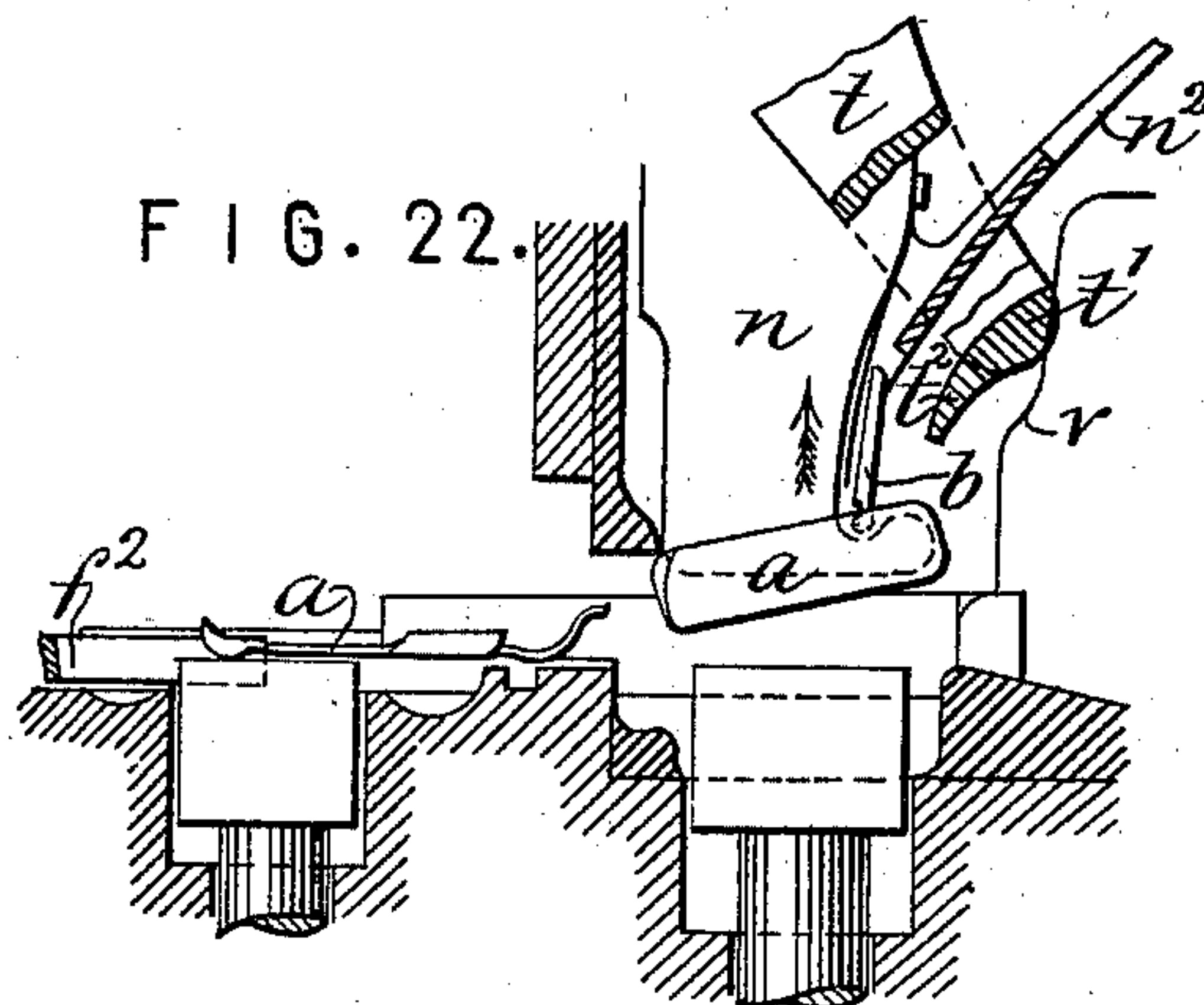
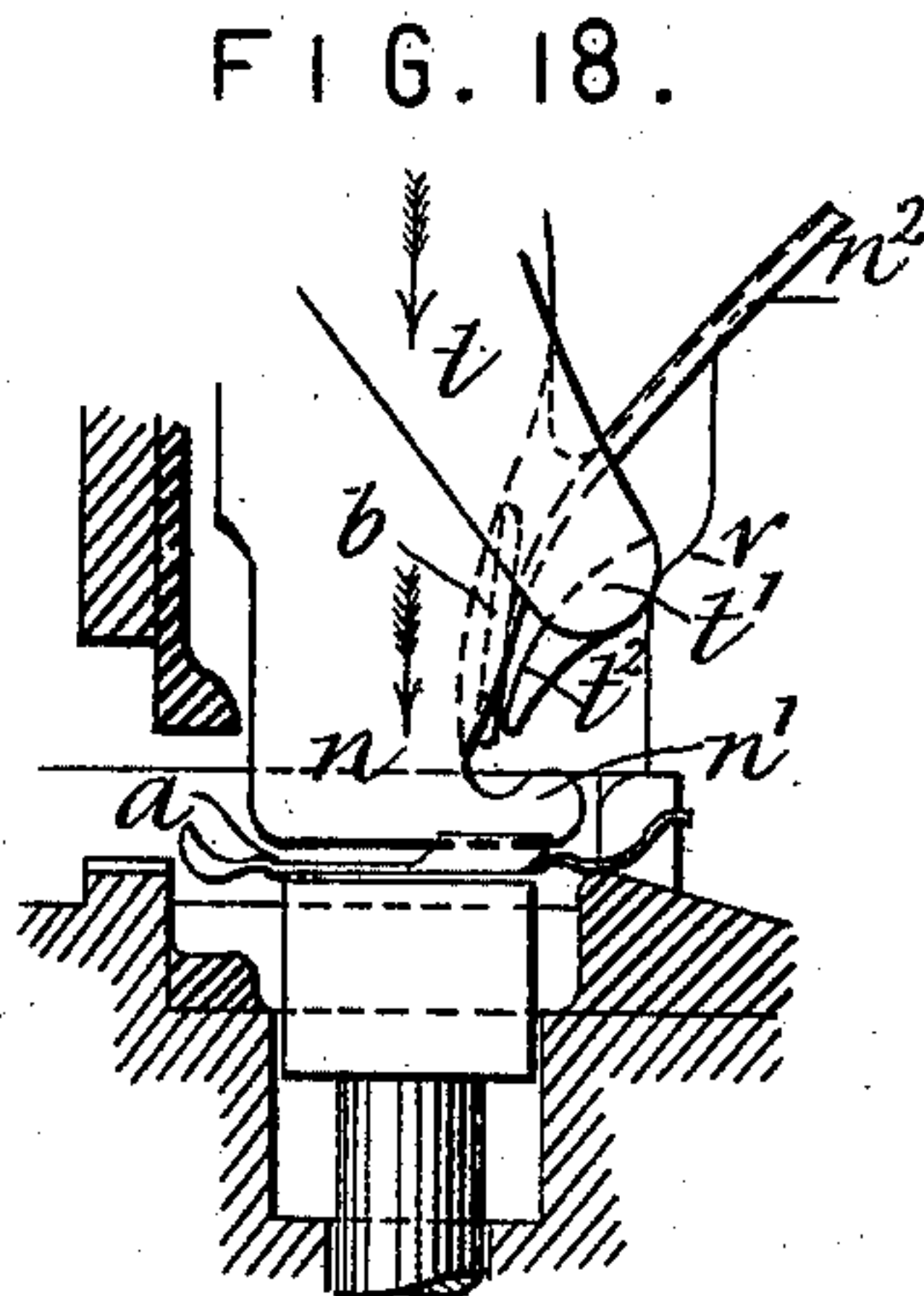
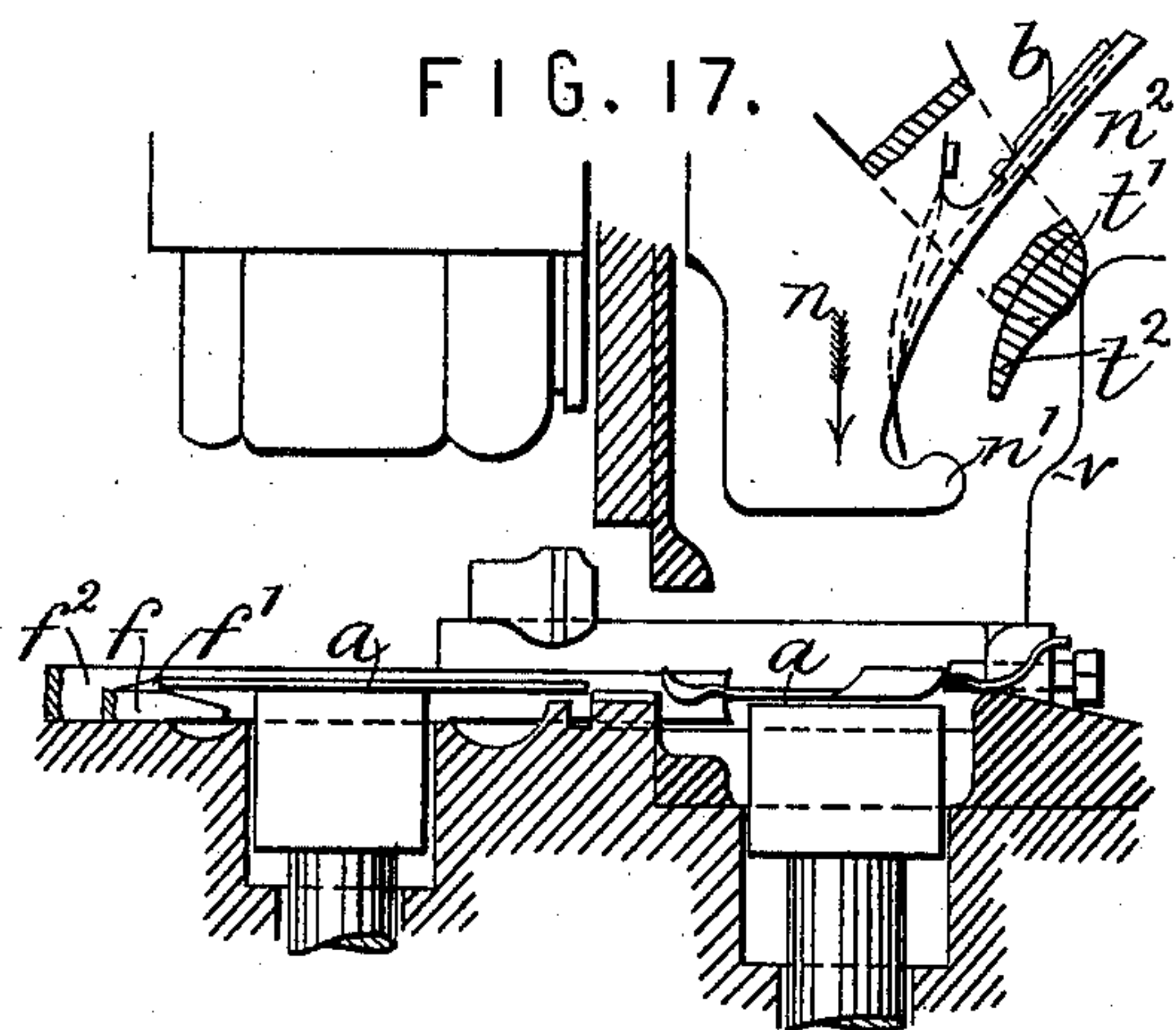
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(Application filed Apr. 16, 1898.)

(No Model.)

8 Sheets—Sheet 6.



Witnesses
J. B. Keefe
R. Coombes

Inventor
Tito L. Carbone
By
James L. Norris
Attorney

No. 625,872.

Patented May 30, 1899.

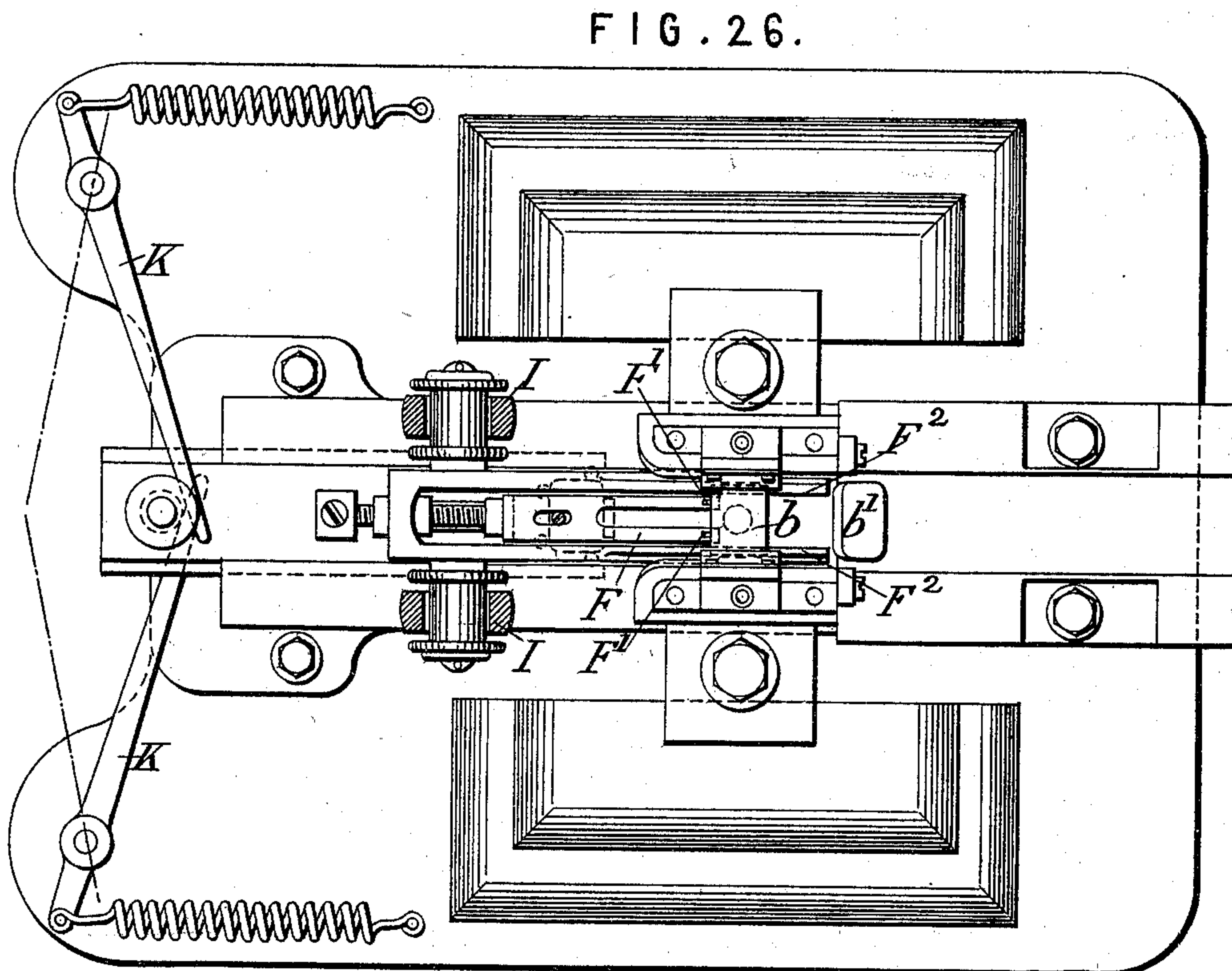
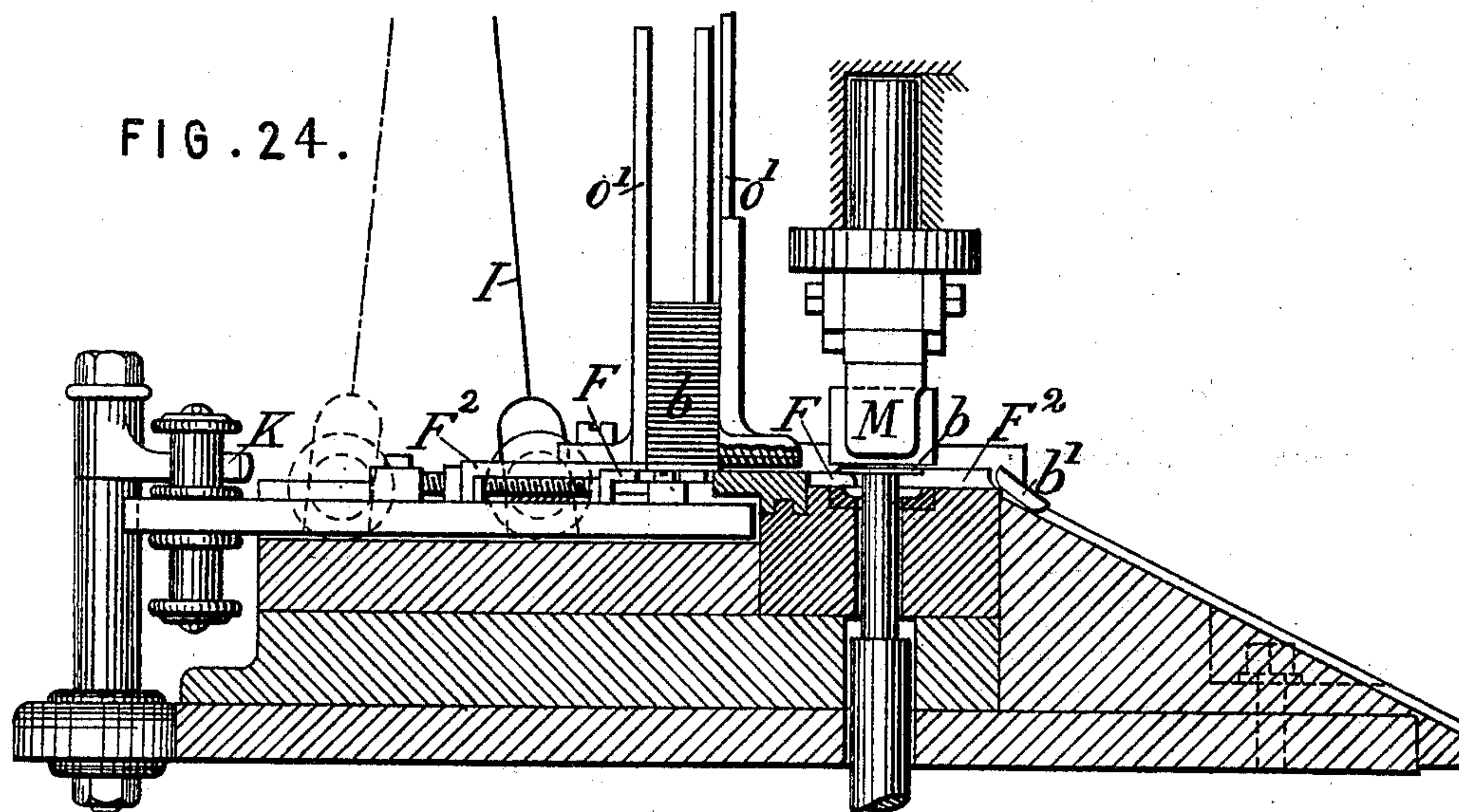
T. L. CARBONE.

APPARATUS FOR MAKING SHEET METAL BOXES.

(Application filed Apr. 18, 1898.)

(No Model.)

8 Sheets—Sheet 7.



Witnesses

~~Subscribed~~
~~W. Cornish~~

Inventor

Tito L. Carbone

3

James L. Norris.

No. 625,872.

Patented May 30, 1899.

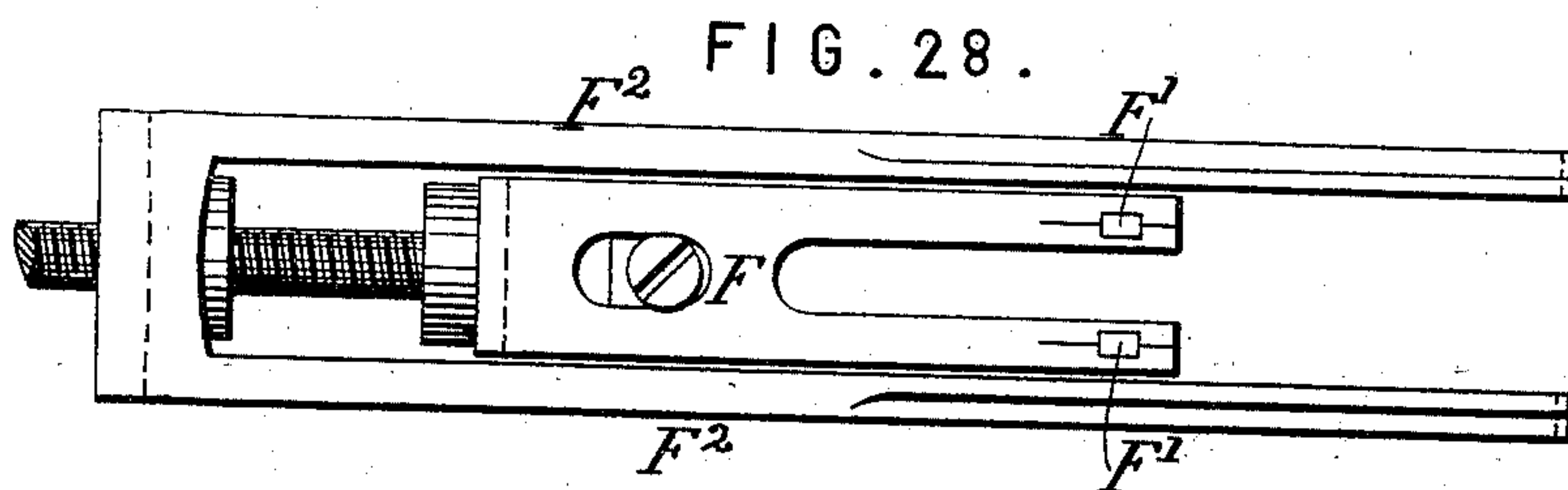
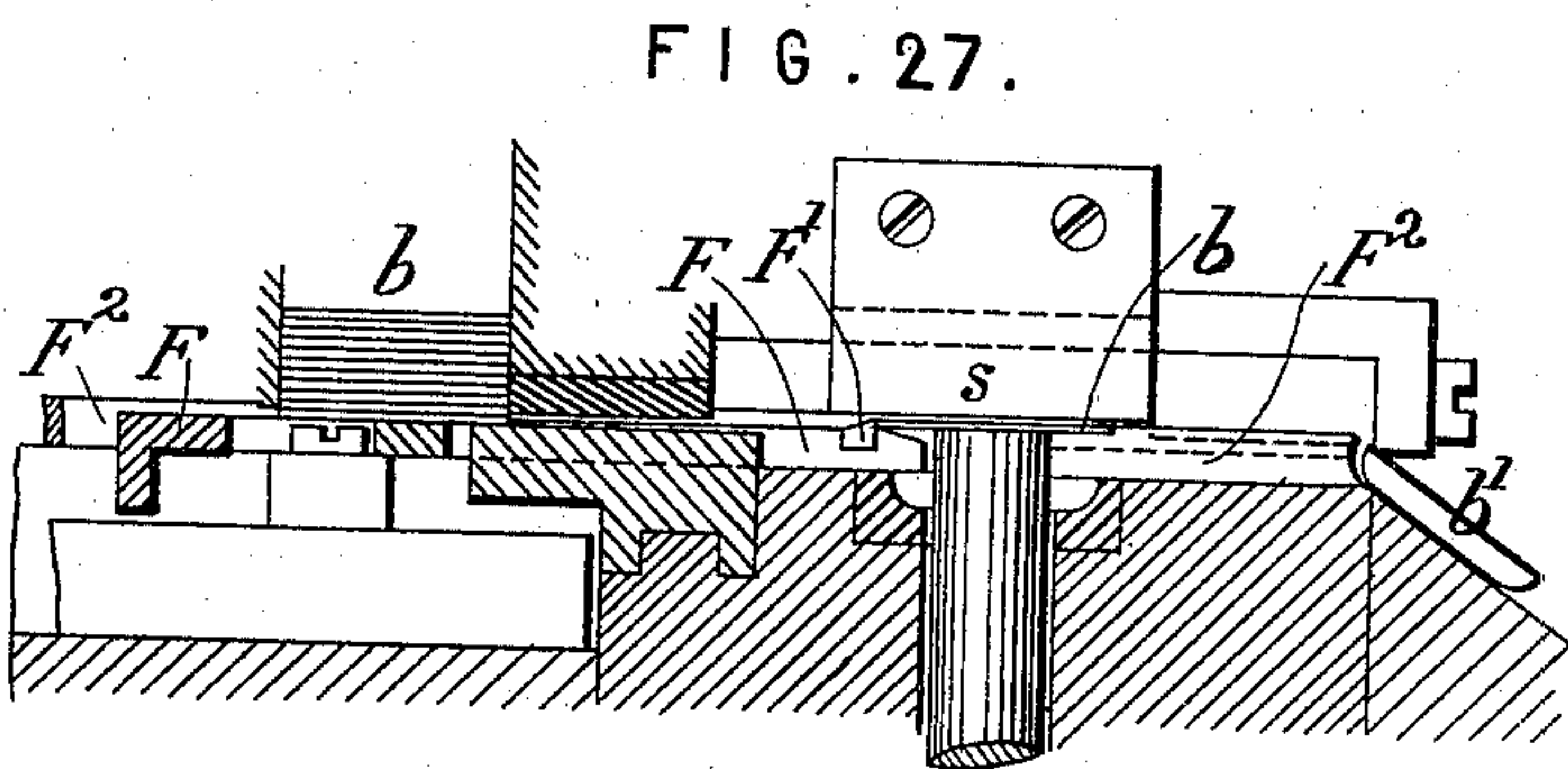
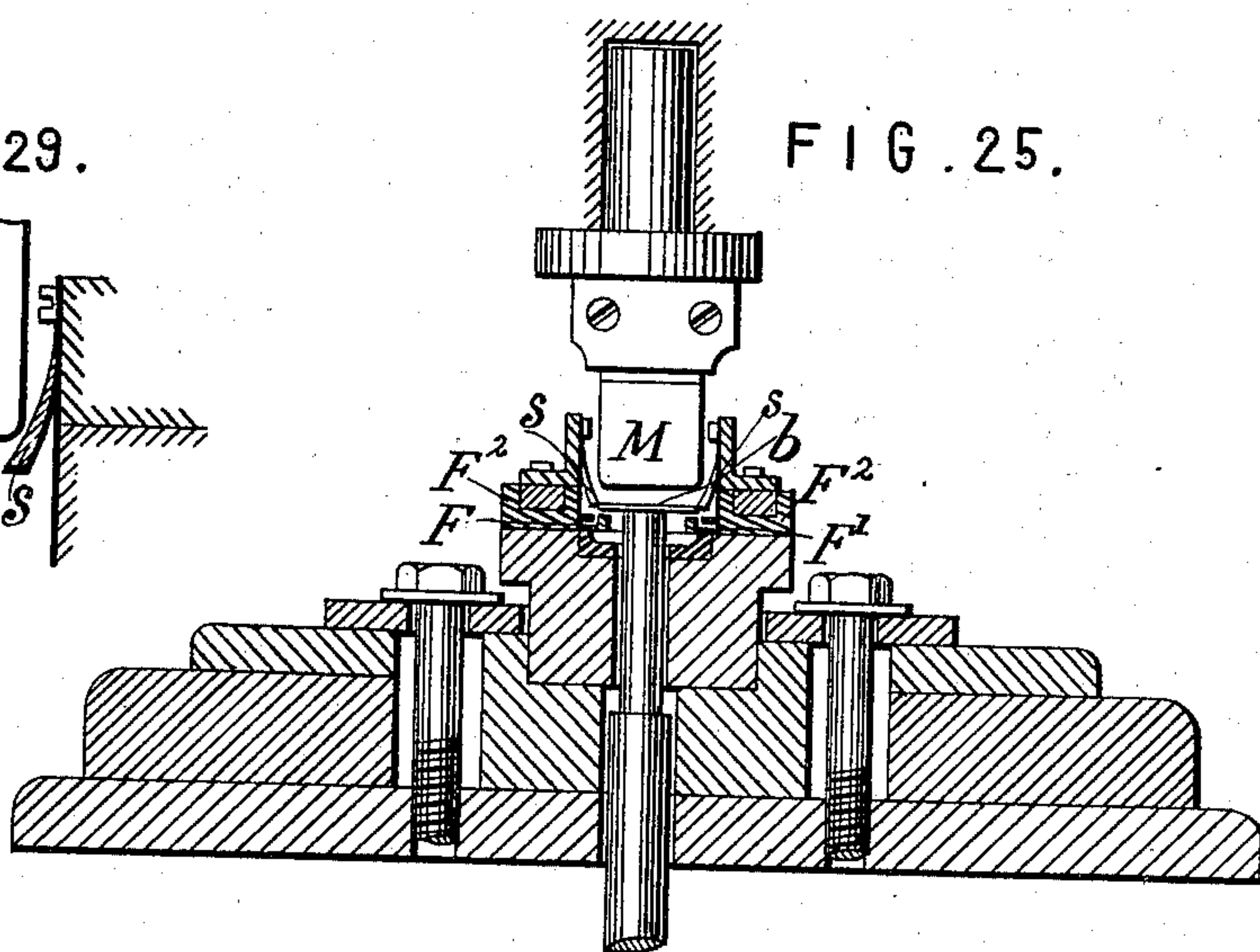
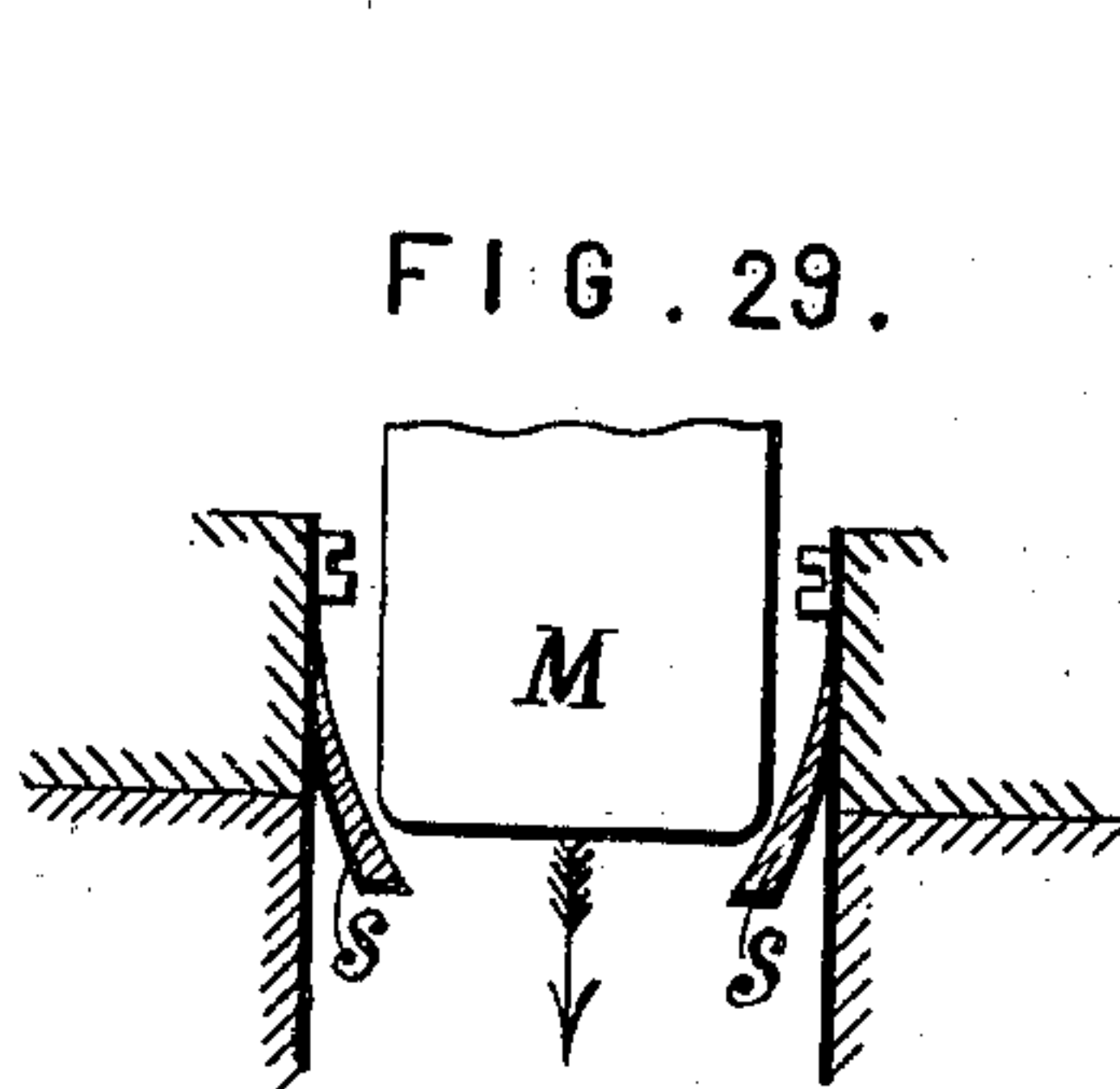
T. L. CARBONE.

APPARATUS FOR MAKING SHEET METAL BOXES.

(Application filed Apr. 16, 1898.)

(No Model.)

8 Sheets—Sheet 8.



Witnesses

J. B. Stead
R. Coombes

Inventor

Tito L. Carbone

By

James L. Norris

Att'y

UNITED STATES PATENT OFFICE.

TITO L. CARBONE, OF MONTEVIDEO, URUGUAY.

APPARATUS FOR MAKING SHEET-METAL BOXES.

SPECIFICATION forming part of Letters Patent No. 625,872, dated May 30, 1899.

Application filed April 16, 1898. Serial No. 677,860. (No model.)

To all whom it may concern:

Be it known that I, TITO LIVIO CARBONE, a citizen of Italy, residing at No. 343 Calle Sarandi, Montevideo, in the Republic of Uruguay, have invented a certain new and useful Apparatus for Making Sheet-Metal Boxes, of which the following is a specification.

In the English Patent No. 17,329 of 1897 is described the construction of a sheet-metal box having its sides and ends bent up from the base and its lid hinged to it in such a manner as to open and close with a spring, the whole consisting of only two pieces, the box and the lid.

The present invention relates to a machine for making these boxes, as will be described, referring to the accompanying drawings, in which—

Figure 1 shows a plan and an edge view of the blank or piece of metal from which the box-body is shaped. Fig. 2 shows a plan and an edge view of the box-lid, the plan looking at its outside. Fig. 3 shows a plan and an edge view of the box-lid, the plan looking at its inside. Fig. 4 shows a plan and an edge view of the box-body formed or shaped from the blank, Fig. 1, except that the back flap has not been fully curved. Fig. 5 shows a plan and an edge view like Fig. 4, the back flap being fully curved. Fig. 6 shows a plan and an edge view of the box with the box-lid open, prior to bending up the front wall of the box-body. Fig. 7 shows a plan and an edge view of the completed box, the lid being open. Fig. 8 is a part elevation and part section of the press employed for shaping the box and applying the lid. Fig. 9 is a plan of the base of the press, part of which is shown to an enlarged scale in Fig. 10, which is a plan, and in Fig. 11, which is a longitudinal section. Fig. 12 is a front view of the finishing-punch and finger for placing the lid. Fig. 13 is a section, and Fig. 14 is a plan, of the mechanism for feeding the lids to the box-press; and Figs. 15 and 16 are part sections showing this mechanism in successive positions. Figs. 17 to 22, inclusive, are part sections showing successive positions of the parts for applying the lid to the box. Fig. 23 is a side view of the levers for moving the slide for feeding the lids. Figs. 24 and 25 are sections on plans at right angles to each other of the dies for

shaping the lids. Fig. 26 is a plan. Fig. 27 is a part section and Fig. 28 a part plan on an enlarged scale. Fig. 29 is an enlarged view of the punch and springs for detaching the lid.

The apparatus, which will presently be described, is constructed and arranged so as to carry a box and its lid through the successive stages of manufacture shown by Figs. 1 to 7, inclusive. Fig. 1 shows the piece *a* of sheet metal cut out to form the body of the box. Fig. 2 shows the piece *b* for the lid, which is simply dished a little, as shown in Fig. 3. The box-body is also dished, the back flap being curved, as shown in Fig. 4. This flap is bent farther forward, as shown in Fig. 5. The lid is then placed with its edge lying in the groove of the back flap, as shown in Fig. 6, the sides of the box being now turned up. Finally, as shown in Fig. 7, the front of the box is turned up and the two upper lips of the sides are bent over the two tongues of the lids, so as to constitute a spring-hinge.

The shaping of the box-body and the placing of the lid are effected by a press such as is shown in Figs. 8, 9, 10, and 11, the shaping of the lid being effected in a separate press, having dies and feeding mechanism arranged as shown in Figs. 24 to 29, inclusive. Assuming the plate *a* to be cut out and the lids *b* to have been prepared as will hereinafter be described, the plates *a* are piled on the press over one another between columns *e* and the lids *b* are piled between columns *o'*, both sets being ready to be advanced by feeding mechanism.

The feeding mechanism for the plates *a* comprises an eccentric or cam on the fly-wheel shaft of the press, which at every revolution moves to and fro a lever *i*, which terminates in a fork engaging pins *i'* on a sliding frame *f*, having a pair of inclined studs *f'* projecting just the thickness of one of the plates *a*, so that as *f* makes its stroke to the right it pushes the lowest plate *a* to the first die *c*, where on the descent of the punch *m* it receives its first dishing, and on the retreat of the punch it is pushed upward by the bottom of the die, which is urged upward by a spring *g*. At each side of the slide *f* there is a bar *f²*, which is fixed to *f* and moves with it, so that when the dished piece *a* is pushed up out of the die it is advanced by the bars *f²* to

the second die d , when it has to undergo all the subsequent operations on it. The feed-slide f and its side bars f^2 are retracted by spring-lever k . The punch n for the second die is fixed to the same head o as the punch m moving with o . It has at one side a rounded nose n' and has mounted on it a spring-finger t in the form of a yoke, having in its middle a nose t' , which being guided along a cam-guide v operates in conjunction with the nose n' to turn over the rounded back of the box and to secure the lid b in position, these lids being fed in the following manner: An arm o^3 , Fig. 23, attached to the vertically-reciprocating head o , which carries the punches m and n by means of levers r^5 r^4 , gives reciprocating movement to a feed-slide r , Figs. 13, 14, 15, and 16, which slides over a plate p , having through it an inclined slot p' . The slide r has a tongue r' and an adjustable nose r^2 , which as it moves to the left along with the tongue r' pushes the lowest lid b onward, causing it to drop through the slot p' , as shown in Figs. 16 and 17.

Referring now to Figs. 17 to 22, inclusive, the lid b is received on an inclined guide n^2 , down which it descends while the punch n descends, and while the die is bending the back of the box over the nose n' , Fig. 19, the edge of the lid b , guided by the nose t^2 of the pawl t , descends into the groove formed along the front edge of the box-back, Fig. 20. Then by the farther descent of the punch n and box to the position shown in Fig. 21 the box ends, the lips of which had been previously turned vertically upward, are made by the sides of the die to turn upward, and consequently their lips are closed over the tongues of the lid, completing the hinge.

The punch n then rising, the bottom of the die, urged upward by the spring g' , pushes up the completed box a , with its lid b , in upright position, as shown in Fig. 22, and the dished plate for the succeeding box as it is fed forward pushes the finished box off the punch and its nose, so that it drops into a bent tube x , which conducts to a receptacle below.

The separate apparatus for feeding and dishing the lids b (shown in Figs. 24 to 29, inclusive) is similar to that for effecting the

feed and first dishing of the plates a . A feed-slide F , with adjustable sloping projections F' , is moved forward by a forked lever I , worked by a cam or eccentric on the shaft of the press, pushing the lowest of the pile of plates b under the punch M , which descends while the slide F is retracted by spring-levers K . As the punch M rises a pair of springs S holds back the dished lid b' , which at the next advance of the feed-slide is pushed by the side bars F^2 onto an incline, down which it slides. The dished lids are then taken to the press, Fig. 8, where they are piled between the columns o' , as shown in Fig. 13.

I claim in respect of apparatus for making sheet-metal boxes—

1. The combination in a press for making boxes, of two punches, one in advance of the other, a revolving fly-wheel shaft which works the punches, the two dies, arranged one in advance of the other, and coöperating respectively with the two punches to first dish the box-blank by one punch and die and finish the subsequent folding or bending operations by means of the second punch or die, and feed mechanism for successively feeding the box-blanks to the first die and punch, substantially as described.

2. The combination in a press for making boxes, of two punches, one in advance of the other, a revolving fly-wheel shaft which works the punches, the two dies, arranged one in advance of the other, and coöperating respectively with the two punches to first dish the box-blank by one punch and die and finish the subsequent folding or bending operations by means of the second punch or die, feed mechanism for successively feeding the box-blanks to the first die and punch, and box-lid feeding and guiding mechanism for successively feeding the box-lids to the box-bodies which are being operated upon by the second die and punch, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

TITO L. CARBONE.

Witnesses:

OLIVER IMRAY,
JNO. P. M. MILLARD.