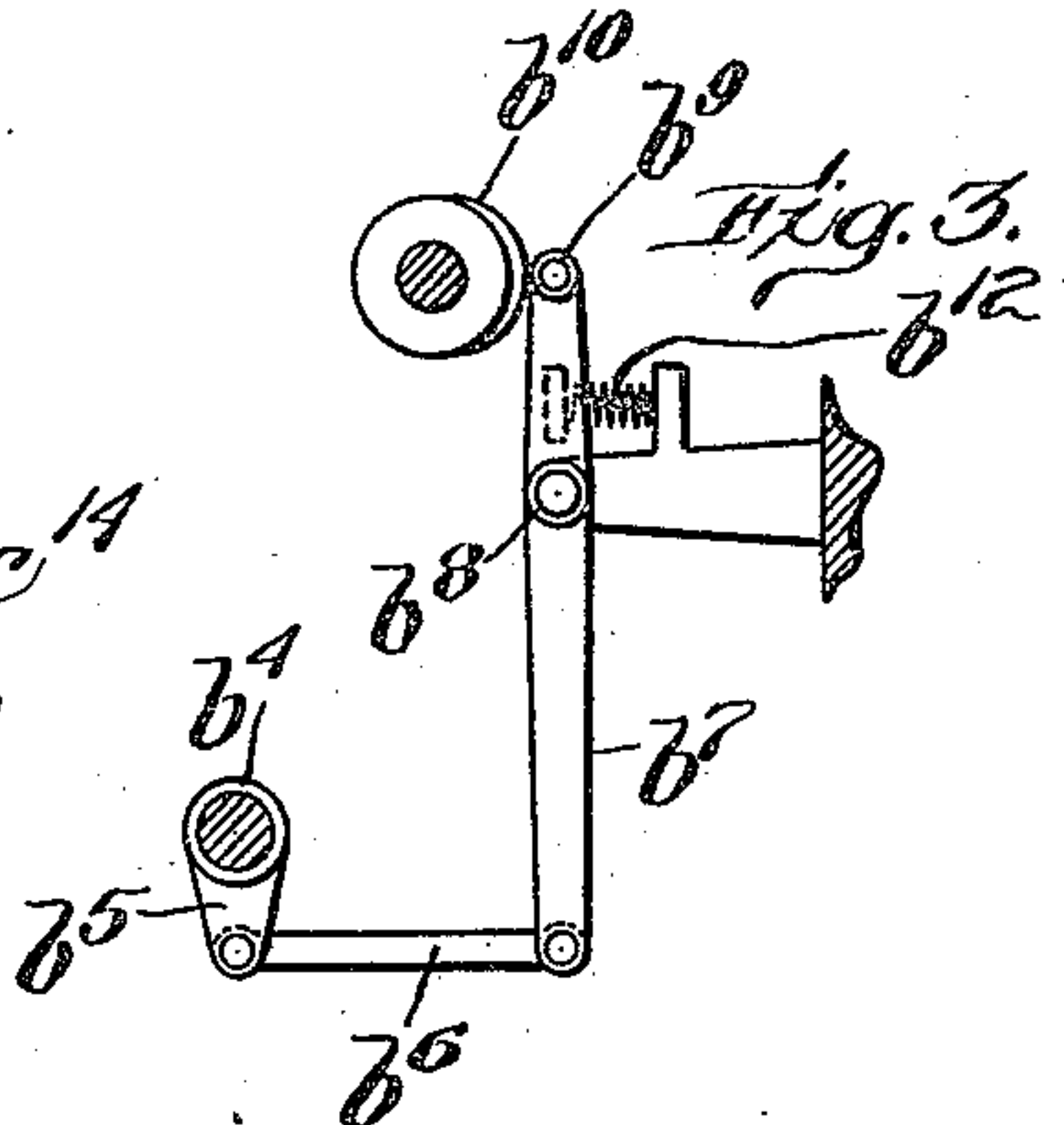
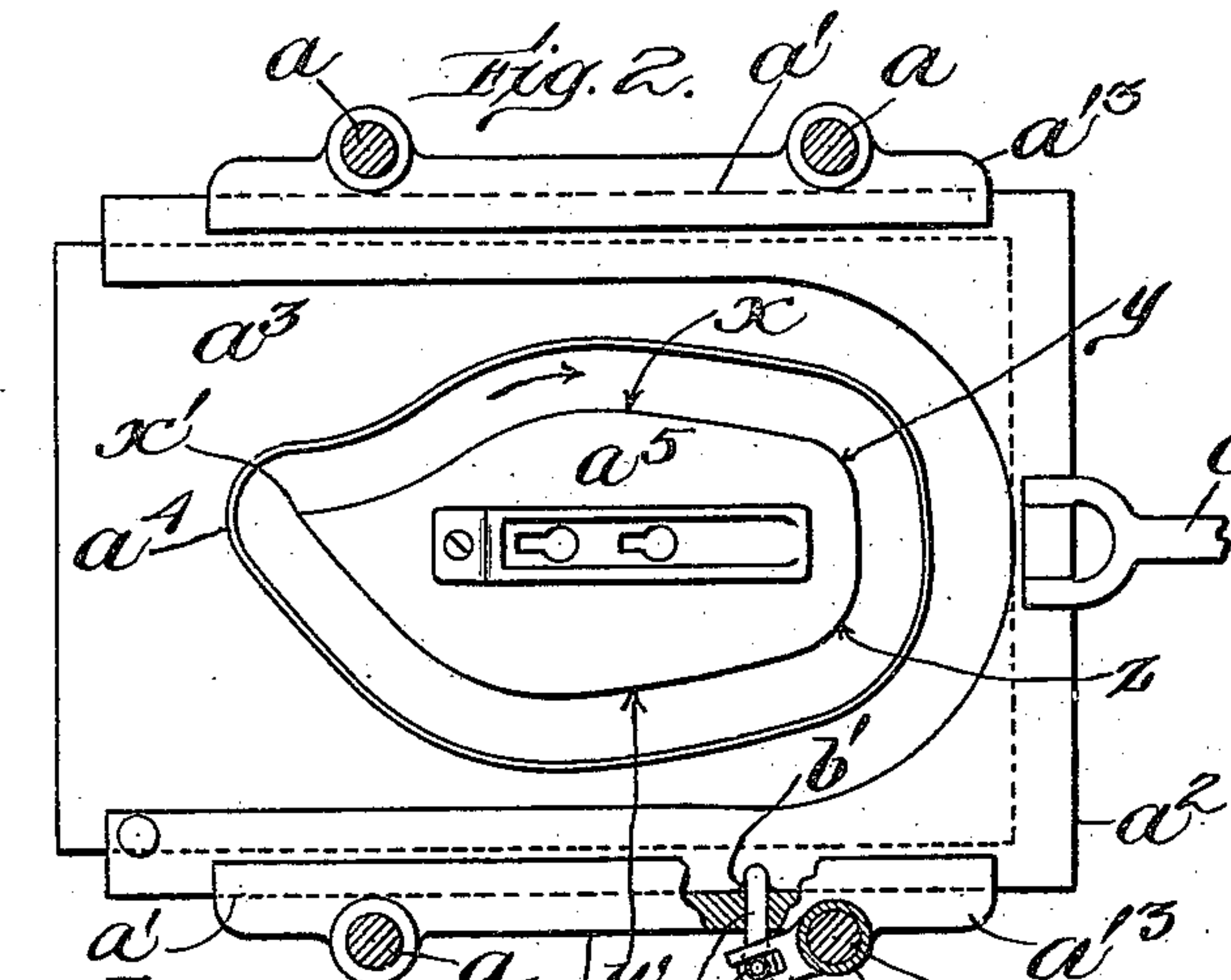
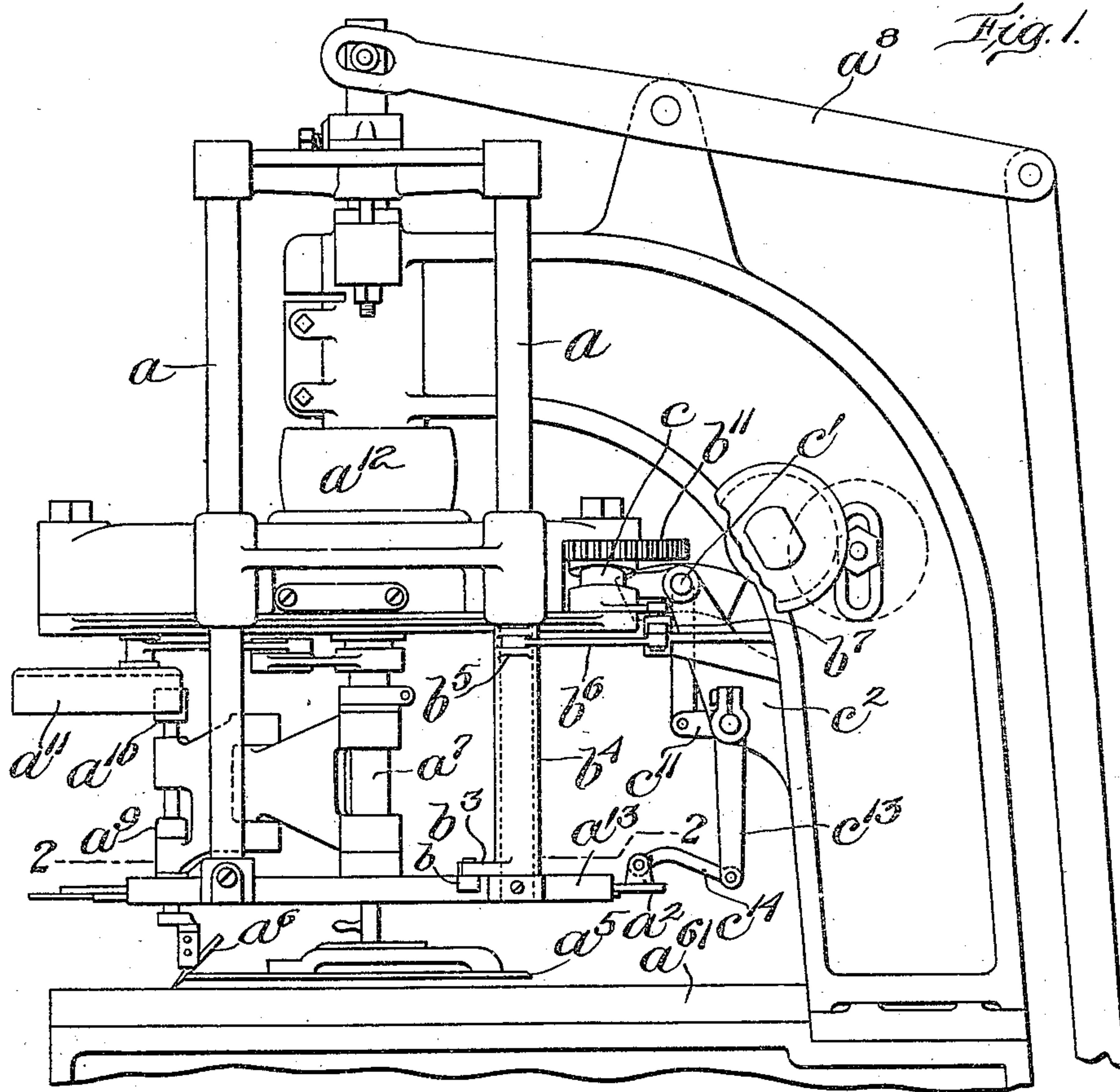


A. M. STICKNEY.
MACHINE FOR CUTTING IRREGULAR FORMS.
APPLICATION FILED MAR. 24, 1910.

961,907.

Patented June 21, 1910.

2 SHEETS—SHEET 1.



Witnesses:
Arthur T. Randall
Hatharine A. Dugan

Inventor:
Allison M. Stickney,
by George A. Rockwell,
att'y.

961,907.

2 SHEETS--SHEET 2.

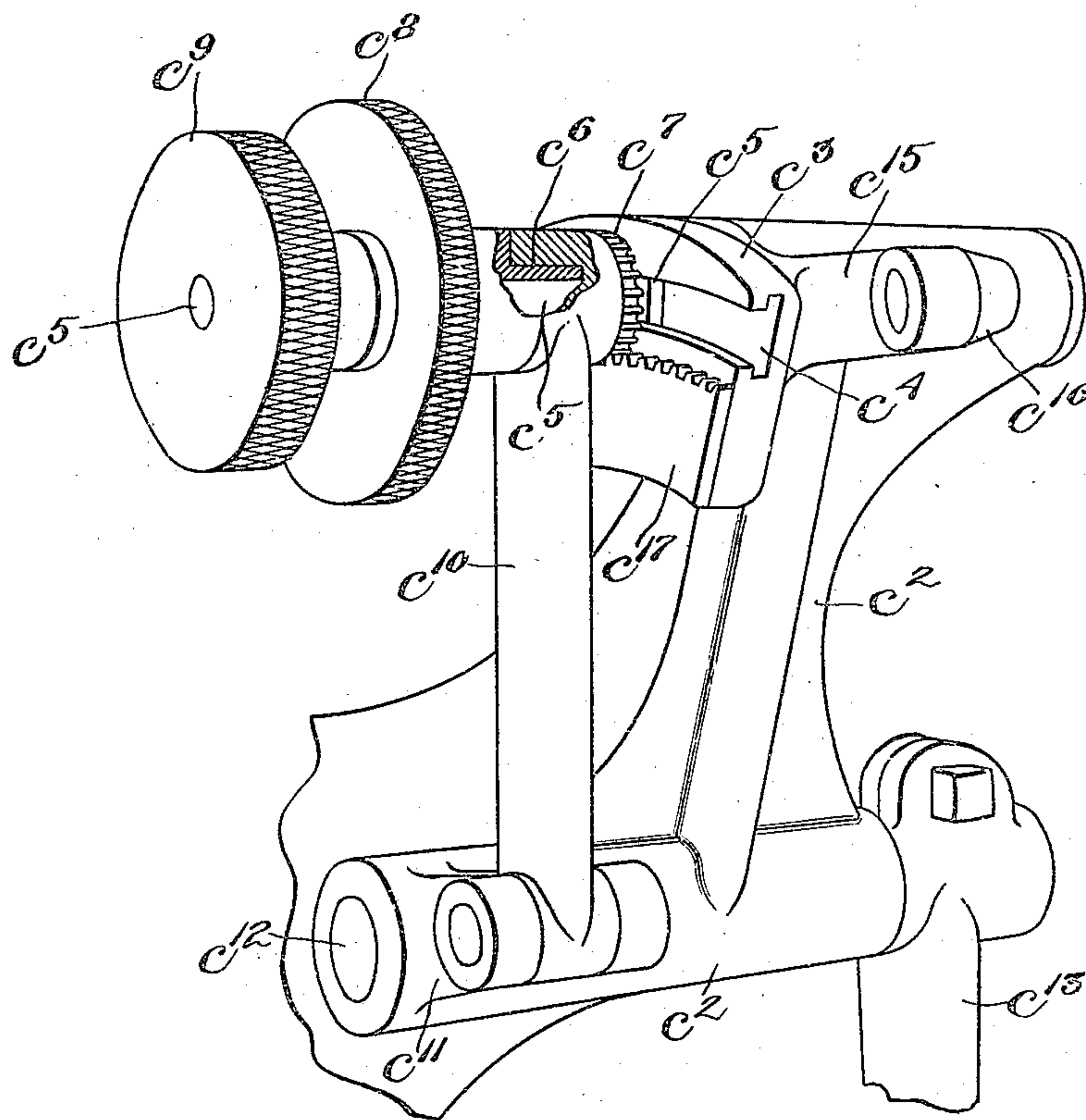


Fig. 4.

Witnesses:
Arthur F. Randall.
Katherine A. Dugan.

Inventor:
Allison M. Stickney,
By George A. Rockwell,
Atty.

UNITED STATES PATENT OFFICE.

ALLISON M. STICKNEY, OF MEDFORD, MASSACHUSETTS, ASSIGNOR TO WELLMAN COMPANY, OF MEDFORD, MASSACHUSETTS, A CORPORATION OF MAINE.

MACHINE FOR CUTTING IRREGULAR FORMS.

961,907.

Specification of Letters Patent. Patented June 21, 1910.

Application filed March 24, 1910. Serial No. 551,392.

To all whom it may concern:

Be it known that I, ALLISON M. STICKNEY, of Medford, in the county of Middlesex and State of Massachusetts, have invented a new and Improved Machine for Cutting Irregular Forms, of which the following is a specification.

My invention relates to the class of machines in which a leader is used to guide the knife carrier, one form of that class being shown in my Patent No. 647,888, dated April 17, 1900.

In using machines of this class it sometimes happens that an abrupt change of direction is to be made at one or more points of the travel of the leader. At such times lost motion or the shaking of the machine or other causes may give slight, but undesirable, movement of the leader with consequent defective cutting of the material.

It is the main object of my invention to overcome this defect and my invention consists mainly in means which are independent of the leader operating means for holding the leader immovable during a part of the travel of the knife.

Other features of my invention will be pointed out below.

In the drawings Figure 1 is a partial elevation of a machine embodying my invention; Fig. 2 is a partial plan on line 2—2 of Fig. 1; Fig. 3 is a detail of the bolt-operating devices; Fig. 4 is a perspective view of the devices for regulating the movements of the leader.

The frame of the machine comprises four vertical rods a which at their lower ends have secured to them the ways a' a' which support the slide a^2 . To the slide a^2 is fastened in the usual manner a leader a^3 whose flanged opening a^4 coöperates with the knife form a^5 in guiding the knife a^6 throughout the circuit of its travel. The form a^5 acts as a presser foot to hold the work firmly on the table a^{61} said form being secured to the lower end of a stem a^7 which is raised and lowered at the proper times by means of a lever a^8 . The knife a^6 is on a knife-carrier a^9 that is provided with a roll a^{10} projecting into a slotted arm a^{11} which is swung around the axis of the rod a^7 by the usual devices which are operated by means of a belt engaging the pulley a^{12} .

When a tap is being cut from stock of the same size as that for which the opening a^4

is designed then the leader and its slide are held stationary while the knife travels around its circuit. When, however, it is desired to cut a tap larger than that for which the leader-opening a^4 is designed then as the knife travels in the direction of the arrow (Fig. 2) from the point marked x to the point marked y the leader and its slide are shifted toward the right and thereafter while the knife is passing from the point marked z to the point marked w the leader and its slide are shifted back to the left to their first position again. Throughout the remainder of the operation the leader and its slide are held stationary.

When a tap is to be cut which is smaller than that for which the leader opening a^4 is designed then the leader and its slide are shifted toward the left as the knife passes from the point marked x to the point marked y and to the right as the knife passes from the point marked z to the point marked w . It will thus be seen that the leader is designed for a middle or intermediate size and is used to cut either larger or smaller taps, a different form a^5 being used for each size that is cut.

The form a^5 is of the same size and shape as the tap that is cut and as will be seen from Fig. 2 there may be a sharp point x' around which the knife swings and abruptly changes its direction of movement and it is highly desirable that the knife negotiate this part of the operation properly that the leader a^3 be held rigidly immovable since any slight movement or play due for instance to lost motion between the parts of the mechanism which operates and controls the leader even though very slight would greatly deflect the knife and cause defective cutting of the tap at that point sometimes producing a somewhat circular enlargement or other defect at the point. Therefore I have by my present invention provided automatic means to lock the leader and its slide rigidly and immovably to the bars a^{13} forming part of the frame of the machine and in which the ways a' are formed. This means comprises a bolt b mounted in one of the bars a^{13} and co-operating at its inner end with a socket b' formed in the leader slide a^2 . At its outer end the bolt b carries a roll or stud b^2 engaged by a slotted arm b^3 projecting from a sleeve b^4 rotatably mounted upon one of the rods a . At its upper end the sleeve b^4 is

made with an arm b^5 connected by a link b^6 to one end of a lever b^7 fulcrumed at b^8 upon the frame of the machine. The other arm of lever b^7 carries a roll b^9 cooperating with a cam projection b^{10} formed on the hub of a gear b^{11} . This hub is also formed with a cam groove c which actuates the devices by means of which the back and forth movements of the leader and its slide are effected, the gear b^{11} being connected with, and driven by, the pulley a^{12} to the usual mechanism such as is shown in Patent No. 647,888 above noted and corresponds to the gear c^2 of that patent.

During the operation of the machine and when enlarging or reducing from the leader a^3 the cam c acts to shift the leader in its ways a' as above described and to hold the leader stationary while the knife is passing around that part of the tap being cut to the left of the points x and w with the socket b' directly opposite the end of bolt b' which is held retracted of course during the movements of the slide a^2 . As the knife approaches the point x' the cam b^{10} acts through lever b^7 , link b^6 , arm b^5 , sleeve b^4 and arm b^3 to shove the bolt b inwardly into the socket b' and to hold it there until after the knife has passed around and left the point x' . As soon as the cam b^{10} passes away from the roll b^9 a spring b^{12} acting on lever b^7 withdraws the bolt b from the socket b' leaving the slide free. It will thus be seen that while the point x' on the tap is being cut the slide and leader are rigidly and immovably locked directly to the bars a^{13} of the frame of the machine so that lost motion between the parts connecting the slide a^2 and the cam c can not produce irregularities in the tap being cut. In other words the slide and leader are locked against any play or movement whatever from any cause and a perfect point x' will be made on the tap.

The means for actuating the slide a^2 includes a shaft c' journaled in a bracket c^2 fixed to the frame of the machine and to this shaft is rigidly fixed a rocker c^3 made with a slot c^4 within which is arranged the head of a bolt c^5 . This bolt extends through a sleeve c^6 carrying at one end a pinion c^7 and at its other end a hand-wheel c^8 and at its outer end is threaded to receive upon it a nut c^9 .

The sleeve c^6 is journaled in a bearing at the upper end of a link c^{10} which is pivotally connected at its lower end with an arm c^{11} fixed to a shaft c^{12} journaled on the bracket c^2 . The shaft c^{12} also has fixed to it a depending arm c^{13} connected at its lower end with the slide a^2 by a link c^{14} . The rocker c^3 is made with an arm c^{15} carrying a cam roll c^{16} which is engaged by the cam groove c . For each cycle of the machine the

gear b^{11} is rotated once and the cam c acts to vibrate the rocker c^3 and if the axis of the bolt c^5 is opposite the axis of the shaft c' then there will be no movement to the link c^{10} and the parts which connect said link with the slide a^2 and therefore the slide and leader will be held stationary throughout the operation of the machine which would be appropriate to the cutting of a tap of the same size for which the leader a^3 was designed.

When the leader is being used to cut taps longer than the size for which it was designed then the bolt c^5 is shifted in the slot c^4 away from the shaft c' a distance appropriate to the desired size and toward the right in Fig. 1. In reducing, that is, in cutting a tap of a size smaller than that for which the leader a^3 was designed then the bolt c^5 will be shifted along slot c^4 toward the left in Fig. 1. The adjustment of the bolt c^5 along the slot c^4 is effected by rotating the wheel c^8 , the pinion c^7 meshing with a rack c^{17} fixed to rocker c^3 and serving to force the bolt along said slot one way or the other. After adjusting the bolt c^5 it is locked in position by setting up the nut c^9 which causes the pinion c^7 and the head of bolt c^5 to tightly grip the flanges bordering slot c^4 .

What I claim is:

1. A machine for cutting irregular forms comprising a leader; means to operate it; a knife guided by the leader; and means independent of the leader operating means to hold the leader immovable during a part of the travel of the knife.

2. A machine for cutting irregular forms comprising a leader; means to operate it; a knife guided by the leader; and automatic means independent of the leader operating means to hold the leader immovable during a part of the travel of the knife.

3. A machine for cutting irregular forms comprising a frame; a leader mounted on the frame; means to operate the leader; and means to lock the leader to the frame while the leader is held stationary by its operating means.

4. A machine for cutting irregular forms comprising a frame; a leader-carrying slide movably mounted on the frame; a movable locking member mounted on the frame and adapted to directly engage the leader-carrying slide and lock it rigidly to the frame; means to operate the leader-carrying slide; and means to operate the locking member so as to cause it to engage the slide while the latter is held at rest by its operating means.

ALLISON M. STICKNEY.

Witnesses:

GRACE W. JENNINGS,
ARTHUR F. RANDALL.