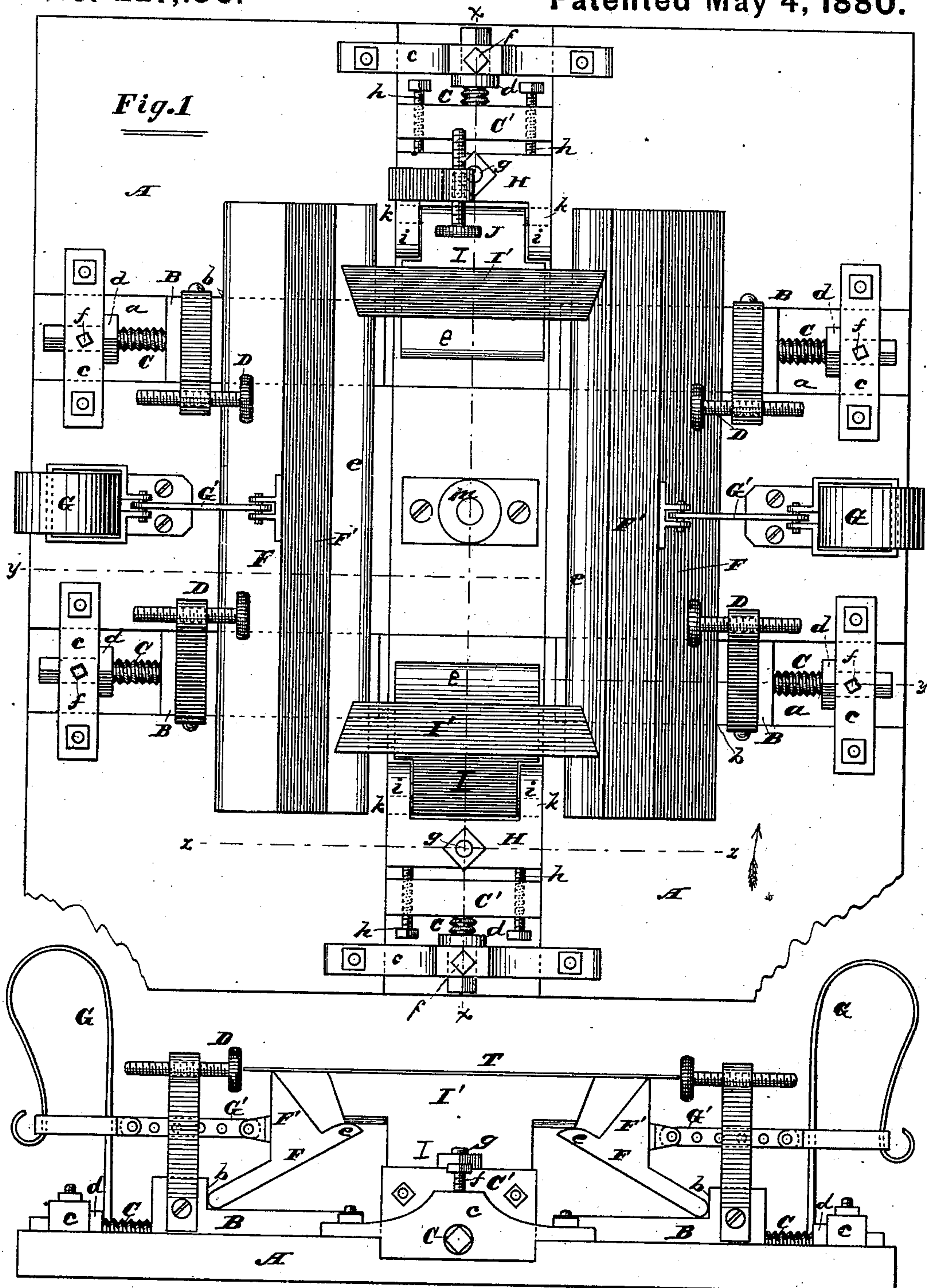


U. D. ALEXANDER.
Machine for Making Sheet-Metal Pans.

No. 227,196.

Patented May 4, 1880.



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W. L. Baker
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Fig. 2

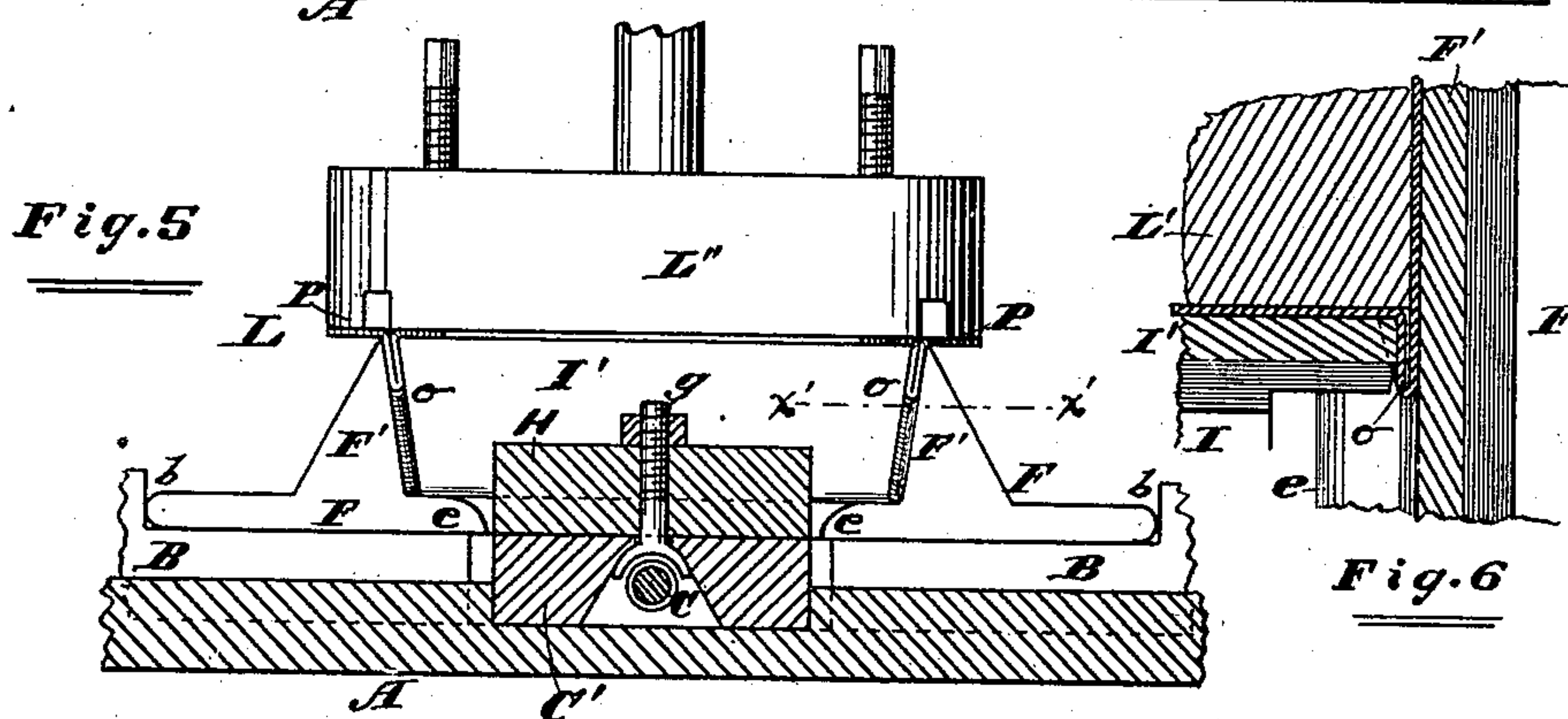
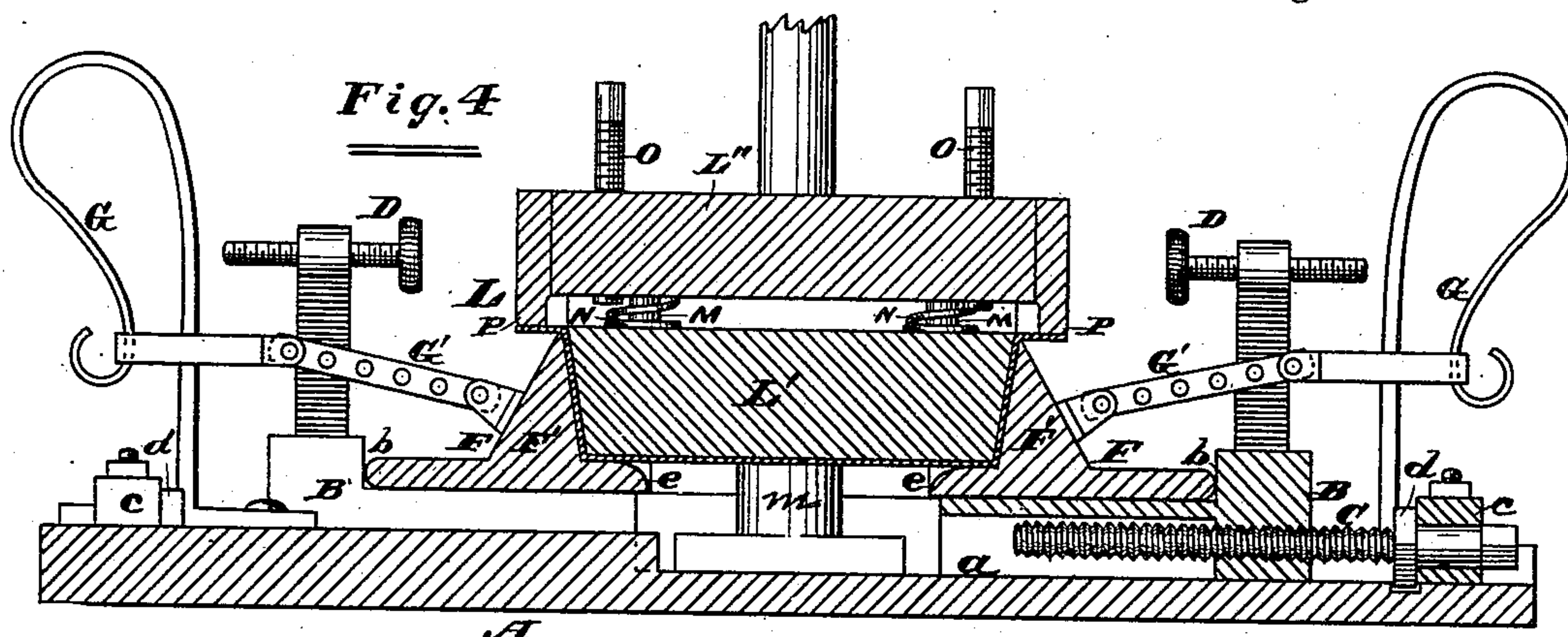
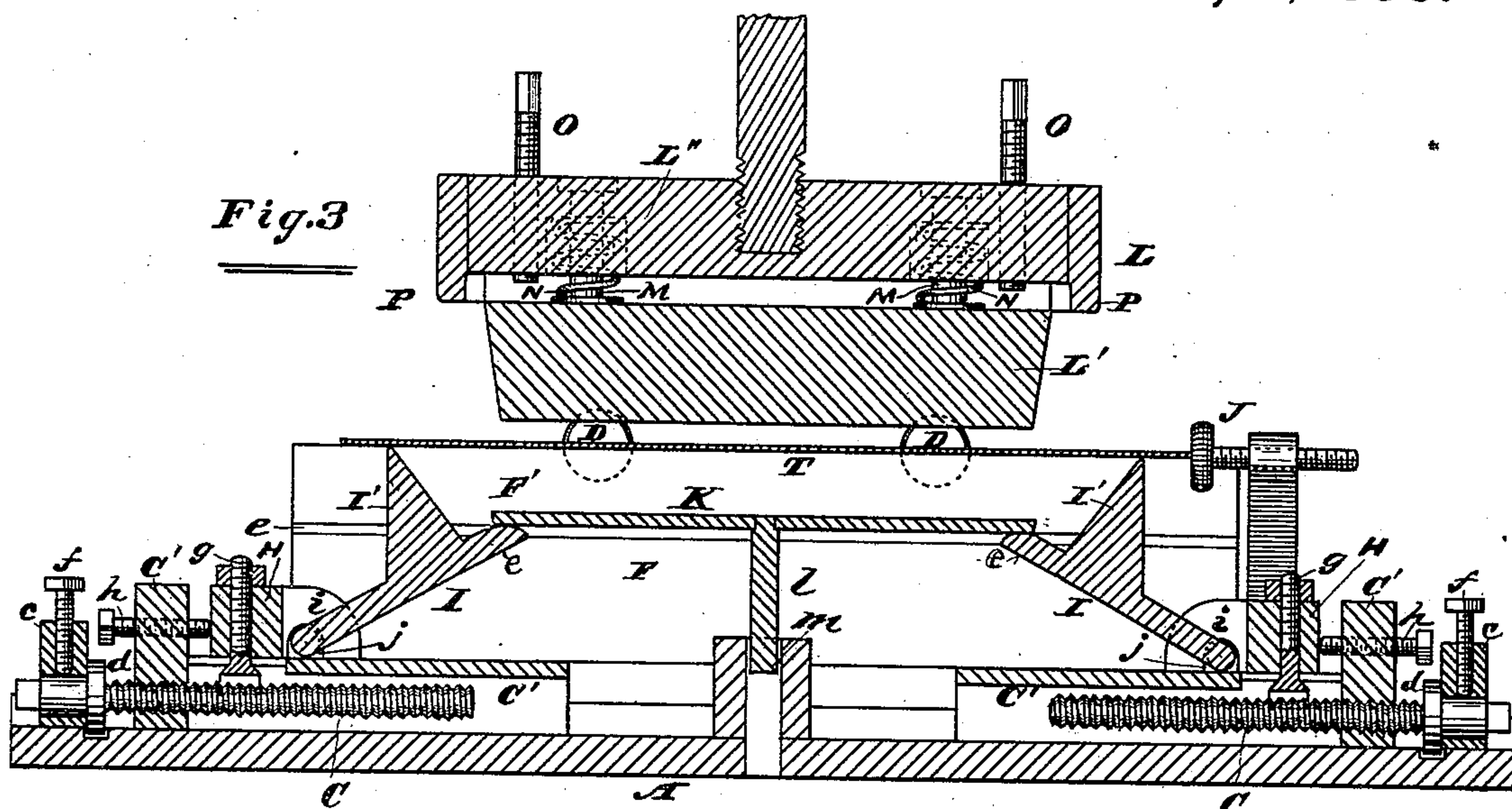
INVENTOR:

Urbana D. Alexander
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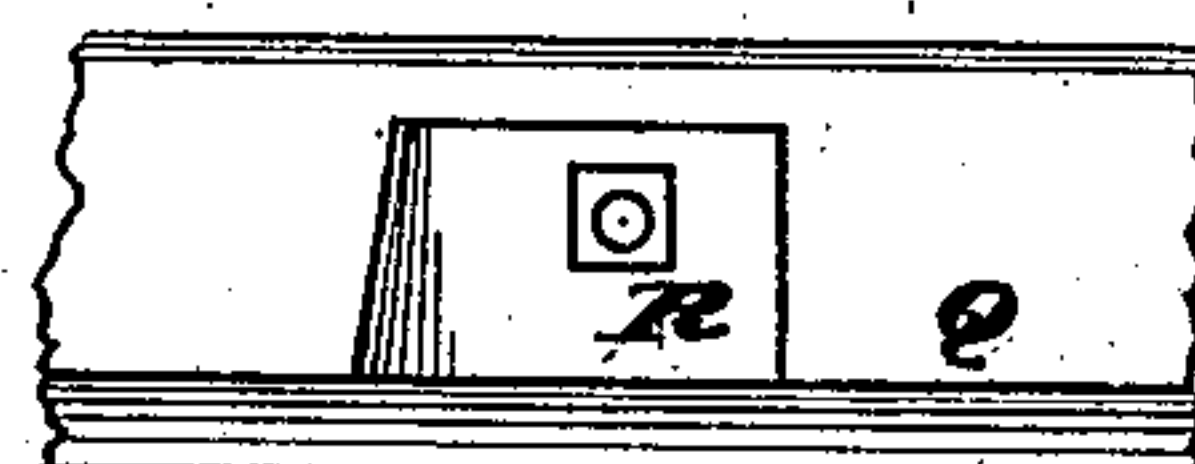
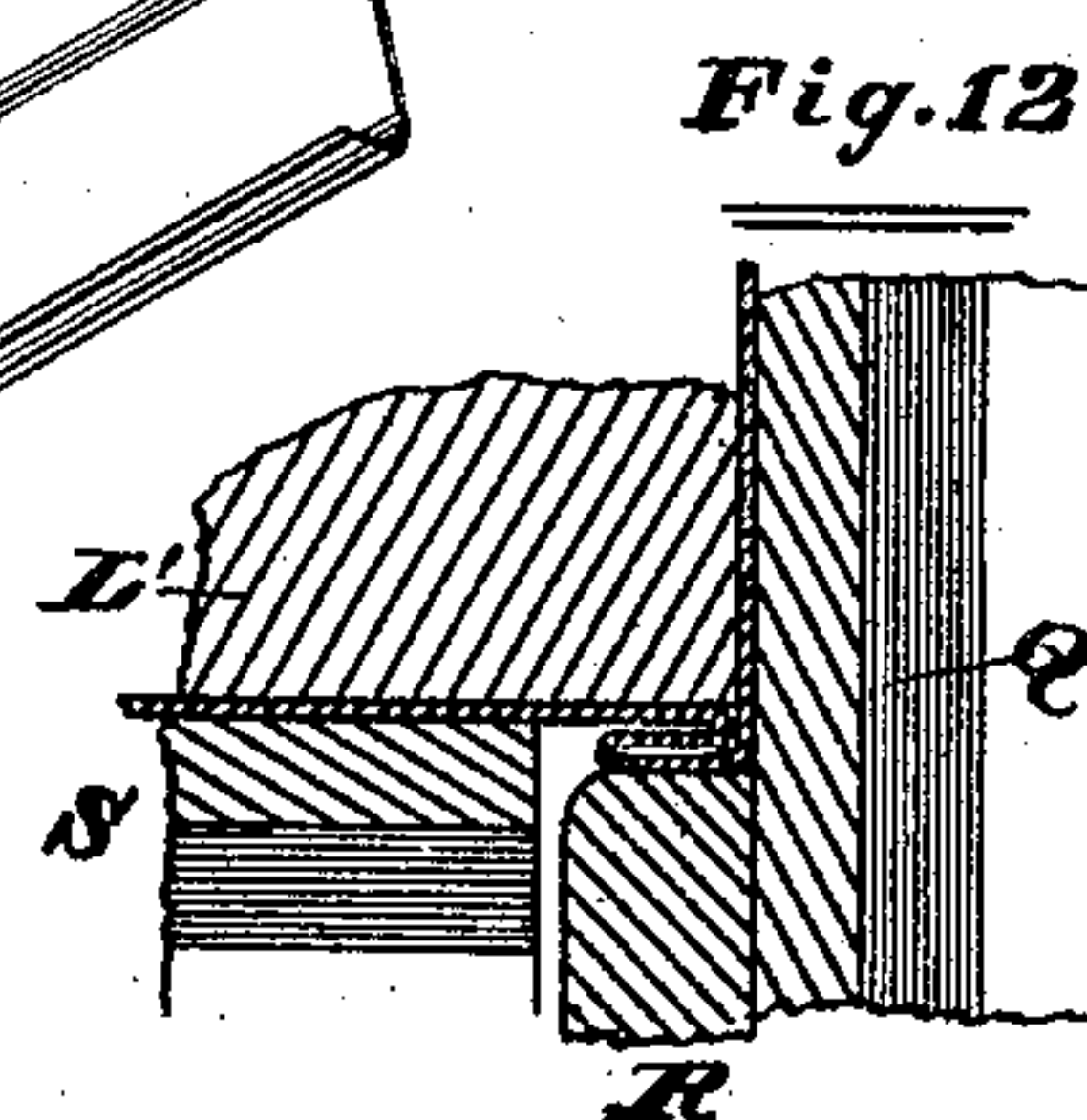
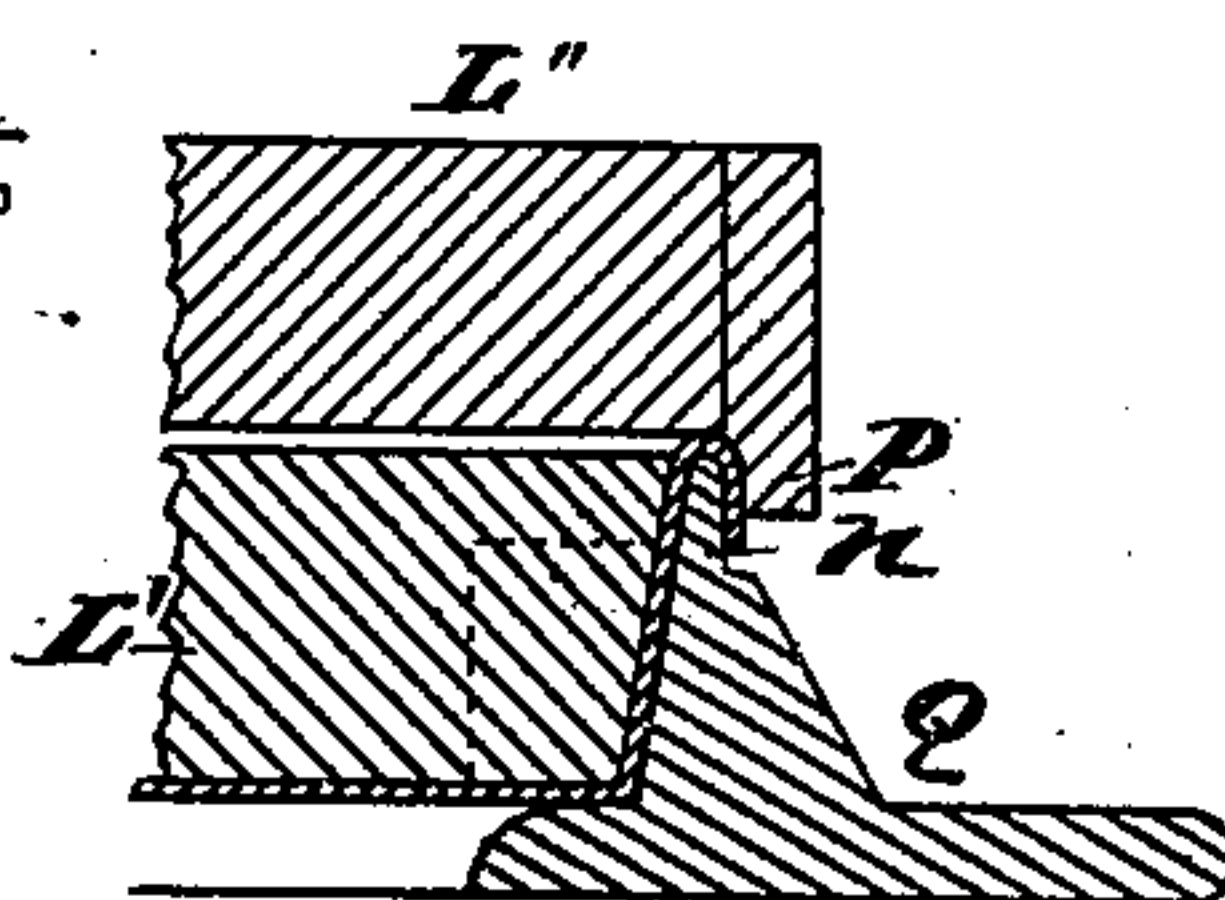
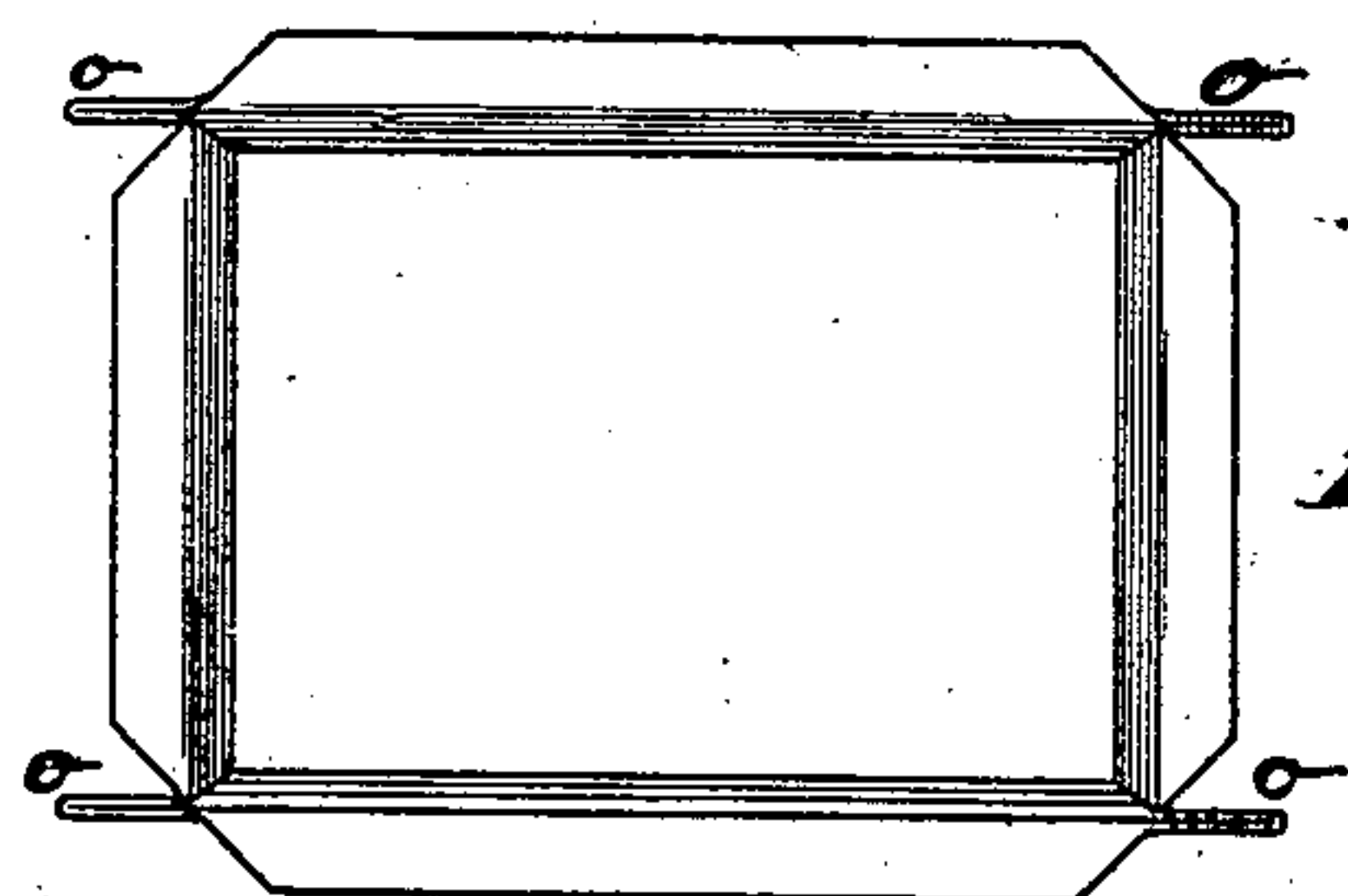
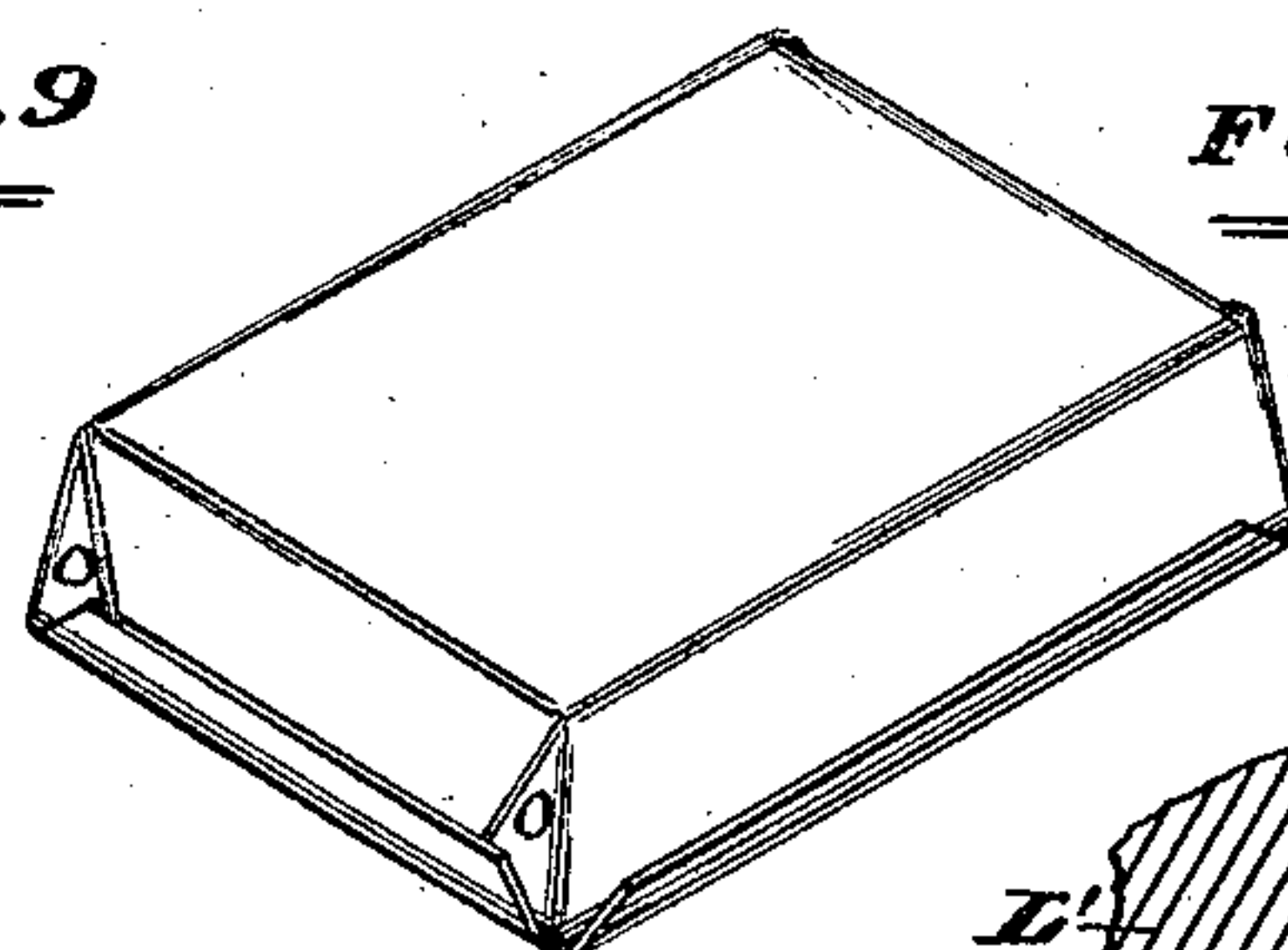
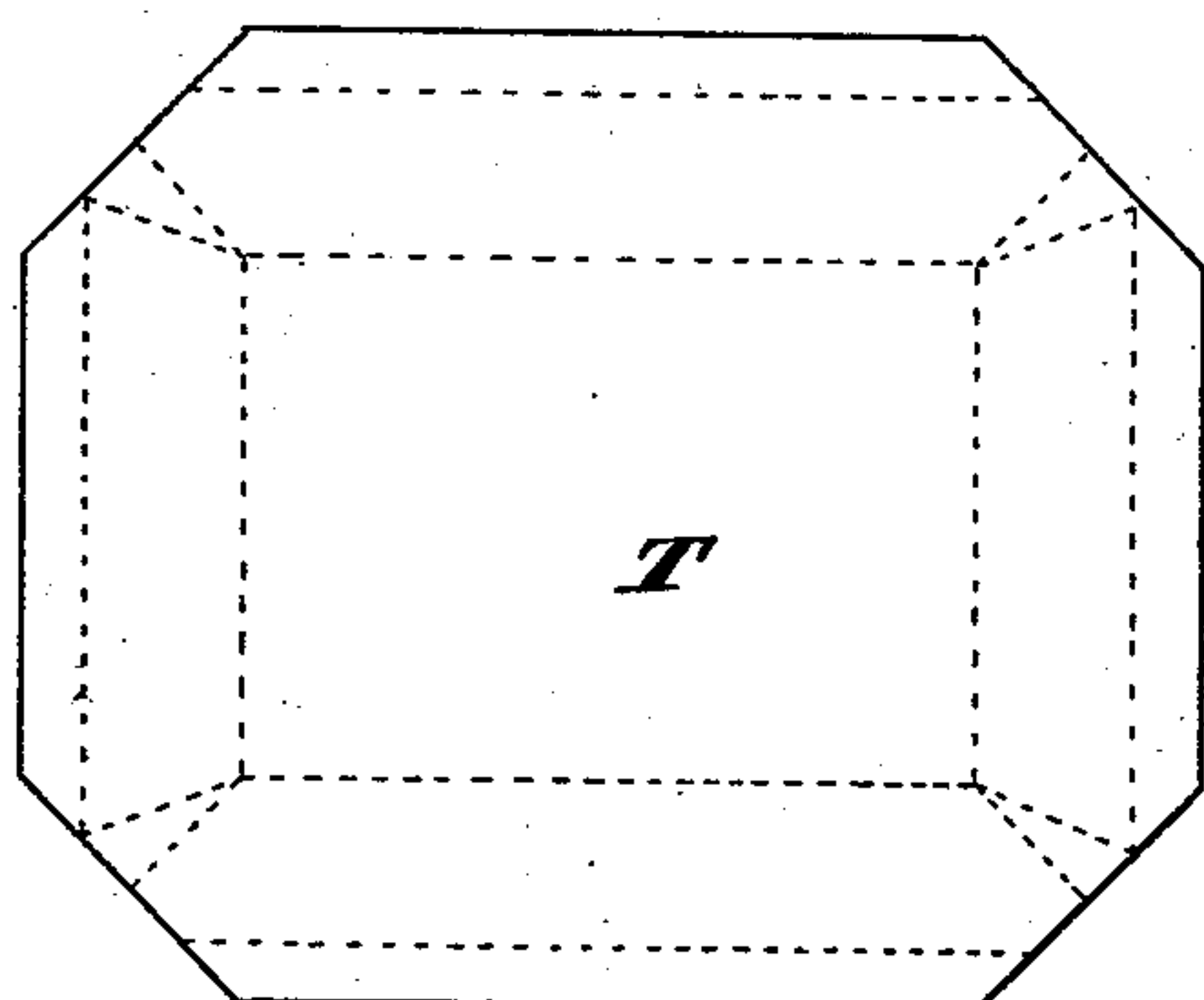
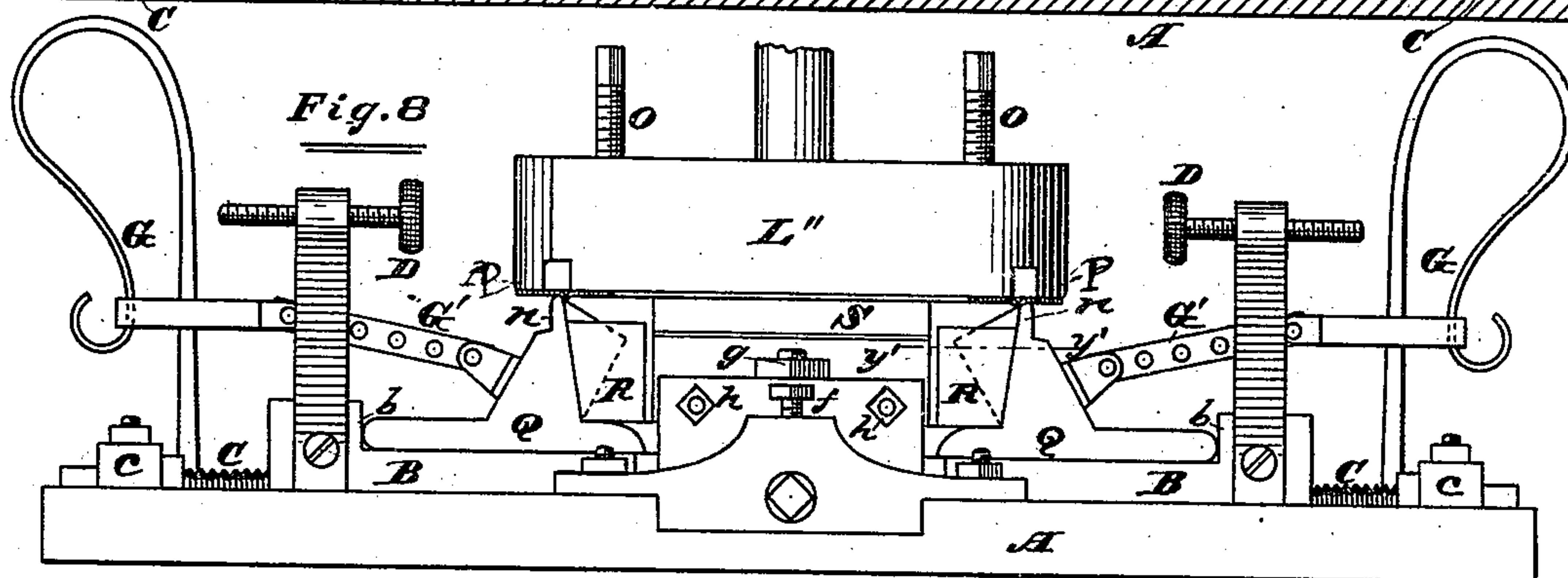
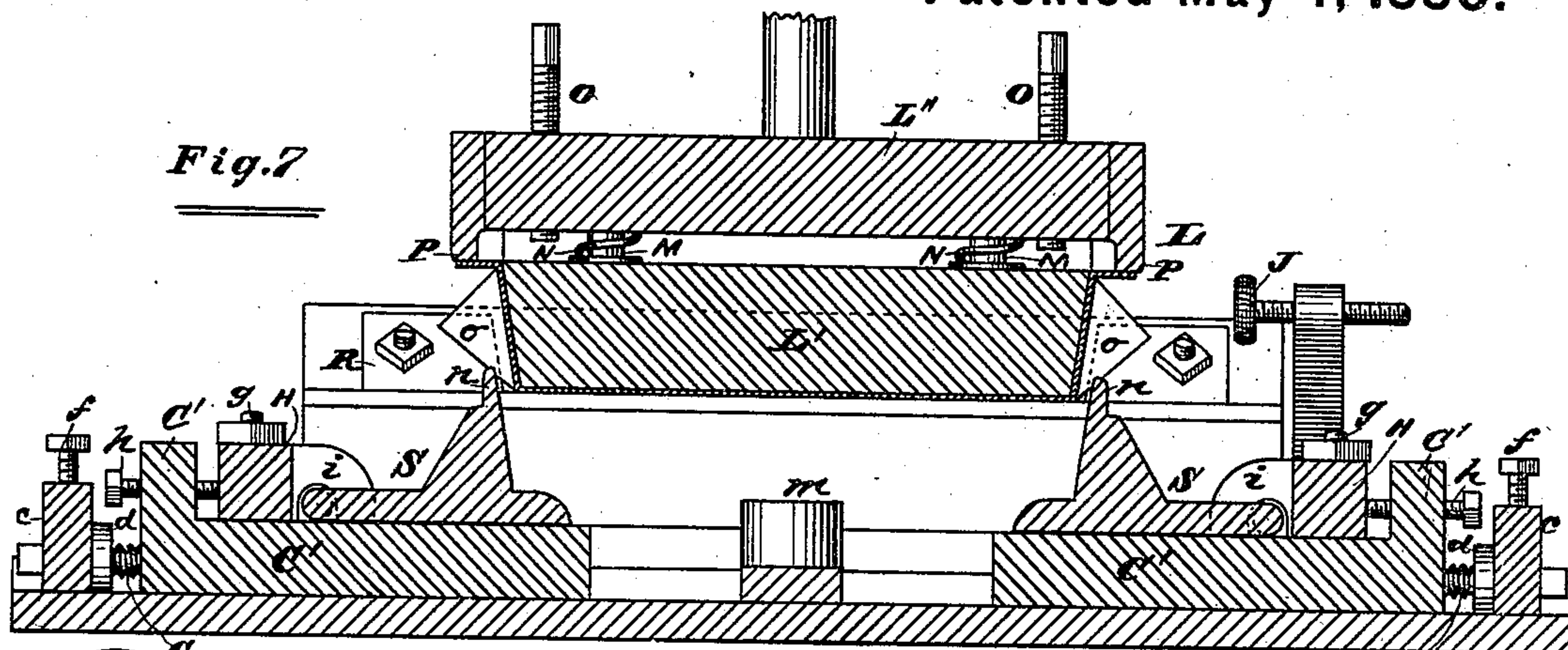
INVENTOR:

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Attest:

Fig. 10

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UNITED STATES PATENT OFFICE.

URBANA D. ALEXANDER, OF CHICAGO, ILLINOIS.

MACHINE FOR MAKING SHEET-METAL PANS.

SPECIFICATION forming part of Letters Patent No. 227,196, dated May 4, 1880.

Application filed January 27, 1880.

To all whom it may concern:

Be it known that I, URBANA D. ALEXANDER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Making Sheet-Metal Pans, of which the following, in connection with the accompanying drawings, is a specification.

In the drawings, Figure 1, Sheet 1, is a top or plan view of a machine embodying my invention. Fig. 2, Sheet 1, is an end view thereof. Fig. 3, Sheet 2, is a section in the plane of the line $x x$ of Fig. 1, showing, in addition to the parts shown in the figure last above referred to, a central longitudinal section of the sheet-metal blank, and of the die or presser, and of the removable floor or block, arranged in their proper positions with relation to each other and the other parts of the machine for the performance of the first step in the operation or work upon the blank. Fig. 4, Sheet 2, is a section in plane of the line $y y$ of Fig. 1, Sheet 1, showing all the parts excepting the movable floor or block in the position they occupy at the completion of the first step or operation upon the blank. Fig. 5, Sheet 2, is a section in the plane of the line $z z$ of Fig. 1, Sheet 1, showing the parts in the position last above referred to. Fig. 6, Sheet 2, is a section in the plane of the line $x' x'$ of the next preceding figure. Fig. 7, Sheet 3, is a longitudinal vertical section through the central part of the machine, showing the modifications of construction required to take the second step in the manufacture of the pans. Fig. 8, Sheet 3, is an end view of the machine when containing the parts shown in the next preceding figure. Fig. 9, Sheet 3, is a face view of the blank; Fig. 10, Sheet 3, a top view of the blank or pan after having the first step performed upon it. Fig. 11, Sheet 3, is a perspective of the same after the second step has been taken. Fig. 12, Sheet 3, is a section in the plane of the line $y' y'$ of Fig. 8, Sheet 3. Fig. 13, Sheet 3, is a sectional detail, showing the relative position of the pan and pressers or formers at the end of the second step; and Fig. 14, Sheet 3, is a detail, showing a face view of one of the blocks which perform the function of laying the corners left projecting after the first step has been taken.

Like letters of reference indicate like parts.

My invention relates to that class of dies or stamps intended for the purpose of producing mechanically pans and like dishes made of flexible sheet metal, or sheet metal which admits of being bent with facility into various forms, and which retains its form after being bent—such, for example, as sheet-tin.

My object is to improve the construction and operation of devices of this class; and to that end my invention consists in the means, substantially as hereinafter specified, which I employ for the purpose above set forth.

A represents the base of the machine, stamp, or die, and this base may consist either of a separate or independent block or board adapted to receive the working parts, as shown, or of a portion of a bench, table, or stand so adapted.

B B are laterally-sliding blocks or bearings arranged in grooves or ways $a a$ in the base A. The upper faces of these blocks are shouldered, as shown at $b b$.

C C are screws arranged horizontally and entering the outer faces of the blocks B B. The barrels or stems of the screws C C turn freely in fixed blocks $c c$, and are provided with collars $d d$, to prevent them from being pushed outwardly through the blocks $c c$. The outer ends of the screws C C are adapted, by preference, to receive a wrench, but may be provided with a milled head or otherwise, so constructed as to be turned with facility. The blocks B B are thus rendered adjustable to and from the sides of the machine or die, for the purpose hereinafter set forth, for they may be drawn back and forth with relation to the sides by turning the screws C C correspondingly.

D D are gages carried by the blocks B B. These gages are also adjustable in the same direction with the blocks B B, the adjustment being capable of being made without adjusting the blocks, by preference, as will hereinafter more fully appear, and this independent adjustment may be accomplished, as shown, by making the rear or outer parts of the gages screw-threaded, and by mounting them in bearings applied to the blocks B B and containing female screws to receive the extensions of the gages.

F F are leaves, and F' F' are shoulders extend-

ing upwardly therefrom, and arranged a little way back from the inner edges of the leaves F F, thus leaving inwardly-projecting lips or shelves *ee*. The inward or working faces of the shoulders F' F' incline a little outward as they extend upward, as shown, for the purpose hereinafter set forth.

G G are springs exerting their force outwardly or toward the sides of the machine, and G' G' are arms connecting the springs G G to the outer or rear faces of the shoulders F' F'. The force of the springs G G should be such as to suspend or support the leaves F F in a tilted or inclined position, as shown in Figs. 2 and 3, the inward edges of the leaves being raised and the outward edges resting on the blocks B B and bearing against the shoulders *b b* articularly.

To admit of the height of the inward edges of the leaves F F being varied the arms G G may be perforated, so that they may be adjustably connected to the shoulders F' F', as shown. These leaves and shoulders, when their functions are considered, as will be hereinafter explained, may be regarded as formers. They are arranged parallel to each other on opposite sides of the machine, and a considerable distance apart, as shown. Set-screws may be employed, as shown at *f*, to prevent the turning of the screws C C after they are once properly set.

C' C' are blocks, substantially the same in construction and operation as the blocks B B, excepting that the former are, by preference, somewhat wider than the latter. The blocks C' C' are arranged, as shown, at the ends of the machine or die, and are movable or adjustable in lines at right angles to the line of motion of the blocks B B.

H H are supplemental blocks, centrally pivoted at their rear ends to the blocks C' C' by means of the vertical pins or bolts *g g*, so that the said supplemental blocks may be canted around slightly upon the pins *g g*, and *h h* are screws for so moving and securing the blocks H H. The blocks H H have inwardly-projecting arms *i i*, in the under edges of which are the notches or recesses *j j*.

I I are leaves, which, with the exceptions hereinafter stated, are substantially the same in construction and operation as F F. The leaves I I have small pins or trunnions extending from their rear or outward corners into the notches or recesses *j j*, as indicated by the dotted or broken lines at *k k*, Fig. 1.

The shoulders I' I' of the leaves I I project laterally far enough to overlap the lips, shelves, or inwardly-projecting edges *ee* of the leaves F F, as shown, so that the parts I I will be tilted upward and downward with the tilting movement of the leaves F F, being raised by the latter and descending on account of their gravity.

J is a gage applied to the rear block, H, and operating in all respects like the gages D D.

It will be perceived from the foregoing description, and from reference to the drawings,

that the shelves *ee* and the inward faces of the shoulders or parts F' F' and I' I' are so arranged with relation to each other as to approximate to the form of a pan or like vessel, excepting that the shelves *ee* do not meet each other; but, as will hereinafter fully appear, it is not essential that they should so meet.

K is a block or false floor resting on the shelves *ee*, and *l* is a guide projecting downward from the central part of the block K into a guideway or socket, *m*. This floor is yielding, for the reason that its supports are yielding; but, instead of being supported upon the shelves *ee*, it may rest upon a spiral spring surrounding the guide *l*. But as the floor itself is not an essential part of my invention, as will hereinafter more fully appear, I have not shown it in combination with the spring last above referred to.

The parts now described may be regarded as the female part of the die, stamp, or machine.

L is the male part of the die. The part or male die L consists of the block L', the sides or edges of which are beveled, as shown, to enter the female part of the die, or to approximate or fit into an ordinary tin pan or like vessel of the form to be produced from the blanks of sheet metal, and substantially such as hereinafter referred to.

L'' is a cap or block, to the under face of which the block L' is yieldingly applied. M M are headed guide-pins rigidly attached to the block L' and extending upward therefrom. The guides M M pass freely through the block L'', which is countersunk to receive their heads, as indicated by the dotted or broken lines shown in Fig. 3.

N N are spiral springs surrounding the pins M M, and holding the blocks L' and L'' slightly apart, as shown, but allowing them to be pressed together. O O are screw-pins passing downward through the block L'', to limit or control the movement of the block L' toward the block L''. P P are lips or flanges extending downward from the sides or edges of the block L'', and these lips set out a little way from the sides of the block L', and do not meet at the corners of the block L'', as shown in Figs. 3, 4, 5, 7, and 8.

Q Q are leaves, pressers, or formers, which I substitute for the leaves F F in performing the second step in the process of making the pans. The leaves Q Q are in all respects like the leaves F F, excepting that the former are provided with blocks R R, for bending the corners of the blanks or partly-formed pans in the manner hereinafter described.

The blocks R R have inclined inward faces and rounded inward corners, as indicated in Fig. 14.

With the leaves Q Q, I employ end leaves, S S, in all respects like the leaves I I, excepting that the vertical shoulders or pressers on the leaves S S are not extended to lap the shelves *ee* of the side leaves. The upper edges of the vertical shoulders on the leaves Q Q and S S should be thinner or more cut away than those

on the like shoulders applied to the leaves F F and I I, for the purpose hereinafter set forth, and as indicated at *n n*, Figs. 7, 8, and 13.

It is to be understood that the leaves F F and I I are interchangeable with the leaves Q Q and S S, respectively.

To use the parts now described for the purpose for which they are intended I proceed as follows, it being understood that I intend to make tin pans substantially like that shown in Fig. 11: I first take a sheet of tin of suitable dimensions and cut away the corners in the manner indicated in Fig. 9, and the sheet so cut may be regarded as a blank from which the pans are made. All the parts of the die while at rest stand in the positions indicated in Figs. 1, 2, and 3. I then arrange the blank on the female parts of the die, as shown in Figs. 2 and 3, wherein T represents the blank, all the gages being so set that the center of the blank will be over the center of the female part of the die. The male part L also stands directly over the female part, and should now be pressed down with sufficient force to press the blank downward. Any suitable means may be employed for moving the part L down and up while operating upon the blanks. As the part L is pushed down it pushes down the blank, and the blank depresses the leaves F F and I I. The vertical shoulders on these leaves all move toward each other as the leaves are depressed, and consequently the sides of the blank are turned up against the sides of the block L' of the male die, as shown in Figs. 4 and 5; but the upper edges of the blank are laid horizontally, as there shown, by contact with the lips or flanges P P during the descent of the die L, so that the blank assumes the form shown in Figs. 4, 5, 6, and 10. A still further downward pressure of the part L' would lay the edges of the blank over or down, ready or nearly ready for the edge-wire, as will be perceived on reference to Figs. 4 and 5; but I have not there shown the edges so turned, for the reason that I prefer to turn them down as a part of the second step in forming the pans, which step I soon shall proceed to describe.

I may here state, before describing the second step, that the downward movement of the part L' is permitted after the part L' has reached the extent of its downward movement, for the reason that the said parts are yieldingly connected, in the manner already described.

The purpose of not having the flanges P P meet at the corners is to allow the flanges to pass down beyond the upper edges of the shoulders F' F' during the descent of the upper or flanged part of the male die after the lower part thereof has reached the extent of its downward movement, for otherwise the parts F' F' would then interfere with the further downward movement of the flanged part of the male die, and consequently the upper edge of blank could not be turned down in the manner described.

The second step is performed by removing the leaves F F and I I, and by applying the leaves Q Q and S S in their places. The blank as formed by the first step, and as shown in Fig. 10, is then placed in the female part of the die, as shown in Figs. 7 and 8, and the part L is then depressed, as before. As the part L is depressed the leaves Q Q, which carry the blocks R R, are folded downward, giving to the said blocks a downward and inward movement, and these blocks are so arranged, as shown, as to pinch in or press the projecting parts *o o*, left at the corners of the blank at the end of the first step, and by the time the part L' has reached the limit of its downward movement the parts *o o* are laid down closely against the ends of the blank, which is now a completely-formed pan, excepting that its upper edges are not turned down to receive the edge-wire. To turn down these edges the pressure is continued upon the die L, and the part L' will then continue to move down until the lips or flanges P P turn down the said edges in the manner indicated in Figs. 11 and 13. The pan is now ready for the edge-wire, which may be applied in any well-known or suitable way.

To prevent the downward movement of the part L' with relation to the part L' during the first step of the operation upon the blank, the pins O O may be turned or screwed down until they strike the upper face of the part L'; but the pins O O are not absolutely essential, for the springs N N may be sufficiently stiff to admit of the first step being performed without laying down the edges of the blank upon the ends thereof, as indicated in Fig. 7, it being understood, however, that those springs are not too stiff to prevent the meeting of the parts L' and L' under an increased pressure, as indicated in Fig. 13.

The position of the blocks R R with relation to the blank at the end of the second step is indicated in Fig. 12.

It will be perceived that the leaves S S employed during the second step lie wholly in contact with their supports, and are not yielding, and do not tilt or rock, but serve merely to receive and confine the descending blank.

When the block or floor K is used it may aid in causing an even or uniform downward movement of all the leaves and help support the central part of the blank; but as the blank itself rests upon the leaves the downward movement is sufficiently even without the employment of the block K. This block, when supported on a spring, as hereinbefore suggested, will also aid in discharging the blank from the female part of the die at the end of each step.

It is obvious that this machine will perform its work upon blanks of uniform size without adjustment, and that provision for adjusting some its parts is made to adapt it to blanks of various sizes, and to the production of either large or small pans, a male die of corresponding size being employed.

It will also be perceived that those parts of

the female part of the die which exert a lateral pressure upon the blank by being arranged in the manner described operate as toggles, and that a lateral pressure of very great force compared with the force required to depress the male part of the die is thus exerted. The blank may also be easily removed, for the attempt to remove it releases the toggle-like parts, and the springs G G also aid in freeing the blank.

The operation throughout is simple, and the product is a pan which is tight and well made without the use of solder, and which, after leaving the die, requires no manipulation, excepting that required for applying the edge-wire, when such a wire may be deemed expedient.

It is also obvious that the parts for performing the first step are complete in themselves, and that the projecting corners o o may be laid down by hand if deemed best. It may also be remarked that the descending male part of the die will actuate the toggle-like parts of the female portion, even though the shelves e e be absent.

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

1. The combination, in the female part of a machine or die for making sheet-metal pans or like vessels, of four formers arranged rectangularly with relation to each other, and consisting of horizontally-arranged leaves having their inner edges suspended or yieldingly held a little higher than their outer edges, and the outer edges resting articulatingly on bearings, and each leaf having on its upper face a longitudinally-arranged shoulder having an inner face set to correspond to the form of the sides of the pan, substantially as and for the purposes specified.

2. The combination, in the female part of a machine or die for making sheet-metal pans or like vessels, of the herein-described four rectangularly-arranged formers, consisting of horizontally-arranged leaves having their inner ends held yieldingly a little higher than their outer edges, and their outer edges resting ar-

ticulatingly upon bearings, and each leaf having on its upper face a longitudinally-arranged shoulder having an inner face set to correspond to the form of the sides of the pan, one set or pair of the said formers having thereon the inwardly-projecting shelves e e and the shoulders on the other pair projecting for support upon the said shelves or bearings e e, substantially as and for the purposes specified.

3. The combination, with the female part of a die or machine for making sheet-metal pans or like vessels, of the interchangeable leaves or formers Q Q and S S, having on their upper faces longitudinally-arranged shoulders with inner faces corresponding to the form of the sides of the pan, the said inner faces having thereon the blocks R R and the rear faces of the said shoulders having therein, near their upper edges, the depressed or contracted parts n n, all in connection with a male die made in two parts yieldingly connected, and the upper of the said parts carrying the flanges P P not meeting at the corners of the said part, substantially as and for the purposes specified.

4. The combination, in a machine or die for making sheet-metal pans or like vessels, of a male die consisting of the cap or block L', having thereon the laterally-arranged and downwardly-projecting flanges or lips P P not meeting at the corners of the said block, and of the block L', yieldingly applied to the under face of the block L', and a female die adapted to receive the said male die, substantially as and for the purposes specified.

5. The combination, with the female parts of a machine or die for making sheet-metal pans or like vessels, of the die L, consisting of the cap or block L', carrying the screw-pins O O, and having thereon the flanges or lips P P, and of the block L', yieldingly applied to the under face of the block L', substantially as and for the purposes specified.

URBANA D. ALEXANDER.

Witnesses:

F. F. WARNER,
W. S. BAKER.