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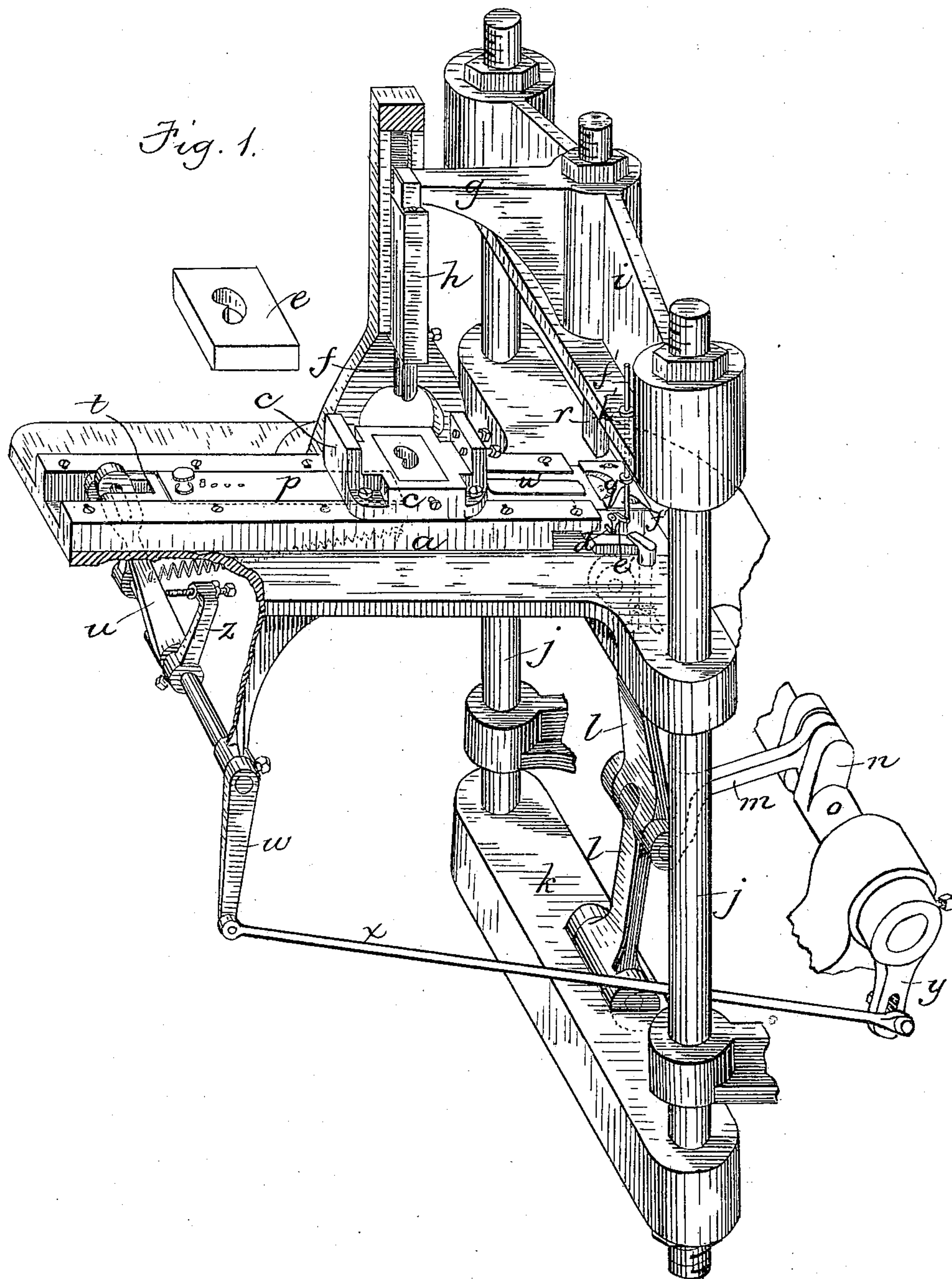
3 Sheets—Sheet 1.

T. F. TYLER & E. H. TAYLOR.

MACHINE FOR FORMING BOX TOES.

No. 316,082.

Patented Apr. 21, 1885.



Witnesses.

R. J. Powers

Chas. S. Gooding.

Inventors.

T. Frank Tyler

Engineer H. Taylor

by Wright & Brown
attys.

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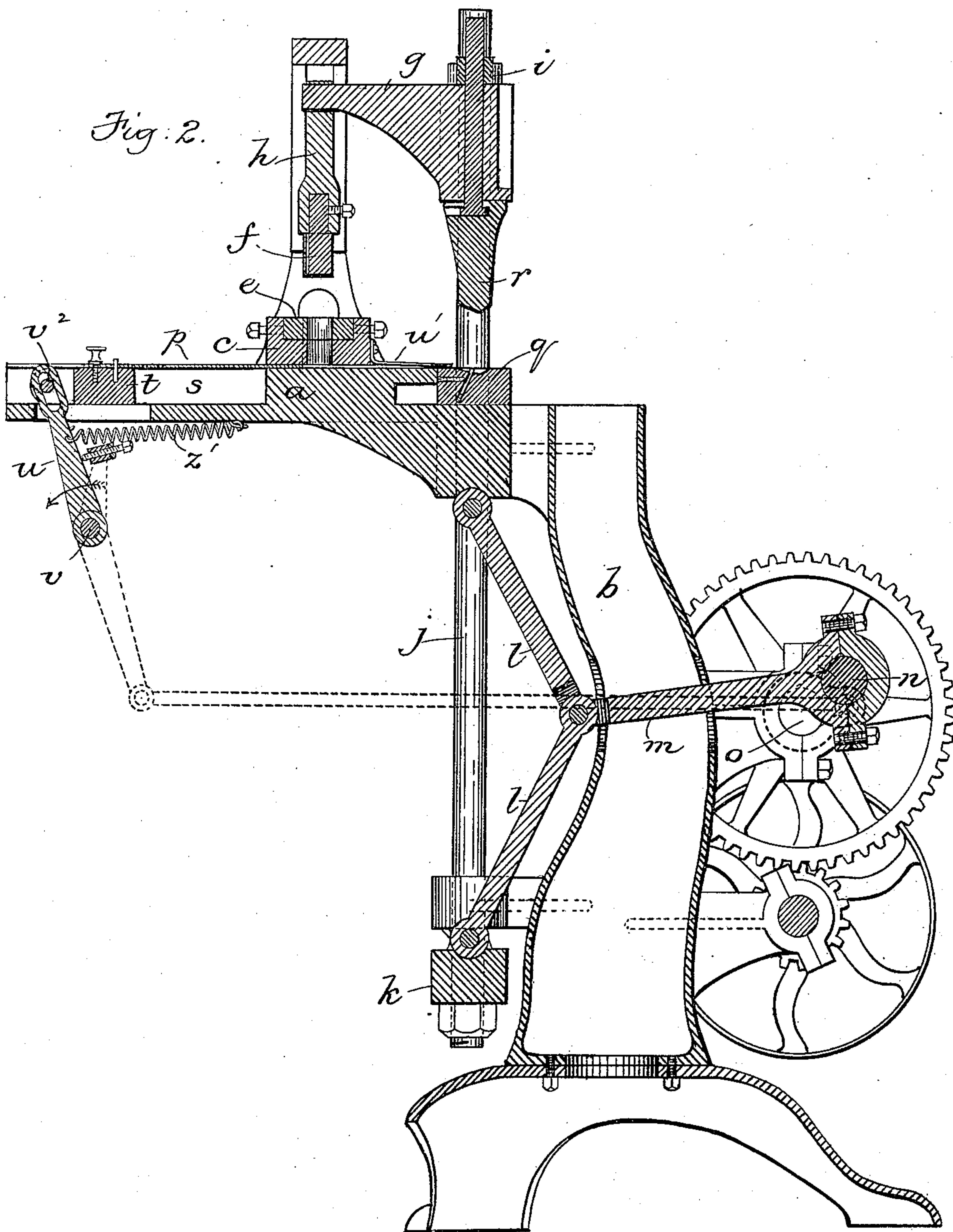
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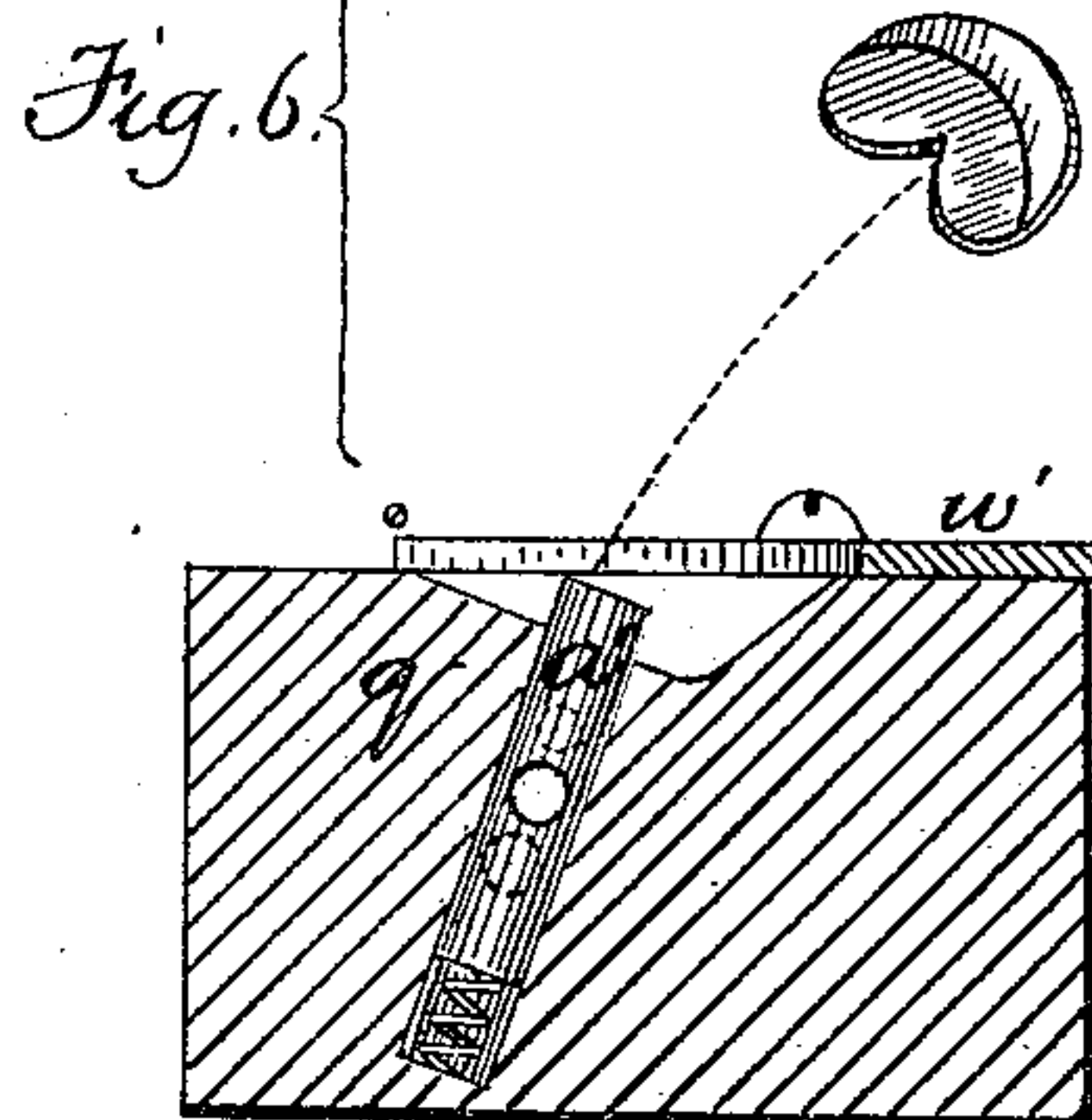
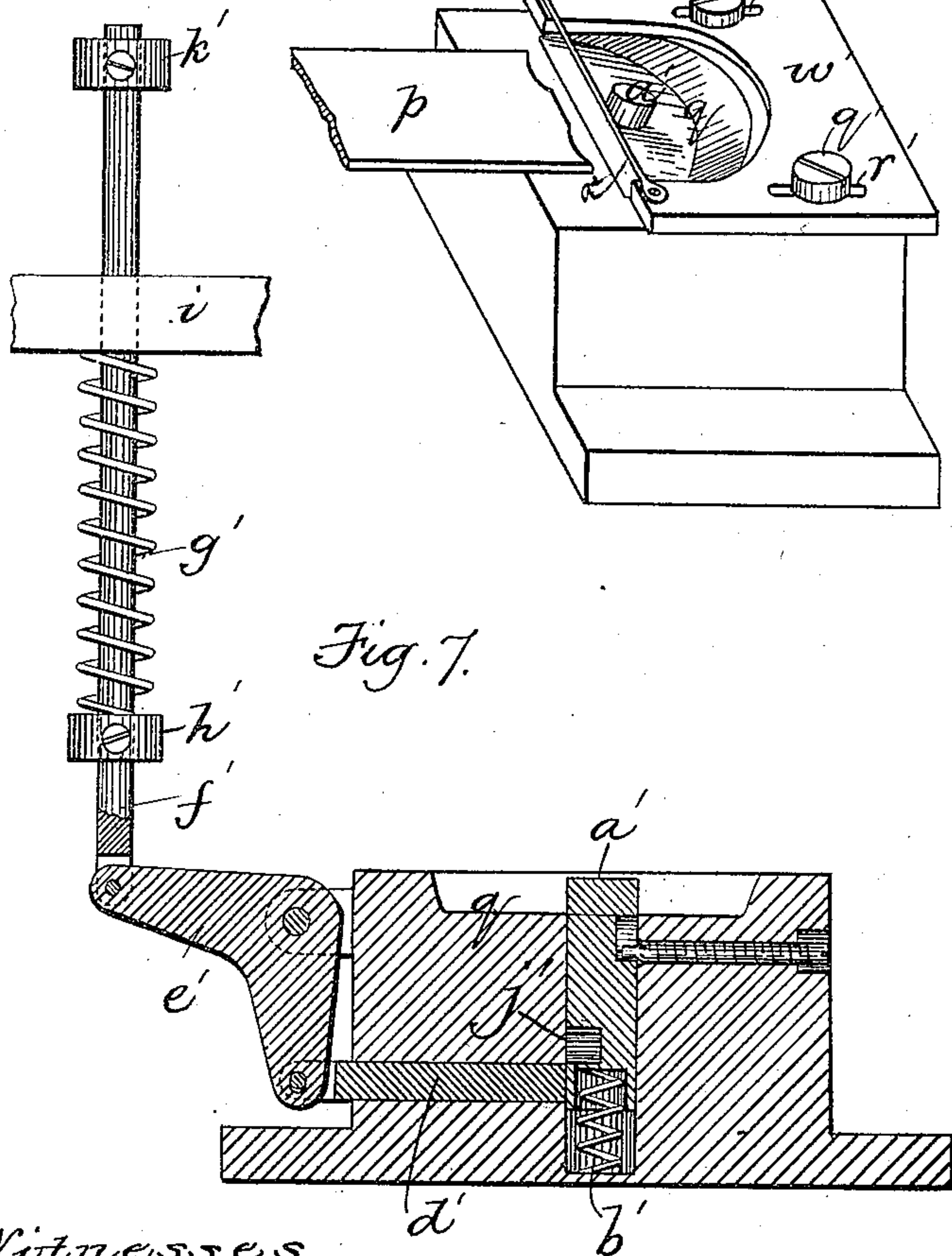
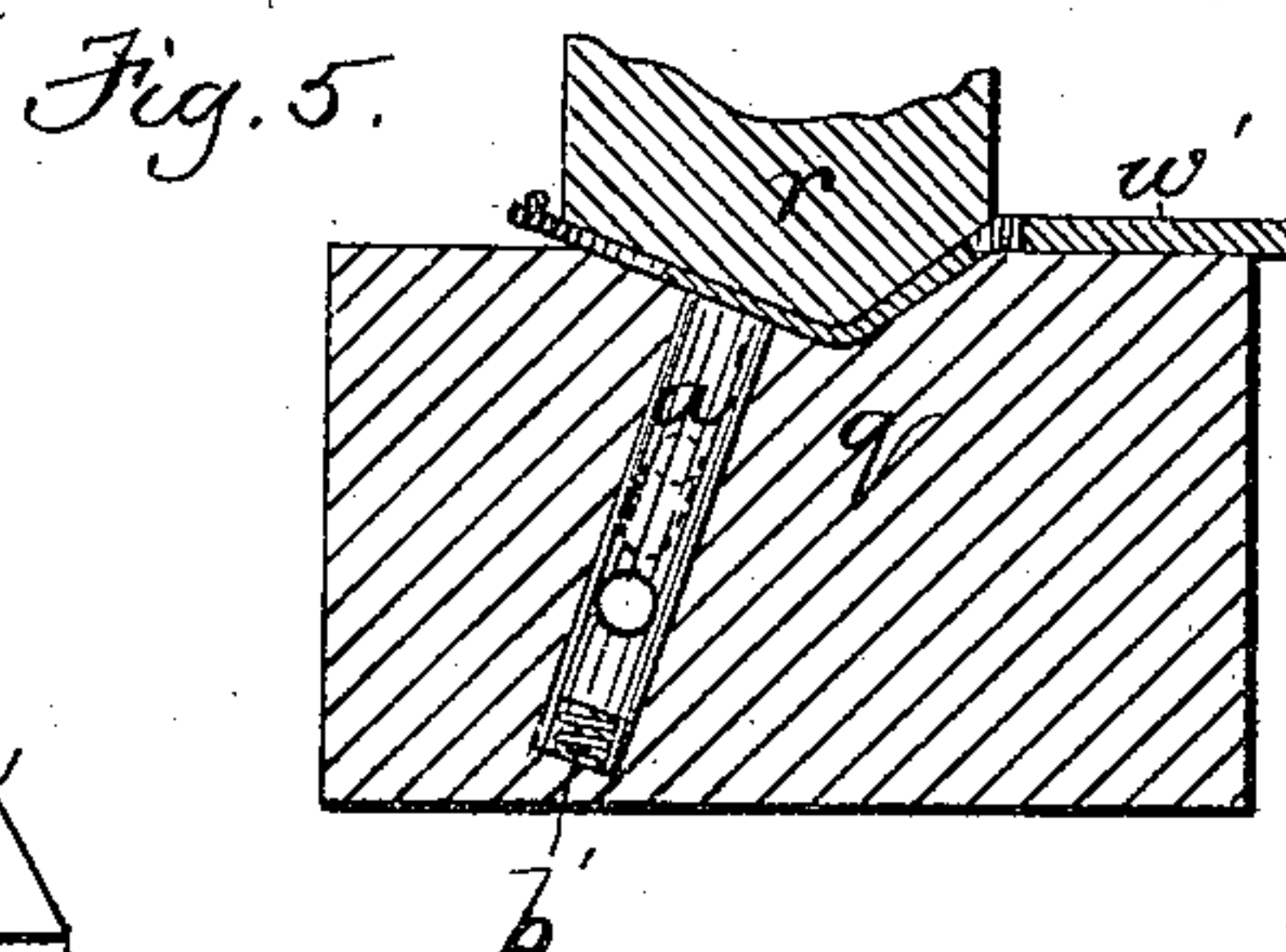
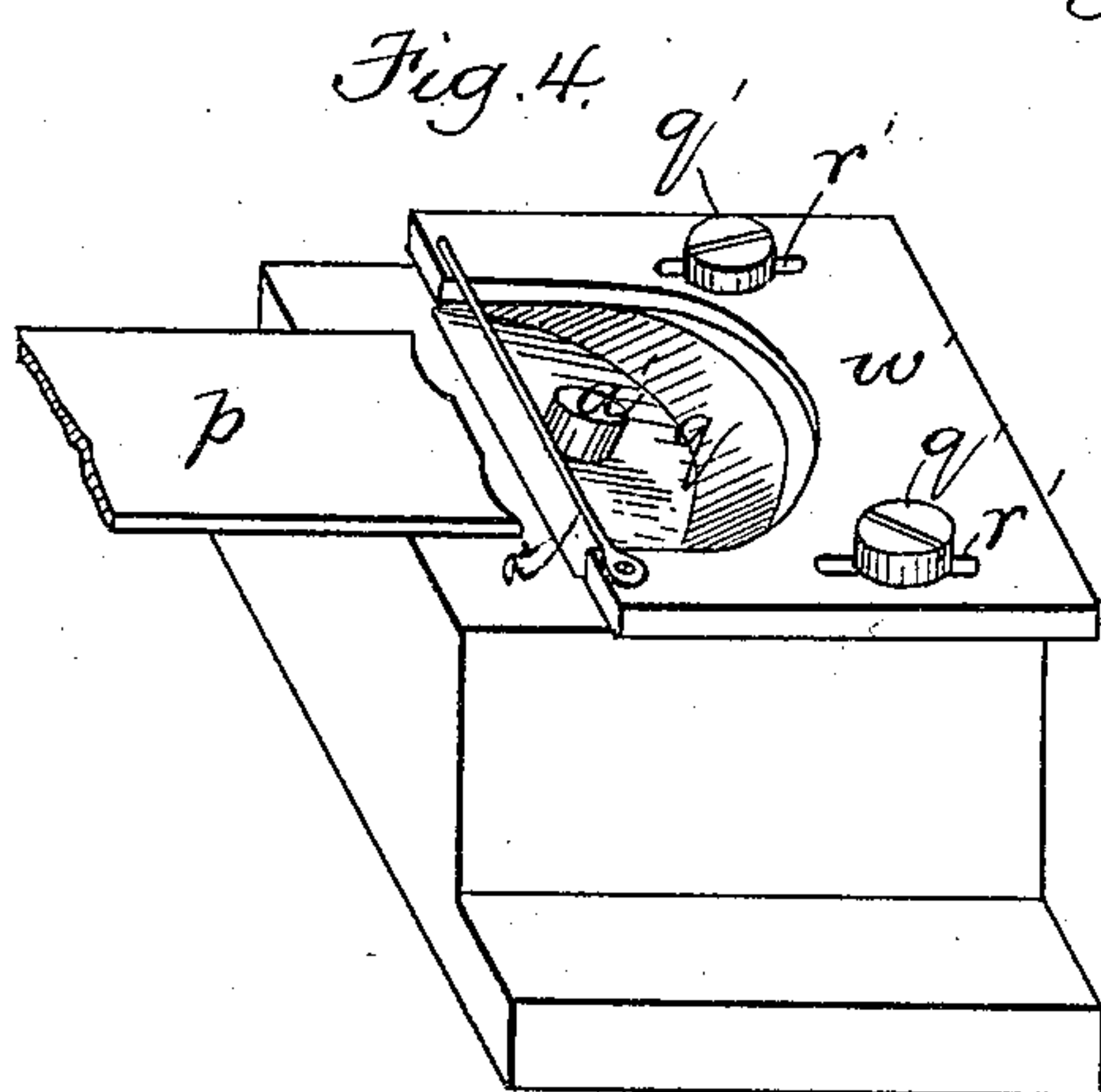
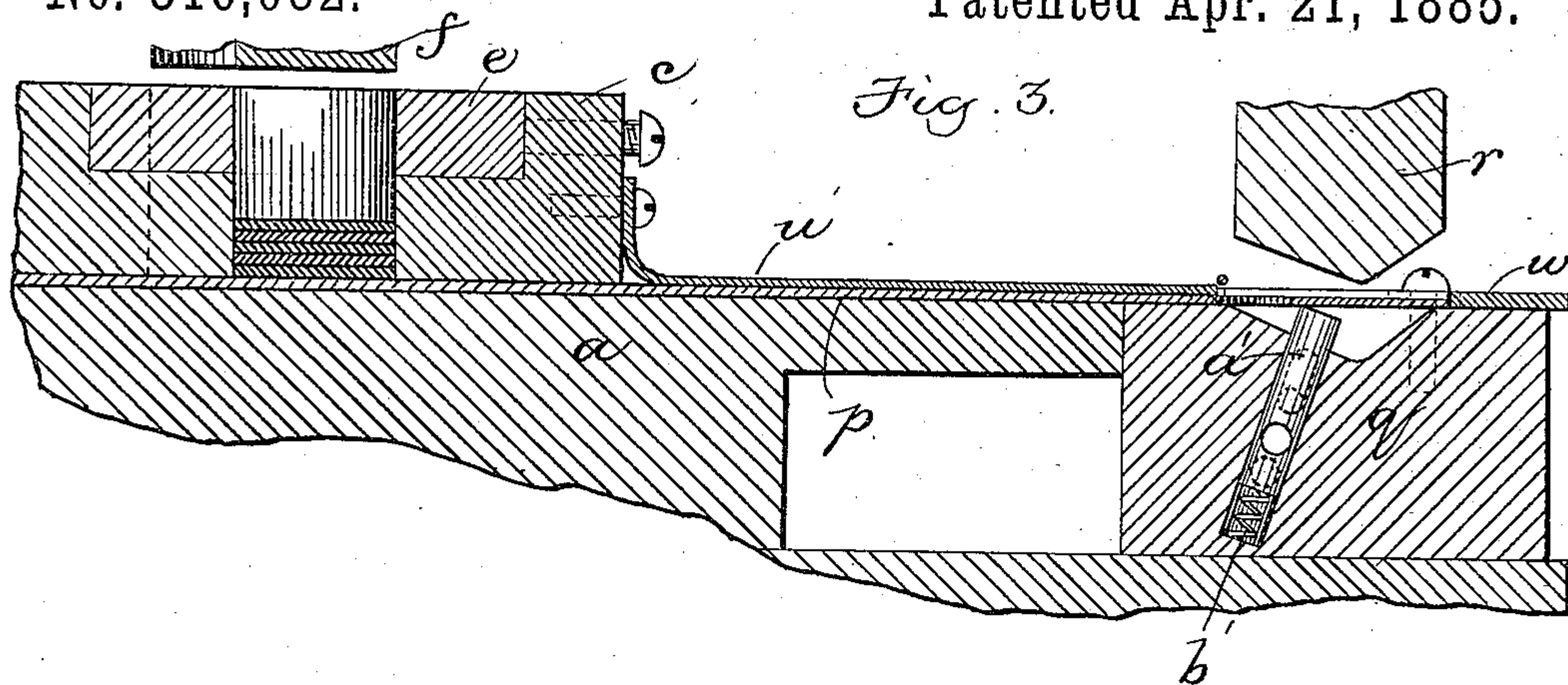
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UNITED STATES PATENT OFFICE.

T. FRANK TYLER AND EUGENE H. TAYLOR, OF LYNN, MASS.; SAID TAYLOR
ASSIGNOR TO THADDEUS W. TYLER, OF SAME PLACE.

MACHINE FOR FORMING BOX-TOES.

SPECIFICATION forming part of Letters Patent No. 316,082, dated April 21, 1885.

Application filed February 14, 1885. (No model.)

To all whom it may concern:

Be it known that we, T. FRANK TYLER and EUGENE H. TAYLOR, both of Lynn, in the county of Essex and State of Massachusetts, have invented certain Improvements in Machines for Making Box-Toes, of which the following is a specification.

This invention has for its object to provide an improved machine for cutting box-toe blanks and other like articles from a sheet of leather-board or other suitable material, and forming or molding each blank between a suitable male and female die and ejecting the molded blank from the female die.

Our invention consists in the improvements which we will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view of the principal portion of our improved machine. Fig. 2 represents a vertical section of the same. Fig. 3 represents an enlarged vertical section of a portion of the machine, showing a blank in position to be molded. Fig. 4 represents a perspective view of the female molding-die. Fig. 5 represents a section of the molding-dies, showing their position when molding a blank. Fig. 6 represents a similar section showing the dies separated and the molded blank ejected. Fig. 7 represents a sectional view of the female die, showing the ejector and the devices for alternately holding and releasing it.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a fixed bed or frame supported by a suitable standard, *b*, or otherwise.

c represents a block or holder attached to the bed *a*, and provided with a removable female cutting-die, *e*.

f represents the male cutting-die, which is secured to a slide, *h*, the latter being attached to an arm, *g*, on a vertically-sliding cross-head, *i*. The cross-head is mounted on rods *jj*, which slide in orifices in the bed *a* and are connected at their lower ends by a cross-bar, *k*. A toggle-joint composed of the links *ll* connects the cross-bar *k* with the bed *a*, as shown in Fig. 2. The meeting ends of the links *ll* are con-

nected by a rod, *m*, with a crank, *n*, on a driving-shaft, *o*, the rotations of which reciprocate the cross-head *i* vertically through the described devices. At each descent of the male cutting-die *f* a blank for a box-toe, or other article which the cutting-dies are formed to produce, is severed from a strip of leather-board or other material placed on the die *e*. The blanks descend through the female die to the bed *a*, and are moved one at a time by a reciprocating feeding-slide, *p*, to the female molding-die *q*, which is attached to the bed *a*, its upper surface being flush with that part of the bed along which the blanks are moved from the cutting-dies.

r represents the male molding-die, which is attached to the cross-head *i* and enters the female die *q* at each depression of the cross-head. The feeding-slide is a thin plate of metal which moves in a slot or passage between the bed and the die-holder *c*, and is attached at its rear end to a block, *t*, which is adapted to slide in a channel, *s*, in the bed *a*.

u represents an arm mounted loosely on a rock-shaft, *v*, which is journaled in arms attached to the bed *a*. Said arm *u* has a slot in its upper end which receives a pin, *v'*, inserted in ears on the block *t*. The rock-shaft has a rigidly-attached arm, *w*, which is connected by a rod, *x*, with a crank, *y*, on the driving-shaft *o*; the rock-shaft being thus oscillated by the rotation of the driving-shaft. An arm, *z*, on the rock-shaft bears against the slotted arm *u* and forces the latter, with the block *t* and slide *p*, backwardly when the rock-shaft is rotated, as indicated by the arrow in Fig. 2, thus drawing the slide *p* back from under the cutting-dies. When the rock-shaft is moved in the opposite direction, a spring, *z'*, attached to the arm *u* and to the bed *a*, draws the arm forward with the block *t* and slide *p*, causing the latter to move the bottom blank in the holder forward to the forming-die *q*. A spring, *u'*, attached to the holder *c* and projecting over the slot through which the blanks are moved by the slide *p*, keeps said blanks in place on the bed until they reach the forming-die *q*.

w' represents a gage-plate or stop, which is attached to the forming-die *q* and limits the

forward movement of each blank. Said plate is adjustable by means of slots r' r' and screws q' q' .

a' represents an ejector in the die q , whereby the molded blanks are expelled. Said ejector is composed of a rod or plunger inserted in an inclined or diagonal socket in the die q , and normally pressed outwardly, as shown in Figs. 3, 4, 6, and 7, by a spring, b' . When a blank is forced into the die q by the downward movement of the die r , the inclined ejector yields, as shown in Fig. 5, and when fully depressed is locked by a pin or bolt, d' , Fig. 7, entering the block, said bolt being pivoted to a bell-crank lever, e' , to which is pivoted a vertical rod, f' , passing through an orifice in a flange on the cross-head i , and provided with a spiral spring, g' , which is interposed between the cross-head i and a collar, h' , attached to said rod. When the cross-head i descends, it compresses the spring g' , and causes the latter to depress the rod f' , and thus turn the lever e' , so as to force the bolt d' into the die q . When the ejector is fully depressed, a recess, j' , in its side coincides with and receives the bolt d' , which locks the ejector in the depressed position shown. When the cross-head i rises, it strikes a collar, h' , on the upper end of the rod f' , and raises the latter sufficiently to cause it to withdraw the bolt d' from the ejector, which is thus released and thrown upwardly by its spring b' , thus throwing the molded blank upwardly with sufficient force to clear it from the die q . The inclination of the ejector causes it to throw the blank upwardly and outwardly or laterally from the space in which the die r moves, so that there is no danger of the blank dropping or falling back in position to be again acted on by the die r . The ejector is not released until the die r is considerably elevated, as shown in Fig. 6, so that said die does not prevent the expulsion of the blank from the die q .

The time of the various operations above described is as follows: Before each action of the cutting and forming dies the feed-slide p moves forward and deposits a blank on the forming-die q . The cross-head then descends, causing the cutting-dies to sever a blank from the sheet of material presented to them, and the forming-dies to mold the blank last moved forward. When the cross-head rises, the formed blank is ejected from the die q , the feed-slide is moved backwardly, and the blanks in the holder c drop, so that the bottom blank lies in the path in which the feed-slide p moves. The slide then moves forward, as before, and pushes the bottom blank to the die q , and thus the operation is continued. It will be seen that the operator has only to present the sheet of material to the cutting-dies, all the other parts of the operation being automatic. We prefer to time the movements of the feeding-slide p so that it will remain in the position it occupies when it has moved the blank to the die

q while the die r is descending and forming the blank, the end of the slide acting as a continuation of the guard w' in preventing the lateral displacement of the blank. The outer end of the spring u' accomplishes the same purpose, so that the blank is held whether the slide p is timed as above indicated or not.

To prevent the formed blanks from clinging to the die r when the latter rises, we attach a narrow strip or spring, a^2 , to the guard-plate w' , so that it will extend across over the portion of the blank which is not immediately under the die r , and will prevent the blank from being raised by said die. The strip a^2 bearing only against one edge of the blank does not interfere with the expulsion thereof by the ejector.

We claim—

1. In a blank cutting and forming machine, the combination of the fixed and reciprocating cutting-dies, the fixed and movable forming-dies, the reciprocating feeding-slides, whereby the blanks are moved from the cutting to the forming dies, and mechanism, substantially as described, for operating said movable cutting and forming dies and feeding-slide, as set forth.

2. The combination of the reciprocating and fixed forming-dies and the inclined or diagonal spring-ejector in the fixed die, whereby the formed blanks are ejected upwardly and laterally, as set forth.

3. The combination of the reciprocating and fixed forming-dies, the spring-ejector in the fixed die, and devices, substantially as described, whereby the ejector is locked when depressed, and released when the reciprocating die is raised, as set forth.

4. The combination of the cutting and forming dies, and the feeding-slide of the spring u' , whereby the blanks are held while being moved from the cutting to the forming dies, as set forth.

5. The fixed forming-die q , having the guard-plate w' , combined with the reciprocating die r , and the feeding-slide, as set forth.

6. The fixed forming-die q , having the guard-plate w' , combined with the reciprocating die r , and the spring u' , as set forth.

7. The combination of the reciprocating forming-die r , and the fixed forming-die q , having the guard-plate, and the arresting-strip a^2 , whereby the formed blanks are prevented from being raised by the die r , as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 6th day of February, 1885.

T. FRANK TYLER.
EUGENE H. TAYLOR.

Witnesses:

JEREMIAH E. BARTLETT,
IRA B. KEITH.