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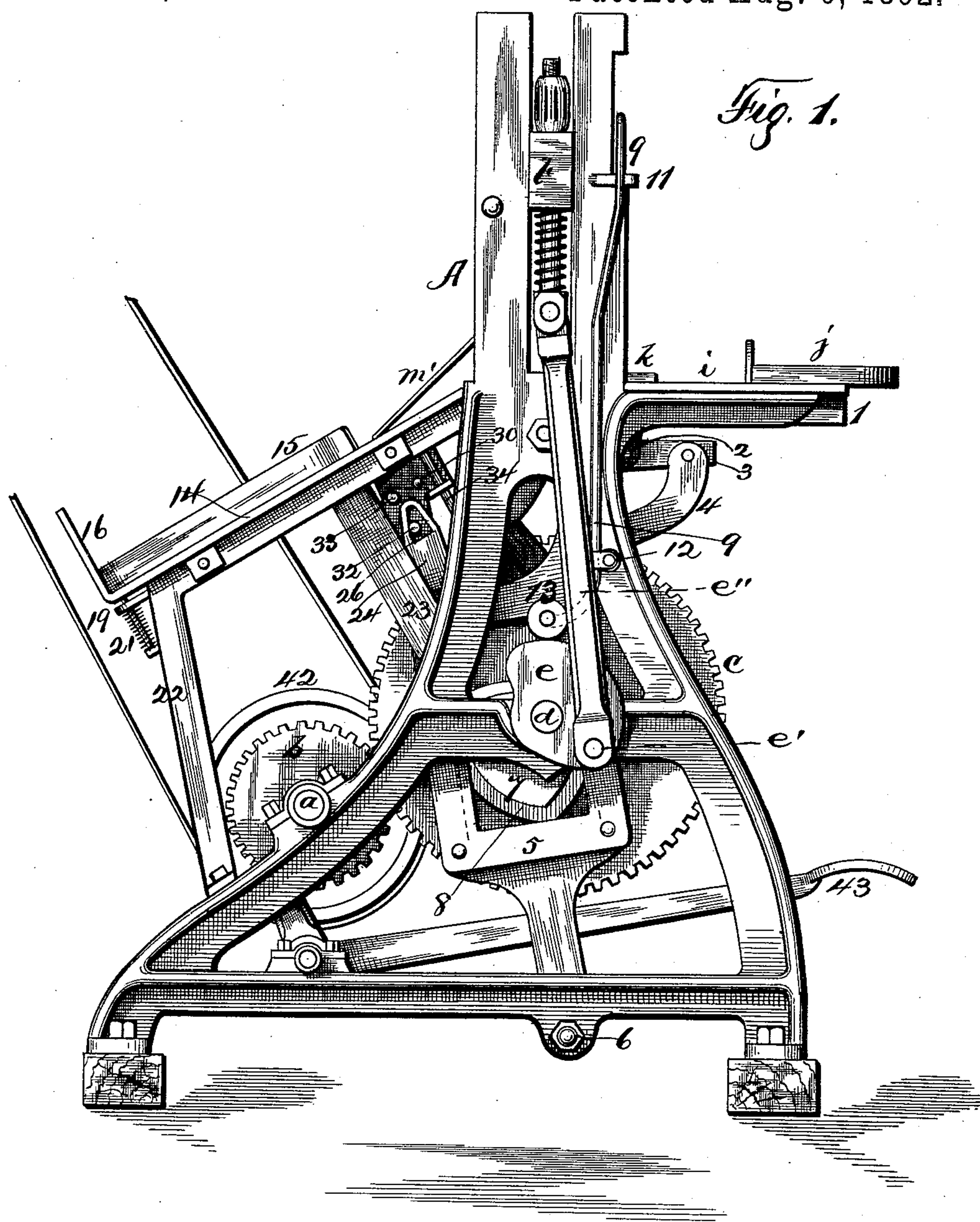
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F. A. BUGBEE.

SOLE MACHINE.

No. 480,317.

Patented Aug. 9, 1892.



WITNESSES:
H. A. Carhart
A. B. Kime

INVENTOR,
Fred A. Bugbee
BY
Smith & Denison
his ATTORNEY

(No Model.)

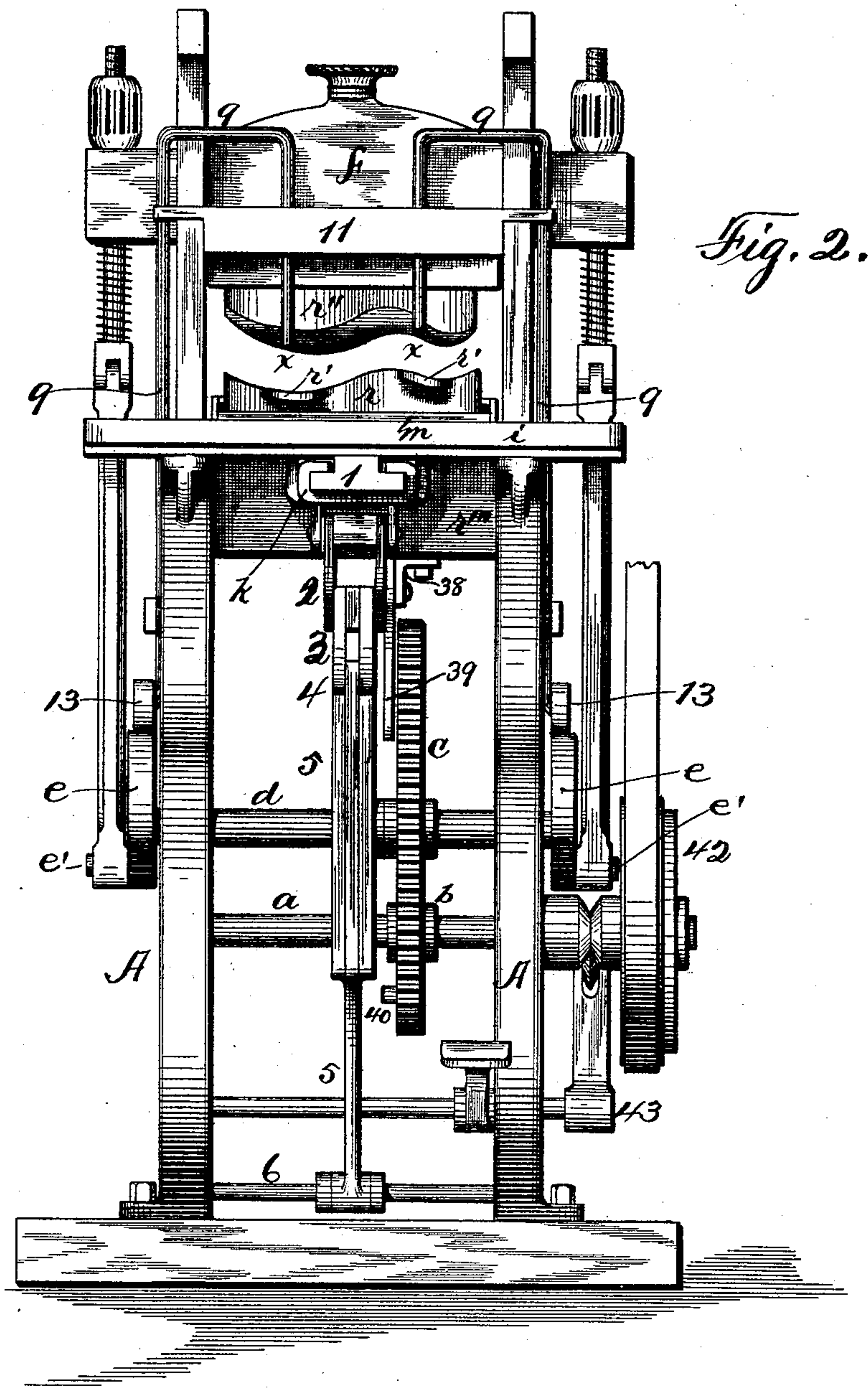
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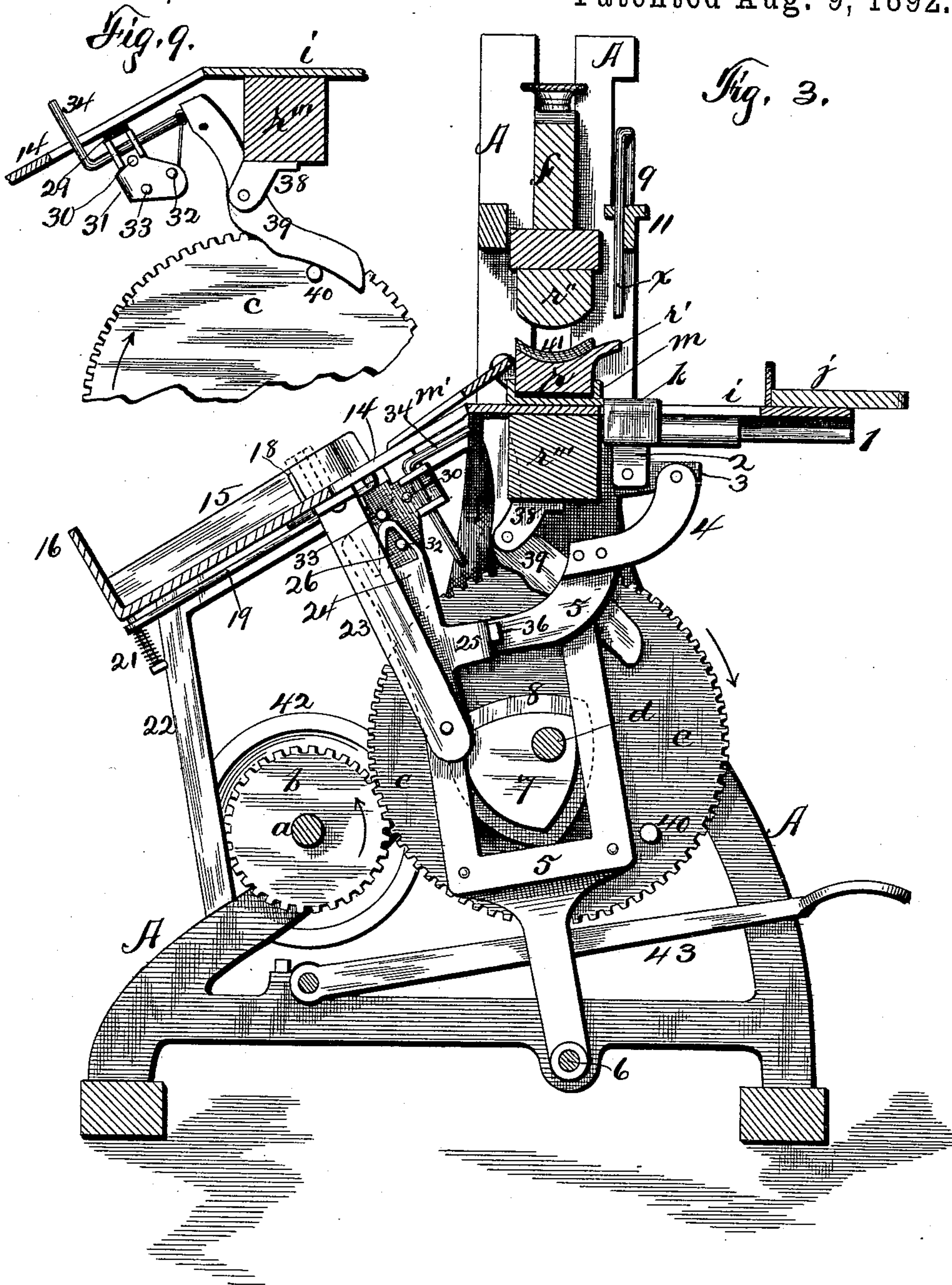
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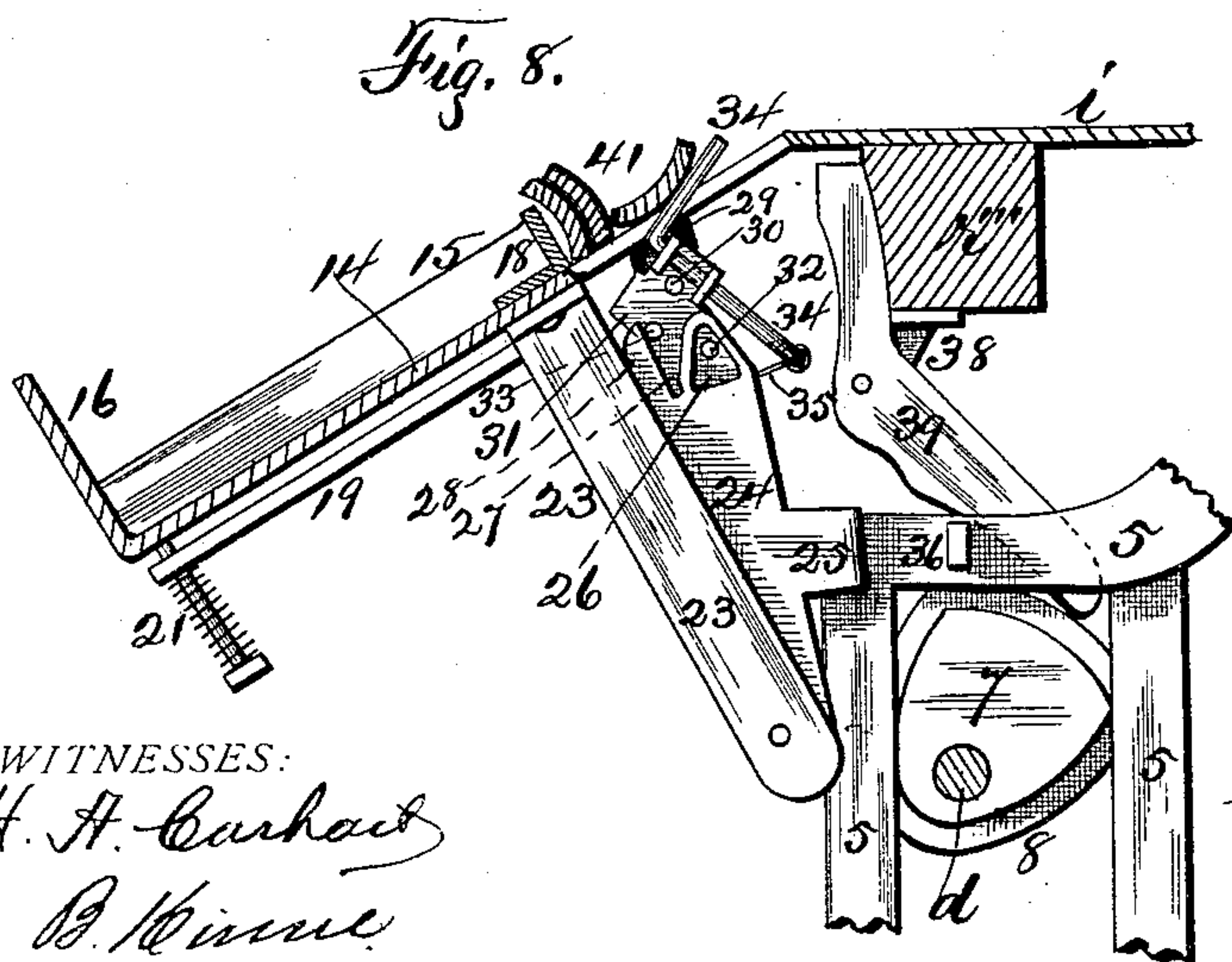
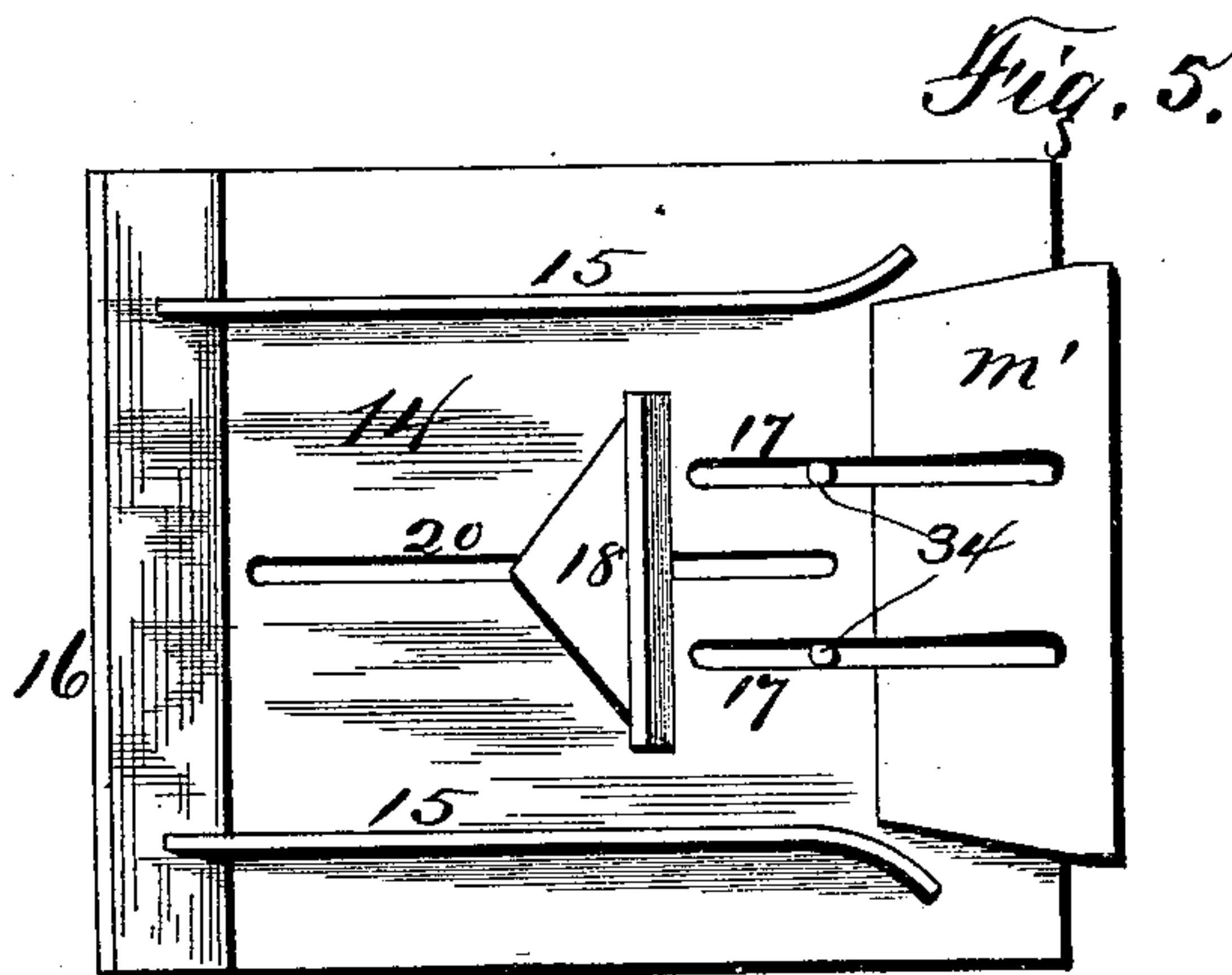
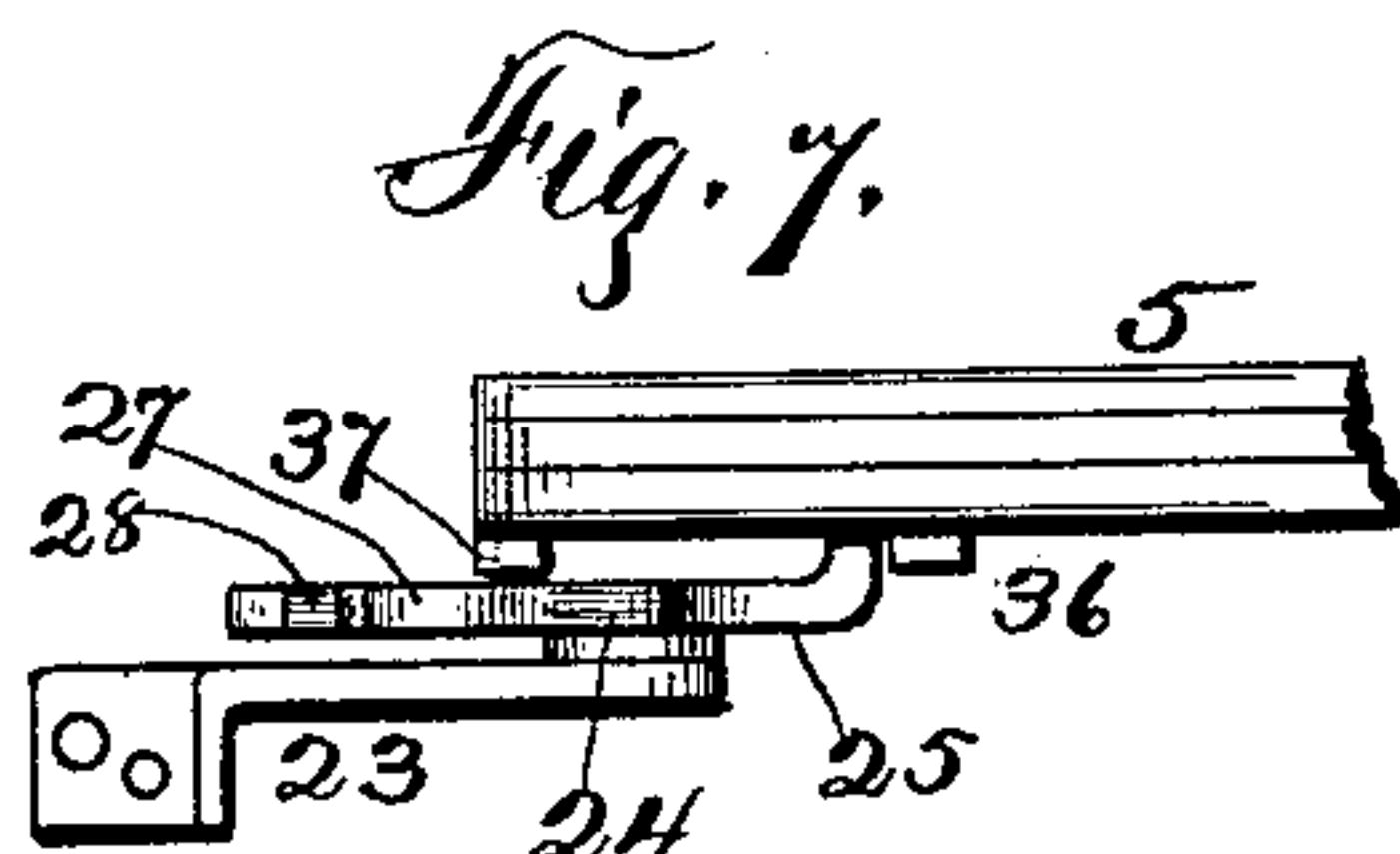
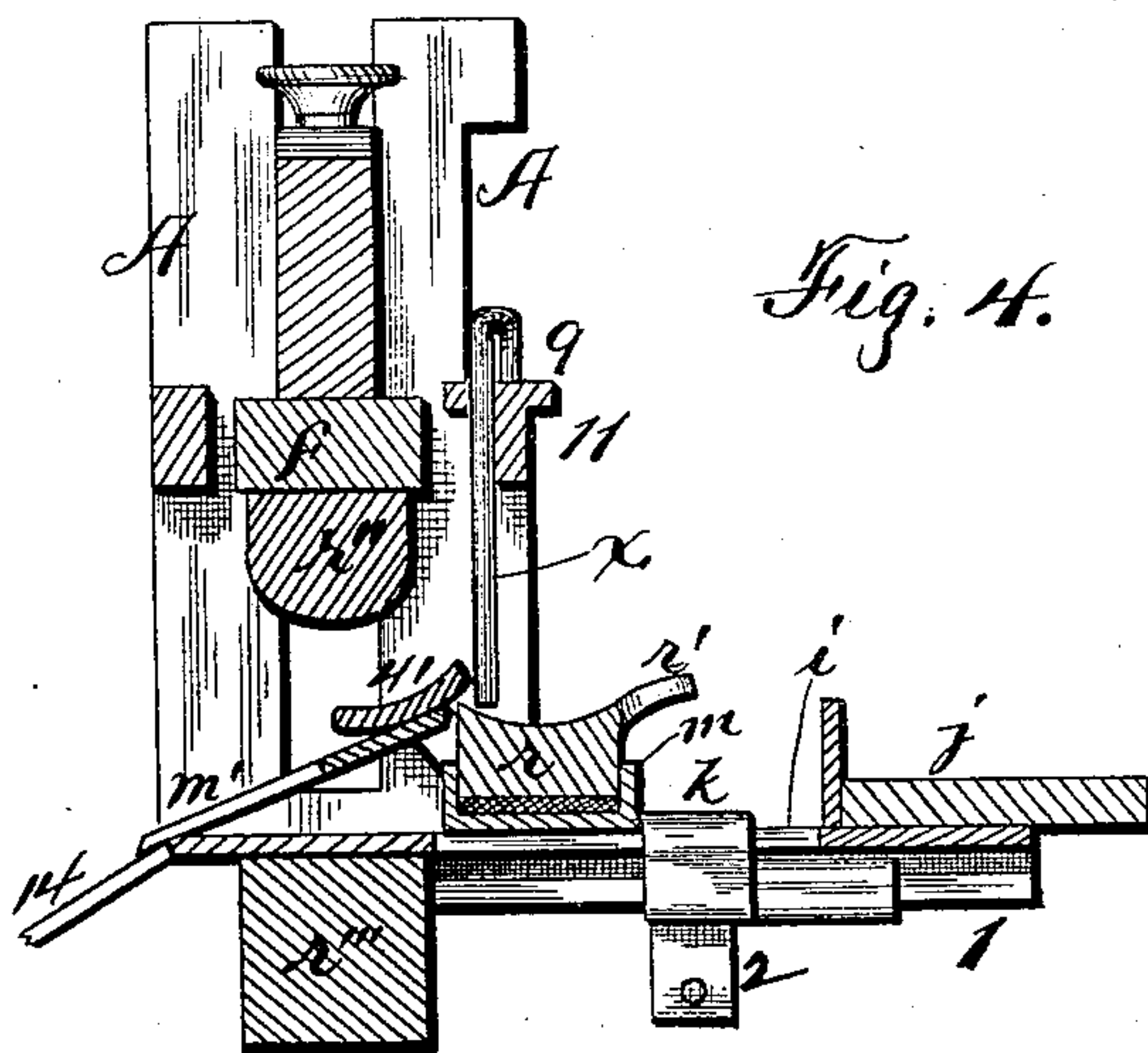
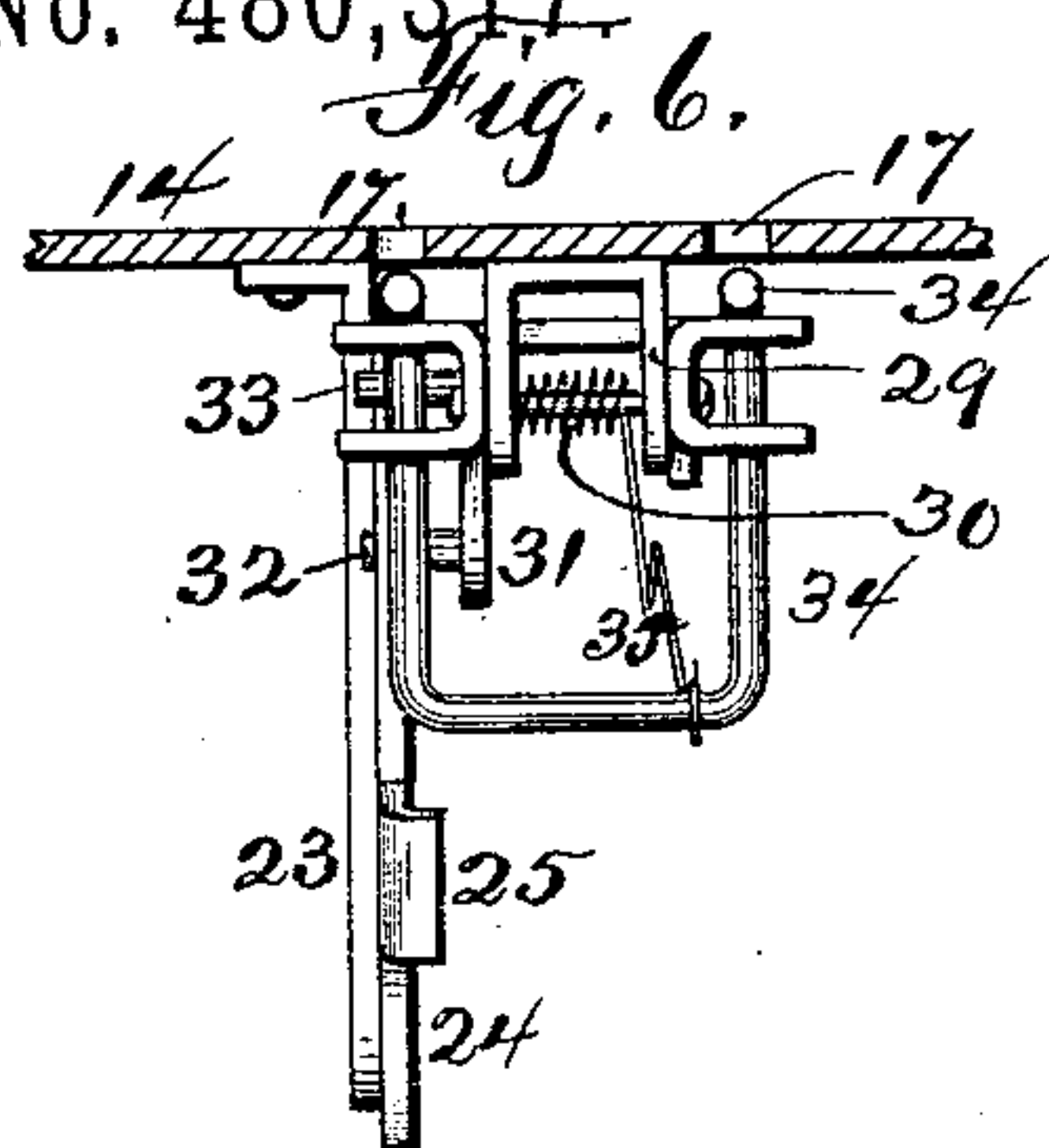
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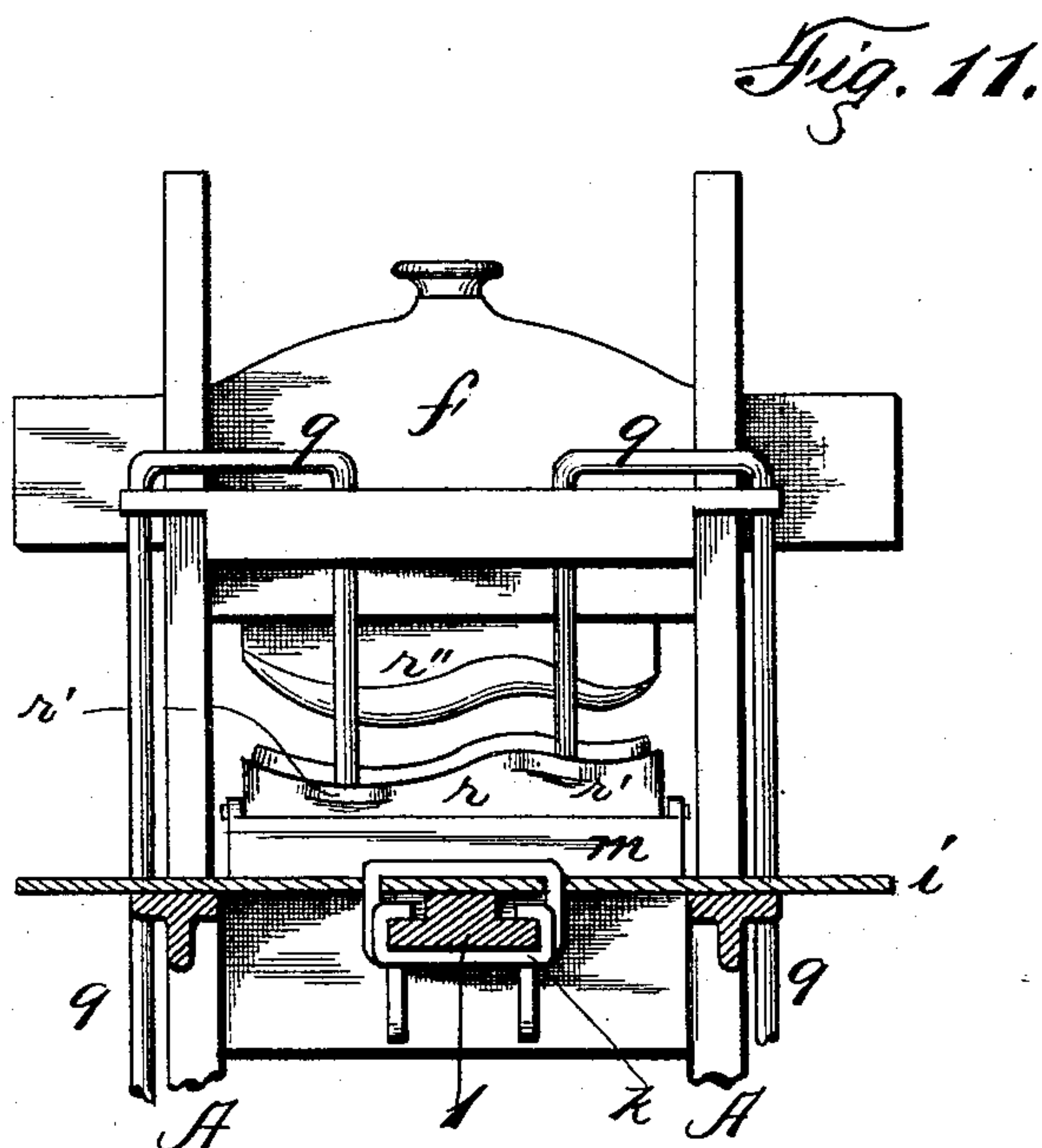
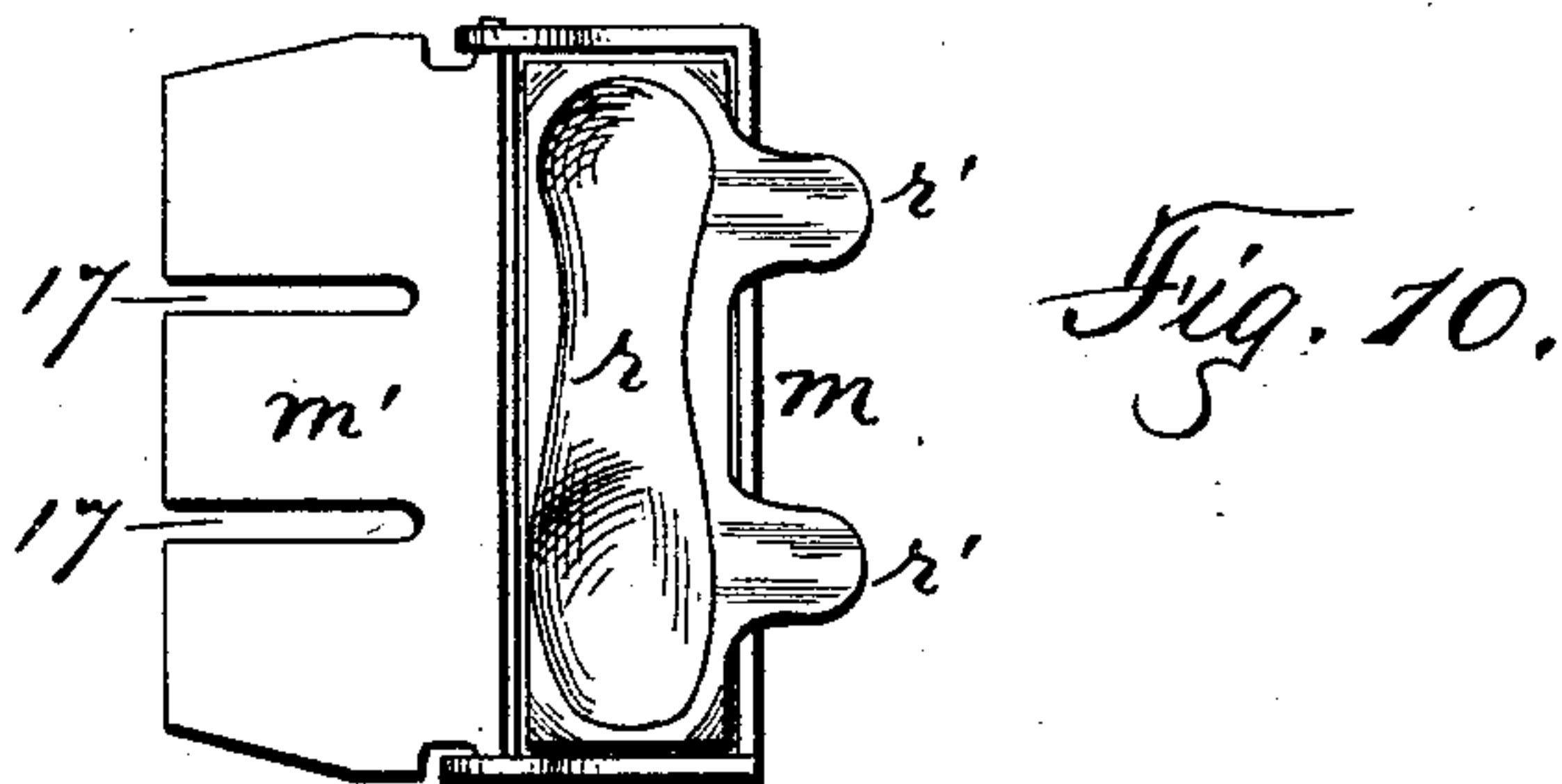
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UNITED STATES PATENT OFFICE.

FRED A. BUGBEE, OF AUBURN, NEW YORK.

SOLE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 480,317, dated August 9, 1892.

Application filed January 21, 1892. Serial No. 418,755. (No model.)

To all whom it may concern:

Be it known that I, FRED A. BUGBEE, of Auburn, in the county of Cayuga, in the State of New York, have invented new and useful
5 Improvements in Formers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to machines for forming or shaping and pressing soles for boots and shoes, so that they will fit upon the last when applied thereto for lasting.

My object is to produce a machine in which all of the danger to the hands and fingers of
15 the operator is avoided and done away with by providing the machine with a die-holder, which is automatically shifted from beneath the platen or male die to receive a sole-blank and then brought under the platen and pressed
20 or shaped, and from which the sole is then automatically removed or stripped and is thereafter automatically piled upon a receiving-table.

My invention consists in the several novel
25 features of construction and operation hereinafter described, and which are specifically set forth in the claims hereunto annexed. It is constructed as follows, reference being had to the accompanying drawings, in which—

30 Figure 1 is a side elevation of the machine with the dies in position as when a sole is being pressed. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical longitudinal sectional elevation showing the dies as in Fig. 1 and the operating mechanisms in corresponding relations. Fig. 4 is a vertical sectional elevation of the dies, the female-die holder, the apron connected thereto, and the stripping-fingers in their respective positions
40 as the female die is thrown out toward the feed-table and the fingers are removing a sole after it has been pressed. Fig. 5 is a top plan of the apron and receiving-table detached. Fig. 6 is a detail showing the piling-arms drawn down under the table. Fig. 7 is a detail, in top plan, of the oscillating frame and mechanism for operating the piling-arms. Fig. 8 is a sectional detail of the piling-table, piling-arms, and their actuating mechanism,
45 showing said arms about to raise the sole upon its edge and piling it. Fig. 9 is a detail of part of the piling mechanism, showing the

parts in their position when pressing the soles against the stop. Fig. 10 is a top plan of the female die, its holder, and the apron hinged
55 thereto. Fig. 11 is a front elevation of the upper part of the machine, showing the table, its supporting-brackets, and the way upon which the slide traverses, and also showing the strippers resting upon the fingers upon
60 the die-holder.

A is the main frame, and *a* is the drive-shaft, journaled in bearings thereon and provided with the drive-gear *b*, which meshes with the gear *c*, mounted upon the shaft *d*,
65 which I designate the "cam-shaft," as it carries and its rotation operates the several cams in the machine. Upon the ends of this cam-shaft, exterior to the main frame, I mount pressure-cams *e*, each provided with a crank-pin *e'*, upon which the jointed pitman-rods *e''*
70 are mounted, their upper ends being adjustably connected to the platen-beam *f*, which extends across the main frame and reciprocates vertically in the parallel guides in the
75 frame-uprights.

Upon the frame I secure the table *i*, extending through between the uprights of the main frame and provided upon its front end with the feed-board *j*, said table being slotted longitudinally to receive the slide *k*, which is connected to the die-holding frame *m*, to which upon the rear side the apron *m'* is hinged and which holds and carries the female die *r*. This die is provided upon its upper front edge with the flat arms *r'*, and its upper face is concaved to the proper form for the outer face of the sole.
85

Upon the under side of the platen-beam *f* I secure the male die *r''*. The female die
90 when receiving the impact of the other rests upon the backing or bed *r'''*. The female die is reciprocated by the forward and backward traverse of the frame *m* and slide *k* upon the table *i* by the following mechanism: The slide
95 is guided by the ways 1 under the table and is provided with an arm 2, to which the connecting-rod 3 is pivotally connected at one end and at the other to the arm 4 of the rocking frame 5, which is pivotally mounted upon
100 the rod 6 across the lower part of the main frame. This frame 5 is provided with a rectangular opening, substantially as shown, and the equilateral spherical triangle cam 7 fits there-

in, said cam being secured eccentrically upon the cam-shaft *d*. This cam is provided with a flange 8, which fits in grooves in the frame 5, as shown by the dotted lines in Fig. 3, and this flange steadies said frame against lateral vibration or movement. Then when the cam-shaft *d* is rotated the cam will oscillate said frame from the position shown in Fig. 3 outward, and this will, through the connections, draw the female die and its frame out toward the feed-board, as partially shown in Fig. 4, and then return it to the position shown in Fig. 3. When so thrown outward, the operator places the sole-blank upon the die, and its retraction brings it in proper position under the male die to receive the pressure, all without requiring the operator to put his fingers between the dies for feeding.

The mechanism for pressing the blanks consists of the cams *e* upon the cam-shaft, the pitman-rods, and the platen-beam, which carries the male die, all timed to operate synchronously with the mechanism for reciprocating the female die.

The mechanism for removing or stripping the sole after it is pressed from the female die is shown as consisting of two fingers *x*, each consisting of a wire or rod 9, bent substantially as shown, creating the finger on one end, mounted in and guided by the block 11 across the frame, Fig. 2, and also guided upon the side of the frame, as at 12, Fig. 1, and provided upon its lower end with a friction-roller 13. This roller engages with the edge of the cam *e*, which thus supports and carries and raises and lowers the arms 10 toward and from the plane of the top of the female die, their operation being so timed that said arms will be close to or in contact with the arms *r'* upon the die at substantially the time when the pressure is completed, so that when the die is thrown outward, as aforesaid, the points of said fingers will engage with the sole, and as said movement of the die continues they will force the sole off from the die onto the apron *m'*, as shown in Fig. 4. Just as this is finished said cam will raise said finger-arms back to the position shown in Fig. 2, and while this is being done the operator has placed another sole-blank upon said die, as aforesaid, and said arms are out of the way of the return of said die to position under the male die. All this stripping is automatic and is performed without any danger to the operator incident to the common way of removing the sole with his fingers inserted between the dies. When the female die is reciprocated, as aforesaid, it carries the apron *m'* forward and back with it, and its inclination is such that when the sole is pushed off from the die it will slide down the same into a receiver.

A receiver is shown, consisting of an inclined table 14, provided with guides 15 and a bottom 16 at the bottom, and in conjunction therewith a piling mechanism. Both the apron and the inclined table are provided with

coinciding and parallel slots 17, the object of which will appear later on, and the same is true of the stop 18 and the friction-bar 19, said stop being mounted in and guided by a slot 20 in the inclined table, said bar engaging with said stop and its frictional tension being regulated by a spring 21, which bears upward against said bar.

The sole-piling mechanism is constructed and operated as follows: The outer end of the inclined table is supported by supports 22 upon the main frame. A leg 23 is secured beneath the table, Fig. 3 or 8, and the cam-bar 24 is pivotally connected thereto, said bar being provided with a side arm 25, bent over, as shown in Fig. 7, and in its upper end with a triangular cam-opening 26 and a notch 27, creating a finger 28, Fig. 8. A bracket 29, Fig. 6, is secured beneath said inclined table, and upon an arbor 30, inserted transversely through said bracket, a frame is secured, of which 31 is one side and which is provided with a projecting pin 32, which fits loosely in the cam-opening in the cam-bar 24, and also with another pin 33. In this frame and suitably guided therein I mount the sliding piling-fingers 34, which are the free ends of a wire bent first to substantially a U form, as shown in Fig. 6, and then bent at substantially a right angle, Fig. 8, and 35 is a spring coiled around said arbor and connected to said wire and to said bracket 29, so as to create a spring-tension when said frame and fingers are vibrated, as hereinafter set forth. Lugs 36 and 37 are provided upon the upper cross-bar of the rock-frame 5, with which the hook on the arm 25 on the cam-bar 24 alternately engages.

Upon a bracket 38 under the bed *r'''* I pivot a bell-crank lever 39, and upon the gear *c* I provide a stud 40, which is adapted with each revolution of the gear to come into engagement with the lower arm of said lever and throw the upper arm thereof backward, as shown in Fig. 9. Then when the rock-frame 5 is thrown over to the left, Fig. 3, the hook on the arm 25 will engage with the lug 36, throwing the cam-bar 24 over to the left, and the action of the cam-opening and the cam-pin 32, engaging therewith, will throw the frame carrying the piling-fingers down, bringing said fingers below the inclined table, (they swinging through the finger-slots 17.) These fingers will then remain in this position, which is while the sole is being pushed off from the female die onto the apron and sliding down over it until stopped by the stop 18 or the soles standing against it. Then when the movement of the rock-frame 5 is shifted over toward the right said hook on the arm 25 of the cam-bar 24 will be brought into engagement with the lug 37 on said frame, which will pull the cam-bar over to the right, and the pin 33 will engage with the wall of the notch 27 and swing said piling-frame back toward its normal position, first bringing the piling-fingers up through

the slots 17 beneath the sole 41, as shown in Fig. 8, and will raise it up on one edge, and then when the fingers are substantially at a right angle to the inclined receiving-table the upper arm of the lever 39 will be thrown against said finger-wires by the stud 40, as shown in Fig. 9, and said bar will then cause said finger-wires to slide in their mountings and said fingers to press said soles close together against the stop 18 and pile them against it, as shown in Fig. 8 as to two of them. This pressure of said fingers is sufficient to force said soles tightly together, and also sufficient to move said stop downward a short distance each time to make room for the succeeding sole upon the front of the pile. When this is done, the lever 39 becomes disengaged from the stud 40, and the tension then upon the spring 35 throws said fingers away from the pile and also throws said lever 39 back to its position in Fig. 3, aided somewhat by the gravity of its lower arm. Then said fingers are tilted down again, as shown in Fig. 3, by said cam-bar 24 and its arm 25 coming again into contact with the lug 36 on the rock-frame 5, as aforesaid.

The mechanism is driven by power applied to the drive-pulley 42 on shaft *a*, said pulley being of the friction-clutch pattern and of ordinary construction, so that I do not deem it necessary to more fully describe the same, the friction being applied by the foot-lever 43 for starting the machine and keeping it in operation in the usual manner.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the vertically-operated male die, of the horizontally-reciprocated female die holder, the female die mounted therein, and the apron hinged to said holder.

2. The combination, with the main frame, the table mounted thereon, and the reciprocating die-holder mounted upon the table, of the female die mounted in said holder, the apron hinged to said holder, and means to reciprocate them upon said table.

3. The combination, with the main frame and the male die operated vertically therein, of the table in said frame, the die-holder supported thereon, the apron hinged to said holder, the female die mounted in said holder, and means to reciprocate said holder and die to and from the operative position below the male die.

4. The combination, with the female die and means to reciprocate it horizontally, of a stripper and means to operate it vertically simultaneously with the reciprocation of said die.

5. The combination, with the female die and means to reciprocate it horizontally, of a stripper adapted to be raised clear of the die as it travels forward and to be lowered into contact with it when the die travels backward and a cam operatively engaging with the said stripper.

6. The combination, with the main frame, the table thereon, and the male die operative vertically above the table, of the female die and its holder and the apron hinged thereto, the rock-frame and its operating-cam actuating the female die and its holder and the apron across said table, the inclined receiving-table, and the stripper operative vertically simultaneously with the travel of said die and holder.

7. The combination, with the horizontally-reciprocating female die, the apron connected thereto, and the inclined table in extension of said apron, slotted as shown, of piling-fingers adapted to project above said table and to be withdrawn below it through the slots, a cam mechanism operating said fingers, and a stop upon the table.

8. The combination, with the horizontally-reciprocating female die, the apron connected thereto, and the inclined table in extension of said apron, slotted as shown and provided with a stop, of piling-fingers mounted in a rocking frame, a vibratory cam engaging with said frame, and means to operate it.

9. The combination, with the main frame and the table thereon, of a female die adapted to be reciprocated upon said table, arms upon said die, and a stripper adapted to be lowered into contact with said arms and to remain in that plane while said die is moving forward and to be raised above the die and its arms when they are moved backward.

10. In a sole-forming machine, the combination, with the reciprocating female die, of the vertically-reciprocating strippers and the fingers supporting them adjacent to the front of the die.

In witness whereof I have hereunto set my hand this 24th day of December, 1891.

FRED A. BUGBEE.

In presence of—

C. W. SMITH,
HOWARD P. DENISON.