(No Model.) 3 Sheets—Sheet 1.

E. S. MANSELL.

MACHINE FOR FORMING HEEL STIFFENERS.

No. 267,439. Patented Nov. 14, 1882.

Fig. 1.

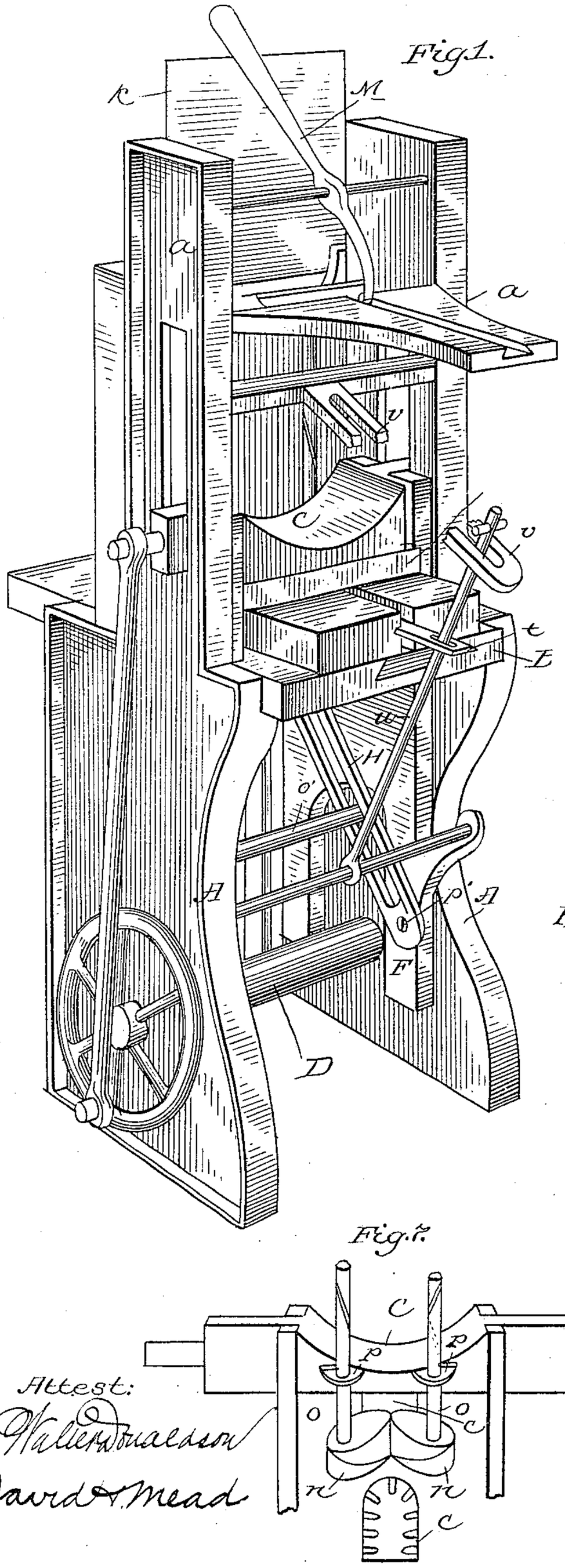

Fig. 5.

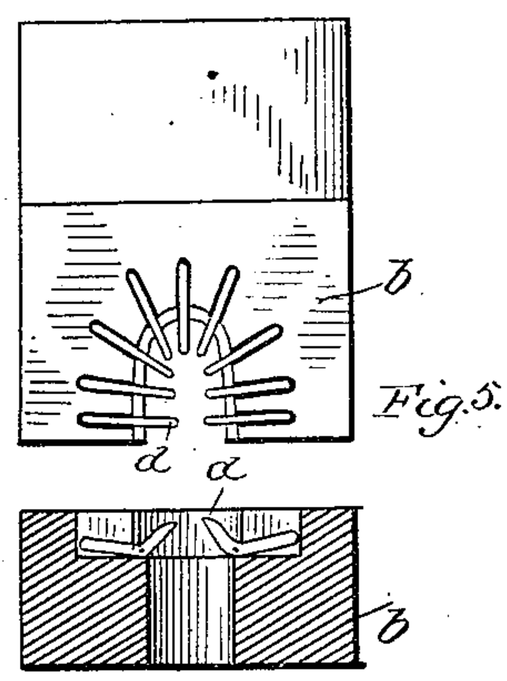

Fig. 6.

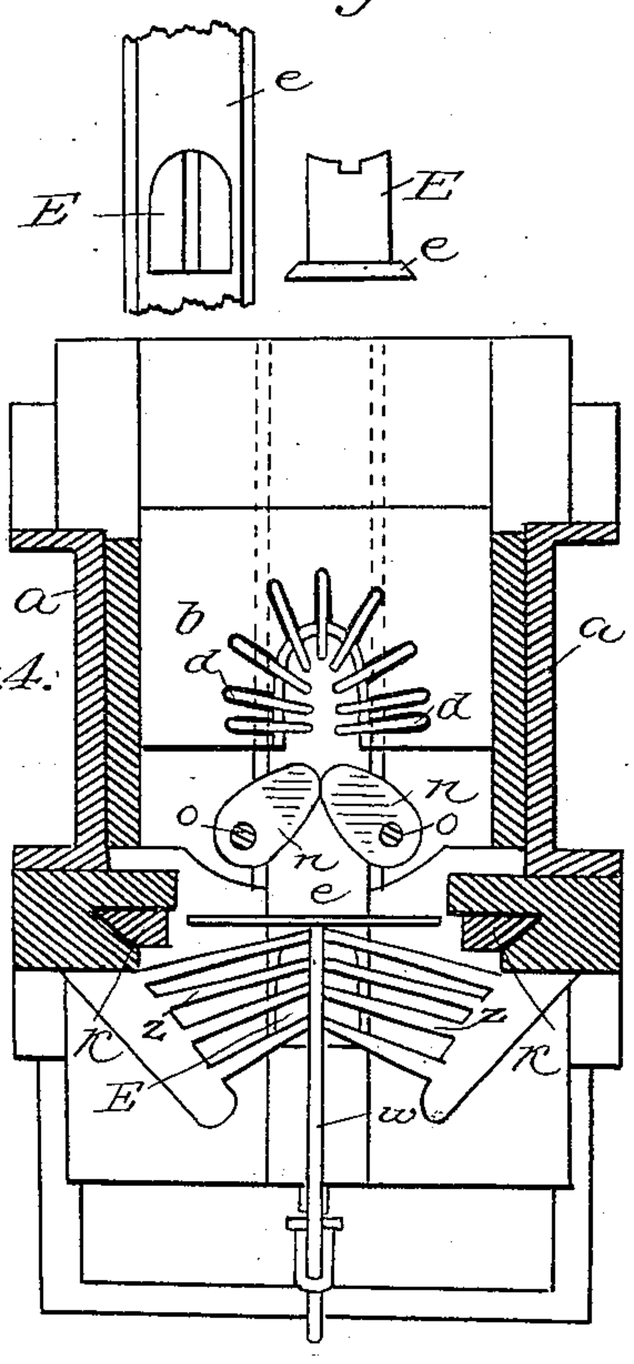

Fig. 4.

Fig. 7.

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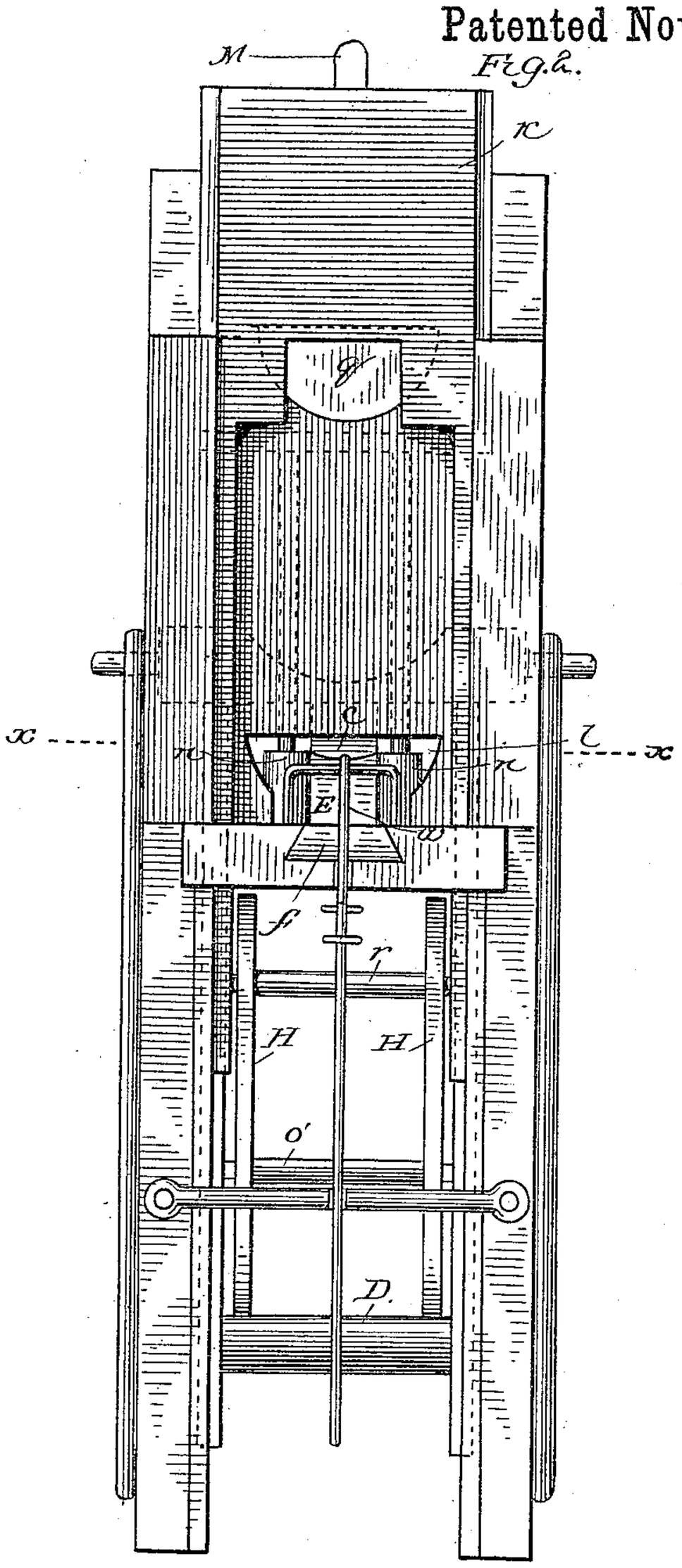
Fig. 2.



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MACHINE FOR FORMING HEEL STIFFENERS.

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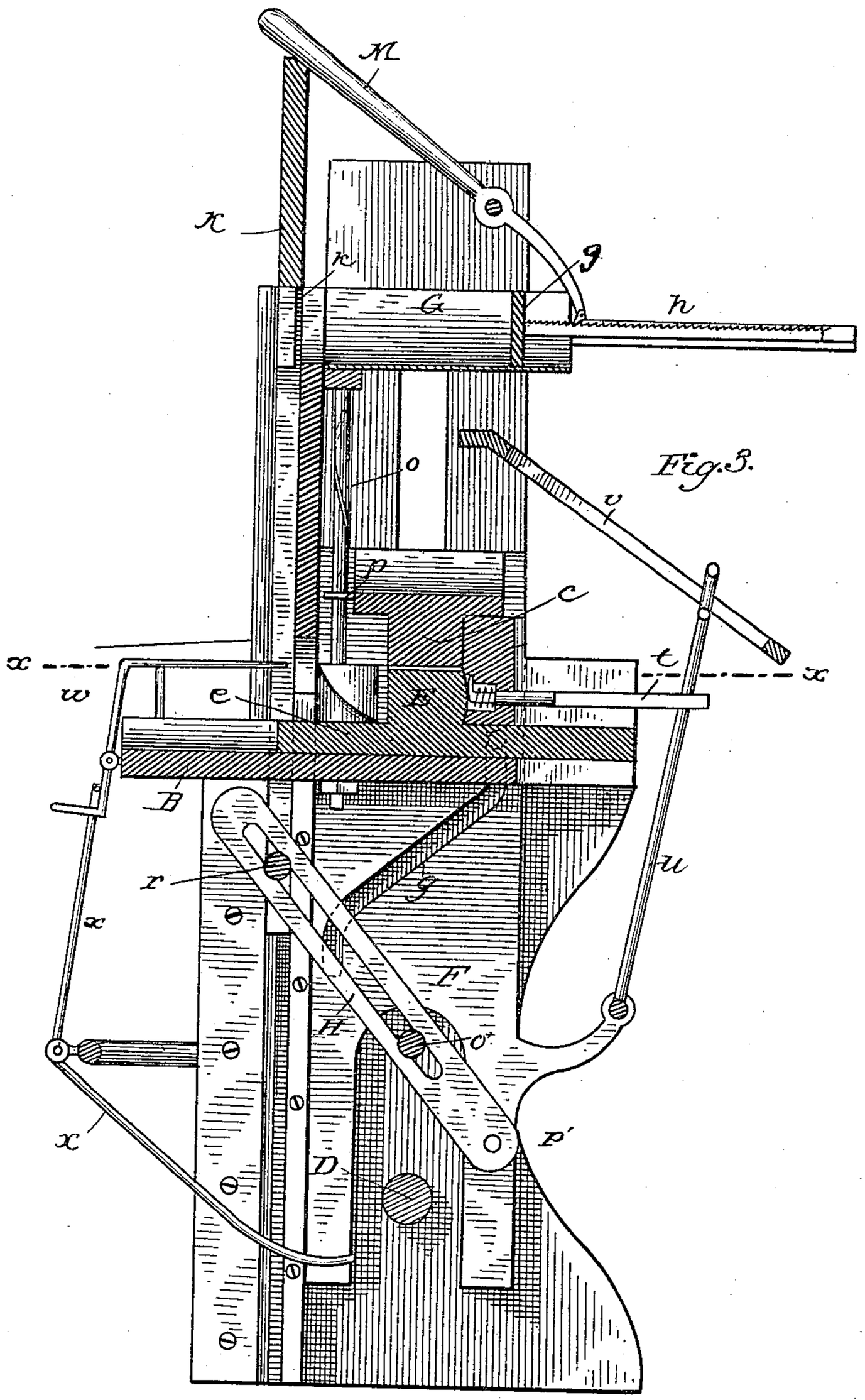

Fig. 3.

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UNITED STATES PATENT OFFICE.

ELBRIDGE S. MANSELL, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GEORGE O. TARBOX, OF SAME PLACE.

MACHINE FOR FORMING HEEL-STIFFENERS.

SPECIFICATION forming part of Letters Patent No. 267,439, dated November 14, 1882.

Application filed April 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, ELBRIDGE S. MANSELL, of Lynn, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Machines for Forming Heel-Stiffeners; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to machines for forming heel-stiffeners for boots and shoes. The general purpose of the invention is to form these stiffeners in a complete manner, by automatic movement of the various parts of the machine, from the blank of leather, and to turn out the stiffener with the flange and shape wholly complete.

In the accompanying drawings, Figure 1 is a perspective view of the front of the machine. Fig. 2 shows a rear elevation of the same. Fig. 3 is a central longitudinal section taken vertically. Fig. 4 is a cross-section on line *x x* of Figs. 2 and 3. Figs. 5, 6, and 7 represent details.

In the figures, A A represent the sides of the frame-work of the machine, and B the top of the table on which the swaging or compressing mechanisms are mounted. The sides are provided with extensions *a a*, slotted to receive the tenons of a cross-head, C, on the ends of which are pins connected to wrist-pins on wheels carried on the ends of a driving-shaft, D. The cross-head C carries on its lower face a plunger, *c*, which fits into the die or cavity in the block *b*, resting on the face of the table. The form of the die is shown in Fig. 5. In plan view it is approximately of the shape of a heel-stiffener contour when formed for the last, and the plunger *c* is fitted to it. The die has slots cut in the block approximately radial to the cavity, and opening into it. In these slots are set small bent levers *d*, pivoted near the edge of the slots, with the bent ends projecting into the cavity of the die and the rear ends resting in the slots when the parts are at rest. When, however, the plunger descends it forces down the inner ends of the levers *d*, thus throwing inwardly the outer ends. The purpose of this is explained hereinafter in connection with the rear plunger. This rear plunger is shown at E. It is fixed upon a slide, *e*, which moves in a way in the table, as shown at *f* in Figs. 1 and 2. This plunger has a reciprocating horizontal movement to bring the blanks forward into the die one by one. It receives its motion from the vertical movement of the head-block through side plates, F F, which are connected to the head-block and move up and down therewith. In the faces of these plates, facing inward, are grooves *g g*, inclined in the main part across the face, but having ends parallel with the sides and line of movement. Pins from the edges of the plate *e* of the guide-block enter these grooves, so that the vertical movement of the plates gives horizontal movement to the plunger. The same vertical movement of the side plates, F, acts upon the vertical feed. The mechanism for this is shown in Figs. 2 and 3. A horizontal channel, G, is set between the upper extensions, *a a*, of the frame, and extends from front to rear. It is rounded on the bottom, so as to fit the counter-blanks when said blanks are set across it with the rounded edge downward. A plunger, *q*, fitted to the channel, has a notched stem, *h*, adapted to be worked step by step to advance the plunger from front to rear as the lever M is successively worked by the rising of the vertical feed-plate. The plunger is drawn back to admit a supply of the blanks, which are placed in an orderly manner, with rounded edges down. The rear blank will rest in and exactly fill a cavity, *k*, in the front side of the vertical feed-plate K, while the plunger presses against the front. Thus each successive step of the plunger to the rear will force a blank into the cavity *k*. The front face of K is plane above the cavity, and as it descends closes the rear of the channel G by pressing against the rear blank. As the plate K descends it carries the blank down to an opening, *l*, of the same shape and size as the cavity, except that it is cut away at the lower part to admit the rear plunger. When the blank is thus brought to register with the opening *l* the plunger E, which has been carried to the rear of the plate K previous to its descent, is moved forward through the lower part of the opening *l* and

through the opening in the plate K, taking with it the blank and carrying it into the die. The front end of the plunger is rounded, as shown more clearly in Fig. 6, thus conforming to the die and acting to shape the blank properly.

Directly in front of the plate K is a pair of cam-shaped pressure-rollers, *n n*, set on vertical shafts *o o*. These rollers are provided with shallow recesses in their faces corresponding to the shape and position of the blank, and when the plunger advances with the blank it brings it to the cavity or recess in the roller and presses it through them. The rollers turn to allow the plunger to pass through, but at the same time press upon the leather and form it about the head of the plunger.

Proper motion is imparted to the rollers by means of spiral ribs on the shafts, which work in grooves in the ears *p p;* but the rollers may be pressed in by springs and thrown out in any suitable manner for the return of the plunger. The ears *p p*, being on the cross-head, move with it, and thus act on the rib to turn the rollers. The upper parts of the grooves *g* are evidently adapted to bring the plunger forward into the die before the upper plunger has been brought down. As the side plates, F, descend the groove *g* on the inclined part carries the block E backward, so that it is pressed quite into the die by the time the pins reach the end of the incline. This occurs before the plunger *c* has reached the lower limit of its movement, so that the die E may be in place before the plunger *c* reaches it. Further downward movement of the plates F leaves the plunger E unmoved, as the pins then travel in the upper vertical parts of the grooves *g*.

It will be observed in Fig. 3 that the groove *g* has a vertical part at its lower end also. In that figure is shown the mechanism for bringing down the feed-plate K, for which the aforesaid vertical part of the groove is provided. A slotted lever, H, is pivoted on a pin or rod, P′, set in the plates F. It is connected to the main frame by pin *o′*, and to the feed-plate K by pin *r*, so that it is fulcrumed on *o′*, and the power is applied to *p′* to move the feed-plate as a weight. The longer arm is from *o′* to *r*, to give the larger movement required by the said feed-plate. Plainly, upward movement of F will bring down K; but upward movement of F also carries back the plunger, and the rear limit of movement of said plunger is made when the pin has reached the end of the incline in the lower part of the groove *g*. Further movement simply brings down the plate K to its limit. This allows the block or plunger E to move to the rear before the feed-plate can come down to strike it, and the reverse movement must, it is plain, raise the feed-plate out of the way before the plunger E starts forward. As this feed-plate rises it leaves the blank brought down in its last descent, and the plunger carries said blank into the die. The lever M, which works the plunger *q* step by step to supply blanks to the feed-plate, is extended to lie across the upper edge of the plate K, so that the free end rises and falls therewith, and the last part of the movement of the plate K causes the lever M to work the plunger *q* sufficiently to force a blank into the cavity *k*.

To briefly recapitulate the order of movement, it may be stated that after the plate K has risen to the position shown in Fig. 1, a blank being in the cavity *k*, the continued revolution of the shaft D immediately starts the said plate downward, the plunger E is carried back, and then the plate K reaches its lowest position with the blank directly in front of the plunger. Continued motion of D reverses the motion of plates F, and as they descend they lift the plate K, leaving the blank, which is carried forward to its place in the die.

In order that there may be a portion of the blank for turning down to form the bottom flange, it will be understood that the said blank (inverted, as a matter of course) must project above the upper surface of the plunger E. Then as the plunger E carries it into the die the vertical plunger *c* comes down and strikes the upturned ends of levers *d*, which are arranged around and inclined over the edge of the blank, above its vertical plunger. This bends the said flange down upon the top of the plunger E. The vertical plunger *c* has grooves to receive the ends of the levers *d* and leave a plain surface on the face of plunger *c* to press the flange. When this operation has been performed the plunger E retreats, and a pusher-rod, *t*, worked by a rod, *u*, on the sliding plate F, and by slotted arm *v*, projects the blank, with the plunger, to the rear. Plunger E has a longitudinal groove in its upper face, and as it goes back an arm, *w*, enters this groove, passing under the flange of the stiffener, and as this happens when the plunger E has reached its rear limit the further movement of the plates F causes the said plates to strike a lever, *x*, which gives a sudden impulse to the lever *w*, throwing the horizontal end upward, and thus throwing out the stiffener. Spring-arms Z yield to allow it to pass, but close down over the plunger to prevent its return.

It will be plain that many of the details, especially those relating to the moving parts, may be changed without departing from the spirit of my invention.

I claim—

1. A machine for forming heel-stiffeners, consisting of a fixed block having a cavity to receive and form the stiffener, a horizontally-moving plunger to bring the blank to the cavity, a vertically-moving feed mechanism acting in connection with the horizontal plunger to bring the blank in front of said horizontal plunger, a vertically-moving plunger adapted to enter the cavity from above after the horizontal plunger has entered, said plunger acting in connection with devices to turn the edge of the blank to form the crimp or flange, all

the parts specified being organized in the machine and in connection with operating mechanism, substantially as described.

2. In combination with the block having forming-cavity, having the pivoted crimping-levers, an upper plunger made with grooved face to receive the upper ends of the levers, and a horizontal plunger to push the blank into its place in the cavity, substantially as described.

3. The combination of the fixed block having forming-cavity, a horizontal plunger adapted to push the blank into said cavity, and cam-rollers, operated as described, arranged in front of the cavity, to form the stiffener before it passes into the cavity, all substantially as described.

4. The vertically-moving cross-head carrying the upper plunger, the slotted arms H H, pivoted in the fixed frame and upon the vertically-moving frame L, and operated by connection with the cross-head, a vertically-sliding feed-plate connected to said arms, so as to be brought down when the cross-head goes up, and the reverse, and suitable mechanism to bring the blanks to the vertically-sliding feed-plate, substantially as described.

5. In combination with the vertically-sliding feed-plate, the feed-box G, slide *g*, and feed-lever M, operated by the vertically-sliding plate, when said plate rises to the upper limit, all substantially as described.

6. The ejecting devices, consisting of a plunger, *t*, in the block, operating through the same to press the stiffener from its cavity, in combination with the lever *w*, adapted to enter a groove in the horizontal plunger and to throw the stiffener therefrom, substantially as described.

7. In combination with the ejecting-levers and the grooved plunger, the guard-springs, arranged to operate substantially as described.

8. The combination of the vertically-sliding cross-head, its connecting-frame having inclined slots, as described, the slotted levers operated by said frame, the cross-bar, and the slide carrying the horizontally-moving plunger, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ELBRIDGE S. MANSELL.

Witnesses:
F. L. MIDDLETON,
J. W. HAMILTON JOHNSON.