(No Model.) 5 Sheets—Sheet 1.

C. T. STETSON.

METALLIC SHANK MACHINE.

No. 352,495. Patented Nov. 9, 1886.

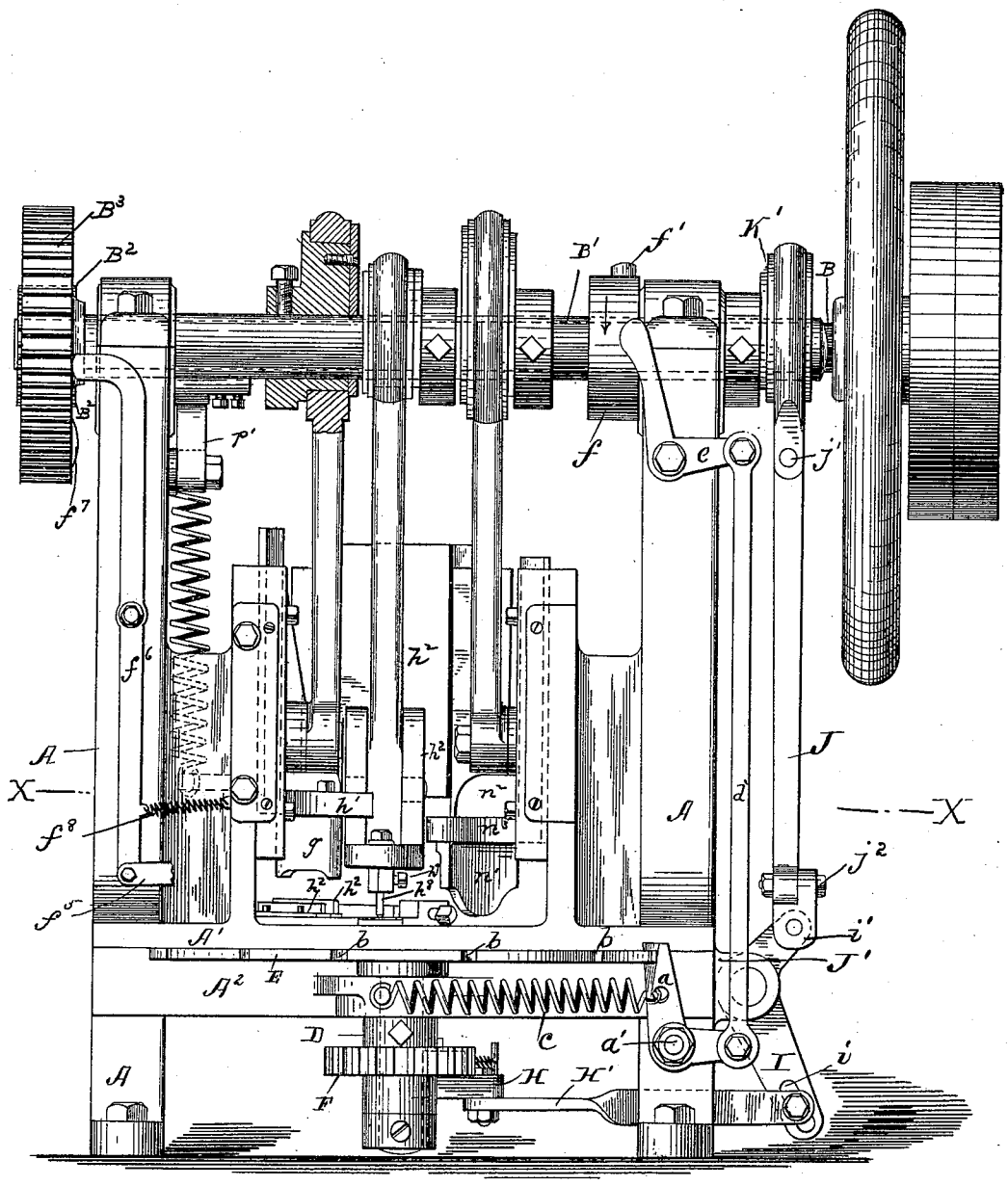


Fig. 1

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Robert Wallace.

INVENTOR:
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C. T. STETSON.

METALLIC SHANK MACHINE.

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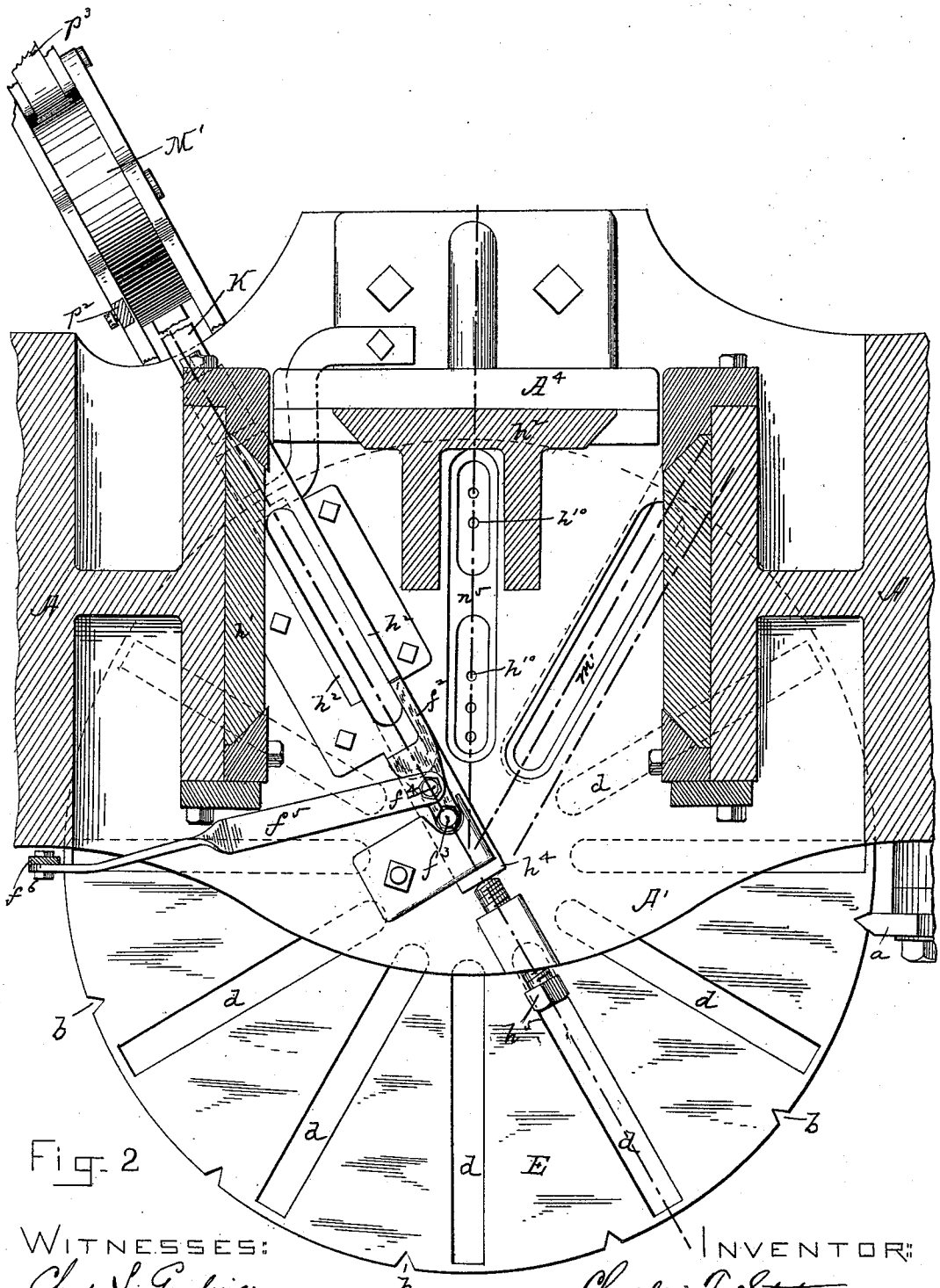


Fig. 2

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C. T. STETSON.

METALLIC SHANK MACHINE.

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Fig. 3.

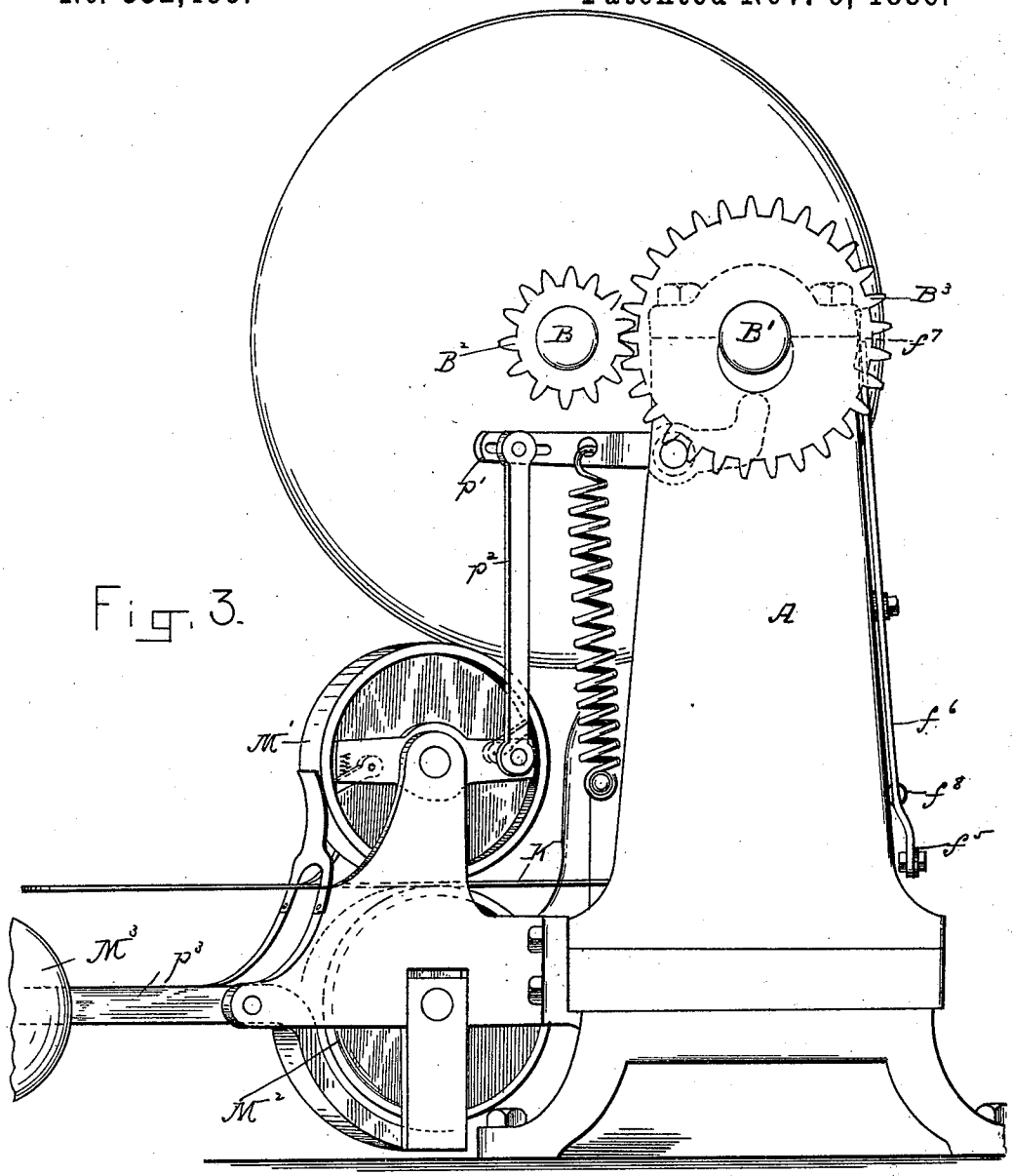
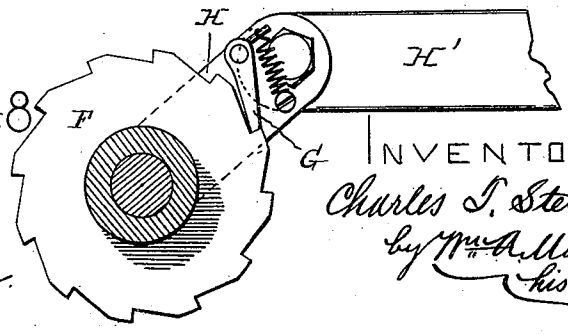


Fig. 8



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C. T. STETSON.

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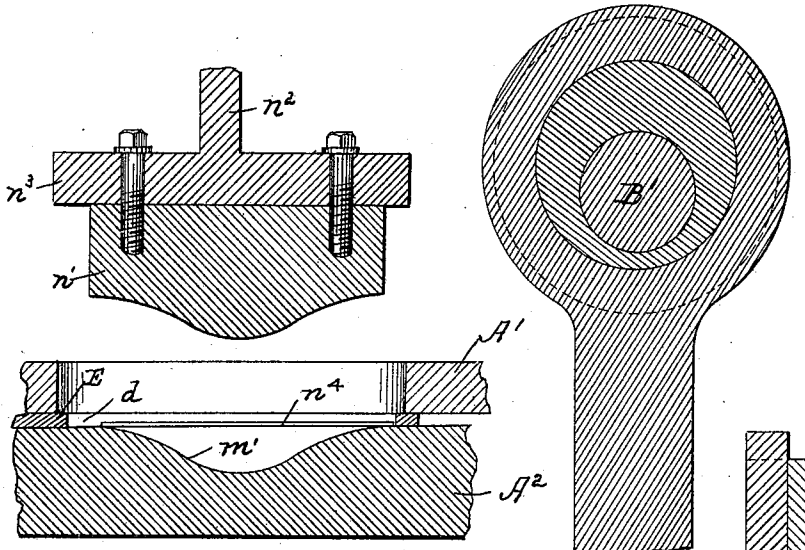


Fig. 6.

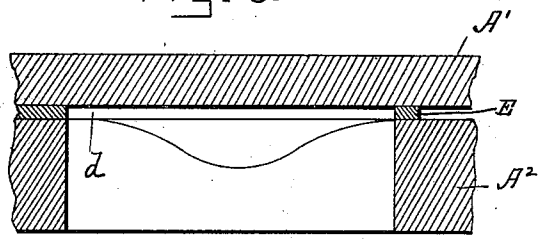


Fig. 7.

Fig. 4.

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(No Model.) 5 Sheets—Sheet 5.

C. T. STETSON.

METALLIC SHANK MACHINE.

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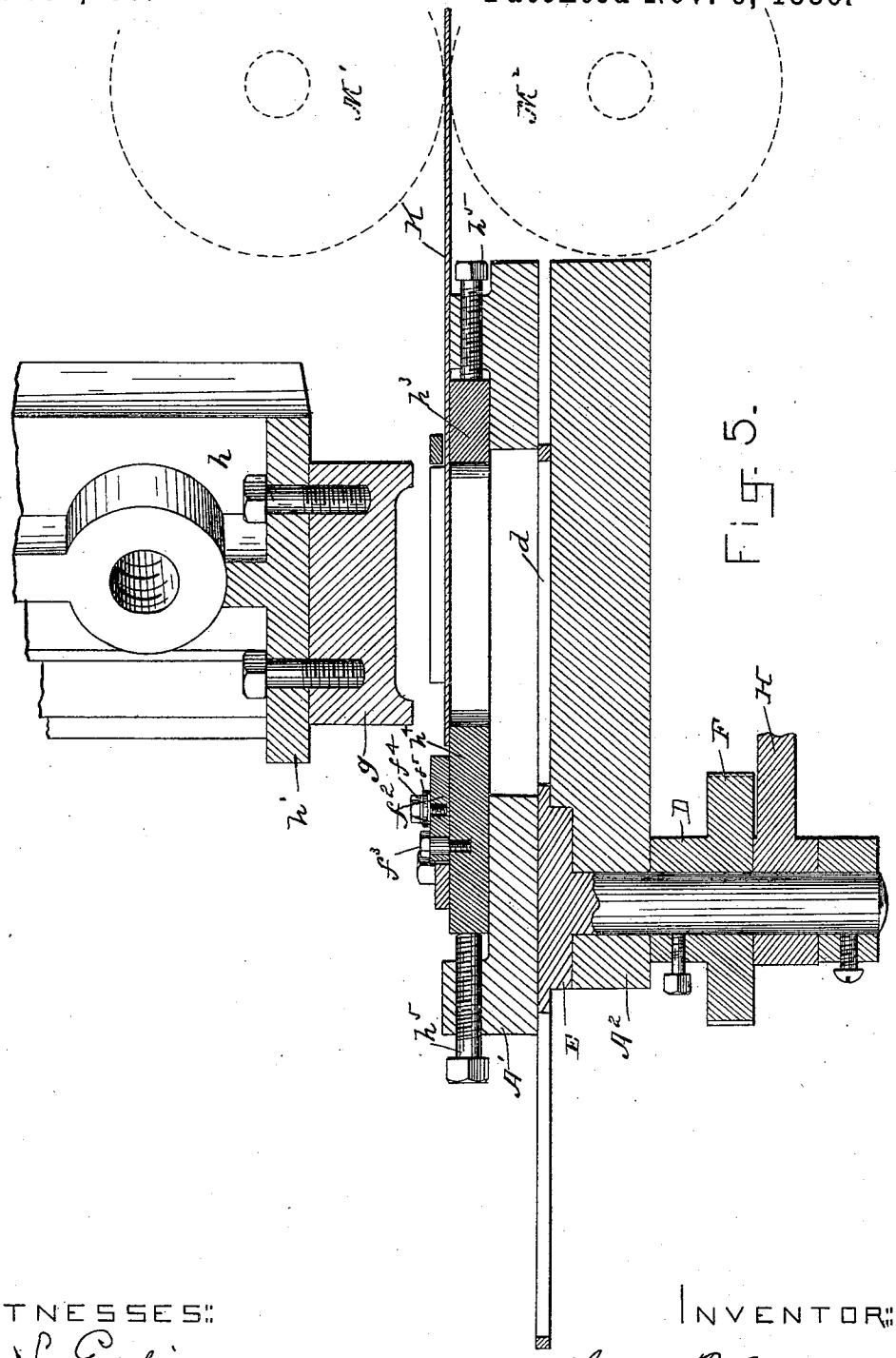


Fig. 5.

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UNITED STATES PATENT OFFICE.

CHARLES T. STETSON, OF ROCKLAND, ASSIGNOR OF ONE-HALF TO OSCAR W. WHITCHER, OF HYDE PARK, FRANK W. WHITCHER, OF BOSTON, AND J. HENRY EMERY, OF QUINCY, MASSACHUSETTS.

METALLIC-SHANK MACHINE.

SPECIFICATION forming part of Letters Patent No. 352,495, dated November 9, 1886.

Application filed May 5, 1886. Serial No. 201,141. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. STETSON, of Rockland, county of Plymouth, State of Massachusetts, have invented certain new and useful Improvements in Machines for Making Metallic Shanks for Boots and Shoes, of which the following is a specification, taken in connection with the drawings accompanying and forming a part hereof, in which—

Figure 1 is a front elevation. Fig. 2 is a plan view of parts below line *x x*, Fig. 1. Fig. 3 is an elevation of the feed mechanism as seen from the left of Fig. 1. Fig. 4 is a vertical central section through the punching-die. Fig. 5 is a vertical sectional view of the cutting-die, showing also the metallic strip from which the shanks are cut as it is fed into the die. Figs. 6, 7, and 8 are details.

The object of my invention is the construction of a simple and efficient machine for making metallic shanks for boots and shoes from strips of sheet metal; and it consists in the mechanism hereinafter described for first feeding the strip into the machine, then cutting the blanks therefrom, then punching the holes in the shank by which it is secured in the shoe, then bending the shank to the proper form, and finally dropping it out of the machine in the completed state.

In the following description like letters of reference indicate like parts throughout the drawings.

A is the frame of the machine, which is provided with two bed-plates—an upper and an under—A′ A^2, respectively, the lower bed being cut away, forming a space between it and the upper plate to receive the disk E.

B is the main shaft, to which power is applied in the usual manner, and B′ is a secondary shaft geared to the main shaft by pinion and gear B^2 B^3. The main shaft is journaled in arms on the top of the upright frame parts, and the secondary shaft is journaled parallel therewith in said uprights, (see Figs. 1 and 3,) and is provided with eccentrics which operate the plungers or dies for cutting, punching, and bending, hereinafter more fully described.

On the under bed of the machine, and secured to the short vertical shaft D, is the horizontal disk E, the function of which is to carry the blank which has been cut at one point to the points where it is successively punched, bent, and discharged. The disk is revolved intermittently a given distance by means of the ratchet F on its shaft D, the ratchet being actuated by a pawl, G, on an arm, H, pivoted at one end to the shaft D, and at the other to a rod, H′, which is pivoted in a slot in the lower arm of the bell-crank lever I, which is pivoted to a lug, J′, on the frame. To the upper arm of the bell-crank lever is pivoted a connecting-rod, J, the upper end of which is attached to an eccentric, K′, on the shaft B′. The slot at *i* on the lower arm of the bell-crank lever is for purposes of adjustment, and permits of increasing or diminishing the throw of rod H′. The connecting-rod J is pivoted at *i′* *j′* j^2, to prevent it from cramping as the upper arm of the bell-crank lever moves outward and downward out of line with the eccentric K′. The pawl-and-ratchet mechanism is so timed as to move the disk E through one-twelfth of a revolution of the shaft.

The disk E is provided with twelve slots, *d*, equidistant from each other and cut radially therein. These slots are of a length and width just sufficient to accommodate a shank-blank. For the purpose of holding the disk E positively when it is stationary, and insuring its movement through exactly one-twelfth of its revolution at each rotation of the main shaft, I provide a stop-pawl, *a*, having a V-shaped face, which acts in the V-shaped notches *b* in the periphery of the disk. The pawl *a* is pivoted on the frame at *a′*, and is held against the periphery of the disk by the tension of the spring *c*, fast at one end to the pawl and at the other to the bed A^2, and is moved out of the notch *b* by the downward movement of the connecting-rod *d′*, which is pivoted at its lower end to the rear of the pawl, and at its upper end to a bell-crank lever, *e*, pivoted to the upper part of the frame. (See Fig. 1.) The upper arm of the lever *e* projects into the path of a pulley, *f*, on the shaft B′, provided on its periphery with a projection, *f″*, which, as the pulley revolves, strikes the upper arm of lever *e*, throwing it back, and throwing down the lower arm and the connection *d′*, and raising the stop-pawl out of the notch *b*.

The upper bed, A′, is provided with three slots, which are so cut in the bed as to converge to a central point in line with the axis of rotation of the disk E, and at such a dis-

tance from each other and from the said center as to correspond with the slots *d* in the disk E, so that as the disk is rotated the slots in the bed A′ will be directly over the corresponding slots *d* of the disk. On the bed A′, and on opposite sides of the cutting-die slot, are secured two guides, h^2, which serve to keep the strip from which the shank is cut in place, and at opposite ends of this slot are placed the dies h^3 h^4, which are set on the bed A′, and are provided with adjusting-screws h^5, by which they may be moved nearer to or farther from each other when it is desired to shorten or lengthen the shank. As the shank-strip is preferably of the same width as the shank which it is desired to produce, it is necessary only to cut the ends of the shank, and these dies h^3 h^4 are made at their cutting ends of a form corresponding to the form desired for the end of the shank.

In the machine shown in the drawings the shank is rounded at each end, and the dies h^3 h^4 are consequently concaved at their cutting-faces to correspond to the round desired for the end of the shank. The upper member, *g*, of the die corresponds in shape to the space between the two parts h^3 h^4 of the lower member, and is securely bolted to an arm or flange, *h′*, on the lower part of the vertically-moving head *h*, which is arranged to slide in a dovetailed groove formed on the inner face of a part of the upright frame A′. (See Fig. 2.) To the head *h* is bolted the connecting-rod which connects it with the eccentric on the shaft B′.

As the method of constructing eccentrics for the purpose of operating parts which have a vertical movement in ways or grooves is well known to all skilled in the art, I do not deem it necessary to give a particular description of the construction of the eccentrics and vertically-moving heads which operate the cutting, punching, and bending dies. These parts will be readily understood from an inspection of the drawings.

The central slot in the bed A′ is to allow the punching-die to pass downward to the slot in the disk E, which contains the shank, which said disk is carrying from the point where it was cut to the point where the holes are punched in it. The punching apparatus is mounted in a head, h^2, which slides in a dovetailed groove in an upright portion, A^4, of the frame, which rises from the bed A′ of the machine. The head h^2 is operated by a connecting-rod and an eccentric similar to that used to operate the cutting-die, and it is provided with two punches, h^8. It is desirable to mount these punches in such manner that they may be set at various distances from each other, and so as to punch the holes in the shank wherever desired. To do this I secure the piece h^6 (see Fig. 4) to the under side of the head h^2, and provide it with a series of holes, h^7, at each end to receive the punches h^8, which are inserted therein, and are held in place by set-screws h^9 in the side of piece h^6. Directly beneath the holes h^7, which receive the punches, the lower bed, A^2, of the machine is provided with corresponding holes, h^{10}, to receive the ends of the punches as they pass through the shank. The centrifugal motion imparted to the shank-blank n^4 by the revolution of the carrying-disk E keeps the outer end of the blank against the outer end of the slot *d* in the carrying-disk, so that the exact points at which the punches will pass through it, as also the exact point at which the bending-die will strike it, may be readily determined.

From the punching-die the disk E carries the shank to the bending-die, which consists of a concavity, *m′*, in the lower bed, A^2, of the machine, and a corresponding convexity on the lower face of the block *n′*, which is secured to the head n^2, which is actuated vertically by a connecting-rod and eccentric on the secondary shaft B in the same manner as are the heads of the cutting and punching dies. The ways in which the dovetail n^2 slides are constructed on the inner face of a part of the upright frame of the machine, similar to the ways on the opposite side, in which the head of the cutting-die slides, the block *n′* being secured to a projection or flange, n^3, formed so as to bring the block *n′* in line above the radially-set slots of the carrying-disk and the upper bed, A′, the slot at this point in the upper bed, A′, being merely for the purpose of allowing the block *n′* to pass downward on the blank n^4, to press it into the concavity *m′*, and thus bend it to shape in the same manner in which the central slot of the bed A allows the punching-dies to move downward to punch the holes in the shank. This central slot is shown in the drawings, not as a single slot, but two slots in line with each other, it being unnecessary to entirely cut away the central portion, n^5, Figs. 2 and 4, to accommodate the punches. It is obviously immaterial whether this central portion, n^5, be wholly cut away, forming a single slot at this point in the bed A′, or whether it be allowed to remain, so far as the working of the machine is concerned. I prefer, however, to leave it, as shown, Figs. 2 and 4, as it adds somewhat to the strength of the parts. The concavity *m′* in the bed A^2 is extended beyond the point at which the shank is bent and opens into a slot through the bed, which, as the carrying-disk E revolves, receives the bent shank, and allows it to drop through the bed and clear of the machine.

As the shank-strip is fed into the cutting-dies and the shanks are cut therefrom, a small waste piece is left on the part h^4 of the die in making shanks with rounded ends, and in order to insure the clearing of this piece from the die, thus preventing clogging of the parts with these pieces, I have provided a finger, f^2, pivoted at one end on the die at f^3, and having a connecting-rod, f^5, secured to it by a pivot, f^4, (see Fig. 2,) the other end of the rod being pivoted to a lever, f^6, which in turn is pivoted centrally (see Fig. 1) to the upright A of the frame of the machine. This lever f^6 is

bent, (see Fig. 1,) so as to throw its upper end nearer to the face of gear B^3 and in contact with a projection, f^7, on the face of the gear at each revolution thereof. As this projection strikes the lever f^6 it throws the upper end thereof back and the lower end out, thus swinging the finger f^2 across the top of the die h^4, and throwing off the waste piece from the shank-strip which has been deposited there. The finger is returned after its movement by means of the spiral spring f^8, which is secured at one end to the lower end of the lever f^6 and at the other to a part of the stationary frame. (See Fig. 1.)

An intermittent feed of any desired form or construction may be readily adapted to the machine. I prefer, however, the one shown at Fig. 3, which is old and well known, and will not require detailed description. The upper wheel, M′, of this feed is operated by a friction-pawl mechanism through the lever p' and connecting-rod p^2 and cam projection on shaft B′, and the lower wheel, M^2, is held against the under side of the strip by a weight, M^3, on a lever, p^3, on the inner end of which lever, in suitable bearings, the feed-wheel is journaled. (See Fig. 3.) One advantage of this feed mechanism I find to be the readiness with which the feed may be stopped by the operator simply raising the weight M^3 with his hand.

I have shown the carrying-disk E as having twelve carrying-slots, *d*, and have so described it, since the machine shown in the drawings is so constructed. It will be obvious, however, that the number of these slots is not material, as by changing the relative positions of the cutting, punching, and bending dies the number of these slots may be varied.

The operation of the machine is as follows: The strip K is fed forward by the feeding apparatus into the cutting-die, the upper member of which then descends, punching a blank from the strip, and allowing it to drop through the slot in the upper bed, A′, into the slot *d* in the carrying-disk. The carrying-disk is then revolved, so as to carry the shank thus formed under the punching-die, which then descends and punches the securing-holes therein. At the same time, or very shortly after, the cutting-die has again descended and cut another blank from the strip, which in the meantime has again been fed forward, and this next blank has dropped into the next succeeding slot in the carrying-disk. The carrying-disk again revolves, carrying the first blank from the punching-dies to the bending-dies and the next succeeding blank from the cutting-dies to the punching-dies, when the dies again descend, and the first shank is bent, the next succeeding blank is punched, and another blank is cut from the strip. Another part revolution of the carrying-disk discharges the first shank and carries the others into position to be bent and punched relatively, and so the operation is repeated. The cutting, punching, and bending dies do not descend simultaneously, but one slightly in advance of the other. They might, by setting the eccentrics together on shaft B′, be made to move together; but I consider it an advantage to have them fall successively, as the rack and wear of the machine are thereby lessened.

What I claim is—

1. In a shank-machine, the combination of the cutting, punching, and bending dies with the intermittently-rotated carrying-disk, for the purpose and substantially as shown and described.

2. In a shank-machine, the combination, with independently-actuated cutting, punching, and bending dies and the carrying-disk, of an intermittent feed mechanism, whereby a strip of metal the width of a shank may be fed into the cutting-dies at each cut, substantially as set forth.

3. In a machine for making shanks for boots and shoes, provided with cutting, punching, and bending mechanism, the combination of the slotted upper bed, A′, the lower bed, A^2, and the slotted carrying-disk, mounted between said beds, and its operating mechanism, substantially as shown and described.

4. In a shank-machine provided with cutting, punching, and bending mechanism, the combination of the carrying-disk E and its operating mechanism and the stop-pawl *a* and its operating mechanism, whereby the positive movement of the disk is regulated, substantially as and for the purposes set forth.

5. The combination, in a shank-machine provided with intermittent feed mechanism, of the cutting-dies and the clearing-finger f^2 and its operating mechanism, for the purposes and substantially as described.

CHARLES T. STETSON.

Witnesses:
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