# A. F. SMITH.

## Machine for Forming Heel-Stiffeners.

**No. 206,145.** **Patented July 16, 1878.**

*Fig. 1.*

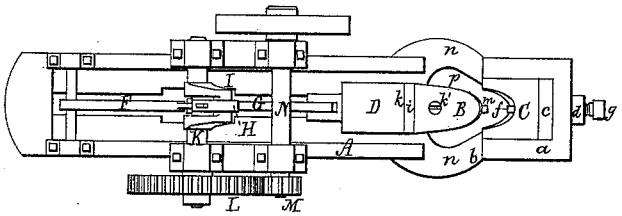


*Fig. 5.*

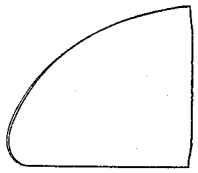


*Fig. 2.*

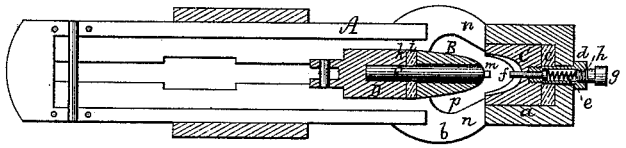


*Fig. 6.*

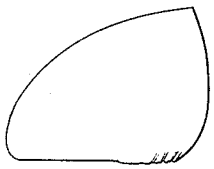


*Fig. 3.*

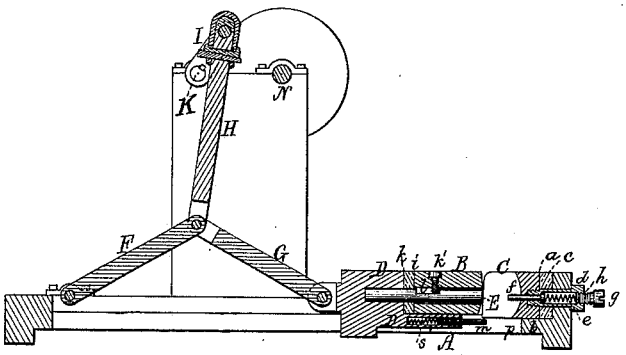


*Fig. 7.*

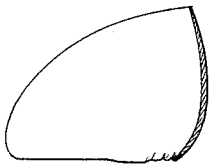


*Fig. 8.*

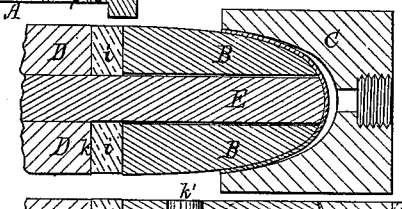


*Fig. 4.*

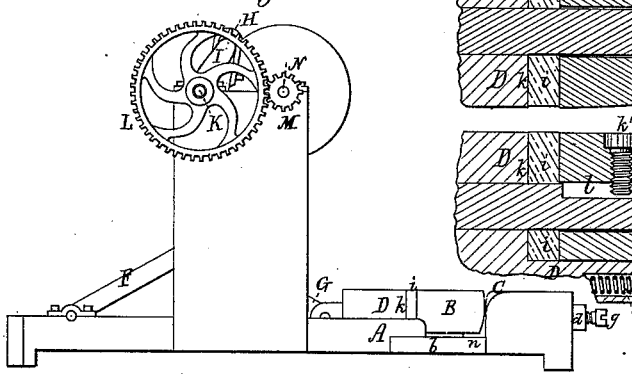
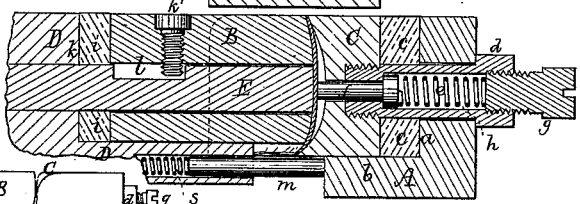


*Fig. 9.*



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R. H. Eddy.

# UNITED STATES PATENT OFFICE.

AARON F. SMITH, OF LYNN, MASSACHUSETTS.

## IMPROVEMENT IN MACHINES FOR FORMING HEEL-STIFFENERS.

Specification forming part of Letters Patent No. **206,145**, dated July 16, 1878; application filed June 3, 1878.

*To all whom it may concern:*

Be it known that I, AARON F. SMITH, of Lynn, of the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Machinery for Molding or Forming Heel Counters or Stiffeners for Boot or Shoe Uppers; and do hereby declare the same to be described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a horizontal section, Fig. 3 a vertical and longitudinal section, and Fig. 4 a side elevation, of a machine embracing my invention.

In molding heel counters or stiffeners by means of dies it has been found difficult to obtain the desired convexity of the middle of the counter without unduly wrinkling the counter. In my improved machine the counter-blank is grasped and held along its upper and lower portions while the middle portion is being stretched and molded into shape.

Fig. 5 denotes a side view of a counter-blank as it appears before being subjected to the action of the machine. Fig. 6 is a side view, and Fig. 7 a vertical section, of a counter as formed by the machine. Figs. 8 and 9 represent, on an enlarged scale, sections of the dies and the counter-blank between them preparatory to the auxiliary male die being forced forward into the blank to stretch it into the female die.

My invention relates to or consists as follows, viz: In the combination of a movable main die, its spring or elastic cushion, an auxiliary or stretching die, a slide or carriage, and a female die, all being arranged and applied substantially in manner and to operate as hereinafter described; also, in the combination of a discharger and its spring and holding-screw with three dies, a carrier, and an elastic cushion, all being substantially as described and represented; also, in the combination of a central counter-blank movable supporter and its operative spring with a carriage and dies, as set forth; also, in a chambered holding-screw, provided with a spring-adjusting screw and ejector, in combination with a die and its elastic spring or cushion, all being essentially as shown and specified.

In the drawings, A denotes the frame for supporting the dies and their operative mechanism. These dies are represented at B and C, that marked C being the concave or female die. It is placed in a socket, *a*, of the bed *b* of the frame A, and rests against an elastic cushion, *c*. A screw, *d*, inserted in the frame and through the cushion and screwed into the die, serves to hold the die in its socket and allow the die to move backward. The screw is chambered to receive a helical spring, *e*, which bears against the head of a movable pin, *f*, such pin being arranged in the die and screw in manner as shown.

A screw, *g*, screwed into the rear end of the spring-chamber *h*, serves to hold the spring therein, and to contract it as occasion may require. The pin, through the pressure of the spring, operates to discharge from the mold or die the counter after the molding of it may have taken place.

The male or convex die (shown at B) is supported by and upon a slide or carriage, D, adapted to the frame, so as to be capable of moving rectilinearly therein toward and from the die C. At its heel the die B rests against springs or an elastic cushion, *i*, intervening between it and an abutment or shoulder, *k*, of the carriage D. From the central part of such abutment an auxiliary die, E, projects, and extends loosely through the die B. A screw, *k'*, screwed down in the die B, enters a groove, *l*, in the shank of the auxiliary die, and with such groove limits the advance of the die B on the die E, and allows the said die B to move backward in the die E.

A movable stud, *m*, extending from the middle of the front end of the slide or carriage D, and arranged to slide back within the carriage and against a spring, *s*, placed therein, serves to support a counter-blank at the middle of its lower edge preparatory to and while such blank may be in the act of being pushed into the female die by the male die, the blank being placed edge downward on the stud and on the parts *n n* of the bed *b* of the frame.

When the stud *m* is forced against the female die during advance of the male die, such stud will remain stationary and the last-mentioned die will continue to advance. The spring will advance the stud when the male die may be in the act of being drawn backward out of the

female die. Toggles F G are pivoted to the frame and the die-carriage, and together, and to a connecting-rod, H, which in turn is pivoted on the wrist of a bell-crank, I, carried by a shaft, K. On this shaft a gear, L, is fixed, and engages with a pinion, M, carried by a driving-shaft, N, all being arranged as represented. During each revolution of the bell-crank the toggles will be worked so as to cause an advance and recession of the die-carriage.

On placing a blank between the dies, it, during the next advance of the male die, will be forced into the female die, and, to a certain extent, will be molded or shaped by such dies. They, however, will grasp it firmly along and near to its upper and lower edges, after which the carriage, continuing to advance, will force the auxiliary die forward against the blank and stretch such blank between the grasped portions of it, and finish the curving of it at its center or heel.

On recession of the carriage both the auxiliary die and the male die will be retracted, so as to cause them to separate from the female die far enough to allow the spring *e* to press the pin *f* against the formed counter and eject it from the die.

By having the female die movable against an elastic cushion, such die can accommodate itself to counter-blanks of different thicknesses. Each of such blanks should be firmly grasped by the dies B C before the auxiliary or stretching die E may be moved forward within and relatively to the male die B. Thus it will be seen that, with the three dies B C E arranged and to operate as described, I can stretch and crown the blank at its middle without materially or injuriously wrinkling such blank at either or both of its edges.

The bed-plate is provided with an opening or passage, *p*, extending down through it and arranged under the dies, and made of a width and form sufficient to enable the counters, as they are molded, to be discharged into and down through it.

What I claim as my invention is as follows:

1. The combination of the movable main die B, its spring or elastic cushion *i*, the auxiliary or stretching die E, the slide or carriage D, and the female die C, all being applied and to operate substantially as set forth.

2. The combination of the discharger *f* and its spring *e* and holding-screw *h* with the three dies B C E, the carrier D, and the elastic cushion *c*, all being applied and to operate substantially as explained.

3. The combination of the central counter-blank movable supporter *m* and its operative spring *s* with the carriage and the dies B C, arranged and applied as set forth.

4. The chambered holding-screw *d*, provided with the spring *e*, adjusting-screw *g*, and ejector *f*, in combination with the die C and its elastic spring or cushion *c*, all as set forth.

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Witnesses:
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