

J. D. BILLINGS.
Machine for Making Horseshoes.

No. 198,448.

Patented Dec. 25, 1877.

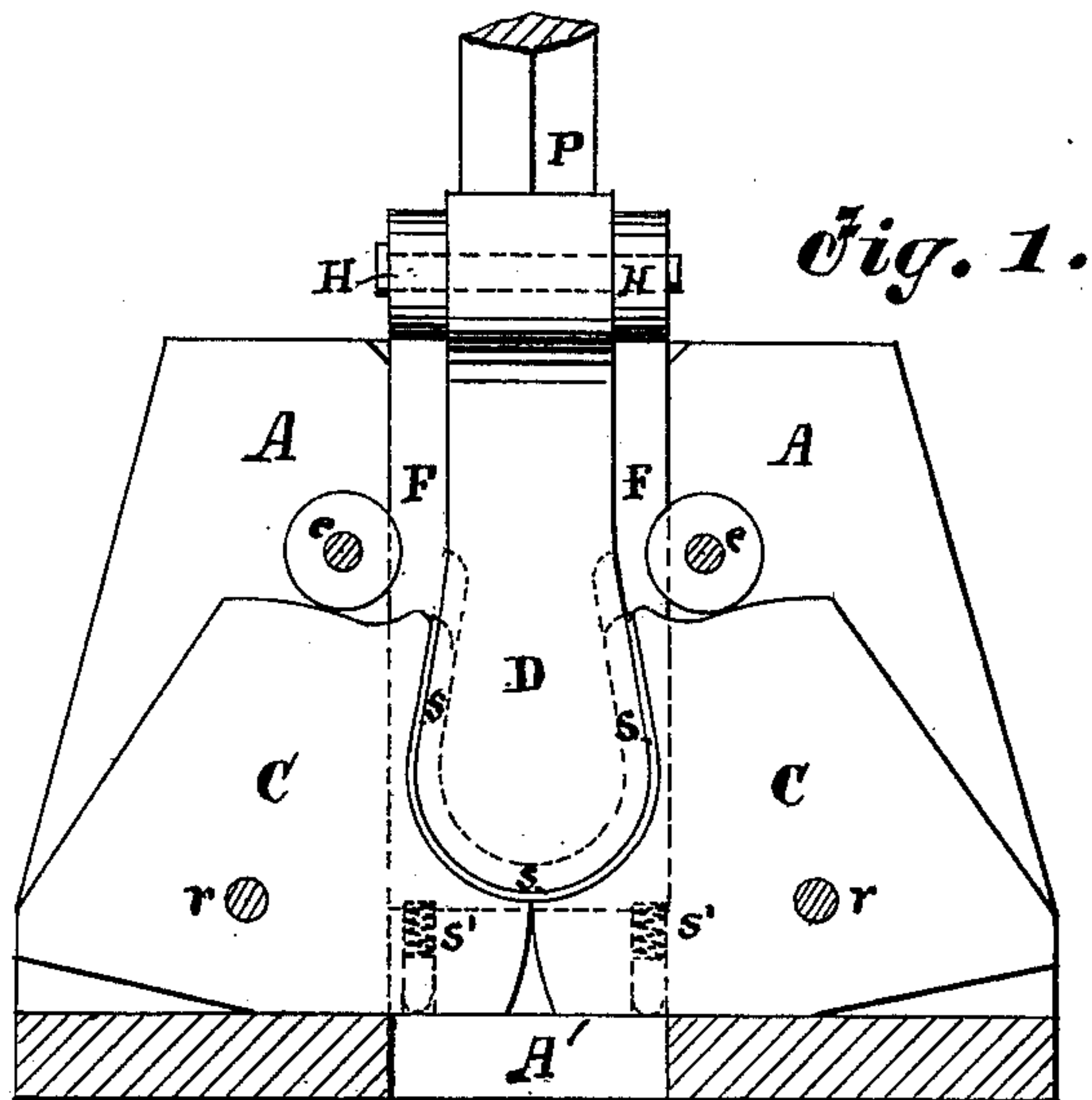


Fig. 1.

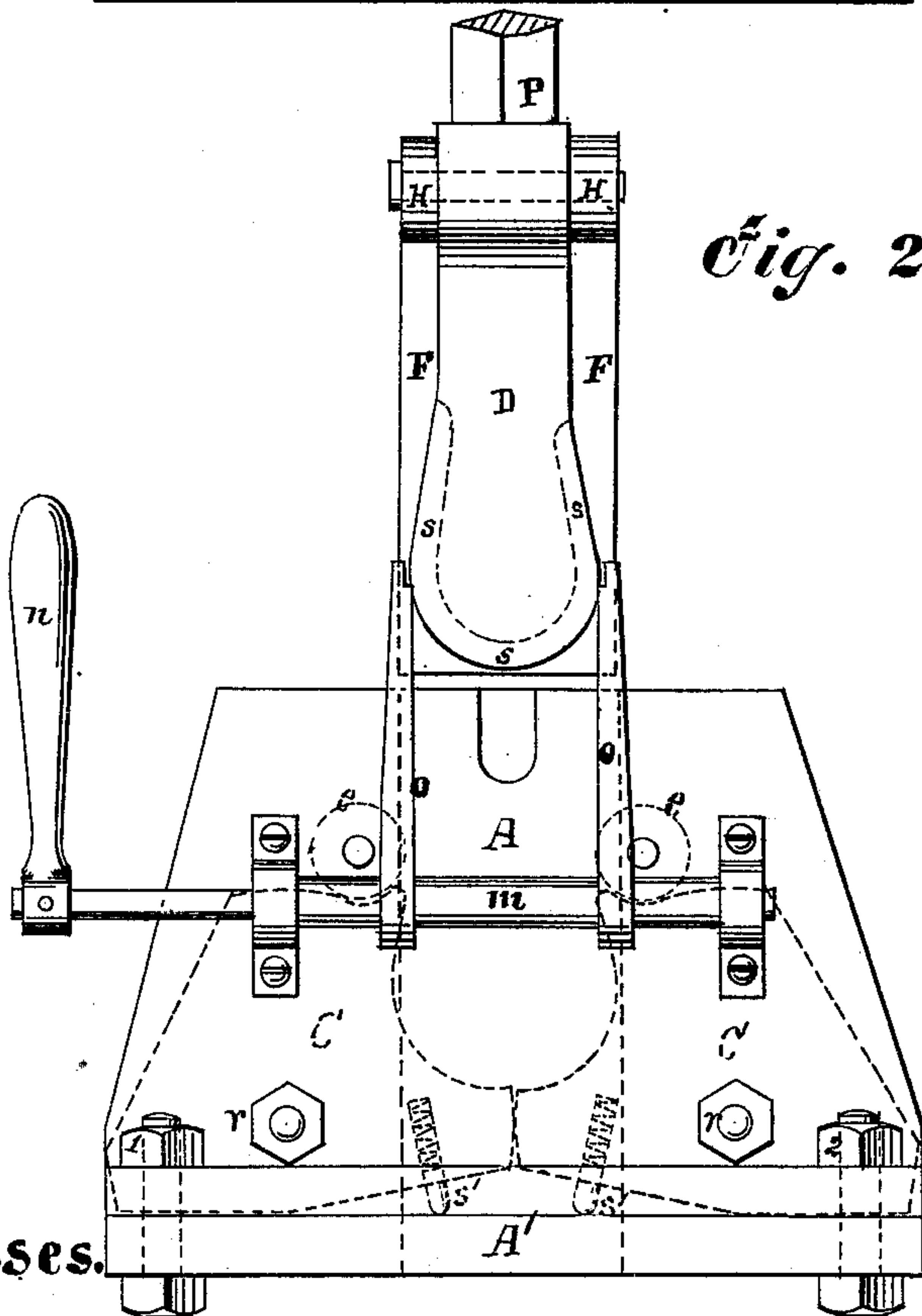


Fig. 2.

Witnesses.

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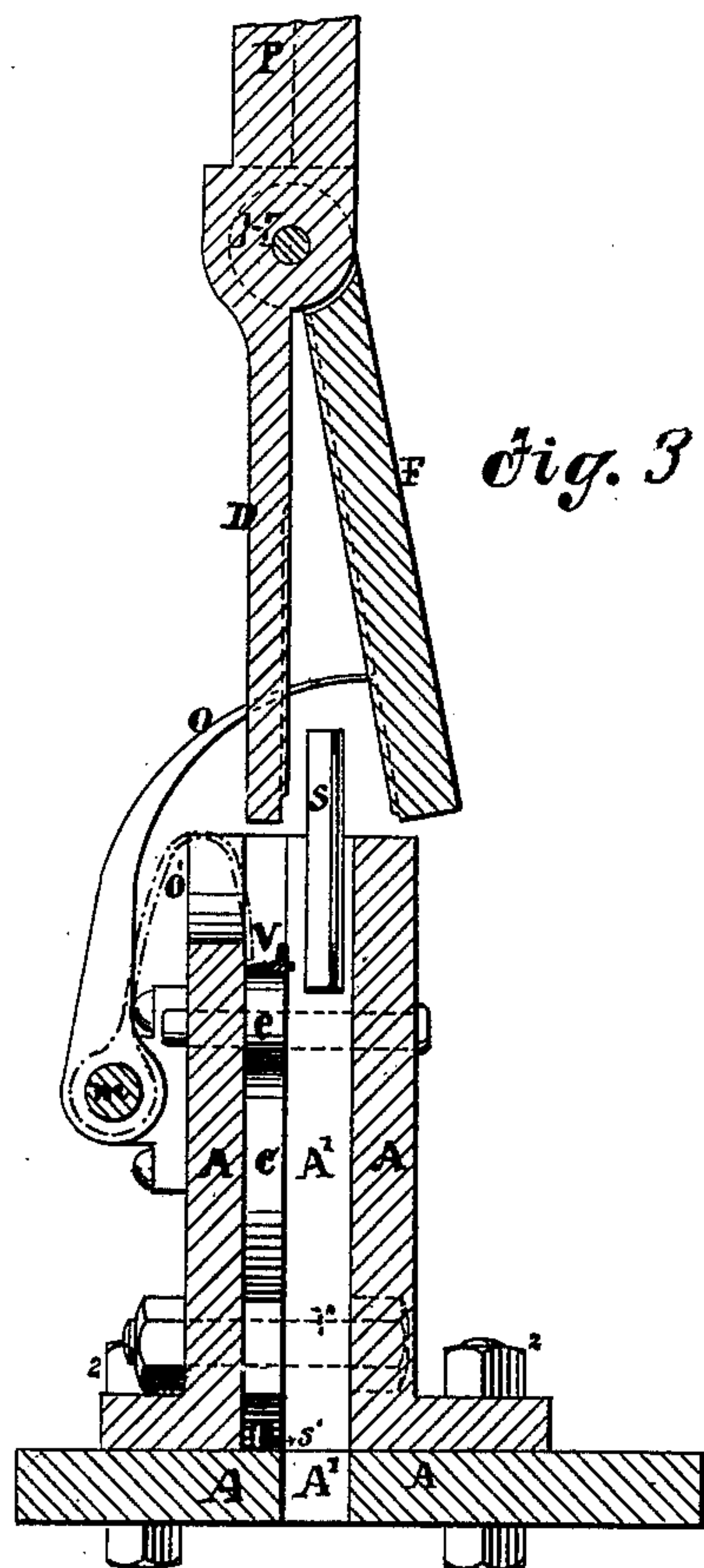


Fig. 3

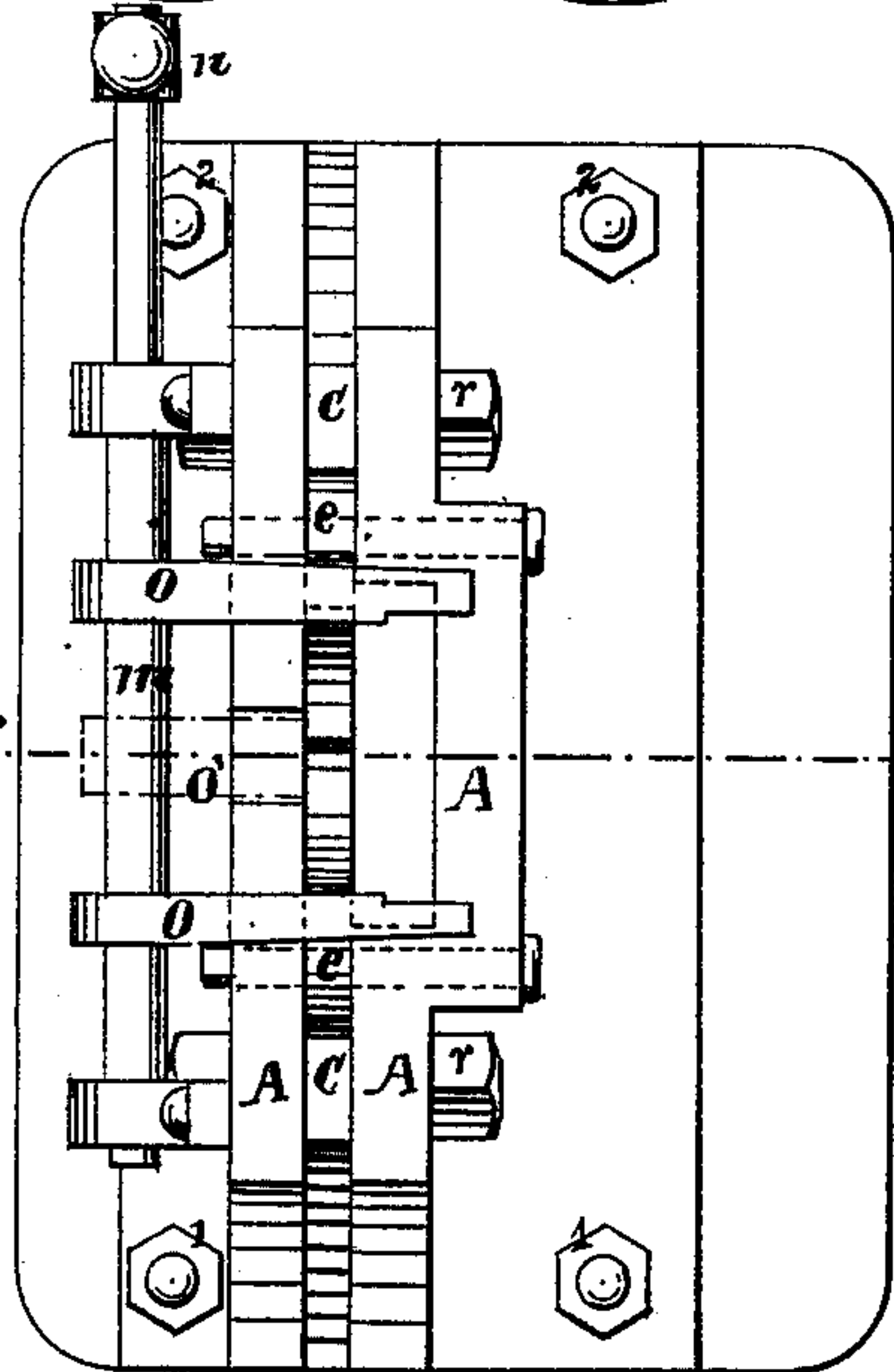


Fig. 4

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UNITED STATES PATENT OFFICE.

JOHN D. BILLINGS, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR MAKING HORSESHOES.

Specification forming part of Letters Patent No. 198,448, dated December 25, 1877; application filed September 26, 1877.

To all whom it may concern:

Be it known that I, JOHN D. BILLINGS, of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Machinery for Bending Angle-Iron for Horseshoes or other uses; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in mechanical devices employed for bending angle-iron into curvilinear forms for horseshoes and other purposes, without wrinkling the same, by heat and pressure, which is one of the most essential items in the manufacture of my improved horseshoes.

Referring to the drawings, Figure 1 is an internal vertical view, showing the working parts of my machine for bending angle-iron or steel bars in the form of a horseshoe.

A A represent the vertical back of the machine, composed of solid iron plates or otherwise. C C are eccentric oscillating jaws, operating upon their axes *r r*. These cam-jaws are also provided with springs *S' S'* at the bottom thereof. D is the punch. *ee* are anti-friction-rollers, which receive and support the angle-iron blanks (or bars) preparatory to their being forced down into shape shown at S S S, which represent one of my improved horseshoes in the bending-machine. F F is a swinging plate hinged at the back of the dropping die or punch D, as shown at H H. This punch is kept in motion by means of the vertical shaft connected to the head of the punch D, as shown at P, which represents a short section of the same. The punch may also be provided, on each side thereof, with vertical standards to keep it in a perpendicular line when operated by the shaft P, worked by any suitable gearing and motor power.

Fig. 2 is an exterior front view of the machine, showing the punch or die D elevated above the machine A, in the position where the shoe S is dropped down through the machine, coming out at the bottom thereof at A',

by means of the arms or springs *o o* upon the shaft *m*, operated by the lever or other power *n*, pressing the shoe S and hinged back plate F free from the punch D, which allows the shoe to fall by its own gravity through the opening A'.

1 and 2 are bolts to hold the machine together.

Fig. 3 is a transverse vertical section of my bending-machine, through the center thereof, at *x x*, Fig. 4, the punch D being raised up in a similar position to that of Fig. 2, and having the swinging back plate F pressed back by the arms or springs *o o*, and the shoe S in the act of dropping down through the hopper or flue A'; after which operation the arms *o o* are thrown back to the front of the machine, and the hinged plate F falls by its own gravity in position against the back of the punch D, ready to be forced down into the flue A' with the falling punch to press the angle-bar *v* into shape. *o'* is a flexible compensating-spring, secured to and operated by the rock-shaft *m*, at one end thereof, while the upper end passes down into the machine and presses against the outer face of the punch D. This spring is not of very great importance, excepting as a compensator, hence may be left off without deteriorating the other working parts of my machine.

Fig. 4 is a plan view of my machine.

The letters of reference represent similar parts to those indicated by the same letters in the other drawings.

Having set forth the individual parts of my invention, I will now describe the *modus operandi* of my improved mode of bending an angle-iron or steel bar into the curvilinear form of a horseshoe without wrinkling the same.

First, raise the punch D sufficiently high to place the bar of angle-iron to be bent upon the top of the anti-friction rollers *ee*, as shown at *v*, Fig. 3. The punch or vertical die D is set in motion under sufficient pressure to force the bar or blank *v* down between the anti-friction rollers *e* upon the internal curved forming-edges of the oscillating cam-jaws C C, as shown at S S S, Fig. 1, in such a manner that the inner lower points of the jaws C C are forced downward upon the bed-plate of the ma-

chine, so that the tops of the jaws C C are forced inward (toward each other) as they oscillate upon their eccentric axes *r r*, thereby compressing the ends of the bar, forming the heel of the shoe S, inward until the shoe assumes the proper form, as shown at Fig. 1. The forming-die D, with the shoe S, is then raised in the position shown at Fig. 2, when the arms *o o* set the shoe free by pressing it and the swinging plate F in the position shown at Fig. 3. The shoe S, being fashioned into its proper form, falls by its own gravity down through the hopper or flue A', ready for punching the nail-holes.

The jaws C C are forced upward by the springs S' S' into the position shown in dotted lines at Fig. 2, ready to receive another blank.

I would here state that my machine is equally well adapted to bending angle-iron for various purposes, by simply changing the dies or punch D and jaws C to suit the required curve; but the present form of die or punch and compressing-jaws are expressly intended for horseshoe-blanks, such as produced by my patent forming-machine. The novelty of my present invention consists in the construction of a machine for bending angle-iron or steel bars into the required curvilinear form by means of a vertical drop, die, or punch, D, forcing the same down between two anti-

friction rollers, *e e*, upon the inner curved edges of the oscillating jaws C C, and then raising the perfectly-formed shoe out of the jaws C C, and dropping the same through the opening A' by means of the arms *o o* and hinged plate F F, finished for punching the nail-holes in a perfect manner.

What I claim as novel and useful, and wish to protect by Letters Patent of the United States, is—

A machine for bending angle-iron or steel bars into curvilinear shapes for horseshoes, S S S, and analogous uses, consisting of a vertical punch, D, oscillating cam-jaws C C, operating on spring-bearings S' S', in combination with the springs or arms *o o*, hinged plate F F, hopper or flue A', and anti-friction rollers *e e*, with or without the spring *o'*, all constructed, arranged, and operating in the manner and for the purpose substantially as above set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

JOHN D. BILLINGS.

Witnesses:

MATTHEW J. McKEON,
JAMES P. McLEAN.