(No Model.) 4 Sheets—Sheet 1.

Z. V. PURDY.

HORSESHOE MACHINE.

No. 434,837. Patented Aug. 19, 1890.

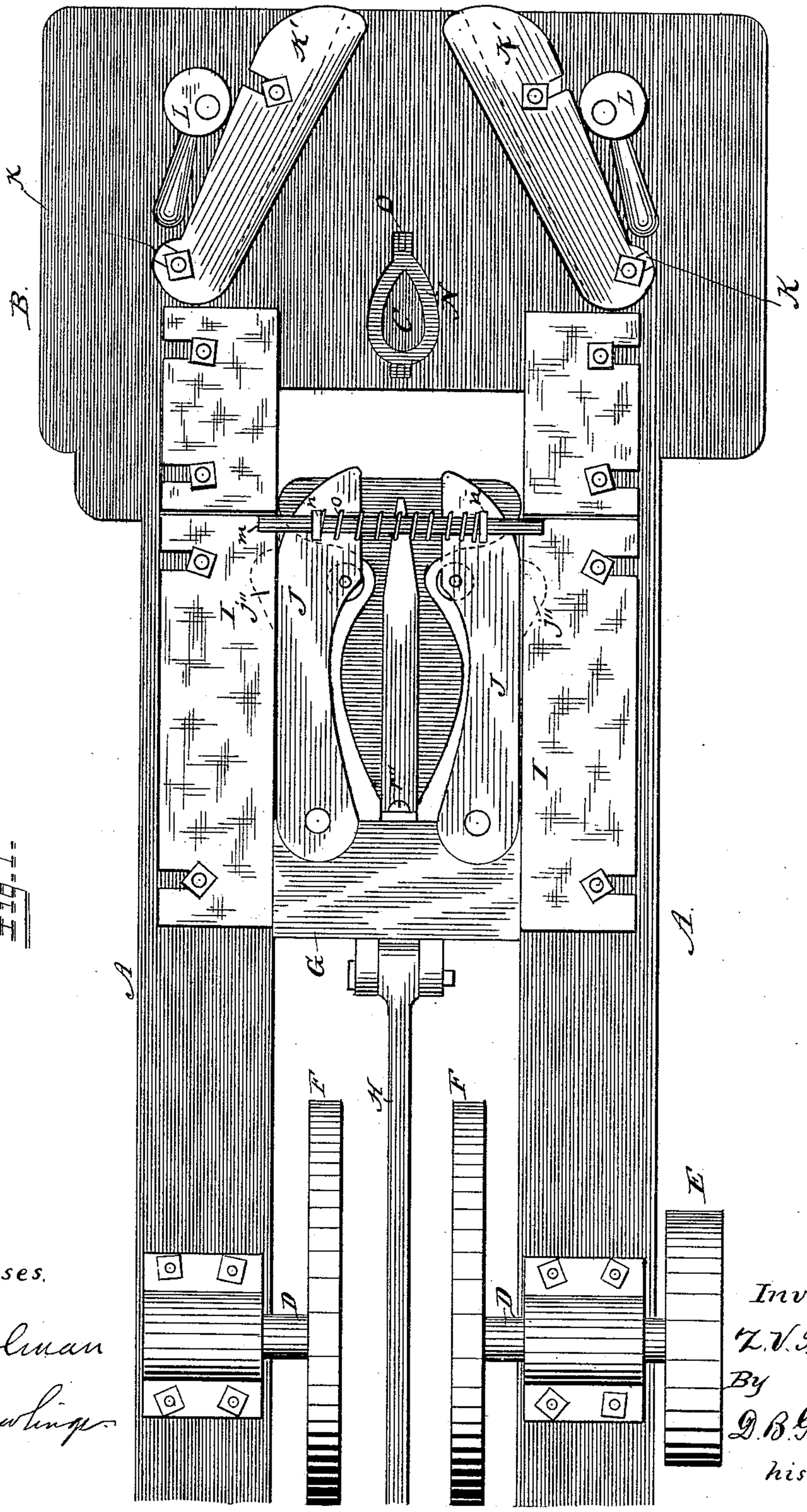

Fig. 1.

Witnesses.

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(No Model.) 4 Sheets—Sheet 2.

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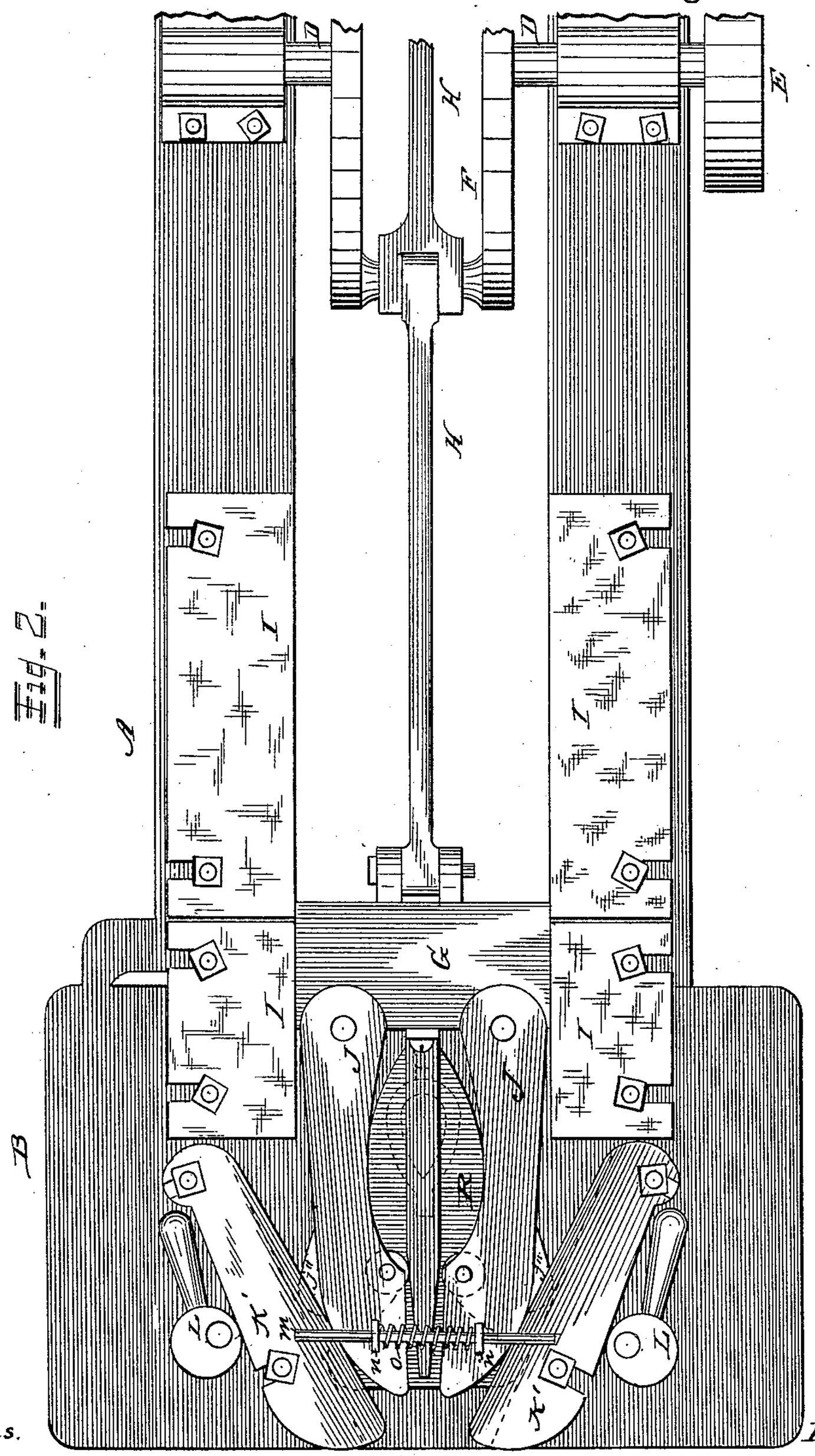

Witnesses.

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HORSESHOE MACHINE.

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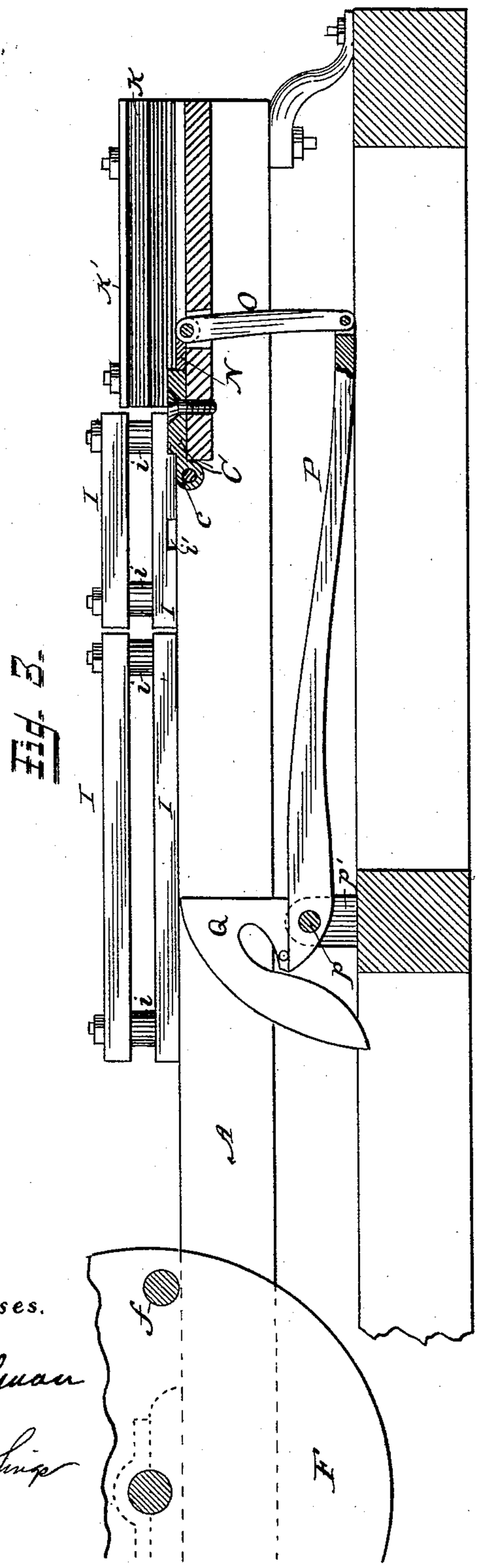

Fig. 1.

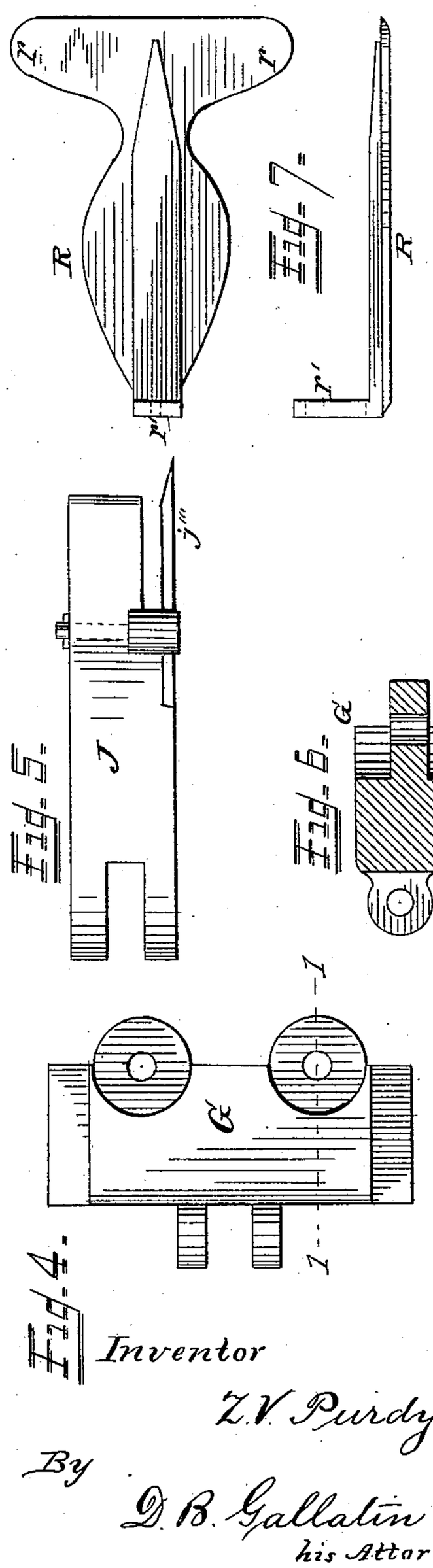

Fig. 2.

Fig. 3.

Fig. 5.

Fig. 6.

Fig. 4.

Witnesses.

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HORSESHOE MACHINE.

No. 434,837. Patented Aug. 19, 1890.

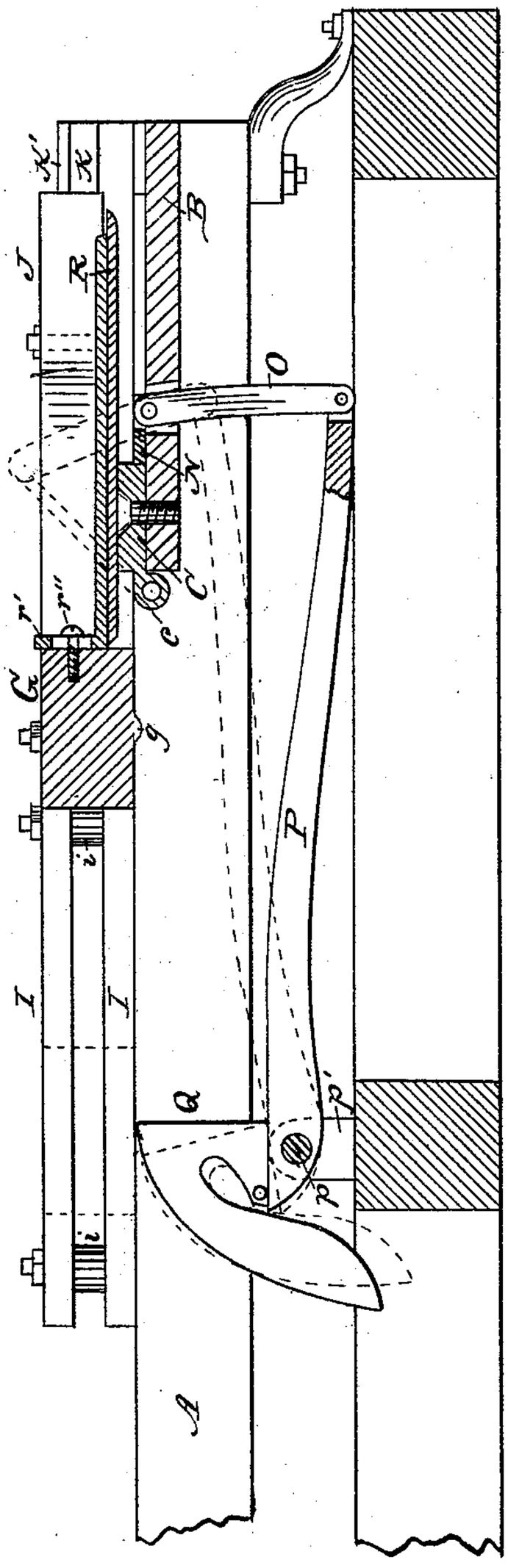

Fig. 8.

Witnesses.

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UNITED STATES PATENT OFFICE.

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HORSESHOE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 434,837, dated August 19, 1890.

Application filed December 28, 1889. Serial No. 335,261. (No model.)

To all whom it may concern:

Be it known that I, ZACHARIAH V. PURDY, a citizen of the United States, residing at Vienna, in the county of Fairfax and State of Virginia, have invented certain new and useful Improvements in Horseshoe-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for making horse and mule shoes; and it has for its principal objects to simplify the construction and operation of machines of this character, to secure greater durability, to enable the machine to be operated with less power, to increase its capacity, and incidentally to reduce the cost of the product.

The invention consists, essentially, in the means described for severing the blank from the bar, for bending it and forming it into a shoe, in the means for discharging the shoe from the machine, and in details of construction and combinations and arrangements of parts, as will be hereinafter described, and specified in the claims.

In the accompanying drawings, which illustrate my invention and form a part of this specification, Figures 1 and 2 are plan views of the two ends of the machine, the two views together giving a plan view of the whole machine. Fig. 3 is a longitudinal sectional elevation of one end of the machine with the cross-head and forming-jaws removed. Fig. 4 is a plan view of one of the cross-heads. Fig. 5 is a transverse view of the cross-head on the line 1 1 of Fig. 4. Fig. 6 is an inner side view of one of the forming-jaws. Fig. 7 shows in plan and side view the flattener detached, and Fig. 8 is a sectional elevation of one end of the machine, showing by broken lines the position of the discharging mechanism in the operation of discharging a shoe from the machine.

The machine is double-acting—that is to say, it is a double machine with devices for forming shoes at both ends, both sets of forming devices being driven and operated from the same shaft, so that two shoes are formed during each revolution of the shaft. The mechanisms of the two ends being alike it will be sufficient to describe but one end of the machine.

The frame of the machine comprises two parallel side rails A A and two tables B B, one at each end, which connect the side rails at both ends.

C designates the "former," around which the blanks are bent to form the shoes. This former is a metal block of suitable shape secured upon the table B. It might be made integral with the table, but by making it separate I am enabled to remove it and substitute another of different size or shape, thereby adapting the machine to make shoes of different sizes.

D designates the driving-shaft, which is mounted transversely upon the rails A A, and is provided with any suitable means for the application of power. The drawings show a band-pulley E. Centrally between the rails A A the shaft has a crank, which is shown in the drawings as composed of two disks F F connected by a crank-pin *f*. In order to make the machine run smoothly these disks should be weighted opposite the crank-pin to counterbalance the pin and pitman. This being a common expedient I have not considered it necessary to show the weights in the drawings.

G designates a cross-head, which is connected by a pitman H with the crank. This cross-head runs in suitable guides bolted upon the side rails A A, which guides are composed of upper and lower plates I I, with spacing-blocks *i i* between them to hold them apart. The guides at each side are divided into two sections, which are adjustable separately, the bolt-holes being slotted, as represented in Figs. 1 and 2, to permit of their being moved in and out. The rear section requires adjustment to the cross-head only, but the front section, or at least the lower plates thereof, requires a wider range of adjustment to adapt the machine to be set to make shoes of different sizes, as will more plainly appear hereinafter.

J J are two jaws, which I denominate the "forming-jaws," and which are hinged or pivoted to the cross-head so as to be capable of swinging toward and from each other. Near

their front ends the jaws are each provided with a roller j', which projects slightly below the jaw and slightly beyond its inner face. These rollers bear upon the shoe-blank and press and bend it around the former C as the jaws move forward.

K K are guides secured upon the table in front of the guides I I. They run obliquely inward toward the front and are for the purpose of pressing the jaws together as the latter move forward. They are adjustable in and out in order to adapt the machine to be set for shoes of different sizes or shapes. As the jaws move forward they strike against the guides K K and are pressed together, the angle of the guides being such as to cause the rollers j' to travel in a path corresponding with the shape of the former C and at a distance from the latter corresponding with the width of the shoe. Shoes as ordinarily made are thicker and narrower at the heel than at other points, and this thickening is effected by so setting the guides K K that the rollers j' will gradually approach the former toward the completion of the stroke, whereby the metal of the blank is compressed laterally and the heels thickened.

K′ K′ are plates which lie upon the guides K K and project inward beyond them, as represented by broken lines in Figs. 1 and 2. These plates are for the purpose of holding the jaws J down and preventing their riding up. Each jaw has upon its outer side, near the front end, a projection J″, which runs between the guide-plates I I and under the plate K′. These projections run against the guides K, whereby the jaws are forced inward, as already explained, and under the plates K′, whereby they are held down and prevented from riding up. The plates K′ are also adjustable in and out and may be so set as to act in conjunction with the guides K to press the jaws inward, or they may be set to act as guides independently of the guides K, in which case they will subserve the double purpose of guides and holding-plates.

L L are pivoted cams for adjusting and holding the guides K.

N designates a ring which surrounds and fits the former C. Its width corresponds with that of the shoe, and in forming the latter the rollers j' roll around in contact with its edge. At its inner end the ring N is hinged to the former C, the latter being provided with an extension c for this purpose. (See Fig. 3.) This ring lies flat upon the table and serves as a base upon which the shoe is formed. At its forward end it has an extension to which is pivoted one end of a link or bar O, the other end being pivoted to the end of a lever P, which is fulcrumed at p in a standard p' rising from the supporting-frame upon which the machine rests. Pivoted in the same standard and upon the same pin p is a second lever Q, which normally stands in vertical position and projects up into the path of a projection g on the under side of the cross-head G. When the cross-head and jaws move back after a shoe has been formed, the projection g strikes the lever Q and trips it. A shoulder or projection q on the side of the lever Q presses down the rear end of the lever P and throws up the front end, which, being pivoted to the ring N, brings the latter into an inclined position, whereby the shoe is raised bodily from around the former C, and is by its own gravity discharged from the rear edge of the table. Inasmuch as the shoe is supported all around by the ring N, there is no liability of its being twisted or bent out of shape in the operation of removing it from the former. As soon as the cross-head passes over the lever Q and releases it the parts resume their normal positions by gravity. The lever Q is capable of turning forward independently of the lever P far enough to permit the cross-head to pass over it in the forward stroke. An arm q' serves as a weight to restore it to its proper position after the cross-head has passed over.

R designates the flattener, which consists of a flat plate shaped substantially as represented in Fig. 7, so as to lie between the jaws J J in their closed position. Its forward end is broader than the rear part, forming laterally-projecting arms r r, which extend under the front ends of the jaws, the latter being cut away in front of the rollers j', as represented in Fig. 5. At its rear end the plate has a vertical slotted arm r', by which it is attached to the cross-head by means of a screw or bolt r'', which passes through the slot, the latter permitting vertical adjustment.

In the under side of one of the guide-plates I is a transverse groove or notch i', forming a passage through which the blank is introduced into the machine. This opening must of course be in rear of the former C, in order that when the blank is introduced it shall be in proper position to be bent around the former. The precise location is of little or no consequence. The lower guide-plate I, on the side of the machine opposite the opening i', serves as a stop for the blank when the latter is introduced.

The blanks, which I prefer to prepare in long bars by a set of rolls, which will form the subject of a separate application, are cut apart after being fed into the machine. As the jaws move forward they will, as soon as they come in contact with the blank, carry the latter forward with them. The jaw on the side from which the blank is fed, and the plate I, in which the passage i' is formed, act together as a pair of shears to sever the blank from its bar as it is pushed forward. The flattener R projects forward beyond the shoulder formed by cutting out the jaw, which shoulder forms one member of the shears, the operation of which has just been described, and therefore passes over or upon the blank before the latter is severed from the bar or moved forward by the jaws, and if the

blank be bent or twisted it will be flattened down and straightened before it is cut off, and will be held down and prevented from buckling or twisting during the forming operation. The table B is below the upper faces of the side rails A A a distance corresponding with the thickness of the clearing-ring N, and the jaws J J are made to run as close to the table as possible. Since the opening *i'*, through which the blank is fed into the machine, is above the plane of the table, a support is required for the blank to prevent it from sagging down and to guide it over the rail A on the opposite side, if the plate I on that side sets out beyond the inner face of the rail. Now for this purpose I cut out or slot the front ends of the jaws, as represented in Fig. 5, leaving a forwardly-projecting lip *j'''* at the bottom equal in thickness to the thickness of the ring N. If the passage *i'* be so located relatively to the position of the jaws at the limit of their backward movement as to be opposite the slot in the jaw the blank will be introduced through said slot. If the inner edge of the lip on the opposite jaw be beveled it will enable the end of the blank to ride up thereon and will guide it over the rail A. The lip *j'''* extends forward beyond the end of the jaw proper, and at its end is beveled down, as shown in Fig. 5, so that it may pass under and raise the blank in case the latter bends or sags down upon the table.

m is a transverse rod supported by two standards *n n* in the outer ends of the jaws J J. A helical spring *o* surrounds the rod *m* between the two standards and presses the jaws apart.

Having now fully described my invention, I claim—

1. The combination, with the fixed former, the reciprocating cross-head, and the swinging jaws hinged to said cross-head, of the flattening-plate R, arranged between the said jaws and having at its front end lateral wings which extend under the jaws and which press upon and hold down the blank while it is being bent around the former, substantially as and for the purpose described.

2. The combination, with the former, of a flat ring surrounding and fitting the same and capable of being removed therefrom to discharge the shoe, substantially as shown and described.

3. The combination, with the former fixed upon the table, of a flat ring surrounding and fitting the same and hinged at one side, and means for lifting the free side of said ring to raise the formed shoe from the former, substantially as shown and described.

4. The combination, with the former fixed upon the table, and with the reciprocating cross-head G, of a flat ring N, surrounding and fitting the former and hinged at one side, the lever P, coupled to the free side of said ring, and the lever Q, standing normally in the path of the cross-head and adapted to be tripped thereby and to operate the lever P and throw up its coupled end, the whole operating to raise the said ring from around the former and to discharge the shoe, substantially as shown and described.

5. In a horseshoe-machine, the combination of the reciprocating jaw J, a square-cutting shoulder thereon, and below said shoulder a forwardly-extending lip *j'''*, beveled down and sharpened at its front end, and a longitudinal guide-plate I, having therein a transverse channel *i'*, through which the blank is fed into the machine, said jaw and guide-plate acting together as cutters to sever the blank from the bar, substantially as shown and described.

6. The combination of the reciprocating cross-head, the swinging jaws hinged thereto, longitudinal guides for said cross-head and jaws, separate and independently-adjustable inclined guides to force the jaws toward each other during their forward movement, and cams or eccentrics L L for adjusting and holding the said inclined guides, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

ZACHARIAH V. PURDY.

Witnesses:
WARREN C. STONE,
GEORGE K. FLYNN.