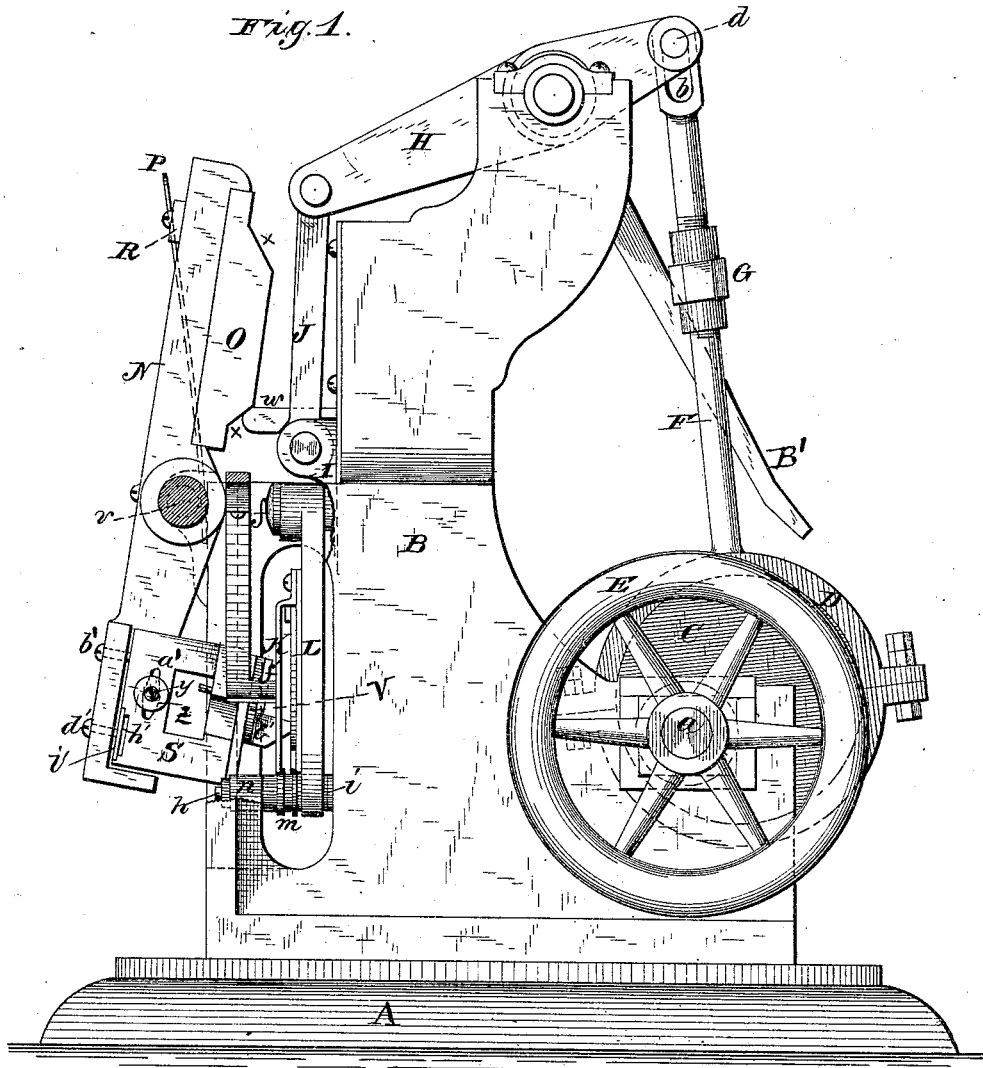


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Machine for Bending Horseshoe-Blanks.

No. 210,376.

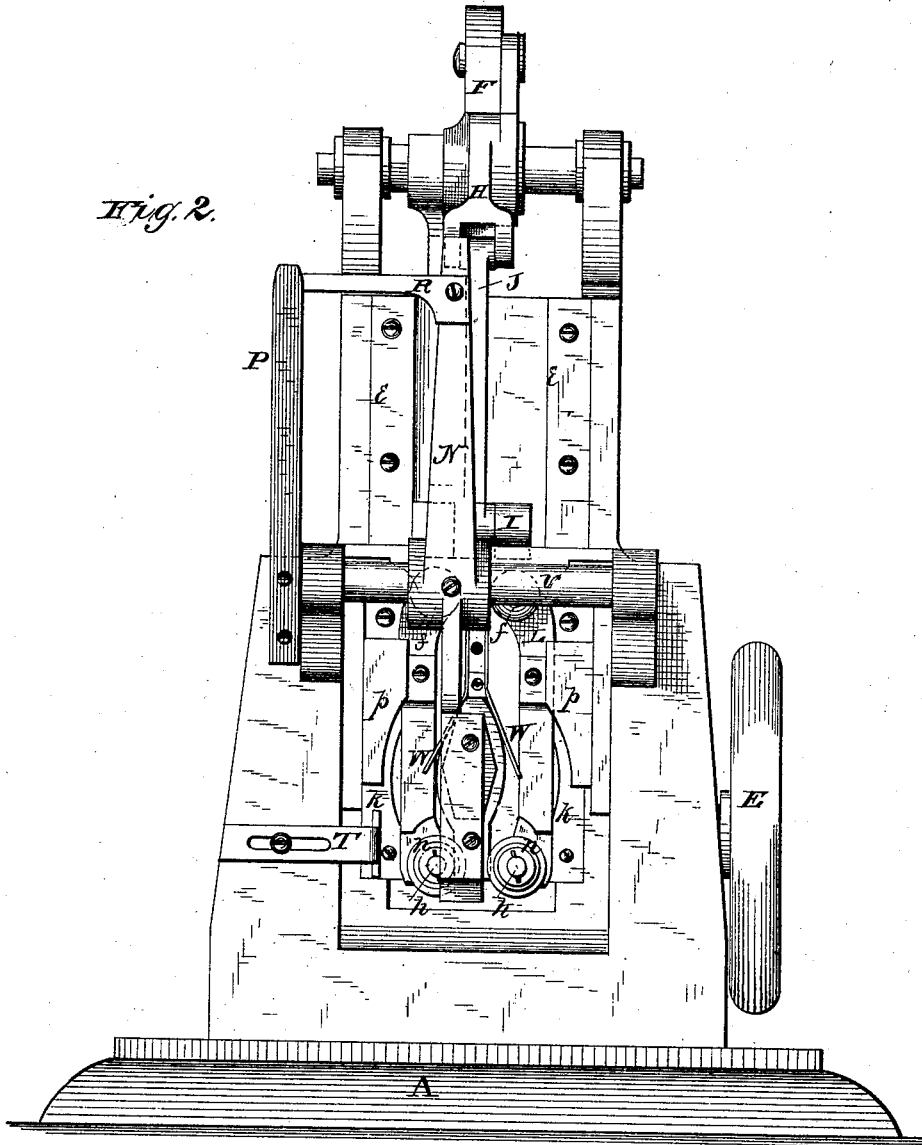
Patented Nov. 26, 1878.



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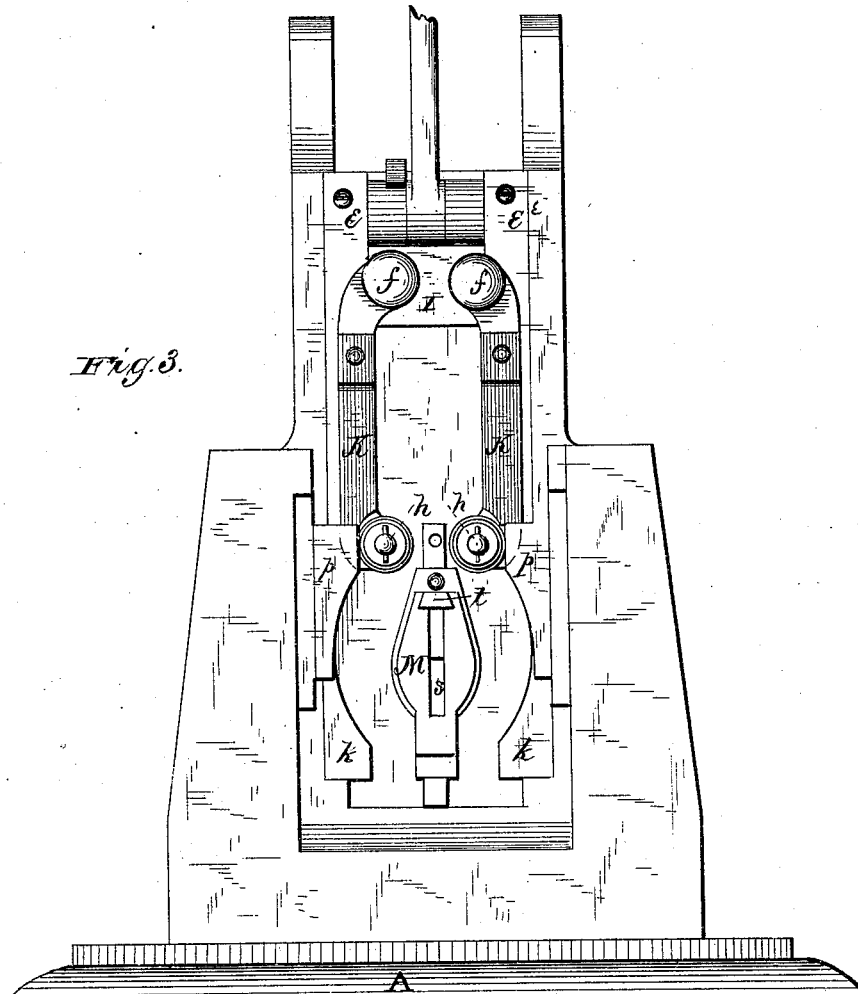


Fig. 3.

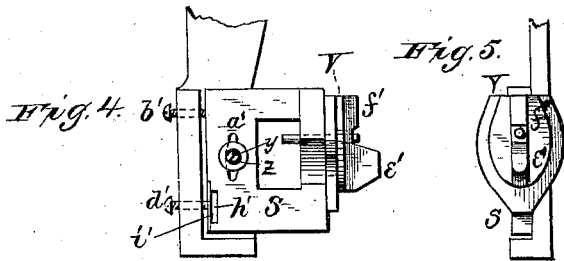


Fig. 4.

Fig. 5.

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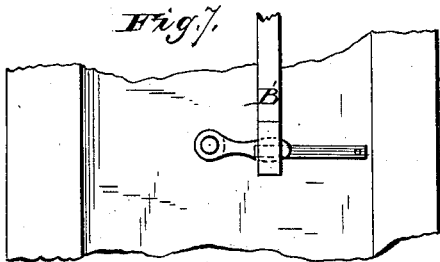
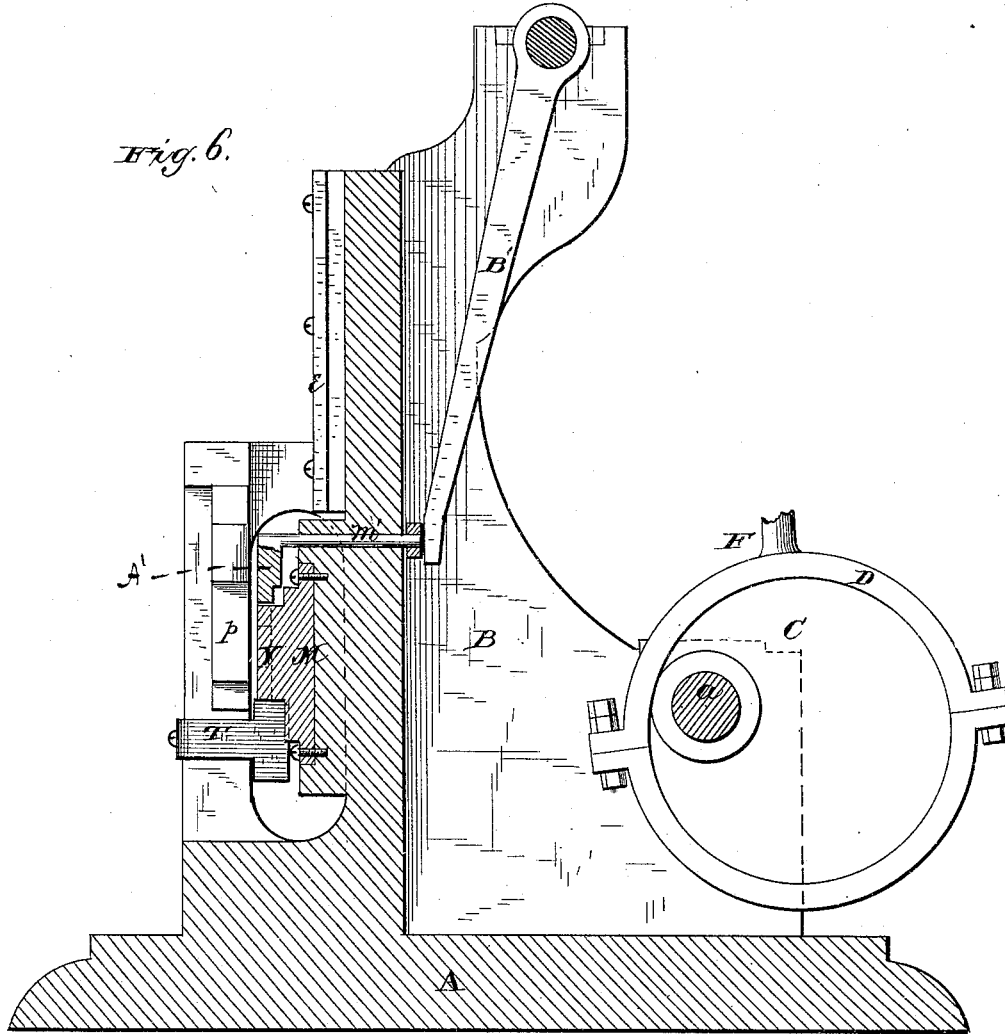
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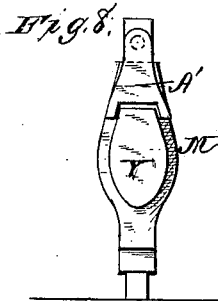
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UNITED STATES PATENT OFFICE.

JAMES T. WALKER, OF ALBANY, NEW YORK.

IMPROVEMENT IN MACHINES FOR BENDING HORSESHOE-BLANKS.

Specification forming part of Letters Patent No. **210,376**, dated November 26, 1878; application filed November 9, 1878.

To all whom it may concern:

Be it known that I, JAMES T. WALKER, of Albany, in the county of Albany and in the State of New York, have invented certain new and useful Improvements in Machines for Bending Horseshoe-Blanks and other articles; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a machine for bending horseshoe-blanks, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a side elevation of my machine. Fig. 2 is a front elevation of the same. Fig. 3 is a front view of the main part of the machine, with the swinging beam and die removed. Figs. 4 and 5 are detailed views of part of the machine. Figs. 6, 7, and 8 show a modification of the machine.

A represents the bed, upon which is supported a suitable frame-work, B, for containing the operative parts of the machine.

In the rear part of the frame B is mounted a shaft, *a*, upon one end of which is a fly-wheel, E, and to which shaft motion may be communicated in any suitable or convenient manner. On the shaft *a* is keyed or otherwise firmly secured an eccentric, C, around which is placed the usual band D, having the rod or pitman F projecting from the same. This pitman is made in two parts, connected by a double nut or screw-sleeve, G, by means of which the pitman can be lengthened or shortened, as required, for the proper working of the machine.

The upper end of the pitman F is provided with a longitudinal slot, *b*, and works over a pin, *d*, in the rear end of a walking-beam, H, mounted upon trunnions in the upper part of the main frame B. The bending mechanism is connected to the forward end of the walking-beam, and operated by the eccentric and connecting-rod or pitman above described.

It will readily be seen that at the upward stroke of the pitman the weight of the bending mechanism will carry it down, and keep the pin or stud, *d* at the rear end of the walking-beam, at the upper end of the slot *b* in the pitman. At the completion of the downward movement of the front end of the walking-beam the pitman continues to move upward the length of the slot *b*, and at the commencement of its downward movement it will again move the length of said slot before it will commence to actuate the walking-beam. This beam, with the bending mechanism, will thus remain at rest for a certain period, sufficient for the insertion of a new blank.

The forward end of the walking-beam H is, by a rod, J, connected with a cross-head, I, moving vertically in guides *e e* on the frame B. On this cross-head are two studs, *f f*, upon which the bending-levers L L are hung, the lower ends of said levers carrying horizontal arbors *h h*, parallel with the studs on which the levers are hung. The arbors *h h* project both in front and rear of the levers, and carry upon their rear ends rollers *i i*, which work against curved guides *k k*, attached to the main portion of the frame.

Upon each arbor *h*, in front of its lever, is a grooved roller, *m*, or a roller provided with two circumferential flange, which are slightly beveled, forming a groove between them. These rollers are adjustable on their arbors at right angles to their line of motion. The adjustment of the rollers has the effect of twisting or controlling the twisting, stretching, or bending of either edge of the bar by bringing the corresponding flange of the rolls in contact therewith, the other flanges serving to guide the other edge of the bar. In front of the roller *m* on the arbor *h* is a smooth roller, *n*, which works against a guide, *p*, attached to the forward portion of the frame B.

Each lever L also carries on its forward side a guide, K, corresponding with the grooved roller *m*, for the insertion of the blank.

To the lower portion of the frame B, between the bending-levers, is attached a plate or form, M, of substantially the form shown in Fig. 3, having at its upper end a forwardly-projecting lug, *t*, and below the same a vertical slot, *s*.

In suitable bearings at the front portion of

the frame B is placed a shaft, *v*, upon which is secured an upright beam, N. The upper portion of this beam has upon its inner side a bar, O, attached to it, the upper and lower ends of which are beveled, as shown at *x x* in Fig. 1. This beam is operated by means of a rounded pin or lug, *w*, projecting from the cross-head I, and a spring, P, attached to the frame B, and acting against an arm, R, attached to the beam, as shown. The tendency of the spring P is to throw the lower end of the beam N outward, while the lug *w*, working against the bar O, throws said lower end of the beam inward. The lower end of the beam N forms a sort of flanged box to receive a frame, S, which is held by means of a single bolt, *y*, with washer *z*, the bolt passing through a slot, *a'*, in the frame, so that said frame can be tilted up and down, as hereinafter described, the frame being held by means of adjusting set-screws *b' d'* at the back at any angle desired. Upon the inner face of the frame S is fastened the die or former V, having a nose-piece, *e'*, beveled on its under side, to enter the slot *s* in the plate M, said nose-piece having above it a rib, *f'*, which abuts against the lug *t* on said plate M.

The frame S has at the back, in its lower portion, an opening, *h'*, with shoulders at top and bottom, on which shoulders is laid a cast-iron plate, *i'*, and against this plate works the lower adjusting-screw, *d'*.

In case of any mistake in feeding the blank (for instance, if it should be fed above the nose-piece *e'*) as the bending-levers move upward, some part of the machine would necessarily break. Now, by providing the cast-iron plate *i'*, unsupported in the center, this part is the weakest, and hence said plate is the part that will break and ease the machinery. It then takes but a moment to remove the broken pieces and insert a new plate, at a very trifling cost.

T represents an adjustable stop, against which the blank is fed. W W are clearers, arranged to remove the bent shoe from the die or former V.

The operation of my machine is substantially as follows: The machine being in the position shown in Figs. 1 and 2—that is to say, the rollers at the lower ends of the bending-levers L, below the plate or form M, and the lower end of the beam N thrown outward—the operating parts are at rest, and the blank is inserted in the guides K K against the stop T. The bending-levers L now move upward, and the lower end of the beam N, with the former V, moves inward, so that the flanged or grooved rollers *m* will bend the blank around the former. Just before the upward movement of the levers L ceases, and they commence to move downward again, the die or former V is moved outward again, and the clearers W remove the bent shoe from the former, and the shoe drops down, leaving the parts ready for the next blank.

In the construction of my machine, it will be seen that while bending the blank the four corners of the blank are operated upon, the two inner corners by the plate M and former V, and the two outer ones by the flanged rollers. By this means I control the twisting of the shoe and any tendency to bend unequally.

It is well known that in the bending of horseshoe-blanks the inner circumference upsets or thickens, while the outer circumference stretches and becomes thinner, and for this reason machines ordinarily used have failed to control the tendency of the blank to twist in the operation of bending.

In my machine I can, at will, either entirely prevent or so control and direct the twisting tendency as to produce or form a blank of any desired inclination. This is accomplished by means of the former V, which is carried by the adjustable frame S, or equivalent device, in connection with flanged rollers or other controlling devices for the outer walls of the shoe.

The flanged rollers *m* are set so as to guide the outer walls of the blank to be operated upon by the bending mechanism, the former V and former M being adjusted to guide the inner edges.

In a horseshoe-blank where grooves are made for the nail-holes the iron is thinner at one side than at the other, and the thinner side would naturally, in bending, have a tendency to spread or twist more than the other. This is effectually controlled in my machine; and, if desired, I can, by inclining the former V relative to the flange-rollers *m m*, so direct the twisting tendency as to give any desired inclination to the blank, and the inner walls of the nail-grooves may be thus made on any desired incline suitable for either a hind or front shoe.

It will be seen that the rollers *i* and *n* on each arbor *h*, working against their respective guides *k* and *p*, will hold the arbor perfectly straight and maintain the central bending-roller, *m*, in its proper place to perform the work designed for it.

In Figs. 6, 7, and 8 I have shown a modification of my machine, consisting of placing the former V on the plate or form M, instead of on the frame S. In this case I provide a clearer, *A'*, above the upper end of the former, with a rod, *m'*, projecting rearward through the frame and operated by a rod, *B'*, on the journal of the walking-beam H. I also then use flanged rollers *n'*, in connection with the former, to hold the corners of the iron, in substantially the same manner and for the same purpose as above described.

For different sizes and shapes of shoes the forms M V and guides *k p*, as well as rollers *m*, are removed, and others substituted in their places.

The completed shoe-blank may thus be made perfectly straight or flat, or more or less

twisted, and with the heel straight and more or less tapering, and thickened as may be desired.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for bending horseshoe-blanks into horseshoe form, a mechanism, substantially as herein described, to give the blank the required form, and which controls the inclination of the wall of the crease in the process of bending.

2. In a machine for bending horseshoe-blanks into horseshoe form, a mechanism, substantially as herein described, to give the blank the required form, and adapted by adjustment to vary or control the inclination of the wall of the crease in the process of bending.

3. In a machine for bending horseshoes, a bending mechanism, substantially as herein described, operating in connection with a former, and constructed to hold the four corners of the blank and control the twisting tendency of the iron, substantially as herein set forth.

4. The combination of the adjustable frame S, provided with the shouldered recess *h'*, the plate *i'*, and set-screws *d'*, for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 7th day of November, 1878.

JAMES T. WALKER.

Witnesses:

C. L. EVERT,
FRANK GALT.