

(No Model.)

2 Sheets—Sheet 1.

H. H. BURDEN.

MACHINE FOR MAKING HORSESHOES.

No. 366,373.

Patented July 12, 1887.

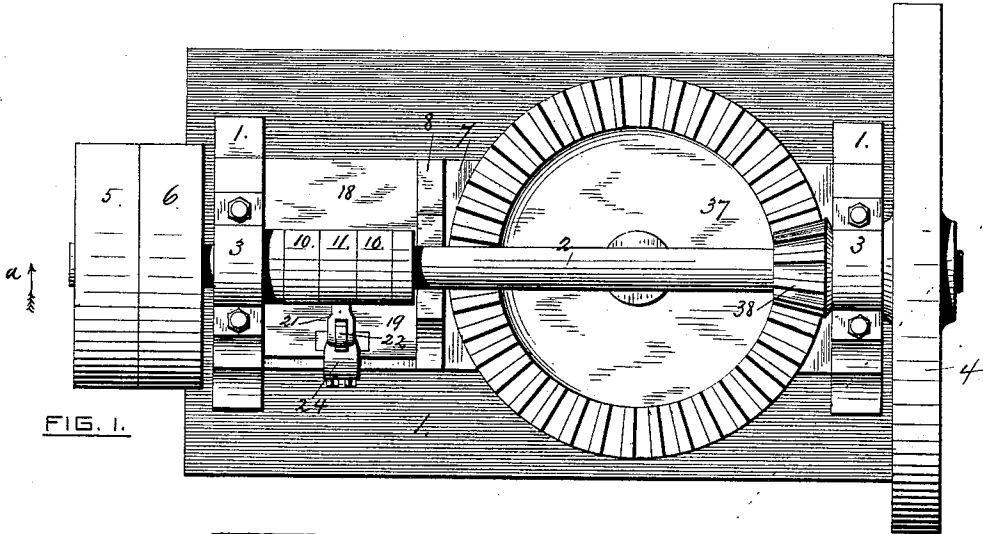


FIG. 1.

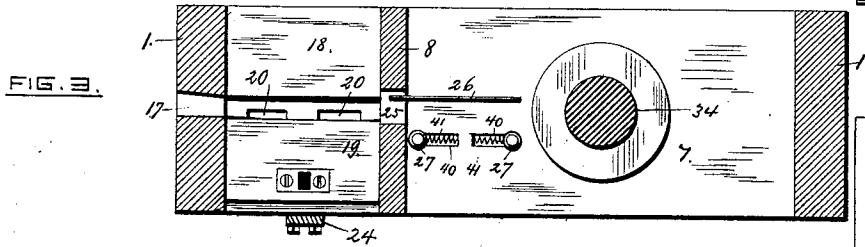


FIG. 3.

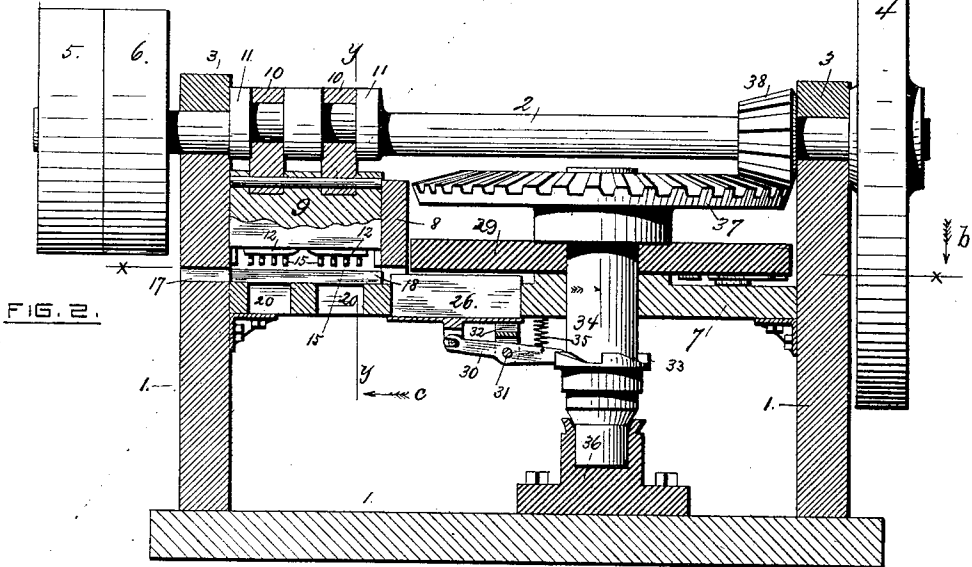


FIG. 2.

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(No Model.)

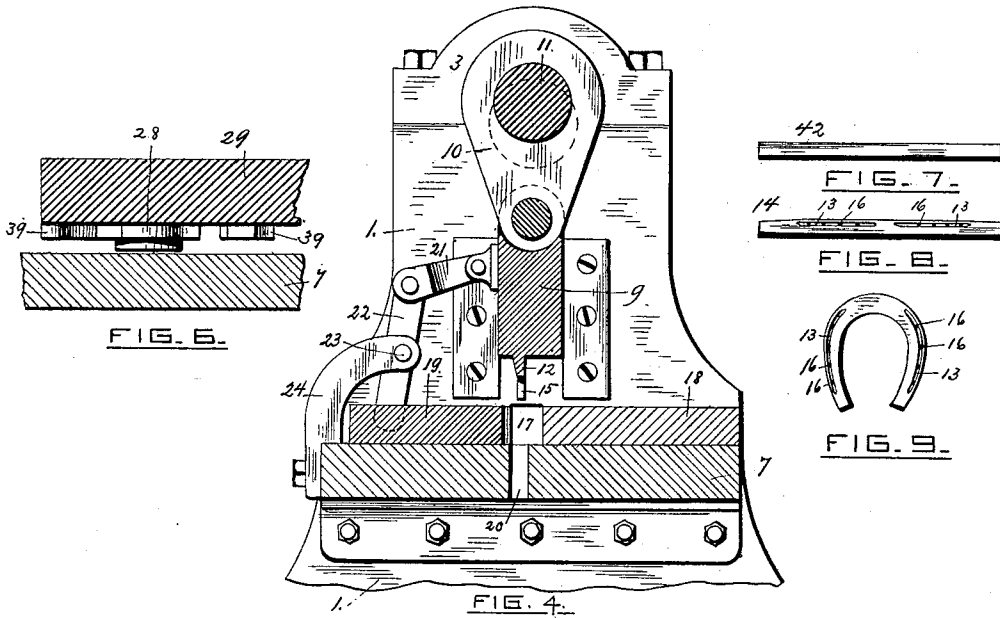
2 Sheets—Sheet 2.

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MACHINE FOR MAKING HORSESHOES.

No. 366,373.

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WITNESSES:

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UNITED STATES PATENT OFFICE.

HOWARD H. BURDEN, OF TROY, NEW YORK.

MACHINE FOR MAKING HORSESHOES.

SPECIFICATION forming part of Letters Patent No. 366,373, dated July 12, 1887.

Application filed March 14, 1887. Serial No. 230,774. (No model.)

To all whom it may concern:

Be it known that I, HOWARD H. BURDEN, a citizen of the United States, residing at Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Machines for Making Horseshoes; and I do hereby declare that the following is a full, clear, and exact description thereof, which, in connection with the drawings making a part of this specification, will enable others skilled in the art to which my invention belongs to make and use the same.

My invention relates to an automatic machine for manufacturing finished horseshoes directly from the bars; and my invention consists in certain novel features of construction and operation of the machine, as will be hereinafter fully described.

Referring to the drawings, Figure 1 represents a plan view of my machine. Fig. 2 is a central longitudinal section through the machine, looking in the direction of arrow *a*, Fig. 1, some of the parts being shown in full lines for a more clear understanding thereof. Fig. 3 is a horizontal cross-section on line *x x*, Fig. 2, looking in the direction of arrow *b*, same figure. Fig. 4 represents, on an enlarged scale, a section on line *y y*, Fig. 2, looking in the direction of arrow *c*, same figure. Fig. 5, also on an enlarged scale, represents the under side of the horizontal wheel or table which carries the dies and roll-guides for shaping the shoe-blanks, to be hereinafter fully described. Fig. 6 is a detached section of a portion of the table shown in Fig. 5, taken on line *z z*, looking in the direction of arrow *d*, same figure, and of the bed upon which the shoe-blank is supported, to be hereinafter fully described. Fig. 7 is a plain shoe-blank previous to being operated upon by my machine. Fig. 8 shows said blank after the creases and nail-holes have been formed therein and the ends compressed or swaged; and Fig. 9 represents the completed shoe, or the blank shown in Fig. 8 after it has been shaped by the shoe-die, in connection with the rolls and roll-guides, to be hereinafter described.

In my machine the rods or bars from which the finished horseshoes are made are fed in at one end of the machine through the opening at the left, Fig. 2, and are cut off the proper length by means of any ordinary form of

shearing mechanism. (Not shown in the drawings, and forming no part of my present invention.)

If preferred, the rods or bars may be first cut into proper lengths, and then the blanks from which the shoes are to be made be fed into the machine one after the other.

The horseshoe-blank first has the nail-holes and creases formed therein. The blank is then swaged to reduce any unevenness and to increase the thickness of the ends of the blank or the heel portions of the shoe. The blank, after it is thus operated upon, is pushed along by the feeding in of the next blank, and is then operated upon by the shoe-shaping die carried upon a horizontal revolving table, in connection with the forming-rolls and roll-guides, and the shoe completed.

In the accompanying drawings, 1 is the frame of the machine, on which are mounted and supported the several parts thereof.

2 is the main shaft, mounted in bearings 3 upon the upper part of the frame 1. On the end of the main shaft 2 is secured a fly-wheel, 4, and upon the other end of said shaft there is a fast and loose pulley, 5 and 6, driven by a belt, (not shown in the drawings,) for operating the machine.

The main shaft 2 may be operated by gear-connection instead of by belt-connection, if preferred.

The bed 7 of the machine extends longitudinally through the central portion of the machine, and is supported upon and secured at each end to the frame 1. (See Fig. 2.) The bed 7 has a stand, 8, supported thereon and extending up at right angles therefrom. Said stand 8, in connection with the frame 1, furnishes bearings in which the vertical sliding die-block 9 moves up and down. The upper edge of said die-block 9 is connected by the links 10 with the crank 11, formed on the main shaft 2.

Upon the lower edge of the die block 9 are provided two dies, 12, for forming the two creases 13 in the upper surface of the shoe-blank 14. (See Figs. 8 and 9.) Eight points or pins, 15, project out from the lower edge of the dies 12 to form the nail holes 16. (See Figs. 8 and 9.)

In the frame 1 there is a hole or opening, 17, at the left, Figs. 2 and 3, through which the

shoe-blank 42, Fig. 7, is inserted, and is guided under the die-block 9, to be acted upon thereby by a stationary guide-piece, 18, secured upon the bed 7, extending between the frame 1 and stand 8, and a movable horizontal swage-block, 19, supported and moving back and forth upon the bed 7 between the frame 1 and stand 8. (See Fig. 4.)

Holes or openings 20 are made in the bed 7 beneath the pins 15 in the die-block 9, (see Figs. 2, 3, and 4,) to allow the metal punched out of the blank by the pins 15 in forming the nail-holes therein to drop down out of the way.

The horizontal swage-block 19 is provided with swages upon its inner edge, which act upon the shoe-blank to reduce any unevenness caused by the operation of the die-block 9 and to swage the ends of the blank or the heel portions of the shoe to the proper degree. (See Fig. 8.)

The horizontal swage block 19 is operated in connection with the vertical die-block 9, in this instance being connected therewith by means of a link, 21, pivoted at one end to the die-block 9 and at the other end to the upper end of a lever, 22, fulcrumed at 23 in an arm or stand, 24, secured to the bed 7, the lower end of said lever 22 being connected with the horizontal swage-block 19, all as clearly shown in Fig. 4. As the driving-shaft 2 revolves the crank 11 thereon, connected through links 10 with the vertical sliding die-block 9, causes said die-block to be lowered and the nail-holes and creases, by means of the punching-pins 15 and creasing-dies 12, to be made in the shoe-blank inserted directly under said block 9. At the same time that the block 9 is lowered the horizontal swage-block 19, connected with the block 9 in the manner above described, moves forward and swages the blank in the manner above described. The continued revolution of the driving-shaft 2 and crank 11 causes said blocks 9 and 19 to recede or be withdrawn, and the feeding in of the next shoe-blank through the hole 17 pushes the shoe-blank just operated upon along through a hole, 25, in the stand 8 preparatory to the same being operated upon by the shoe-shaping dies and the finished shoe completed. A vertical movable slide or guide, 26, extends through a slot in the bed 7, and the shoe-blank 14 passes between said guide 26 and the forming-rolls 27 as it is pushed along upon the bed 7 through the hole 25 in the stand 8, and stops in front of one of the shoe-dies 28, secured upon the under side of the horizontal revolving table 29, to be operated upon thereby, as will be hereinafter described.

The under side of the guide 26, which has its bearing in and moves up and down through the bed 7, is connected in this instance with one end of a lever, 30, fulcrumed at 31 in a bracket, 32, secured upon the under side of the bed 7. The other end of the lever 30 is held in contact with a cam or notched collar, 33, secured upon the vertical spindle 34, in this instance by a spiral spring, 35. It will thus

be seen that as the spindle 34 and collar 33 thereon revolve in the direction of the arrow, Fig. 2, the guide 26 will have a positive up-and-down motion, regulated in such a manner that said guide 26 will be in its upward position as the blank 14 is pushed through the hole 25 in the stand 8 to guide the same in a proper manner and in its downward position out of the way of the shoe-dies 28 when the blank 14 is in its proper position to be acted upon by said dies.

The vertical spindle 34 extends through an opening in the bed 7 and has its step or bearing 36 at its lower end bolted to the frame 1. (See Fig. 2.) Upon the upper end of said spindle 34 is secured a large bevel-gear, 37, which meshes with and is driven by a small bevel-gear, 38, on the driving shaft 2. (See Figs. 1 and 2.)

Upon the vertical spindle 34, extending between the beveled gear 37 and bed 7, is secured a horizontal wheel or table, 29, upon the under side of which are secured (in this instance four) shoe-dies 28, at regular distances apart, and roll-guides 39, one on each side of the dies 28, for guiding and bringing together the rolls 27, which, pressing against the blank 14, (see dotted lines, Fig. 5,) fed in between said rolls 27 and the guide 26 as the table 29 revolves, causes said blank to be bent or shaped around the dies 28 and the shoe completed.

The rolls 27 are supported and adapted to slide back and forth in the slots 40 in the bed 7. (See Fig. 3.) Spiral springs 41, inclosed in said slots and bearing at one end against the rolls 27, serve to keep said rolls apart, except when they are brought together by the action of the roll-guides 39 at the proper time as the table carrying the shoe-dies 28 revolves, as above described.

The operation of my machine for making horse-shoes will be readily understood by those skilled in the art from the above description, in connection with the drawings, and is as follows:

A blank, as 42, (see Fig. 7,) is fed in through the opening 17 at the left of the machine, and guided by the stationary guide-piece 18 and swage-block 19 directly under the die-block 9. The main shaft 2 is then put into operation, causing the die-block 9, through crank 11 and link, 10, to descend, and the nail-holes 16 and creases 13, by means of the punching-pins 15 and creasing-dies 12, to be made in the upper surface of the blank 42 along one edge thereof. At the same time the swage-block 19, connected with the die-block 9 and operated through the intervention of the link 21 and lever 22, fulcrumed in the stationary arm 24, moves up and swages the ends of the shoe-blank, as shown in Fig. 8. The continued revolution of the main shaft 2 causes the die-block 9 and swage-block 19 to recede, and the feeding in of another blank pushes the blank just operated upon, as 14, Fig. 8, through the opening 25 in the stand 8 between the vertical moving guide 26, which is in its elevated

position, and the rolls 27. As the spindle 34, upon which the horizontal table 29, carrying the shoe-shaping dies 28, revolves, operated by the driving-shaft 2 through the intervention
 5 of the bevel-gears 37 and 38, the guide 26 is drawn down by means of the notched collar 33 through the intervention of the lever 30, and one of the shoe-dies 28 comes in contact with the blank 14, (see dotted lines, Fig. 5,) and the rolls 27, supported upon the bed 7,
 10 are caused to move toward each other by the guides 39, secured at each side of the dies 28 upon the table 29, and thus shape or bend the shoe-blank around the die 28 to form the completed shoe shown in Fig. 9. The continued
 15 revolution of the table 29 allows the finished shoe to be dropped down at the side of the machine, and brings into operation the next shoe-die. The machine will thus continue to
 20 operate as long as the blanks, as 42, are fed into the same.

It will of course be understood that I do not limit myself to the details of construction of the machine shown and described, for any equivalent mechanisms and means for operating the
 25 same may be employed, and the several mechanisms may be made capable of adjustment, so that different-sized shoes may be made upon the same machine after the same has been properly
 30 adjusted.

The horizontal revolving table carrying the shoe-shaping dies may have a less or greater number of shoe-dies secured thereon from what is shown in the drawings.

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

1. In a machine for making horseshoes, the

combination, with a vertical moving die-block carrying dies for punching the nail-holes 40 and forming the creases in the blank for the horseshoe, and a horizontal moving swage-block carrying dies for swaging said blank, of a revolving table carrying dies for shaping and bending said blank to form the completed horse-
 45 shoe, substantially as set forth.

2. The combination, with a vertical sliding die-block carrying the creasing-dies and nail-hole punches, and means for supporting and operating said die-block, of a horizontal sliding swage-block for swaging the ends of the horseshoe-blank, and means for supporting and operating the same in connection with said die-block, substantially as set forth.

3. The combination, with a horizontal table 55 carrying shoe-shaping dies and roll-guides, and means for supporting and revolving said table, of a vertical moving guide and forming-rolls between which the shoe-blanks to be operated upon are guided and then bent around
 60 the shaping-dies by means of said rolls, substantially as set forth.

4. The combination, with a horizontal table or wheel carrying shoe-shaping dies and roll-guides, and means for supporting and revolving
 65 said table, of a vertical moving guide, and means for supporting and operating the same, and rolls supported upon the bed of the machine and adapted to be moved toward each other to bend the shoe-blank around the shaping-
 70 dies, substantially as set forth.

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Witnesses:

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