W. K. Justus,

Horse Shoe Machine.

No. 113,173. Patented Mar. 28, 1871

Fig. 1.

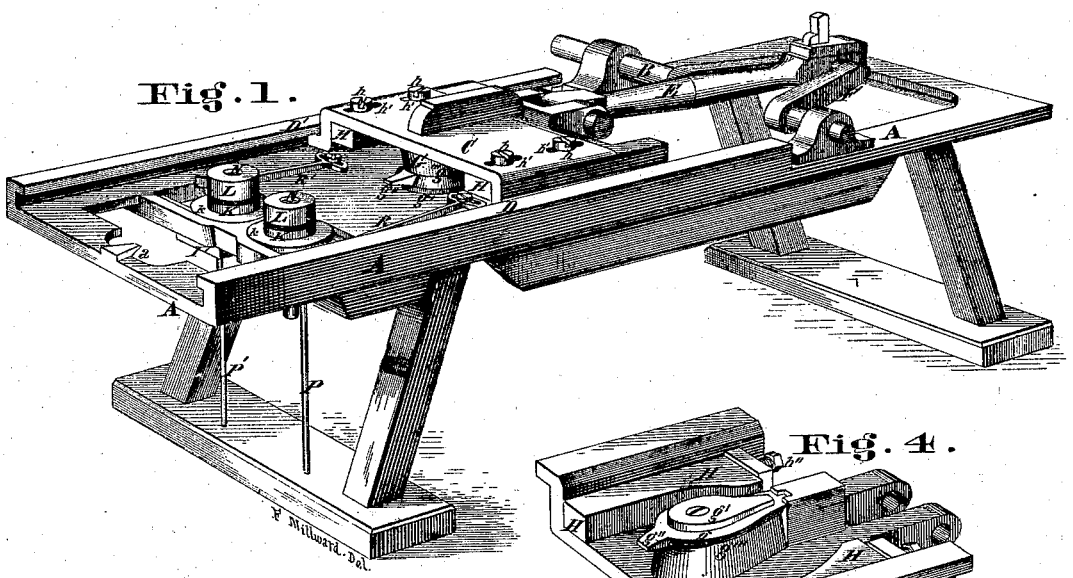


Fig. 4.

Fig. 2.

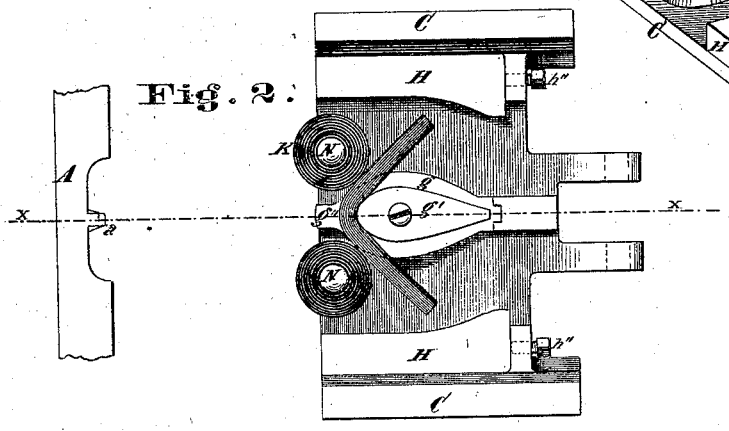


Fig. 5.

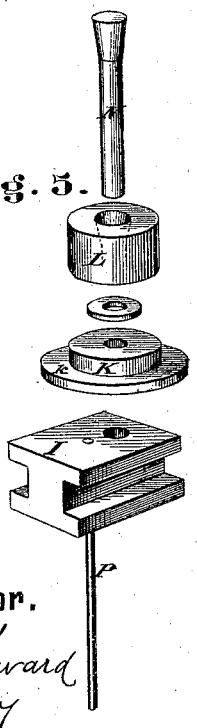
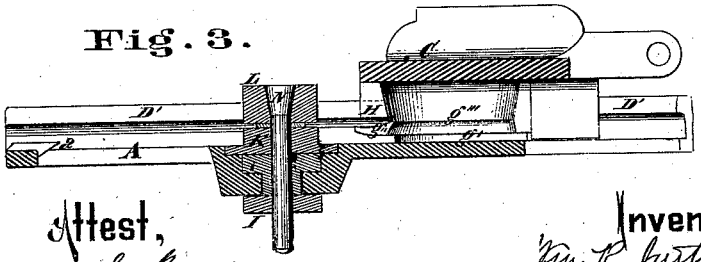


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM R. JUSTUS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO SHOENBERGER & CO., OF SAME PLACE.

IMPROVEMENT IN HORSESHOE-MACHINES.

Specification forming part of Letters Patent No. **113,173**, dated March 28, 1871.

To all whom it may concern:

Be it known that I, WILLIAM R. JUSTUS, of Pittsburg, Allegheny county, State of Pennsylvania, have invented certain new and useful Improvements in Horseshoe-Machines; and I do hereby declare the following to be a sufficiently full, clear, and exact description thereof to enable one skilled in the art to which my invention appertains to make and use it, reference being had to the accompanying drawing, making part of this specification.

Nature and Objects of Invention.

My invention relates to the class of horseshoe-machines which "turn" or bend the shoes from prepared blanks, cut to length, by means of a reciprocating head carrying the form for the shoe and the forms for directing the movement of the swaging-rollers; and consists, first, in arranging the entire forming mechanism above the table upon which the blank is placed, and locating the side forms directly above the shoe-form, so that the corresponding swaging-rollers are also directly above each other, for the purpose of relieving the spindles upon which the rollers revolve from undue canting strain, against which a further provision is made by extending the lower rollers (which bend the blank around the toe of the shoe form, and are consequently subjected to the greatest strain) partly into corresponding recesses in the sliding boxes; second, in the peculiar construction of the form on which the shoe is bent, by which allowance is made for accidental miss-feeding, and breakage thereby prevented; third, in connection with the reciprocating shoe-form, of a projection on the stationary frame, for forcibly removing the bent shoes from the form.

Description of the Accompanying Drawing.

Figure 1 is an exterior perspective view of a machine embodying my invention. Fig. 2 is a plan of the under side of the sliding head and a portion of the frame of the machine. Fig. 3 is a longitudinal section of the sliding head and frame of the machine through line *x x*, Fig. 2. Fig. 4 is a perspective view of the under side of the sliding head. Fig. 5 represents, in perspective, detached views of the swaging-rollers and sliding boxes.

General Description.

A is the frame of the machine; B, the driving-shaft, and C the sliding "former-head," the latter being snugly fitted between the slides or guides D D′, and receiving a rectilineal reciprocating motion through pitman E and crank F.

The head C is provided on the lower side with the shoe-form G and side forms or guides H, both being placed in the head in such a position that the lower face of the side forms is opposite the upper face of the shoe-form. This provision enables the side forms to so direct the swaging-rollers that there shall be but little twisting or canting of said rollers in their bearings.

The form G is constructed with a flat face, *g*, and form proper, *g′*. It also has an inclined projection, *g″*, against which the projection *a* on the frame operates, and a deep recess or gutter, *g‴*, on each side.

The projection *g″* serves to guide the projection *a*, which forces off the finished shoe, and the recesses *g‴* provide an exit or place of escape for any blank which has not been properly fed, and thus saves the machine from breakage.

I I′ are sliding boxes, fitted to move laterally, of such a construction that the rollers K L rest directly upon the top of the boxes, and are journaled on pins piercing the boxes centrally in the frame A. Each of these boxes is fitted with a pair of rollers, K L. The lower roller, K, is the swaging-roller proper. It is constructed with a flange, *k*, on which the lower face of the shoe-blank M rests, and when in action rolls over the side of the blank. The flange *k* of these rollers extends into and snugly fits a recess in the boxes, so that the strain upon said rollers, in bending the blank around the toe of the shoe-form, is mainly sustained by the boxes.

The rollers L rest upon the rollers K, so that any pressure upon the one will be resisted by the other in a line as nearly direct as possible, and the pins upon which the rollers revolve are thus saved from undue

twisting or canting strain on the boxes; and, in connection with the forms H, over which they roll, the rollers L serve to compel the rollers K to form the shoe by confining them to a definitely-prescribed path.

The forms H, I prefer to make adjustable, and this is accomplished by means of bolts *h*, slotted holes *h'*, and set-screws *h''*. These may be so adjusted as to compel the rollers K to thicken up the shoe at the ends.

It will be seen that it is necessary, in the operation of the machine, that the rollers K should revolve in the opposite direction to the rollers L, and to provide for this they are separately journaled on the pins N, the latter being fitted to revolve in the boxes I I'. This construction permits of the pins N either revolving or standing still, and thus taking that course in which there is the least friction, and also renders every piece readily detachable for repairs, cooling, change of rollers for different sizes, &c.

Q P' are straight bars of metal, (steel preferred,) which are fastened at the lower ends to the frame, and at the upper ends to the sliding boxes I I'. These bars, by elastic deflection, permit the boxes I I' to move outward in the slides, and forcibly compel the swaging-rollers to hug the blank in the act of forming the shoe. They also return the sliding boxes to the central position in the frame after the formation of each shoe.

R R' are adjustable gages, between which the blank is placed and held immediately before it is formed.

The springs P P', by acting to preserve the rollers in the central position when not in contact with the form G, and causing them to press tightly against the blank when they are passing around the form, prevent the accidental displacement of the rollers and boxes.

Operation.

The prepared blank, cut to length, is placed flatwise between the guides or gages R R', and against the rollers K, at the time the sliding head is most distant from the rollers. On the return of the head C the blank is bent by the combined action of the shoe-form G and the rollers K K, the rollers L L and side forms H assisting to complete the work by confining the rollers K K to a definite path. When the shoe-form G has passed between the rollers so far as to clear the shoe, the latter is forced off by the projection *a* and drops to the ground.

It is obvious that variations may be made in the formation of certain parts of the machine without any departure from the principle of construction and operation, and also that the action may be reversed, the sliding swaging-rollers receiving a longitudinal as well as a lateral motion, the head C being permitted to stand still.

Each of the pins N can be constructed to revolve or not. If made stationary, the rollers K L will revolve upon the pin in opposite directions. If made so as to compel it to revolve, one of the rollers can be fastened to the pin. If made free to revolve or not, the action will be as before explained.

Claims.

1. The arrangement above the table upon which the blank is placed of the shoe-form G, side forms or ways H H, swaging-rollers L L and K K, and boxes I I', with reference to one another, substantially as and for the purpose set forth.

2. The form G, when constructed with side recesses, *g'''*, as described, and for the purpose specified.

3. In the described combination with the reciprocating shoe-form G, constructed with a projection, *g''*, inclining upward, the projection *a* of the frame A, as and for the purpose set forth.

In testimony of which invention I hereunto set my hand.

WILLIAM R. JUSTUS.

Witnesses:
JAS. E. MCKELVY,
W. J. A. KENNEDY.