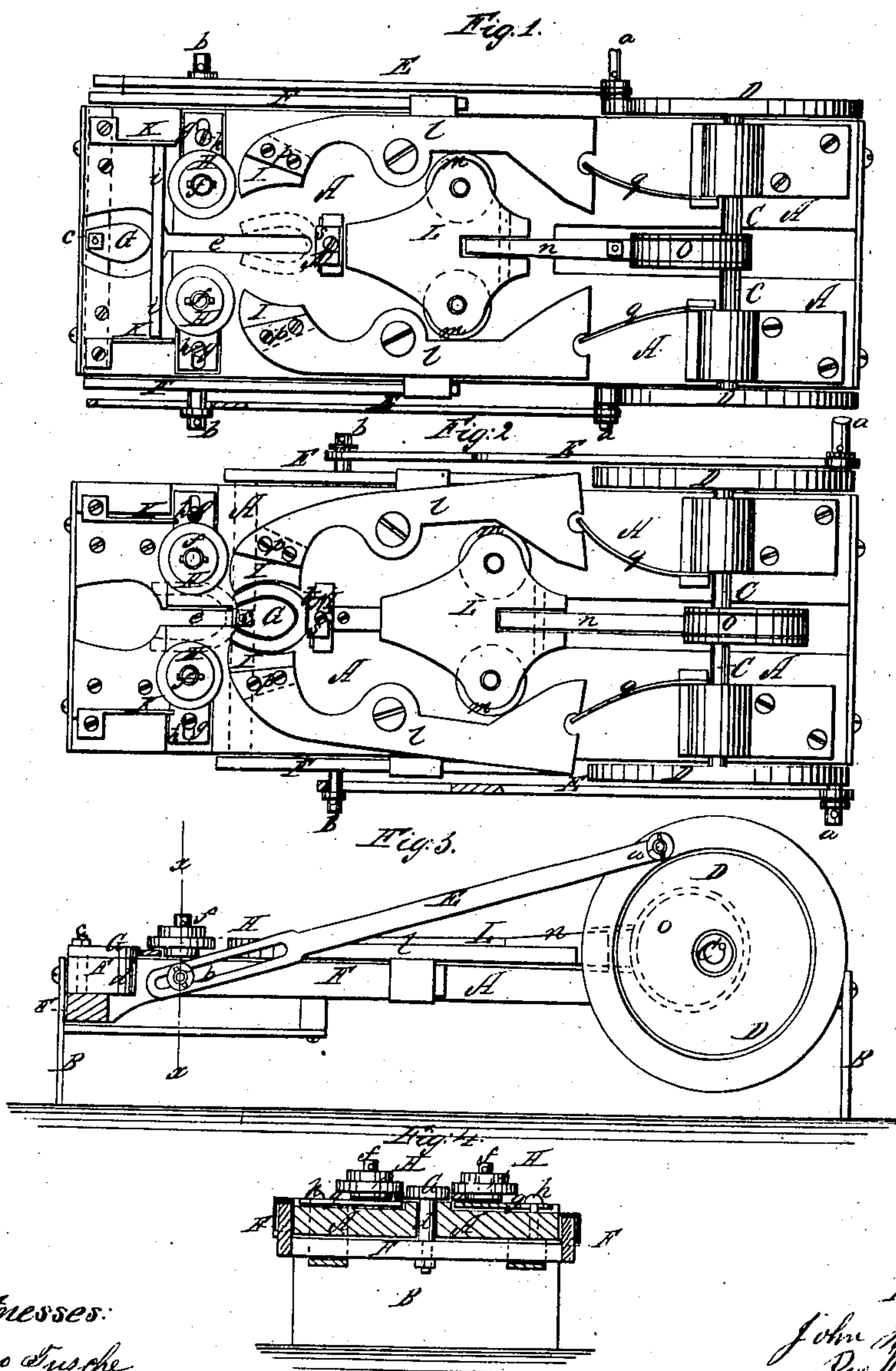


J. W. Kingsbury,
Horseshoe Machine,
N^o 64,883. *Patented May 21, 1867.*



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JOHN W. KINGSBURY, OF NEW BEDFORD, MASSACHUSETTS.

Letters Patent No. 64,883, dated May 21, 1867.

IMPROVED HORSE-SHOE MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN W. KINGSBURY, of New Bedford, Bristol county, Massachusetts, have invented a new and improved Horse-Shoe Machine; 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 make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a machine for forming horse-shoes from hot bar iron, the machines being so arranged as to be adjustable for all sizes of horse-shoes, and so that one shoe is formed during each revolution of the horizontal driving-shaft of the machine.

The invention consists in the general construction of a horizontal machine, and in the manner of imparting the required motion to the different portions, and the invention consists also in the use of a movable and removable die, around which the shoe is formed; said die passing between a pair of rollers, whereby the straight bar which was laid previously across the said rollers, is bent into a U-shaped form. The heels are then pressed in by means of a pair of jaws, which are forced against the shoe by a pair of friction-rollers, working against inclined surfaces on the front end of the jaws, and then the toe of the shoe may be flattened by being forced against an adjustable stationary block. The heels are, or may also be, thickened by the aforesaid jaws, which is a very important item, as the blanks have not to be thickened previous to their being put into this machine by an independent apparatus. The inner die has, during the aforesaid motions, been moved constantly forward, being operated by connecting-rods, which are secured eccentric on the driving-shaft, and are secured to the side of a frame to which the said die is attached. The ends of these rods, which are secured to the frame of the die, are slotted, and after the shoe has been forced against the aforesaid block or abutment, the forward movement of the die is completed. The crank-pins on the driving-shaft, to which the aforesaid connecting-rods are secured, are then on a level with the horizontal driving-shaft, and on that side of the shaft which is opposite to the dies. The slotted other end of the rods has to be moved backward now until the forward end of the slot strikes the pin on the frame of the die. During this motion the jaws are released from the shoe, and then the die is moved back until it is brought as far back as possible. The ready-formed shoe is then dropped through a hole in the cover of the apparatus into any suitable receptacle. While the die is at its rear position the connecting-rods are level again, the crank-pins being on the same side of the driving-shaft as are the dies, and the said shaft must be turned to bring the back end of the slot in contact with the pins on the die-frame. This gives ample time for the introduction of a fresh blank into the machine, so that the operations may be resumed again. In the annexed drawing my invention is illustrated—

Figure 1 being a plan or top view, partly in section, of my machine, showing the different parts in position for operating on the straight blank.

Figure 2 is a plan or top view of the machine, showing the parts in position when the shoe has been formed, and is held between the die, jaws, and stationary toe-piece.

Figure 3 is a side elevation, partly in section, of the same.

Figure 4 is a vertical cross-section of the same, plane of sections being indicated by line *x x*, fig. 3.

Similar letters of reference indicate corresponding parts.

A is an oblong frame made of wood or any other suitable material strong enough to support the other parts of this machine. B are posts or supports upon which the plate A rests. C is the horizontal driving-shaft, which is mounted in suitable boxes, arranged on the frame A, near one end of the same. Two disks, D D, are secured to the ends of the shaft, and are provided with wrist-pins *a*. To these pins are secured the connecting-rods E, which are attached at their other ends to a horizontal sliding frame, F, which is provided with pins *b b*, fitting through the slotted ends of the rods E, as shown in figs. 1 and 3. Upon the frame F is secured, by means of a bolt or screw, *c*, or otherwise, so as to be easily removed or replaced, a reciprocating die, G, which has the shape of the inside of the horse-shoe. This die may be replaced by one of different size, whenever different-sized shoes are to be formed. The reciprocating die G is secured to an upright rod or pin, *d*, which is part of the frame F, and for which a slot, *e*, is provided in the plate A, to allow it to slide forward and backward. The reciprocating die G is elevated so as to be just above the plate A, its lower surface being on the same level as the upper surface of A. By means of the crank-pins *a* and rods E, the frame F, and with it the

die G, is moved alternately forward and backward. In front of the reciprocating die G, and as far apart from each other as the outsides of the shoe to be formed are from each other, are arranged two rollers, H H, and are mounted on vertical pins *ff*, which are secured to slotted plates *g g*, the latter being secured to the plate A by means of screws *h h*, as shown. Thus the rollers H can be moved more or less apart, according to the size of shoe to be formed, as seen in figs. 2 and 4. These rollers H consist of three circular plates, one laid above the other, the centre plate being of the largest diameter, so as to project beyond the lower plate, and to keep the metal down while it is being formed. The upper and lower plates of the rollers H are of different diameters, so that the said rollers may be turned around, and be thus used for a still greater number of different-sized horse-shoes. The straight blank *z* is laid in rear of the rollers H and in front of the reciprocating die G, as shown in fig. 1. By means of spring-gauges K K the blank is held in proper position, said gauges allowing for slight variations in the length of the blanks. When the die G is moved forward, the shaft C revolving, the blank is bent out in the centre, between the die G and rollers H, and receives the form of the letter U, as is shown in red lines in fig. 2. It will then be necessary to bend the heel-pieces in, and this is done by means of two jaws, I I, which are attached to a pair of plates, *l*. The plates *l* are pivoted to the table A, as shown, so as to turn readily on their pivots, and those ends which hold the clamps are forced together into the position shown in fig. 2, by two friction-rollers, *m*, which are attached to a block, L, which is connected by means of a rod, *n*, with an eccentric, *o*, on the shaft C, all as shown in figs. 1 and 2. When the eccentric draws the rod *n* toward the shaft C, the rollers *m* will spread the front ends of the arms *l*, and will thereby force their rear ends together. The toe of the shoe, when to be flattened, is forced against an adjustable stationary block, M, which may be moved forward or backward, being slotted as shown, or against a plate, *s*, which is adjustable on the stationary block M, and is enabled to receive pressure by the application of a wedge, *t*. Jaws I can also be adjusted on the plates *l*, or be removed or replaced with ease, being held in place by means of screws *p*. The heels of the shoe may be thickened by forming the jaws I accordingly, and as indicated in fig. 2. After the shoe has been thus formed, it will be necessary to move the die back to its starting place, and to remove the shoe, so as to be able to form a new one. But the shoe could not be moved back unless the jaws I were first spread apart, and it is important that the jaws should be opened before the die G commences to move back. For this purpose I have arranged the slotted rear end of the connecting-rods E. While the shoe is held between the jaws I, and reciprocating die G, and block M, the rods are as shown in fig. 2, the back end of slot being in contact with the pin *b*, having been pulling the frame F forward. To move the latter backward, the front end of the slot must be brought against the pin *b*. While the shaft C is being turned, and the frame F and die G are thus at a standstill, the eccentric *o* pushes the block L towards M, and releases thus the pressure of the rollers *m* upon the front ends of the plates *l*, and the said front ends are then moved towards each other by means of springs *q*, whereby the jaws I are spread apart, being in position shown in fig. 1, while the die G and the formed shoe are in the position which is indicated by red lines in fig. 1. The frame F and die G are then moved back, and when the die arrives at its original position, (fig. 1,) the shoe drops through an aperture, provided in the plate A, upon the floor or into any suitable receptacle. When the die arrives at the position shown in fig. 1, the forward end of the slot in rod E is in contact with the pin *b*, as shown in section in fig. 1, and while the die G remains stationary during the time, the rod moves so as to bring the back end of the slot in contact with the pin *b*, sufficient time is afforded to place a new blank between the gauges K. The reciprocating die G may also be covered (like the lower plate of each roller H) by a plate with a projecting flange, whereby the iron would be prevented from being bent up by the strong pressure against its sides.

All the parts in this machine may be made of steel or of any other suitable material, and of suitable dimensions. It will be seen that in this machine all sizes of horse-shoes can be formed with great facility, and the heels thickened after the shoe has been formed.

I claim as new, and desire to secure by Letters Patent—

1. The slotted arm E, in combination with the sliding frame F and die G, whereby the movement of said die is initiated, substantially as herein shown and described.
2. The adjustable rollers H, having upper and lower plates of different diameters and thicknesses, in combination with the slotted plates *g*, all as herein shown and described.
3. The combination of the adjustable block M, or its equivalent, with the reciprocating die G, for the purpose of flattening the toe of the shoe, substantially as set forth.
4. The combination of the reciprocating die G, adjustable rollers H, clamping jaws I, for the purpose of forming horse-shoes, all made and operating as herein shown and described.
5. The adjustable block M, or its equivalent, in combination with the reciprocating die G and clamping jaws I, for the purpose of flattening the toe of the shoe, all as set forth.
6. The device for operating the jaws I, consisting of the cam *o* on shaft C, rod *n*, block L, rollers *m m*, plates *l l*, and springs *q q*, all made and operating substantially as set forth.

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