2. Sheets, Sheet. 1.

U. Billings,

Horseshoe Machine.

No. 112,769. Patented Mar. 21. 1871.

Fig. 1.

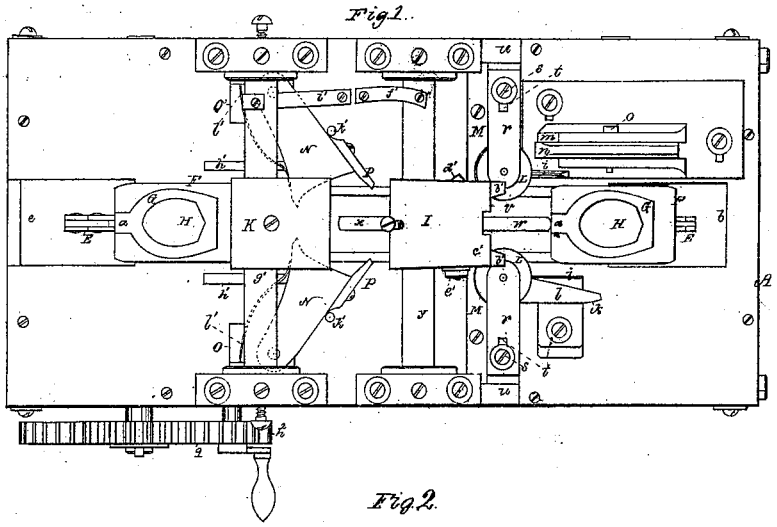


Fig. 2.

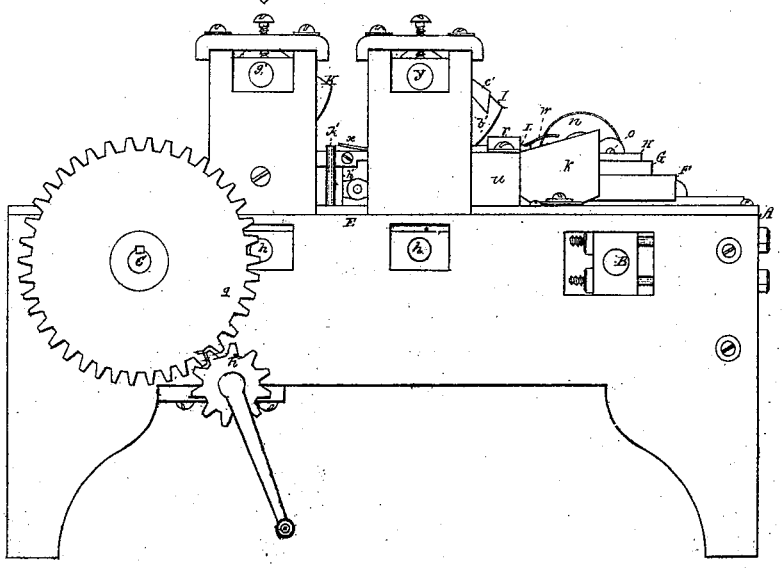
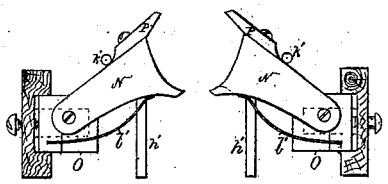


Fig. 7



Witnesses.

S. N. Piper

L. N. Müller

U Billings

by his attorney

N. Wright

U. Billings,

2 Sheets, Sheet 2.

Horseshoe Machine.

No. 112,769. Patented Mar. 21, 1871.

Fig. 3.

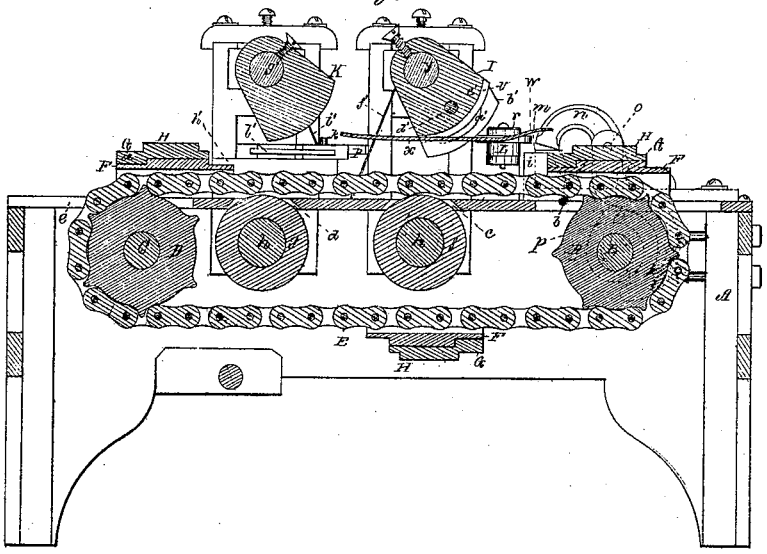


Fig. 4.

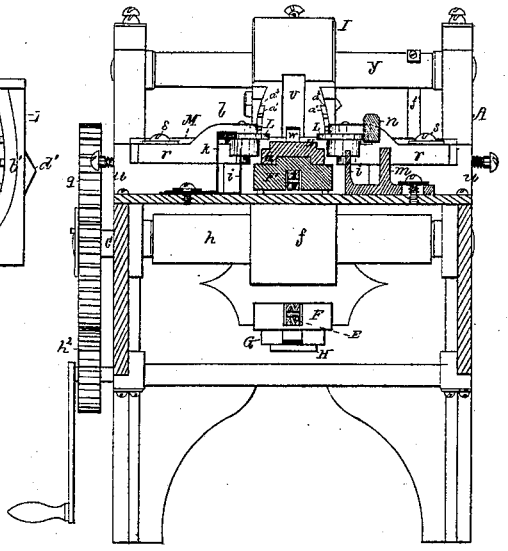


Fig. 5.

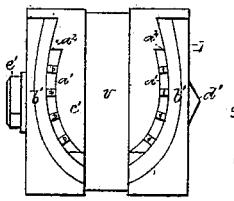
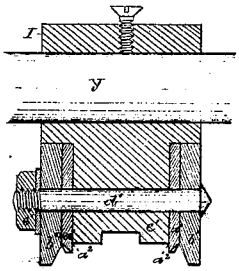


Fig. 6.



Witnesses.

S. N. Piper

L. N. Moeller

U. Billings.

by his attorney.

N. W. Ewing

UNITED STATES PATENT OFFICE.

URIAH BILLINGS, OF CAMBRIDGEPORT, MASSACHUSETTS.

IMPROVEMENT IN HORSESHOE-MACHINES.

Specification forming part of Letters Patent No. **112,769**, dated March 21, 1871.

To all whom it may concern:

Be it known that I, URIAH BILLINGS, of Cambridgeport, of the county of Middlesex and State of Massachusetts, have invented a new and useful or Improved Machine for Making Horseshoes; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a side elevation, and Fig. 3 a longitudinal and vertical section, of it. Fig. 4 is a transverse section taken through its shear-blades. Fig. 5 is an under side view, and Fig. 6 a transverse section, of the reciprocating creaser, to be hereinafter described.

In such drawings, A denotes the frame or table for supporting the operating parts of the machine. Within such frame there are arranged transversely of it, and at a suitable distance apart, two shafts, B C, provided at or near their middles with sprocket-wheels D D. An endless chain, E, goes around, and is supported by the two sprocket-wheels, and serves to support a series of carriages, F F F, arranged on the chain at equal distances apart in manner as represented. On the top of each of the carriages F there is fixed a cam or actuator, G, surmounted by a former, H, the whole being as shown in the drawings.

It will be observed that each actuator G is provided with a nose or projection, *a*, extended from it, the purpose of such part *a* being to centralize the creaser I, or aid in maintaining it in its proper position preparatory to and while it may be in the act of creasing a shoe.

Within the top of the frame or table A are four openings, *b c d e*, arranged as represented. The first and last of these openings are to allow the carriages of the endless chain to pass around with the chain and successively underneath the eraser and the spreading-die K. There is a roller arranged in each of the intermediate openings, *c d*, in manner as shown at *f* or *g*, such rollers being supported by transverse shafts *h h*, disposed as represented.

On opposite sides of the endless chain, and projected from the top of the table or frame A, and arranged as exhibited, are two short rails, *i i*. Outside of one of the said rails is an adjustable abutment, *k*, provided at its top with a guide-lip, *l*, that extends from the inner face of the abutment and inclines toward the periphery of a flanged roller, L, of which mention will be hereinafter more particularly made. A stationary shear, *m*, to operate with a movable lever, cutter, or shear, *n*, is disposed aside of the other of the said rails *i i*. The lever-shear *n* has its pivot at *o*, and is operated by a cam or wiper, *p*, arranged on the shaft B.

A gear, *q*, fixed on the shaft C and engaging with a driving-pinion, h^2, serves to impart motion to the said shaft and indirectly to the endless chain and the carriages thereof.

In advance of the rails *i i* are two flanged rollers, L L, whose peripheries are arranged on a level with that of the former H when at its highest altitude. Each of the wheels L is arranged in and supported by an adjustable slide or carrier, *r*, provided with a clamp-screw, *s*, for holding or fixing it in position, such clamp-screw going down through a slot, *t*, in the slide *r*, and being screwed into the bed *u*, in which the carrier *r* is arranged.

Between the rollers L L, and extended along through a groove, *v*, going through the arc of the creaser I, are two arms, *w x*, which are extended in opposite directions from a transverse and stationary bar, M, at its middle, such bar M, with the arms, constituting a presser, and being arranged as represented. The purpose of the arms of the presser is to prevent a shoe, while embracing a former, H, from rising off the said former during its passage along underneath the creaser and to the spreading-die K. The said creaser is a sectoral block fixed upon a rocker-shaft, *y*, having its journals supported in boxes adjustable vertically. This creaser is grooved along the middle of its arc, as shown at *v*, the groove being to enable the creaser to extend below the presser-arm *x* on each side of it, and to co-operate with the nose *a* in centralizing the creaser relatively to the former H.

Within the creaser are tools *a′ a′*, for creasing the shoe, and for forming indentations in it to indicate the positions for the nail-holes. The said tools are arranged in sockets a^2 in the creaser, and held therein by jaws *b′ b′*, which project from the body part *c′* of the creaser. A clamp-screw, *d′*, provided with a nut, *e′*, goes through the creaser and its jaws transversely, and serves, with the sockets in which they are arranged, to hold the jaws and the tools in place. These jaws project below

the arc of the creaser, and with the cam G of each former serve to effect the movement of the creaser in one direction, its return movement being produced by a spring or elastic band, *f'*, fixed to the frame A and the shaft of the creaser.

In advance of the creaser is the spreading-die K, which is a sectoral block fixed on a transverse or rocker shaft, *g'*, arranged as represented, the journals of this shaft being supported in adjustable boxes. The purpose of the die K is to roll down or spread the horseshoe or flatten it, as occasion may require, from its toe toward its heels.

On the flanks of the die K and below it are two reciprocating dies, N N, which are arms pivoted to adjustable blocks O O, so as to be able to turn or vibrate horizontally. Each arm is furnished with a projection or finger, P, arranged as represented particularly in Fig. 7, which is a top view of such two dies N N, with two fingers. Each of the dies moves on one of two supporting-rails, *h'*, elevated on the top of the frame A. A band-spring, *i'*, fixed to the frame A and the shaft of the die K, serves to effect a reverse motion of the shaft and die.

When the endless chain E is in revolution, the several formers H will be carried successively along between the bending-rollers and side dies and underneath the creaser and the spreading-die. At a proper time an attendant is to lay a bar of iron on the stationary shear *m* and the nails *i i*, with the end of the bar against the abutment *k*. Just before the bar may be met by a former, H, while advancing, the movable shear will be actuated so as to sever from the bar a blank, or the part extending from the stationary shear to the abutment. The said former H, continuing to advance, will meet the blank at its middle and crowd it forward against and between the peripheries of the two rollers L L, by which operation the blank will be bent partially around the former H, the further bending of the blank at and near its heels being effected by the dies N N. Each of these dies, while in its rearmost position, ready for action, rests against a stop, *k'*, against which it is maintained by a spring, *l'*, whose object is to effect a reverse motion of the die after the passage of a former, H, by it. The fingers P P of the dies N N, by advancing against the heel of the former H, serve to maintain each of the said dies in its due position relatively to the said former while the dies are bending in or contracting together upon the former-heels of the blank.

I herein make no claim to a rotary former and bending or swaging dies or other devices as shown and described in the United States Patent No. 38,804, granted to me. By the employment of an endless chain with other parts, as hereinbefore described, for making horseshoes, I am enabled to produce a very efficient and in many respects a better operating machine in comparison to that described in such patent.

I am aware that the mechanical devices hereinbefore described are, for the most part, old, and also that combinations of many of said devices are found described in patents numbered 17,665 and 103,681. I do not therefore claim the devices separately, nor any combination thereof, except these combinations hereinafter specified.

I claim in the above-described mechanism the following, viz:

1. The endless chain E, one or more carriages, F, formers H, and actuator G, the frame or table A, the rails *i i*, the rollers L L, the presser, the creaser I, the spreading-die K, and the heel-contracting dies N N, all arranged and combined as and to operate as specified.

2. The shears *m n*, the rails *i i*, the abutment *k*, the rollers L L, the presser, the creaser I, the spreading-die K, the heel-contracting dies N N, all the endless chain E, and one or more formers, H, and actuator G, arranged and combined substantially and to operate as explained.

3. The arrangement and combination of the fingers P P with the heel-contracting dies N N, combined and to operate with a spreading-die, K, a creaser, I, a presser, bending-rollers L L, one or more formers, H, and actuators G, and an endless chain, E, in manner substantially as described.

4. The combination of the sectoral creaser-block I, grooved as described, the arms *w* and *x*, and the nose *a* of the actuator, as and for the purposes set forth.

URIAH BILLINGS.

Witnesses:

R. H. EDDY,

J. R. SNOW.