2 Sheets—Sheet 1.

G. P. CLAPP.

Machine for Reducing the Shanks of Horseshoe Nail-Blanks.

No. 201,094. Patented March 12, 1878.

FIG. 1.

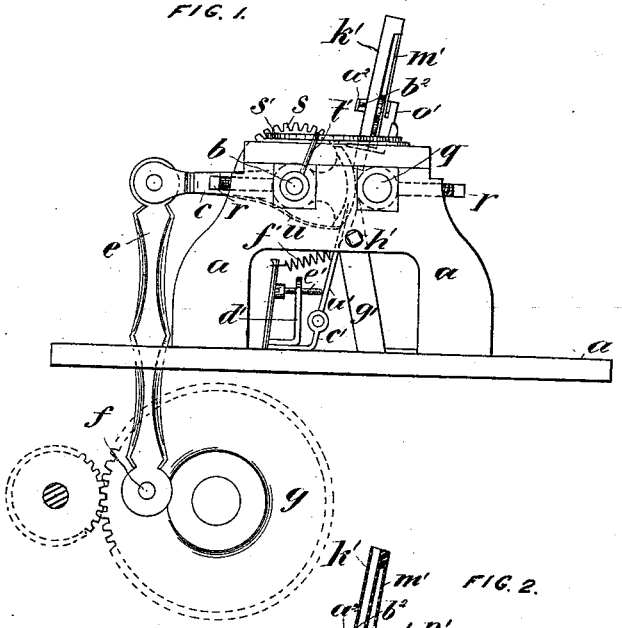


FIG. 2.

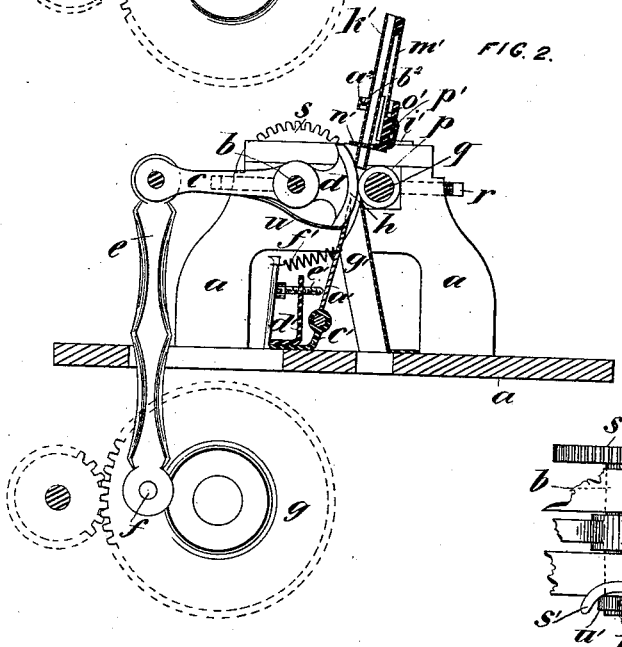
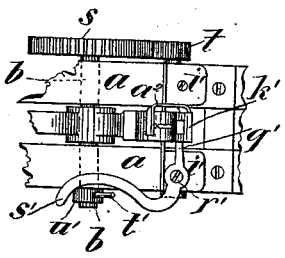


FIG. 3.



Witnesses

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2 Sheets—Sheet 2.

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Machine for Reducing the Shanks of Horseshoe Nail-Blanks.

No. 201,094. **Patented March 12, 1878.**

FIG. 4.

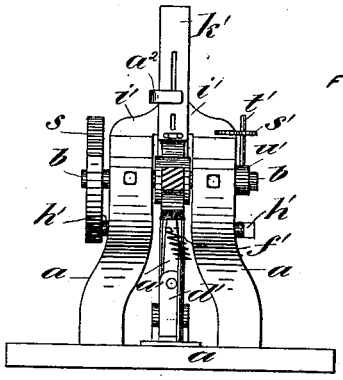


FIG. 5.

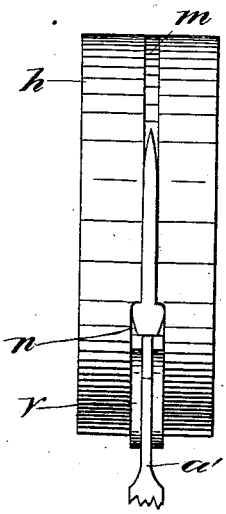


FIG. 6.

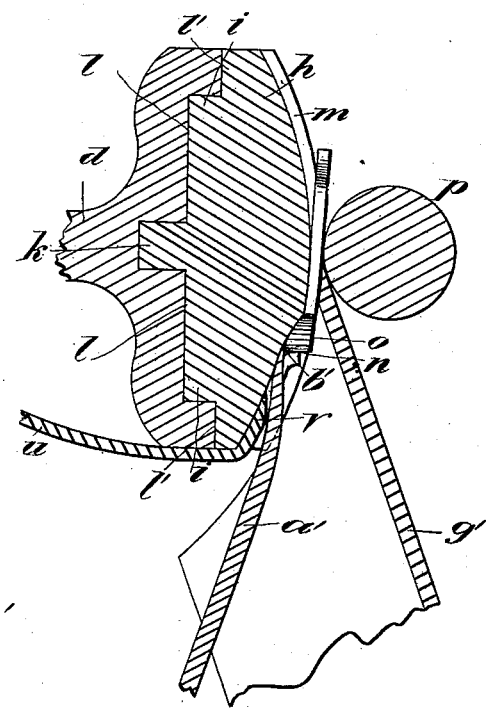
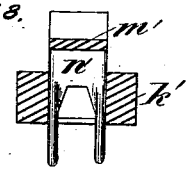


FIG. 7.

FIG. 8.



Witnesses.

Charles G. L. Simpson

John A. Penn

Inventor.

Geo. P. Clapp

UNITED STATES PATENT OFFICE.

GEORGE P. CLAPP, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO JOHN A. PILLOW AND RANDOLPH HERSEY, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR REDUCING THE SHANKS OF HORSESHOE-NAIL BLANKS.

Specification forming part of Letters Patent No. **201,094**, dated March 12, 1878; application filed March 6, 1877.

To all whom it may concern:

Be it known that I, GEORGE PARKER CLAPP, of the city and district of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements on Machines for Manufacturing Horseshoe-Nails; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention has reference to the construction of a machine for performing one of the operations of manufacturing horseshoe-nails.

In this manufacture a "blank nail" is first formed. This blank is a nail having the head reduced to the required form, also the part of the body adjacent to the head reduced to the required size; but the remaining part of the body is left of about or nearly the same thickness as that adjacent to the head. These blanks next require to go through the "elongating process," which consists in drawing out the part of the body opposite to that at which the head is situated, reducing its thickness the amount required to be given to the finished nail. For this purpose the machine forming the subject-matter of the present invention is constructed. The elongated blank is then introduced into a machine, where the point of the blank is, by clipping and beveling, formed, producing a complete and finished nail.

Blanks are formed by two processes—the "hot" and the "cold." Those made by the cold require to be annealed before they are elongated, so that the head and part of the body adjacent to it may be soft; and, by performing the operation of elongation when the blanks are cold, the metal forming the points is made stiff or hard, thus producing a nail with a softened head and body and a hardened point.

In the drawings hereunto annexed similar letters of reference indicate like parts.

Figure 1 is a side elevation embodying my invention. Fig. 2 is a vertical longitudinal sectional elevation of Fig. 1. Fig. 3 is a plan of Fig. 1. Fig. 4 is an end elevation of Fig. 1. Fig. 5 is a detail of elongating-die, &c. Fig. 6 is a detail, in section, of elongating-die, roller, &c. Fig. 7 is a detail of retaining-spring. Fig. 8 is a detail of spout and spring.

Letter *a* is any suitable frame-work and base, to which the moving and other parts are attached by journals, &c., in the ordinary manner. *b* is a shaft, carried in bearings in the frame *a*, upon which, in the part of it extending between the two sizes of the frame *a*, (see Figs. 3 and 4,) is secured a rocking double arm, *c* and *d*. The end of the arm *c* is formed as a double eye, for attaching a connecting-rod, *e*, thereto, the lower end of which is attached to a crank-pin, *f*, on a disk, *g*, which disk may be revolved by power, or the power may be applied through a pinion operating the same. This disk and gearing may be carried in brackets attached to the base *a*, or in any desired manner, so that they are retained in their proper relative positions.

The end of the arm *d* is provided with a die, *h*, either made in one with the arm by welding a steel surface thereon, or by forming a seat to receive the die *h*. (See Fig. 6.)

The latter plan, for economy, I should prefer to adopt, in which case the arm *d* would be provided with a recess to receive a projection, *i*, of the die *h*, and a further recess to receive the neck *k* of the die *h*, the die being secured in place by a "pinching-screw" passed in from the side of a lever, and biting upon the neck *k*, as commonly in use in similar cases. By this arrangement of the die, as it becomes worn out, and its surface requires to be renewed, it may be reduced and the groove deepened, while the distance from the center of the shaft *b* may be maintained at its original amount by "liners" or supplementary pieces inserted between the flat surfaces at *l* and *l'*, in the common manner in use of applying liners, to compensate for wear, &c.

No matter in which way the die *h* is formed, as above, it is provided with a groove, *m*, extending from the top of its surface to about the position shown in Figs. 5 and 6, being in width the exact breadth of the body of the finished nail, and in depth the thickness to which the blank is to be reduced in the main portion of the body and point end. The extension

n of the groove *m* is enlarged to the width of the head of the nail, and the point of junction of the two parts *m n* of the groove is configurated to agree with the under side of the head of the nail, if desired; or it may be made rectangular, the extension *n* being made in that part where the head *o* of the nail rests, to agree in depth with the increasing thickness of the head of the nail.

It will be borne in mind that the blank is produced in the first place with its head and the part of the body adjacent to it reduced to the desired size, so that the part of the groove formed for the head and part of the body adjacent to it to be received therein forms only a receptacle for the same, and is not intended to be used as a die, into which the nail is passed, to perfect the configuration of said parts. The groove *m*, however, diminishes in depth as it extends upward, and forms a die, in which the major part of the body of the nail is pressed by the roller-die and elongated.

p is a plain steel roller, made integral with or secured on the shaft *q*, carried in bearings in the two sides of the frame *a*, which bearings are arranged to slide horizontally a small amount, as are also the bearings of the shaft *b*. The peripheries of the die *h* and roller *p* are maintained in close contact by set-screws *r*, so that the elongation of the blank in the groove *m* will be such as to positively reduce the point end in thickness to the depth of the groove.

The reason the shafts *b* and *q* are made horizontally adjustable is that, whereas said shafts are, in their journals and on the surface of the die *h* and roller *p*, subjected to friction, and consequent reduction, such wear may be compensated for by setting the shafts together by the set-screws *r*.

On the end of the shaft *b*, extending beyond the frame *a* to one side, as shown in Figs. 3 and 4, is secured a gear-wheel or segment of a gear-wheel, *s*, and on the corresponding end of the shaft *q* is secured a pinion, *t*. The relative size of the radius of the gear *s* to that of the pinion *t* is the same as the radius from the face of the die *h* to its center of motion to the radius of the roller *p*.

To the under side of the arm *c* is secured a spring, *u*, extending to the under extremity of the die *h*, where the spring has an upturned portion, *v*, entering into the extension *n* of the groove *m*, and extends up a sufficient distance to rest against the top of the head *o* of the blank, as clearly shown in Fig. 6. The part *v* of the spring *u* is forked and grooved, in the manner clearly indicated in Figs. 5, 6, and 7, for the purpose of allowing the guide a^1 to pass in between the forked and grooved end of *v*, and by making the extension *n* at the point b^1 a little deeper than the thickness of the head of the nail the point of the guide a^1 is enabled to enter below the head of the nail, and clear it from the groove.

The guide a^1 is hinged to a bracket, *c'*, attached on the base *a*. *d'* is a bracket attached on the bracket *c'*, provided with a set-screw, *e'*, for adjusting the position of the guide a^1, and for preventing it from being carried too far back by the spring *f'*, one end of which is attached to guide a^1, and the other end to a standard suitably situated for the purpose. *g'* is a steel spout, having a back and two sides, but open toward the face of the die *h*. Its width from side to side is equal to that of the head of the nail plus such a space as to enable the head to slide freely through the spout. It is securely attached in position by its lower end being bolted or otherwise secured to the base *a*. The exact position of the upper end of this spout is adjusted by set-screws *h'* passing in through the frame *a* on each side. On the upper side of the two sides of the frame *a* is attached a bracket, *i'*, holding a spout, *k'*, in the relative position with the roller *p* and die *h*. (Shown in Figs. 1 and 2.) The passage in this spout is of the same dimensions as the section of the largest part of the head of the nail, and as much larger as will enable the nail to fall freely through the spout. To the back of the spout is attached a spring, *m'*, having at its lower end a forked projection, *n'*, the width of which fork is equal to the width of the passage in the spout *k'*, and the inner end of the fork is tapered, as shown in Fig. 8. To the lower end of the spring *m'* is also attached a bracket, *o'*, having an eye, *p'*, for the reception of the end of a lever, *q'*, pivoted at *r'* to the frame *a*. This lever extends in the form shown at *s'*, to be acted upon by a projection, *t'*, of a collar, *u'*, of the shaft *b*. To the bracket *o'* is attached a spring-arm, a^2, provided with a projection, b^2, entering the passage in the spout *k'*.

The operation of my invention is as follows: A machine having been constructed as above described, the blanks to be elongated, having been formed as above set forth, are fed to the spout *k'* by hand, or in any other desired manner, where, by the action of the spring, *m'*, fork *n'*, and projection b^2, they are retained, and only allowed to fall down one at a time, and at the proper time to be received into the groove *m n*. The arm a^2 is made with sufficient spring, so that, should the projection b^2 mount upon the head of the nail, instead of coming under it, the arm will yield, and no injury to the parts will be sustained.

It will be observed that the fork *n'* is only drawn back for a very short period, so that it catches on the body of the nail, and, by its tapering inner side, brings the upper end of the nail in a central position in the spout, while the head of the nail projects from the spout, and is received in the upper end of the extension *n*. It is then drawn in between the die *h* and roller *p*, in which operation it comes in contact with the guide a^1, and is guided into the spout *g'*, which serves to straighten the nail, and as the die *h* descends the roller *p* elongates the point of the nail in the groove *m*.

With regard to the straightening of the nail by the guide a^1, if a body, such as a nail, is

passing through two rollers, there is sometimes an inclination to stick to one roller more than the other. Now, if the nail is guided in the natural line it would take if it had no inclination to stick to either roller, it will come out straight, and if guided in that line it must do so. This is done in this case by the guide a^1 on the one side and the spout or guide g' on the other. If these guides were placed to one side instead of the center, they would cause each nail to come out in a curved form, and therefore by placing them in the center they must cause the nail to come out straight.

What I claim is as follows:

1. The combination of the die h, spring-fork v, and guide a^1, substantially as and for the purposes set forth.

2. The combination of the die h, roller p, with spout k', having spring m', provided with fork n', and spring-arm a^2, having projection b^2, substantially as and for the purposes set forth.

3. The combination of the spout k', spring m', having spring-arm a^2, and fork n' with lever r' s', operated by projection t' of the shaft b, substantially as described.

Montreal, 27th day of February, A. D. 1877.

GEO. P. CLAPP.

Witnesses:
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JOHN A. RAMIE.