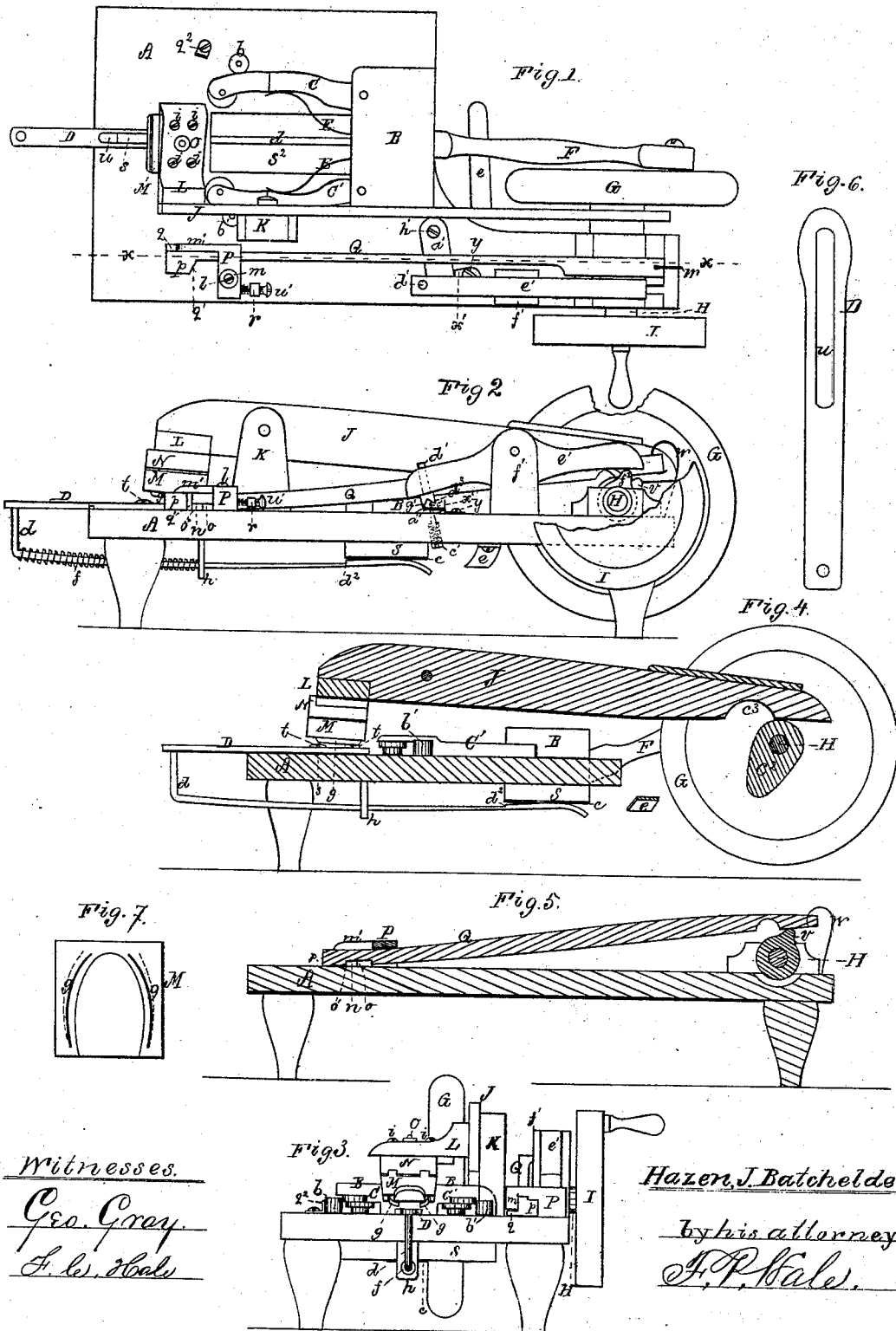


H. J. BATCHELDER.

HORSESHOE MACHINE.

No. 171,258.

Patented Dec. 21, 1875.



Witnesses.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN HORSESHOE-MACHINES.

Specification forming part of Letters Patent No. **171,258**, dated December 21, 1875; application filed
April 23, 1875.

To all whom it may concern:

Be it known that I, HAZEN J. BATCHELDER, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Horse-shoe-Machines; 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 which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

In the said drawing, Figure 1 denotes a top view, Fig. 2 a side elevation, and Fig. 3 a front-end view, of a horseshoe-machine embodying my improvements. Fig. 4 is a longitudinal and vertical section taken through the creaser-operating lever. Fig. 5 is a section on line *x x* of Fig. 1.

My invention or improved machine has reference to mechanism for cutting off the shoe-blank and reducing the ends to constitute the heel parts of the shoe, mechanism for bending, for creasing, and "seating" the shoe, mechanism for discharging it when bent, seated, and creased, and mechanism for punching the nail-holes in the shoe; and my invention consists in the construction, combination, and arrangement of parts whereby these results are effected, the same being as hereinafter referred to and claimed.

In the drawing, A denotes the table for supporting the main operating parts. B is the cross-head affixed to the table, so as to be capable of sliding longitudinally thereon. C C' are two jaws or levers, having their ends pivoted to the cross-head, each of these jaws having a friction-wheel disposed on its outer end. *b b'* are the friction guide-rollers, respectively arranged against the outer vertical faces of the levers C C', the latter being so shaped as to cause them, when acted on by the guide-rollers and impelled forward, to bend the shoe in conformity with, and around, the die or former D. E E are two springs extending from the cross-head, their free ends bearing against the inner faces of the levers C C', and serving to maintain the latter in contact with

the guide-rolls *b b'*, hereinbefore mentioned. F is a pitman, which connects the cross-head with a wheel, G, disposed on one end of a driving-shaft, H, which is arranged at the rear end of the table, and carries on its opposite end a cranked wheel, I, by rotating which reciprocating movements may be imparted to the cross-head, and, consequently, to the bending-levers C C'. The former D (a top view of which is shown in Fig. 6) consists of a flat bar, having its inner end formed of a shape corresponding to that to be given to the shoe. This former is arranged upon a convex seating-plate, *s*, secured to the upper surface of the table by two screws, *t t*, whose shanks pass through a slot, *u*, made longitudinally through the former, and thus guide and allow it to have longitudinal reciprocating movements. Affixed to the outer end of this former is a bent rod or lever, *d*, which extends down underneath, and longitudinally of, the table, and is supported in a guide-post, *h*, through which it slides. Such rod extends underneath the cross-head bed-plate S, and rests against a metallic plate, *e*, affixed to its under surface. This rod is formed with a shoulder, *d²*, which, as the cross-head is moved back, strikes against the edge of plate *e*, and thus draws the former backward until the inner end of the rod is tripped and released by impinging against a bar, *e*, (disposed on the under face of the table,) when the retractile power of the spring *f*, coiled around the rod between its vertical arm and the guide *h*, will restore the former to its normal position.

J is a lever, which is pivoted to a standard, K, extending up from the table, such lever extending longitudinally over the table, and having a head-block, L, securely affixed to its front end. M is the creaser-carrier, having the creasers *g g* arranged on its under surface, the same being as shown in Fig. 7, which is a bottom view of the creaser-carrier and the creasers. These creasers are not fixed rigidly their entire length to the carrier; but only at their heel parts, the same being so arranged in order to allow them to move laterally with the blank, as the same may be expanded while being shaped and seated, the dotted lines in

Fig. 7 showing the deflection of the creasers under the action of the machine. Between the head-block L and the creaser-carrier M is an intermediate block, N, the whole being confined together by a screw-bolt, O, in such manner as to allow the block N and the carrier M to have a slight rocking movement longitudinally of the machine.

iiii are four screws, which extend down through the head-block L, and impinge against the top of the block N, the object of such screws being to either raise or lower the block N, and consequently the creasers, in accordance with the thickness of the shoe-blank.

The mechanism for operating the head-block L, with its adjuncts, consists of a cam, c^2 , arranged on the driving-shaft, acting on a short cam-recess, c^3 , formed on the lever J near its outer end. By this construction and arrangement of the cam and cam-recess, the creasers are caused to quickly perform their duty, so as to remain the minimum length of time on the hot iron.

The mechanism next to be described is that for cutting off the bar of iron, and reducing the ends or parts to constitute the heel portions of the shoe.

P is a head-block, which is affixed to the top of the table by a set-screw, l , and a washer, m , such screw extending down through a hole having a diameter considerably larger than the shank of the screw, so as to enable the block to be adjusted either laterally or longitudinally of the table, in accordance with the width of the metallic bar and the length of the required shoe-blank. m' is an arm which extends at a right angle therefrom, the same being formed of steel, and having near its front end a rectangular opening, n , with a shoulder, o , the latter forming a stationary shear or cutter. Q is a lever, which reciprocates through the block P, and has affixed to a head, p , formed upon its outer end, a cutter or shear, o' , which operates with the stationary shear o to sever the bar. The lever Q is formed with a rectangular opening on its under surface, to admit the shoe-blank, and the head p is formed with two inclined shoulders or flanges, q q^1 , arranged upon opposite sides thereof, and in such manner that after the bar is severed by the backward movement of the lever Q, a slightly further movement of the lever in the same direction will bring the flanges or shoulders against both adjacent ends of the severed bar, and thus compress the same to such extent as may be desired. w' is a holding set-screw, which extends through a supporting-arm, r , extending up from the table A, such screw impinging against the rear face of the block P, the object of such screw being to hold the block P, and consequently the head p , (when adjusted by the screw l) in its true determined position under the great lateral strain induced by the cutters and their adjuncts when the machine is in operation.

When the head-block P has been adjusted

to the length and width of the bar to be operated on, the screw w' is to be screwed up firmly against the block P, so as to maintain the parts in their normal position.

The mechanism for reciprocating the movable cutter or shear consists of a cam, v , disposed on the driving-shaft, acting in a recess formed in the under face of the lever, as shown in Fig. 5, a spring, w , affixed to the rear end of the lever and the frame serving to restore the lever to its normal position after the cam has ceased its action.

The next part of the mechanism to be described is that for punching the nail-holes.

Affixed to the top of the table by a set-screw, y , as shown in Fig. 2, is an adjustable gage, x' , extending transversely of the table, and impinging against the gage is a spring-plate, a' , its inner end being affixed to the table by a screw, h' , the outer end being free, and having a hole made through it, such hole standing directly over a stationary punch, c^1 , which projects up from the top of the table. d^1 is a punch-stock, having a punch, d^3 , formed thereon, such being affixed to the end of a rocker-lever, e' , supported in a standard, f^1 . The punch-stock d^1 is formed with a flange, g' , in rear of the punch d^3 , the object of such flange being to preserve the shoe in proper alignment with the gage while the shoe is being punched, the spring lever or plate a' serving to raise the shoe up or away from the stationary punch after a hole has been formed, so as to enable it (the shoe) to be readily moved forward to receive the requisite number of nail-holes. The movable punch is forced downward by means of a cam, f^2 , disposed upon the driving-shaft, such cam being formed and acting upon the end of lever e' , as shown in Fig. 2.

Having described the construction of my machine, its operation is as follows: If we suppose the parts of the machine to be as shown in Fig. 2, the bar of metal to form the shoe, having been duly heated, is to be placed upon the table, and between the face of the head-block P and the angular shoulder q , when, by the rotation of the driving-shaft, the end of the blank will be narrowed or compressed vertically. It is next moved forward between the shears, and extended across the table between the former D and the ends of the forming-jaws, until it impinges against the gage q^2 , which is adjusted so as to give the required length to the blank to be cut.

By the rotation of the driving-shaft the bar is severed by the shears. A further slight movement of the driving-shaft causes the inclined shoulders q and q^1 to advance and reduce both the end of the severed blank and the contiguous end of the bar, the movement of the forming-jaws and the cutting mechanism being so timed that while the latter is in operation the former are at rest. The blank being severed, and having its ends reduced, as described, the bending-jaws are next brought into operation, which bend the shoe-blank around the former

D. The further advance of the jaws causes them to spread apart, and allow the creasers to be brought into action, the creaser-carrier acting as a swage to press the shoe down upon the seating-plate *s*, and thereby give the desired concave shape thereto. At the same time the creasers are forced into the shoe-blank, the creaser-carriers and the creasers being adjusted by the set-screws impinging against the intermediate block *N*, so as to meet the required thickness to the shoe.

The operation of seating and creasing the shoe being performed, the cross-head, with the bending-jaws, by the rotation of the driving-shaft, is drawn back. The catch-plate on the under surface of the base of the cross-head, striking against the shoulder of the rod *d*, attached to the former *D*, draws the latter, with the shoe around it, over the hole *s*² of the bed-plate, where the shoe is discharged. The end of the rod *d* impinging against the tripping-arm *e*, the rod is released, and, by the action of its coiled spring, is moved back to its normal position. The blank thus formed and creased is next to be taken and its nail-holes punched. The shoe is placed upon the spring-plate *a'*, and with its outer edge against the gage *x'*, by the rotation of the driving-shaft, the movable punch is next brought down, the flange of the punch-block impinging against the inner face of the shoe, thus causing the shoe to be gripped and held on its two opposite faces, while the fixed and movable punches make the nail-hole. The hole being made, the spring-plate *a'* raises the shoe from the fixed punch, and enables the same to be readily moved forward, and successively have the re-

quired number of nail-holes made, when the shoe is finished and ready for the market.

Having described my invention, what I claim is—

1. The combination of the seating-plate *s* and sliding former *D* with the creaser-carrier *M* and its creasers *g*, substantially as shown and described.

2. The expanding creasers *g*, formed and applied to their carriers substantially as shown, and for the purpose set forth.

3. The combination, with the head-block *L* and the creaser-carrier *M*, of the intermediate adjustable block *N*, substantially as and for the purpose set forth.

4. The combination, with the movable head, block *P*, provided with a fixed shear or cutter, *o*, of the head *p*, provided with a shear, *o'*, and having the inclined shoulders *q* *q'* disposed on opposite sides thereof, substantially as shown and described, and for the purpose set forth.

5. The combination, with the adjustable head-block *P*, of the holding set-screw *w'*, as and for the purpose set forth.

6. The combination, with the gage *x'*, the spring-plate *a'*, and fixed punch *c'*, of the movable punch-stock, provided with a punch, *d*³, and flange *g'*, the whole being arranged in manner and for the purpose set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

HAZEN J. BATCHELDER.

Witnesses:

F. P. HALE,
F. C. HALE.