J. H. SWETT.

MACHINE FOR MAKING SPIKES.

No. 111,013. Patented Jan. 17, 1871.

Fig. 1.

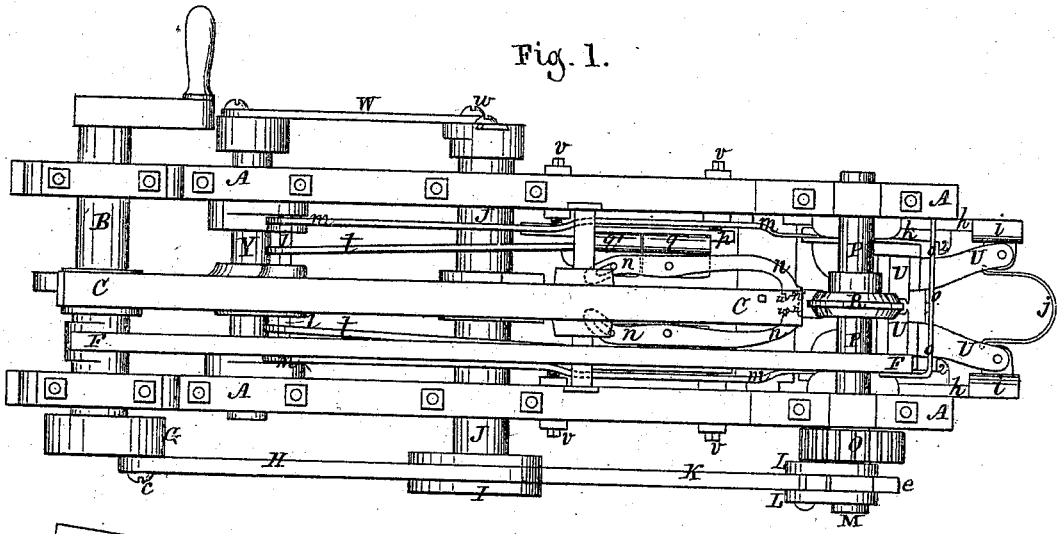


Fig. 2.

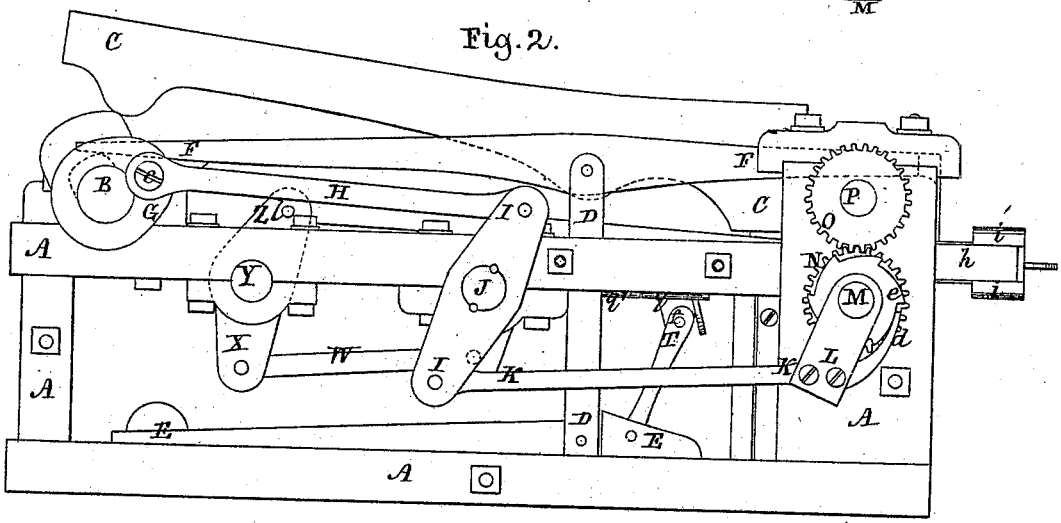
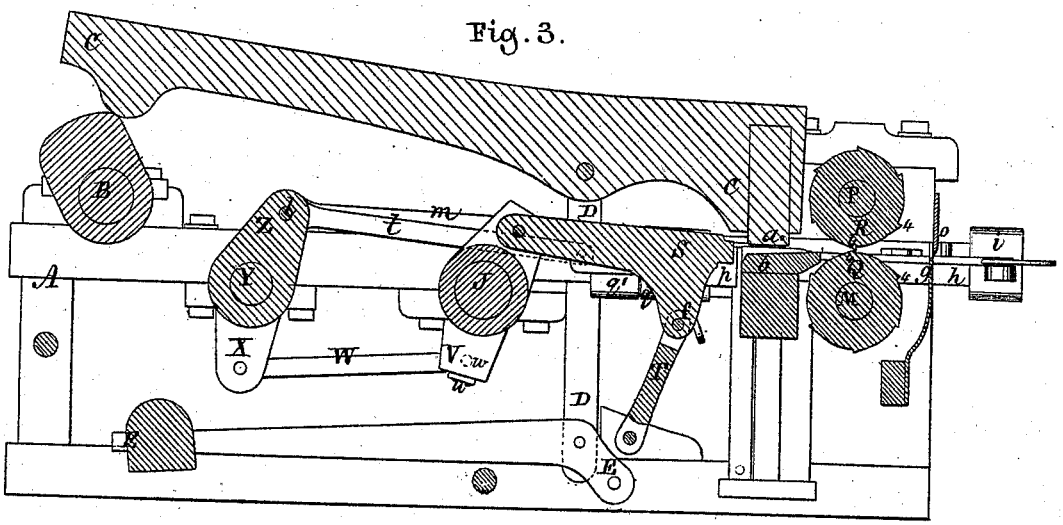


Fig. 3.



2 Sheets—Sheet 2.

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Fig. 4.

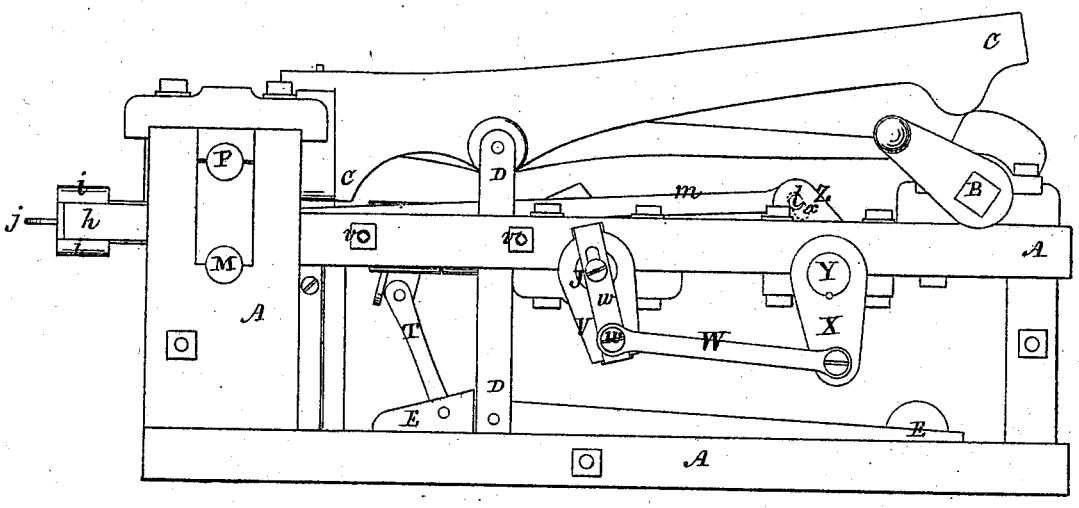
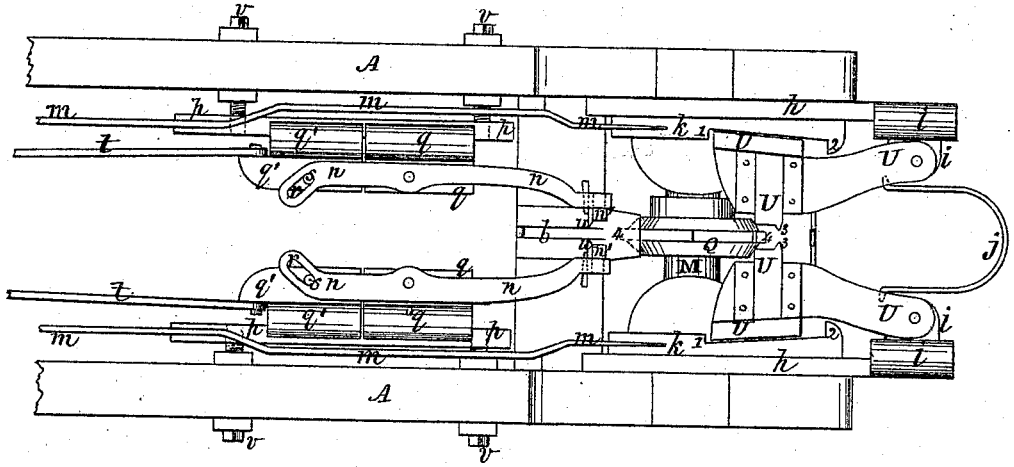


Fig. 5.



Witnesses.

Edmund Masson.

James H. Swett.
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United States Patent Office.

JAMES H. SWETT, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 111,013, dated January 17, 1871.

IMPROVEMENT IN MACHINES FOR MAKING SPIKES.

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, JAMES H. SWETT, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Spike-Machines; and I do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 represents a top plan of the machine.

Figure 2 represents an elevation of one of the sides.

Figure 3 represents a vertical longitudinal and central section through the machine.

Figure 4 represents an elevation of the opposite side of the machine from that shown in fig. 2.

Figure 5 represents a plan of that part of the machine that underlies the griping-levers, which latter, together with other parts, are represented as removed to better show the devices underneath them.

Similar letters of reference where they occur in the several separate figures denote like parts in all of the drawings.

Heading and pointing spikes by machinery is comparatively an easy operation, if the feeding in of the rod or blank, and the taking out of the spike, be accomplished with unvarying certainty. But whenever, from any cause, and there are many, incident to this operation, the feeding in or the delivery fails, or if two blanks get in, or two spikes remain in between the dies, the rapidity and force with which the machine works must break it down or very much strain it.

My invention relates to the means and appliances for the certain feeding in of the rod, bar, or blank, and for the certain removal of the headed spike, with such additional guards against allowing two blanks to get in, or two spikes to remain in, the machine at one and the same time, as to avoid all liability of breaking or straining the machine, while it can be run at a speed and with such power as to make the operation successful and economical and still an entirely safe one.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

In suitable bearings at the rear of the main frame A is hung the cam-shaft B, from which, and by which, all the moving parts of the machine are operated.

The griping-lever *c* is hung by means of stirrups D to heavily-weighted levers E, so that if two blanks or two spikes should, from any uncontrolable cause, get into the griping-dies *a b* at the same time, the griping-lever *c* and its die may, by overcoming the weight of the levers E, yield enough to prevent the machine from "breaking-up," which it would otherwise inevitably do.

The lever F, the object and purpose of which will be hereafter described, is also hung in a manner similar to that, and indeed on the same shaft, with the griping-lever E, but not necessarily so, as the lever F is not so liable to undue strain as is that of the griping-lever E.

To a crank, G, on the cam-shaft B, is attached by a wrist-pin, *e*, one end of a connecting-rod, H, the other end of which is attached to a cross-head, I, on the end of a rock-shaft, J, by which devices said shaft gets its motion; and from the opposite end of the cross-head a second connecting-rod, K, extends to, and is united with, a pawl-head, L, that works loosely on the end of the shaft M.

In this pawl-head L there is hung a spring-pawl, *d*, that works over and engages with a ratchet, *e*, which is fastened on or to said shaft M, and through this mechanism, as above described, the shaft M receives an intermittent and timed rotary motion, which it in turn communicates, through the gears N O, to a shaft, P, directly over the shaft M.

On the shafts M P, and centrally between the sides of the main frame, are arranged the pointing-wheels or dies Q R, respectively; the perimeters of which pointing-wheels or dies are so shaped as to draw out and point the blank, and to sever it, or nearly so, from the bar or rod; though this latter operation it sometimes fails to do, owing to the wearing of the dies, or the inequality of size of the separate and of the same rods, but for which contingency provision is made, as will be hereafter explained.

The header S is operated from the rock-shaft J, but its forward end is connected by a link or pivot-connection, *f*, to a swinging arm, T, so as to control that end of it and bring it properly against the projecting end of the blank that is griped in the dies *a b*.

At the front of the machine, where the spike-rod is fed in, there is a vertical arm, *g*, through a notch in which the spike-rod is guided as it is drawn into the machine.

On ways *h h* are arranged the slides *i i*, and to the slides are pivoted, respectively, the feeding-jaws U U, which are held apart by a spring, *j*.

Behind the feeding-jaws U U (see fig. 5) there are arranged wedge-shaped sliding pieces, *k k*, which not only impart to the feeding-jaws a reciprocating motion by which the rod is drawn between the pointing-dies or wheels Q R, but also lateral move-

ments to close said jaws upon and release them from their hold upon the spike-rod, as will be explained.

From a crank, V, (see fig. 4,) on the rock-shaft J, there extends a connecting-bar, W, which is united to a crank, X, on a second rock-shaft, Y, placed between the cam-shaft B and the rock-shaft J.

By this connection the rock-shaft Y receives its motion, and to cam or crank-rods *l* on this shaft Y are connected rods *m m*, which extend to the forward part of the machine, and are there fastened to the wedge-shaped sliding pieces *k k* and move them back and forth; and through these sliding pieces the feeding-jaws U are operated as follows:

The feeding-jaws catching against the shoulders 1 1 in the slides *k* are moved forward to about the position shown in fig. 5, when the slides *k* begin to move back again.

Now the jaws U U do not commence to slide back with the pieces *k* until the shoulders 2 on said slides come against them; but the slides *k*, between the shoulders 1 2, are tapering, and crowd the jaws U up laterally against the spike-rod, the points or spurs 3 3 biting into the metal of the rod if necessary and seize it firmly, whatever variations there may be in the spike-rod or rods, and they will always vary slightly.

The spike-rod being firmly griped, the jaws U carry it up to, and in between, the pointing-rolls Q R, which draws down and shapes the blank and also points it; the projections 4 on the pointing-rolls meet, or nearly so, and pinch off, or nearly so, the blank from the spike-rod.

The blank being so far prepared is then caught by the nippers *n n*, behind the pointing-rolls, and carried to, and left in, the die *b*.

The griping-lever *c* now operates, bringing its die *a* down upon the blank, and the header comes up and forms the head.

When the blank is completely severed from the spike-rod by the pointing-rolls or dies, the nippers *n n* take and transfer it to the heading mechanism without any trouble.

But it frequently happens, from the wearing of the dies, the difference in the thickness of the rod, or the springing or yielding of any part of the machine, that the blank is not entirely severed from the spike-rod, and there is metal connection between them sufficient to require an immense pull by the nippers upon the blank to separate it from the rod.

This must be and is provided for, but in making this provision for forcing the separation between the two another, and possibly a greater, difficulty arises, namely, the tendency to draw the blank, spike-rod and all, through or into the machine. To prevent this the jaws U, in front of the rolls, are still griping and holding the spike-rod, and, in addition to this, a clamping mechanism, *o*, connected to the lever F, is brought down upon the spike-rod to aid, if necessary, in holding the rod back against the action and force of the nippers *n n*. This can be readily done when a bar is fed in and through.

It might possibly be desirable to cut off the blanks from the bar at *o*, and feed in the blanks as such to the pointing-rolls, in which event the feeding-jaws U alone are relied on for carrying them to the rolls.

The griping-jaws *n n* are separately hung and operated, and are also separately adjustable, still they work in perfect harmony with each other, as will be explained.

On ways *p p* are arranged two sets of slides or sectional slides *q q'*.

Each nipper *n* is pivoted to its section *q*, while at the rear of the nipper there is an oblique slot, *r*, through or in which a pin or stud, *s*, in the other section *q'*, works to open and close said nippers.

To each of the slides or sections *q' q'* there is attached a rod, *t*, that extend backward, and are united to the crank-pin or shaft *l*, extending across or through the cranks *z* on the rock-shaft Y.

While the pins *s s* are moving through the slots *r r* the nippers are closing or opening, as the case may be.

When the pins arrive at the ends of the slots then the nippers, slides and all, go together.

When the nippers have brought and deposited in the heading-dies one blank they immediately return for another, and during this return motion the blank just deposited in the heading-dies is headed. As the nippers bring up the next blank they push the finished spike out of the dies where it has just been headed. This has been usually done by bringing the blank against the finished spike and making the former push out the latter. This is a very dangerous operation, and is the cause of many accidents to spike-machines; for the blank is thus brought against the tapered point of the finished spike, and the latter, instead of being pushed out of the die, rides upon the blank, and so a spike and a blank will both come into or be in the die at the same time, a matter I have striven in my invention to avoid, which I do as follows:

The portions *n' n'* of the nippers seize the blank, and immediately behind these portions are steel dies *u u*, which take against the pointed portion of the finished spike and carry it out in advance of the drawing in of the blank, and so separating the two operations that this overriding cannot take place.

As the point of the spike is a little broader than the head portion, owing to its being squeezed out under the pointing-rolls, these dies *u u* will readily seize that portion as they too project further than the portions *n' n'*, and thus force out the finished spike, while they make a wall, as it were, or separation, between the spike and the blank that prevents their getting together or overriding one another. The dies *u u* are removable and adjustable.

Behind the ways *p p*, on which the nipper-slides work, are set-screws *v v*, by which either nipper of the pair *n n* may be moved to or from the heading-die or the spike in it, or both moved, as the running through of the spikes or blanks may require.

The griping-jaws U U and the pointing-rolls Q R travel at about the same speed, so that there shall be no slip between them and the rod or bar they are operating upon.

And that the heading and griping and delivering may be accurately timed and changed when the rods vary, or the parts become a little worn, the crank-wrist *w*, on the crank V, is made adjustable, and another adjustment may be made at *x* on the crank *z*, by which the throw or motion of these parts may be adjusted or timed.

Having thus fully described my invention,

I claim—

1. In combination with the pointing and heading-dies and nippers, the feeding-jaws U and mechanism to impart to said jaws the reciprocating and lateral movements described so as to feed and hold the spike-rod or blank, substantially as described.

2. The combination of the wedge-shaped and shouldered pieces *k* and mechanism for reciprocating the same, with the feeding-jaws U and pointing-dies, substantially as described.

3. The combination of the nippers *n*, sectional slides *q q'*, adjustable slides *p*, and reciprocating connecting-rods *t*, substantially as described.

4. As an improvement on nippers for spike and nail-machines, the points or spurs *u u* on the faces of the jaws and in rear of the nipping-surfaces, as and for the purpose described.

JAMES H. SWETT.

Witnesses:

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EDMUND MASSON.