3 Sheets—Sheet 1.

A. WHITTEMORE.

Machine for Making Split Spikes.

No. 58,521. Patented Oct. 2, 1866.

Fig. 1.

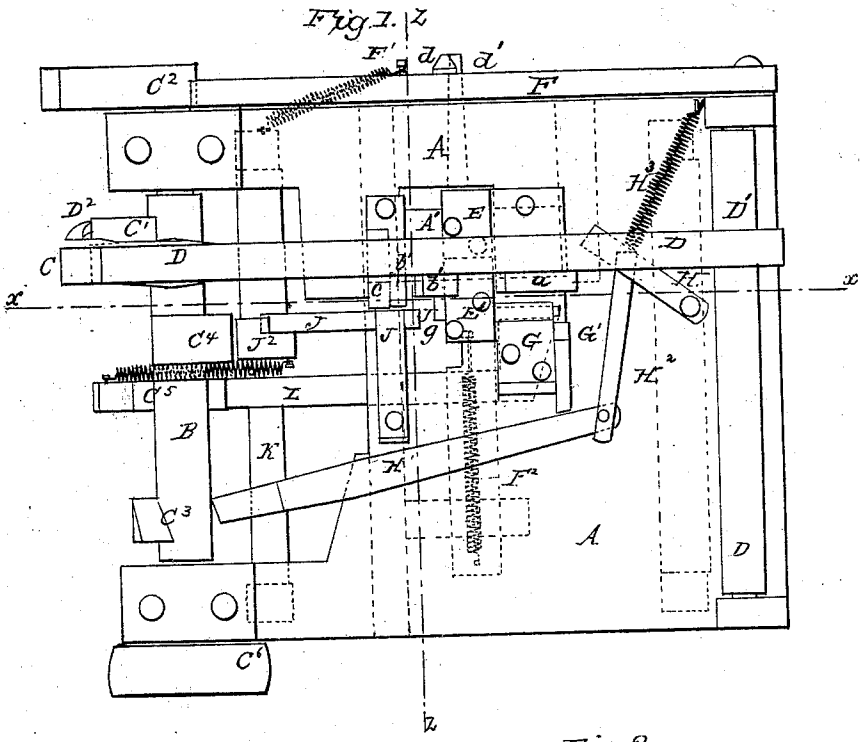
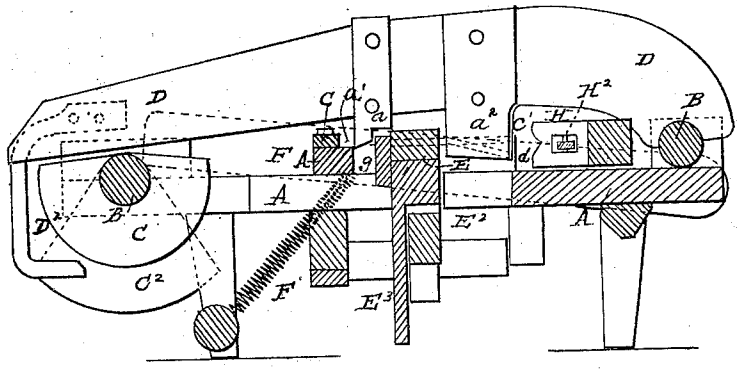


Fig. 2.



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Fig. 3

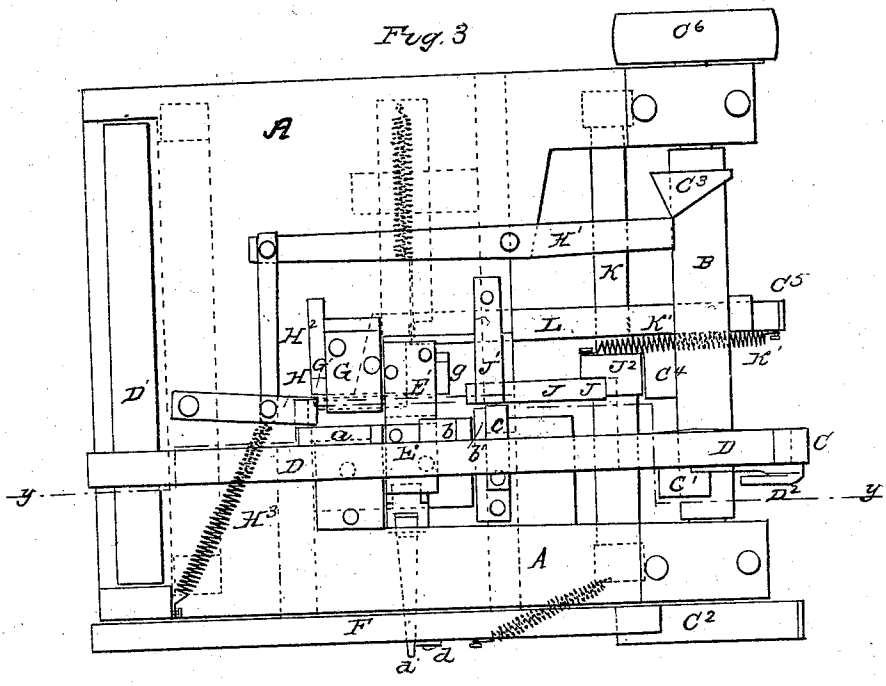
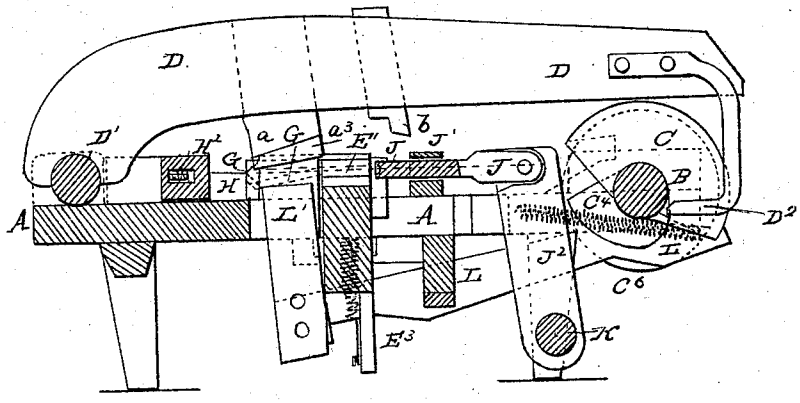


Fig. 2.



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Fig. 5

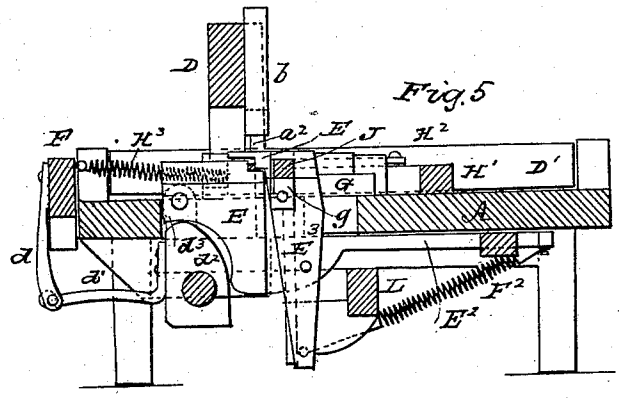


Fig. 6.

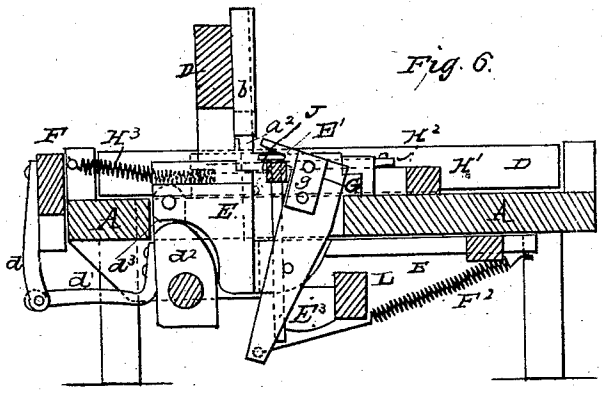
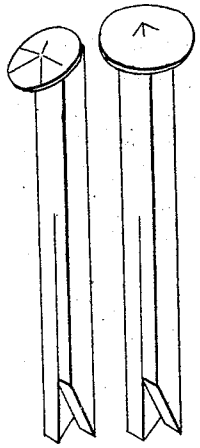


Fig. 7



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UNITED STATES PATENT OFFICE.

AMOS WHITTEMORE, OF CAMBRIDGEPORT, MASSACHUSETTS.

IMPROVEMENT IN MACHINERY FOR MAKING SPLIT SPIKES.

Specification forming part of Letters Patent No. **58,521**, dated October 2, 1866.

To all whom it may concern:

Be it known that I, AMOS WHITTEMORE, of Cambridgeport, in the county of Middlesex and State of Massachusetts, have invented a Machine for Making Split and Beveled Pointed Spikes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan view of the spike-making machine when the several parts are in position for receiving the spike-rod. Fig. 2 is a longitudinal section, taken in the vertical plane indicated by red line *x x* in Fig. 1, showing the cutters in the act of splitting and cutting the nail-rod. Fig. 3, Sheet 2, is a plan view of the machine, showing the operation of beveling the split ends of a spike preparatory to the forward movement of the header. Fig. 4, Sheet 2, is a longitudinal section, taken in the vertical plane indicated by the course of red line *y y*, Fig. 2, showing the position of the parts while the spike is being headed. Fig. 5, Sheet 3, is a transverse section, taken in the vertical plane indicated by red line *z z*, showing the parts in the same position as represented in Fig. 1. Fig. 6, Sheet 3, is a similar sections of the same parts, showing the carriage when open. Fig. 7, Sheet 3, is a perspective view of finished spikes.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to produce spikes for railroad and other purposes by machinery, having their entering ends split longitudinally, and also beveled in such manner that in the act of driving the spikes their split ends will spread out laterally in the wood, and thus afford a very firm hold.

The kind of spikes which I produce by my machine have heretofore been split and beveled by means of saws or chisels, which render the operation very slow, and the spikes so expensive as to keep them out of general use.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents the horizontal table or bed, which is adapted for supporting the several parts of the mechanism for guiding the bar or spike rod to the splitting-shears, splitting and beveling the spikes, and heading and finishing them. B is the main driving-shaft, which has its bearings on top of the table A, and extends transversely across the front end of the same. This shaft B has six cams, C C′ C^2 C^3 C^4 C^5, applied to it, and on one end it carries a belt-drum, C^6. The cams C C′ are designed for operating a shear-beam, D, which is arranged longitudinally over the table A, so as to vibrate in a vertical plane, and which is firmly secured at its rear end to a rock-shaft, D′, which extends transversely across and has its bearings upon the rear end of the table A, as shown in Figs. 1, 2, 3, and 4, Sheets 1 and 2.

The front part of the beam D rests upon and is lifted by the periphery of the semicircular cam C. The free end of this beam D is depressed partly by its own weight and partly by means of a hook or stirrup, D^2, which is acted upon by the toe or cam C′. This cam C′ will, at the proper time, forcibly draw down the free end of beam D, and then release this beam again, so as to allow it to be lifted by cam C.

There are two cutters or shear-jaws, *a b*, secured to the beam D, for the purpose of operating in conjunction with the edges of their respective fixed jaws *a′ b′* to split and cut-off suitable lengths of the spike rod to form the spikes. The shear *a* consists of a beveled cutting-edge, which is inclined toward the rear part of the table, so as to commence splitting the spike-rod at its end, and also a flange or guard, a^2, which serves, in conjunction with the opposite vertical face of the fixed shear-jaw *a′*, to prevent the split halves of the spike-rod from spreading out laterally during the descent of the upper shear-jaw. Said flange or guard a^2 projects vertically below the shear-edge *a*, and forms one side of a box or passage for confining the sides of the spike-rod during the operation of splitting it.

As the beam D descends and splits the spike-rod, one half of the split portion is forced down below the cutting-edge of the fixed jaw *a′* and supported by the guard a^2, while the other half of the split portion is confined in place between the vertical face of the jaw *a*, above its cutting-edge, and the opposite vertical face of the jaw *a′*, above its cutting-edge. The vertical faces of the movable and fixed jaws *a*

a' should both coincide with the center of the spike-rod when in the machine, so that this rod will be split centrally, as shown in Fig. 7, Sheet 3.

In front of the splitting-shears are the cutters for severing the proper length from the spike-rod to form a spike. These cutters consist of an upper beveled jaw, b, and a lower fixed jaw, b', the former being secured to the beam D, and the latter to the top of the table A, so that during the descent of the beam D the splitting as well as the cutting off will take place.

The fixed cutting-edge b' is formed on the rear edge of a block, A', upon which is a perforated guide-piece, c, through which the spike-rod is fed up to a stop, c', which arrests the rod in a position to be acted upon by the cutters.

The vertical center of the aperture through the guide c should be in the plane of cut of the splitting-shears, so that the rod can pass freely up to its work and be firmly supported.

When the splitting and cutting-off operation has been performed it is then necessary to bevel the ends of the spike-blank, head the same, and compress the forked ends, so that the spike will be perfectly straight.

When the rod from which the spikes are formed is first introduced into the machine it passes through an aperture, which is formed by the coming together of two head-blocks, E E', which blocks form a laterally-moving carriage.

The block E is formed on one end of a reciprocating slide, E^2, which moves in suitable guides beneath the top of the table A, and which is caused to feed the split-nail blank up to a position where it will be beveled, headed, and compressed by means of the cam C^2, lever F, arms d d', and vibrating arm d^2, to which latter the slide E^2 is connected by means of a link, d^3, as shown in Figs. 5 and 6.

The slide E^2, with its attachments, are returned to their former position by means of a spring, F', which is connected to the lever F and the table A.

The block E' is formed on the upper end of a lever, E^3, which is pivoted to the front surface of the slide E^2 and acted upon by a spring, F^2, one end of which is secured to said slide and the other end to the lower arm of lever E^3. The object of spring F^2 is to force the block E' up firmly against the block E, so as to gripe and hold this rod between them during the operations of splitting, cutting off, beveling, and heading.

The cam C^2 moves the two blocks E E' laterally to the position shown in Figs. 3 and 4, in which position the spike-blank will be brought up to and held firmly against the vertical and horizontal surfaces of a fixed block, G, against the front surface of which the rear surfaces of blocks E E' abut and are supported. Upon the rear edge of block G a V-shaped steel portion, G', is firmly secured in such a position that the upper and lower angles or corners of the split ends of the spike-blank will be cut off by the vibrating cutter H when this cutter moves up to the position shown in Fig. 3. In this manner the ends of the spikes are beveled. The cutter H is pivoted on top of the table A, so as to vibrate in a horizontal plane. This arm H is moved up to the stationary cutter G' by means of a cam, C^3, vibrating lever H', and pivoted connecting-rod H^2, and it is caused to recede from said fixed cutter by means of a strong spring, H^3. The cutters G and H bevel the forked ends of the spike-blank in opposite directions, so as to cause the spreading out of these ends during the act of driving a spike into a piece of wood.

Immediately succeeding the operation of beveling the split ends of a spike-blank the spike is headed by means of a longitudinally-reciprocating header, J, which is guided by a fixed block, J', through which it passes. The rear end of the header J is pivoted to a vibrating arm, J^2, which is secured at its lower end to rock-shaft K, and acted upon at its upper end by cam C^4, which latter forces the header forward at the proper times and forms the head on the spike-blank. The spring K' retracts the header after each operation of forming a head.

While the spike-blank is confined between the laterally-moving blocks E E' a cam or toe, C^5, on the main shaft B depresses the front end of a lever, L, and throws up the compressing-head L', which is on the rear end of said lever, which head forces the split or forked ends of the spike-blank together, so as to leave the spike straight. The spring N then depresses the rear end of lever L, when its front end is released from its cam.

In order to effect the discharge of the finished spikes a shoulder, g, is formed on the front side of the griping-block E', which is held by the rear end of the header J a short time during the back or return stroke of the head E. This causes the head E' to open and release the finished spike, which then drops through an opening that is made through the table A. When the cam C^2 moves the griping-blocks E E' to the position shown in Fig. 6 the block E' will abut against the table A and cause the spike-blank to be held firmly in place, so that the header may form a perfect head upon it.

Before introducing the rods from which the spikes are formed into the machine, if a header is used for forming heads upon the spikes, I heat said rods; but where a header is not employed the rods may be split by means of the shears above described while cold; and while I prefer to employ a header in conjunction with the splitting machinery, still I do not confine myself to such combination.

Where a header is used for making the hook-head split spikes, that portion of the spike-rod which is between the heads E E' and guide c is left unsupported, so that the cutter b will bend the metal downward slightly in cutting off the blanks; but for making the

rounded or button head split spikes that portion of the spike-rod which is cut off should be supported and prevented from being bent downward or upset.

One of the most important features of my invention is the manner herein described of supporting the metal against lateral displacement during the act of splitting it. The work of splitting the rods could be performed by means of common metal shears; but with these shears the ends of the rod would be spread out laterally, and a smooth cut could not be produced. By so constructing shears that the sides of the spike-rods will be firmly supported against lateral thrust during the act of splitting the rod the cut will be perfectly smooth, and no metal will be wasted in the operation.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. So constructing the splitting devices that in the act of splitting the metal both split portions shall be supported laterally, and be separated in the plane of the cut, substantially as described.

2. The combination of a device for severing the spike-blanks from the rods with a device which will split the spikes in a direction with their length, constructed and arranged substantially as described.

3. The combination of the movable blocks E E′ with the splitting and cutting-off mechanism, and with the finishing mechanism, substantially in the manner and for the purpose described.

4. The beveling-cutters G′ H, or their equivalents, which will bevel the ends of a split-spike blank before its split ends are closed, substantially as described.

5. The combination of splitting and beveling cutters in a machine for producing split spikes, constructed and arranged substantially as described.

6. The combination of the heading-tool J with machinery constructed and arranged substantially as herein described for splitting and forming the spike ready for its action, as set forth.

7. The employment of the compressing-head L′ to close the forked ends of the split rods or spikes, substantially as described.

8. Making split spikes of the construction herein described by means substantially as described, and which operate on the principle set forth.

AMOS WHITTEMORE.

Witnesses:
R. T. CAMPBELL,
EDW. SCHAFER.