A. WHITTEMORE.

Spike Pointing Machine.

No. 42,314.

2 Sheets—Sheet 1.

Patented Apr. 12, 1864.

Fig. 3.

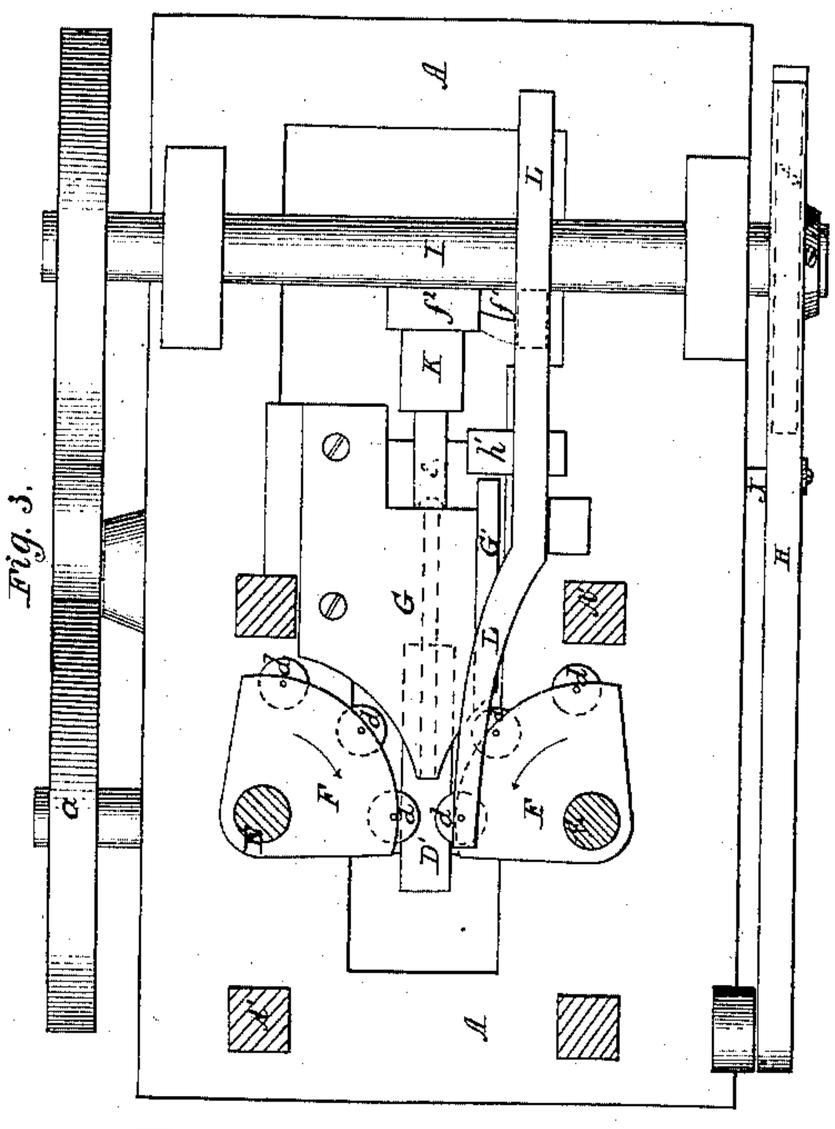


Fig. 4.

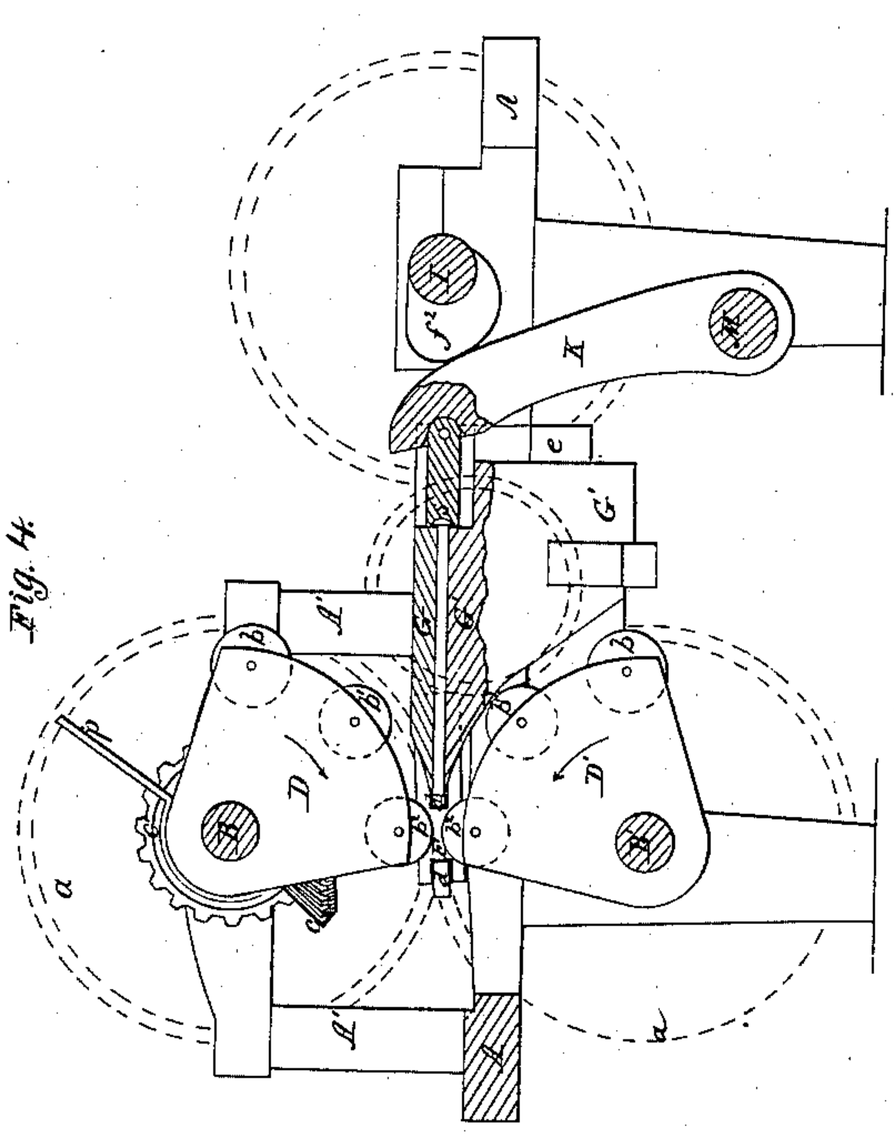


Fig. 1.

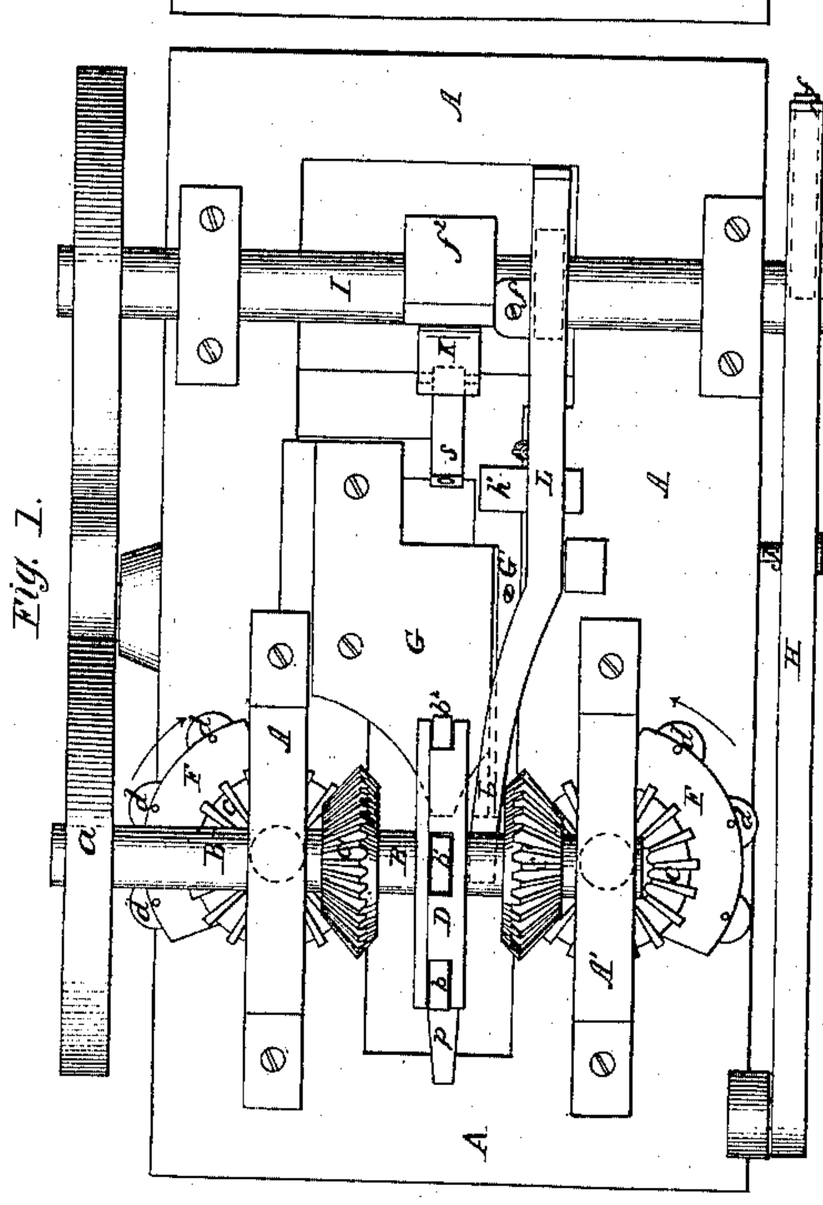
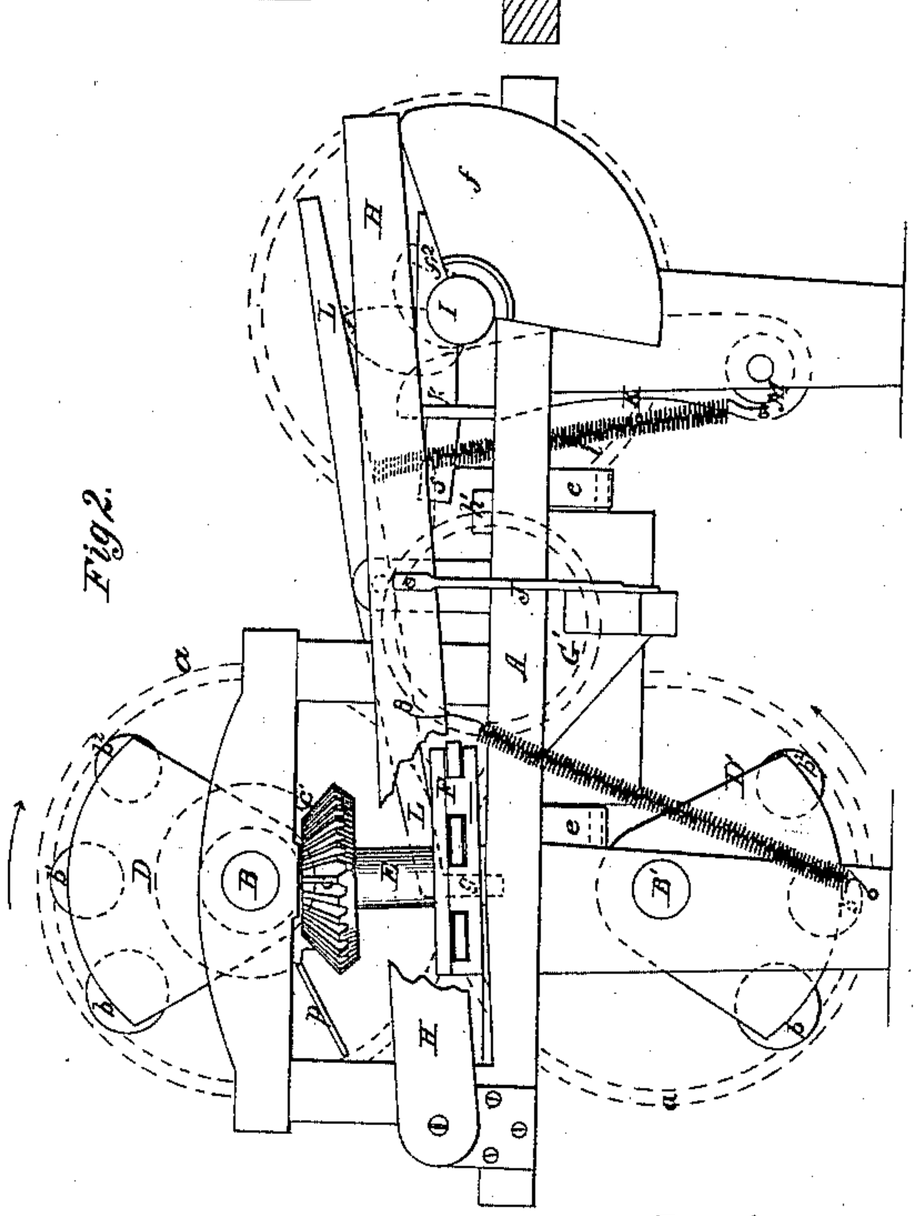


Fig 2.



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by his attys
Mason Fenwick & Lawrence

2 Sheets—Sheet 2.

A. WHITTEMORE.

Spike Pointing Machine.

No. 42,314. Patented Apr. 12, 1864.

Fig. 7.

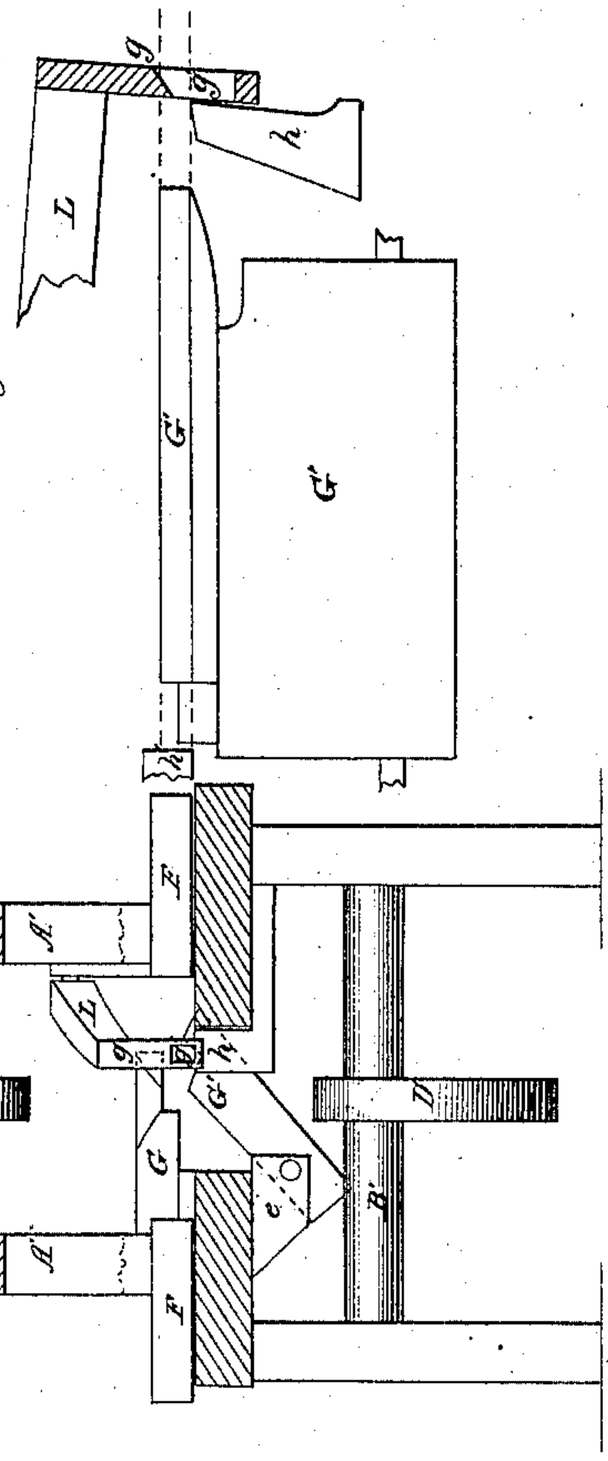


Fig. 6.

Fig. 5.

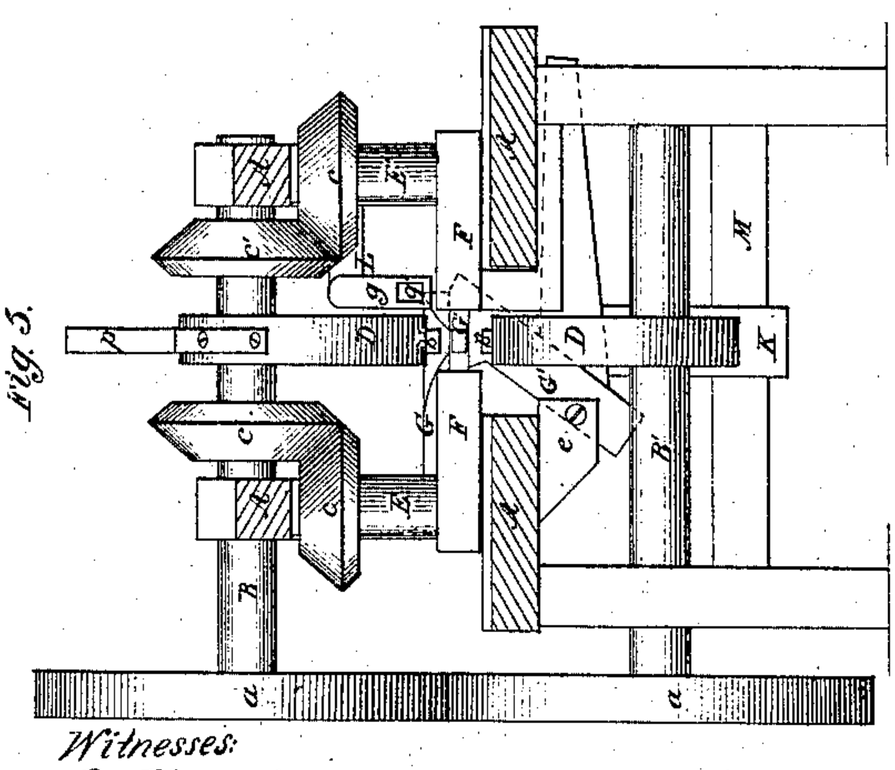


Fig. 10.

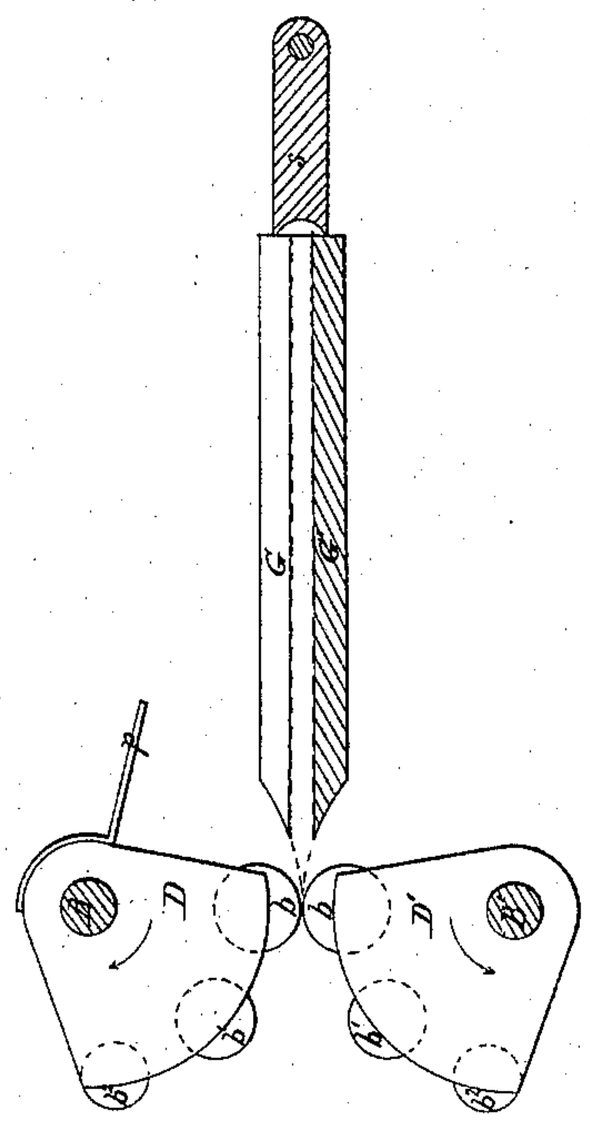


Fig. 9.

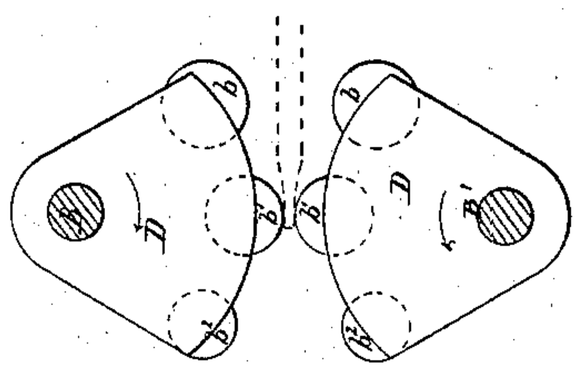
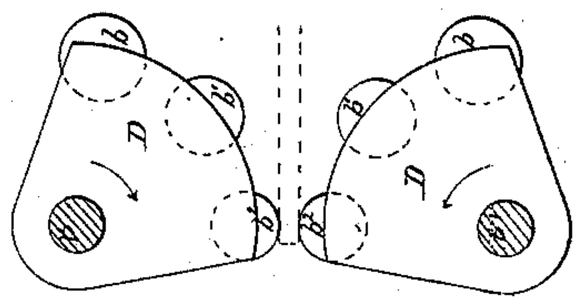


Fig. 8.



Witnesses:
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UNITED STATES PATENT OFFICE.

AMOS WHITTEMORE, OF CAMBRIDGEPORT, MASSACHUSETTS.

IMPROVED MACHINE FOR POINTING SPIKES.

Specification forming part of Letters Patent No. **42,314**, dated April 12, 1864.

To all whom it may concern:

Be it known that I, AMOS WHITTEMORE, of Cambridgeport, county of Middlesex, and State of Massachusetts, have invented a new and Improved Spike-Machine; 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 top view of my improved machine complete. Fig. 2 is a side elevation of same. Fig. 3 is a sectional view of the top of the machine in which the bevel spur-wheels, their shafts, and one of the vertical segments are removed. Fig. 4 is a vertical longitudinal section taken centrally through the machine. Fig. 5 is a transverse vertical section showing the position of the four segments when about to commence the operation on the spike-rod. Fig. 6 is a similar section, showing the positions of the four segments after they have finished their work upon a spike. Fig. 7 is a view in detail of the device for severing a length of rod sufficient for a spike. Figs. 8, 9, and 10 show the three positions of the vertical segments in the operation of forming a point on a spike.

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

The object of my invention is to make railroad and other spikes by machinery without forming on them what are known as "fins." These fins are sharp burrs of the metal forced out in the operation of producing the point, and are found very dangerous to the hands of workmen using the spikes, so much so that ship-carpenters will not use spikes which have been made by machinery for fear of injuring their hands in driving them.

My invention consists in subjecting the sides of the metal rods, in the operation of pointing them, to the drawing and compressing action of cams, segments, or other equivalent devices, which are so arranged as to operate alternately upon or against opposite sides of the rod and gradually reduce it to a point, as will be hereinafter described.

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

In the accompanying drawings, A represents a strong table, and A′ a frame which is erected thereon. The frame A′ and the legs of the table A beneath it support, respectively, two shafts, B B′, which are geared together and driven at the same speed by the twin spur-wheels *a a*. These two shafts each carry and have keyed to them, concentrically with their respective axes, roller-carrying segments D D′, which are provided on their circumference with rollers *b b′ b²*, varying in diameter, the largest rollers *b* being of such diameter as to nearly touch each other as they pass a vertical line coinciding with the two axes of shafts B B′, as shown in Fig. 10, and the smallest rollers b^2 being of such diameter as to slightly compress the spike rod as they pass each other, the roller *b′* being of an intermediate diameter between the two pairs of rollers *b* b^2. The radii of the two segments D D′ are therefore equal to the space between the two axes of the shafts B B′, minus the space occupied by the two large rollers *b b*. The first acting pair of rollers, b^2 b^2, will thus merely compress the spike-rod slightly, the second, or medium-sized rollers, will compress it a little more, while the third and last pair, *b*, will finish the point, as will be further shown. On each side of the upper roller segment, D, is an inclined shaft, E, which has its bearings in the frame A′ and table-bed A. These two inclined shafts, E, are arranged at equal distances from said segment, and are driven in the direction indicated by the arrows in Figs. 1 and 3 by bevel spur-wheels *c c′*, which, being of the same size, give an equal speed to both shafts. To the lower ends of shafts E E are keyed roller-carrying segments, F F, which are provided on their peripheries with small rollers, *d d*, which may be of unequal diameters. These segments E with their rollers *d d* are intended to compress the vertical sides of the spike-rod back to the original width of this rod after each successive operation of the vertical rollers *b b′ b²*, and therefore the pairs of side-rollers *d* should be so arranged upon their segments, with relation to the reducing and drawing or pointing rollers, that the vertical and lateral compression of the spike-rod will take place alternately in the following order—to wit, the small pointing-rollers b^2 b^2 of the vertical segments will first act upon the upper and lower sides of the spike-rod and slightly compress the end thereof, forcing or spreading the vertical unsupported sides of the rod outward. The first pair of side-rollers,

d d, will now compress the vertical sides of the rod back to their original width. The second pair of pointing-rollers, *b' b'*, will now act upon the rod and further reduce its end, spreading the metal out laterally and toward the end of the rod, as before, to be compressed back again by the next pair of side-rollers *d d*. The largest or finishing rollers *b b* now point the spike, while the last pair of side-rollers *d d* compress and leave its sides parallel. In this way it will be seen that while the pointing-rollers are acting upon the top and bottom sides of the spike-rod, the vertical sides of this rod are left unsupported, and consequently the metal is forced out laterally. Then, while the succeeding operation of the side-rollers is reducing the vertical sides of the rod to their original width, the horizontal sides are unsupported, and consequently the point is formed on the rod by the gradually-increased diameters of the vertical pointing-rollers operating alternately with the side-rollers, all of which rollers should be wider than the thickness of the spike. The shaft E of the segments F are both inclined from a vertical line toward the rear end of the machine for the purpose of acting on a longer surface of the spike-rod, as will be hereinafter described.

The devices for receiving and holding the spike-rod during the operation of pointing it consists of a stationary bracket, G, having two sides of the spike-receptacle formed on its edge, as shown in Figs. 4 and 6. The opposite sides of this receptacle are formed on the edge of an oscillating carriage, G', which is pivoted to the inclined blocks *e e*, Fig. 2. When this carriage G' is brought up to its position for confining the spike within its oblong quadrangular recess, as shown in Fig. 5, the recess which contains the spike properly coincides with the space between the segments F F D D' and holds the end of the spike in such relation to such segments that their rollers will act upon it, as above described. The stationary bracket G is secured to the top of table A, and the forward end of this bracket should be reduced on all sides, so as to bring its holding end as near the vertical plane of the axes of shafts B B' as possible, without interfering with the rotation of the four-roller segments.

The oscillating carriage G' serves two purposes besides that of gripping the spike-rod: When this carriage is thrown back by the action of the cam *f* upon the lever H to the position shown in Figs. 1, 2, 6, and 7, its channel forms a guide for receiving the spike-rod before and after it is cut off from the long rod, and then, as the carriage is returned to the position shown in Figs. 4 and 5 it carries the short rod with it and confines it in its proper place to be pointed. The inclined bed of this carriage G' also serves to conduct the finished spikes, which fall on it, to one side of the machine. At the rear end of the table A, and extending transversely across its top, is a long horizontal cam-shaft, I, which has three cams, *f f' f²*, on it, one of which, *f*, oscillates the carriage G' through the medium of a lever, H, and bent arm J, Figs. 1 and 2. The other acts upon the upper end of the heading-lever K, while the third operates upon the long arm of a lever, L. These cams should be so arranged that they will operate in proper time with the pointing-rollers—as, for example, the cam *f'* should be brought into action first for the purpose of depressing the forward end of lever L and cutting off a length of rod sufficient for making a spike. The cam *f* next throws up the carriage, and the cam *f²* finally forces the header up to its place, forms the head on the spike, and causes the heading-tool to hold the spike until the cam *f* releases the carriage. The lever L carries on its forward end a plate, *g*, having a square eye, *g'*, through it. This eye serves to receive the end of the spike-rod and forms a stirrup and guide for this rod as it is introduced on the carriage G', which latter falls back in a line with the eye *g'* when the time for entering the rod arrives. The upper edge of the eye *g'* is beveled so as to form a cutter which acts in conjunction with the fixed cutter-bed *h*, Figs. 5, 6, 7, and severs the lengths from the spike-rod. After this operation the cam *f'* allows the forward end of the lever L to be raised by a spring, *i*, out of the way of the segments.

The gage for regulating the lengths of spikes to be cut off consists of a block, *h'*, arranged on the table A, as shown in Figs. 1, 2, and 3.

The header consists of a lever, K, (secured to a rock-shaft, M,) carrying near its upper end a block, *s*, which has a depression or countersink in its forward end, adapted to form a head on the spike. This block *s* is pivoted to the lever K so that it will adapt itself squarely against the end of the spike-rod when this rod is firmly held in its place above described and form the head against the rear vertical end of the spike-box, as shown in Figs. 4 and 10. This heading-lever is brought into operation immediately after the carriage clamps the spike-rod in place, and it is thrown out of action just before the carriage releases the spike, so that the spike, if it does not fall by its own gravity, will be thrown down upon the inclined bed of carriage G' by the striker *p* on the upper segment, D.

In general the spikes will fall by their own gravity out the stationary part of the spike-box, but in order to render the discharge of the spike certain at all times I have provided the striker *p*.

By slightly inclining the two shafts E E of segments F F, I am enabled to bring the rollers on these segments into action sooner, and thus to make a very long sweep on the sides of the spike, and at the same time drive the shafts E by gearing applied on the upper horizontal shaft B of the vertical segments. The same result would be obtained by moving the

shafts E backward and nearer to the tapering end of the spike-box, but this could not be done without a complication of gearing, which is avoided by moving the lower ends only of said shafts, as shown in Fig. 2.

In order to make clear how the inclination of the segment-shafts E E will cause the segments or rollers thereon to make a longer sweep upon the vertical sides of the spike-rod, reference may be had to the diagram, Fig. 11, in which G is the spike-box, which is curved out to allow the segments to be brought up close to the end of the rod numbered 1, projecting from this box. Let 2 2 be the axes of the shafts E E when arranged perpendicularly to the bed of the machine, and 3 3 the circles which would be described by the peripheries of the rollers on the segments F F as these segments revolve around their respective axes. The sweep which said rollers would make on the spike-rod 1, or the curves produced on the sides of said rod, would form very short arcs with respect to the point; but by moving the axes 2 2, which correspond to the lower ends of the inclined shafts when arranged as shown in Fig. 2, back to 4 4 it will be seen that the curves produced on the spike-rod would be considerably longer in this instance than in the former. This result I obtain by inclining the shafts E and engaging them by means of gearing with the horizontal shafts B B′ of the vertical segments.

While I have described in this specification one method of pointing a spike without leaving fins or burrs on its edges, I do not confine myself to the precise arrangement of the devices for effecting this end, but desire to take advantage, to the fullest extent, of all modifications of these devices operating upon the principles herein set forth.

The rolling or anti-friction surfaces which are employed in the machine herein described, both to form the point and to keep the vertical sides of the rods parallel to each other, being of such width that they operate upon the entire surface of each side of the rods, there will be no possibility of fins being left on the spikes.

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

1. Pointing the spike by swaging each of its four sides, the swaging of two sides being simultaneous and alternating with the simultaneous swaging of the other two sides by means of rolling or turning devices, the spikes being at the same time held stationary.

2. Two or more pairs of rollers, or their equivalents, *b b′ b²*, arranged apart, on turning supports, and adapted and operated so as to swage two sides of the point of the spike simultaneously, while the other two sides are unsupported, and thus alternately act upon respective pairs of the sides so as to finish the point without fins, substantially as described.

3. Arranging the segments F F, or their equivalents, with respect to the taper end of the spike-box and with respect to the segments D D, or their equivalents, by inclining the shafts E E, substantially as and for the purpose described.

4. The construction of the taper end of the spike-box and the segments F F, whereby the end of the spike-rod can be acted upon by the first acting set of the rollers *d d*, substantially as described.

5. Making a finless spike by machinery constructed and operating substantially as described.

6. The segments D D′, carrying rollers or rolling-surfaces for pointing the spikes, in combination with side segments, E E, and rolling-surfaces, or their equivalents, for restoring the lateral width to the spike-point, arranged and operating substantially as described.

7. The combination of the cutter and guide *g g′* with the oscillating carriage G′, substantially as described.

8. The arrangement of striker, *p*, on the segment D, substantially as described.

AMOS WHITTEMORE.

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WM. F. GRUBB.