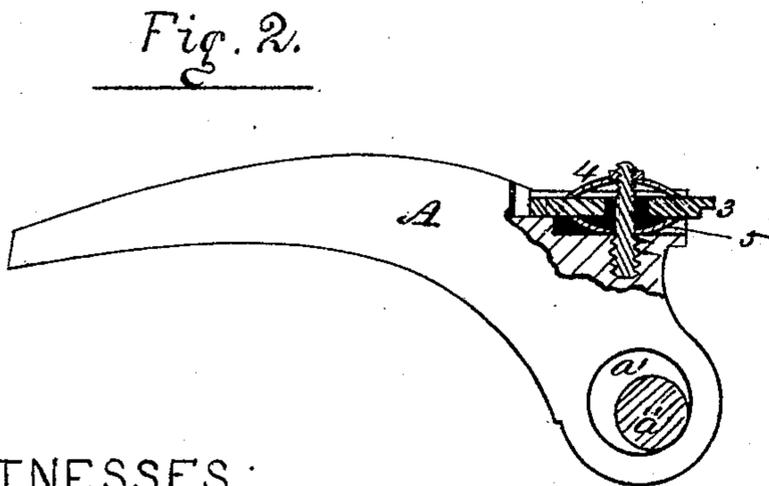
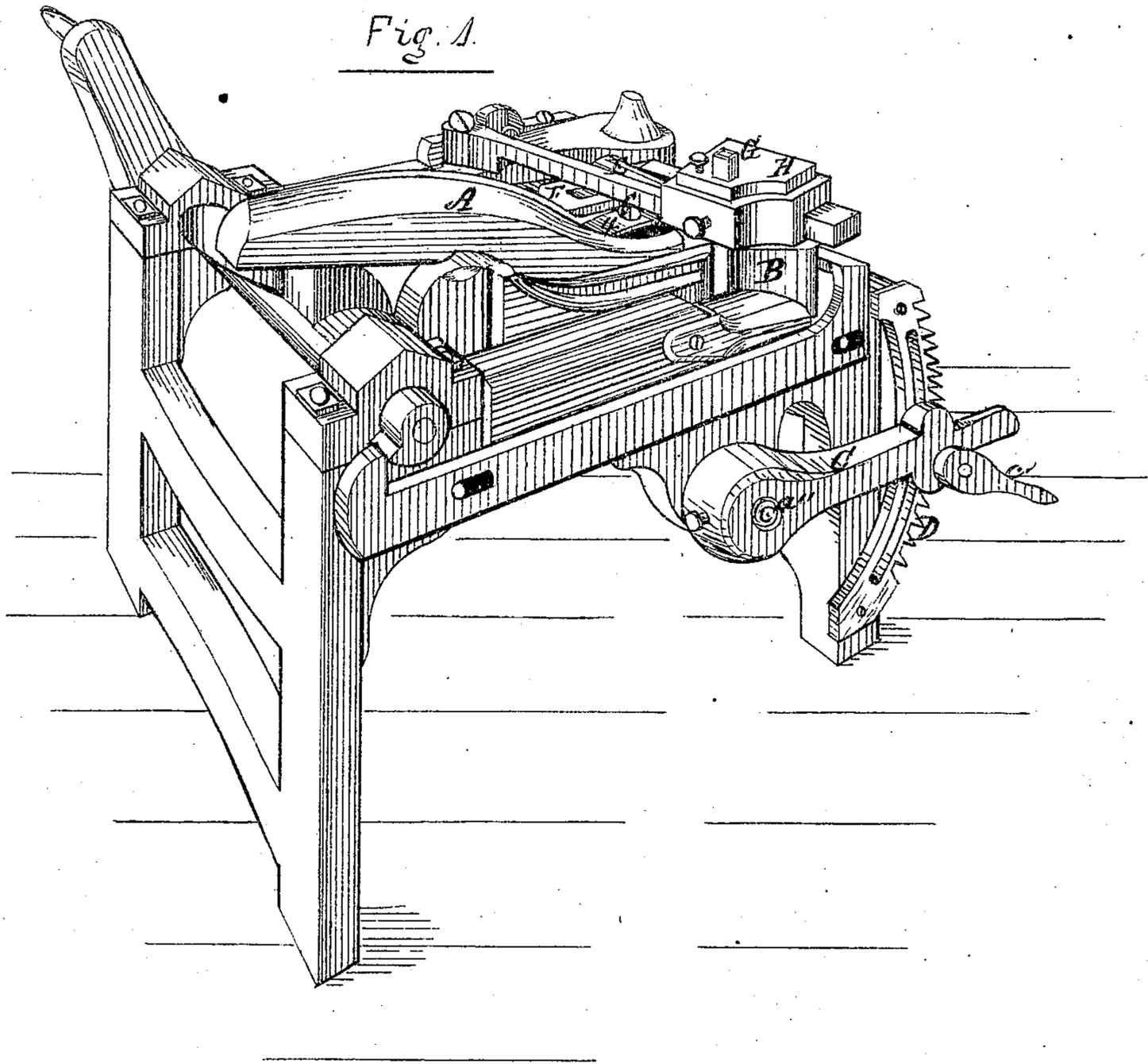


MOODY BELKNAP.

Improvement in Spike Machines.

No. 119,689.

Patented Oct. 10, 1871.



WITNESSES:

*Ben Morrison*  
*Wm H. Morrison*

INVENTOR:

*Moody Belknap*

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Fig. 3.

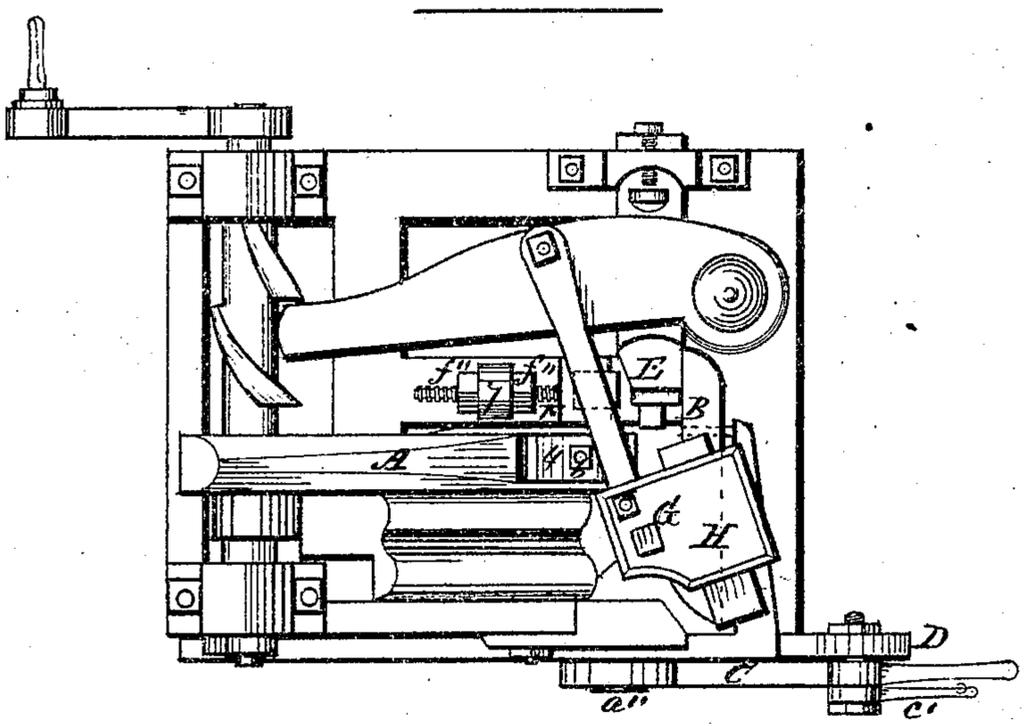


Fig. 4.

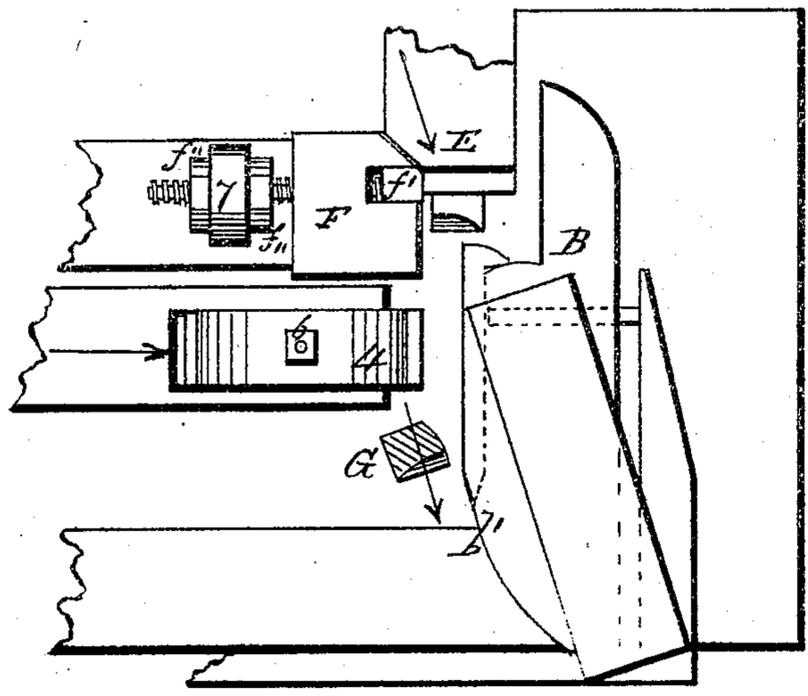


Fig. 5.

Fig. 6.

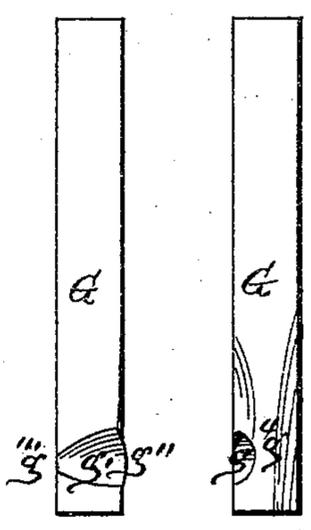
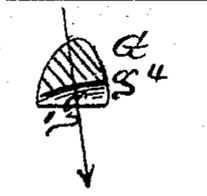


Fig. 7.



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# UNITED STATES PATENT OFFICE

MOODY BELKNAP, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN SPIKE-MACHINES.

Specification forming part of Letters Patent No. 119,689, dated October 10, 1871.

*To all whom it may concern:*

Be it known that I, MOODY BELKNAP, of the city of Philadelphia and State of Pennsylvania, have invented certain Improvements in Spike-Machines, of which the following is a specification:

My improvements have more especial reference to the spike-machine for which Letters Patent No. 15,468 were granted to me, dated August 5, 1856, in which the hot end of a bar of iron inserted in the grooved stationary die-block is held firmly by the advance of a griping slide, while a heading-die advances and compresses the extreme inner end of the bar so held by the griping slide into a head on the spike, and simultaneously a cutter advances obliquely upon the bar, cuts it off of proper length in such a manner as to leave a curved sloping face, which, together with a corresponding slope provided on the opposite side of the end of the spike by the form given to that end of the groove in the stationary die-block, the required sharpened end is produced upon the spike, and on the return movements of the said operating parts the finished spike is caused to drop down out of the die by the advance of a displacing-rod which moves through a suitable hole in the back of the said stationary die-block.

The first part of my present invention relates to the combination of an adjustable arm and a rack with an eccentric cylinder (which forms the fulcrum of a griping-lever for holding the blank) and with a lever and die; the object of this part of my invention being to enable the attendant to readily adjust the gripe of the lever to the different thicknesses of the iron bars out of which the various sizes of spikes are to be formed. The second part of my invention relates to the combination of a spring or springs with the adjustable die in the griping-lever in such a manner that the said die will be permitted to yield slightly up and down when necessary; the object of this part of my invention being to permit the said die to accommodate itself to the usual slight inequalities in the thickness of the particular size of iron to which the griping-lever may have been adjusted. The third part of my invention relates to the construction and arrangement of an adjustable controller of the header in such a manner that the extent of the lateral motion of the latter can be regulated thereby

with facility; the object of this part of my invention being to enable the attendant to readily adjust the said controller so as to cause the header to make the lengths of the heads of the spikes to suit all sizes of the iron used for making them. The fourth part of my invention relates to the curved form of the cutting-edge of the knife, and also to the size of the angle included between the two sides of the cutting-edge of the said knife; the object of this part of my invention being twofold: first, to give increased strength and durability to the cutting-edge of the knife; and second, to produce or leave a smoother and better surface in the cut on the spike.

Figure 1 is a perspective view of a spike-machine embodying my invention. Fig. 2 is a side elevation, partly in section, of the griping-lever and its eccentric fulcrum detached. Fig. 3 is a plan view of Fig. 1. Fig. 4 is an enlarged sectional plan view of the different parts which immediately act on the blank and form the spike, arranged in the relative positions into which they come on being withdrawn from the finished spike to let the latter fall out of the die and permit the introduction of another heated blank. Figs. 5, 6, and 7 are three different views of the cutting-edge and sides of the knife.

The griping-lever A is arranged at a right angle to the stationary die B on the bed-plate or frame, and turns upon a cylindrical fulcrum,  $a'$ , which is supported by journals which are eccentric thereto, the outer one  $a''$  having an arm, C, which extends across a slotted curved rack, D, to which the said arm C is adjustably secured by a screw and pawl attached to a small hand-lever,  $d'$ , in the usual well-known manner, so that the arm C, and consequently the fulcrum  $a'$ , can be readily and securely adjusted in its relation to the stationary die B to suit the different sizes of iron bars used for the different sizes of spikes. The inner end of the griping-lever A is recessed at its upper side for the reception of the griping-die 3, the outer end of which die is recessed (see Fig. 2) so as to adapt it to bear against both the side and the top edges of the blank in the stationary die B, and for the purpose of allowing the said die 3 to rise and fall sufficiently to adjust itself to any slight inequalities in the thickness of the blanks and thus prevent its being broken or the spike damaged. A spring, 4,

is secured to bear firmly down upon the blank, and also a counter-spring, 5, to bear firmly upward against it, the said springs being secured in place by a screw-bolt, *c*, which passes down through the springs and die into the lever A in such a manner that the pressure of the springs upon the die can be increased or diminished according to requirements. The lateral movement of the header E is effected by an adjustable controller, consisting of a stationary block, F, fitted with a sliding tongue, *f'*, (see Fig. 4,) which can be readily adjusted to project any required distance to give the lateral motion required in the header E to suit the size required in any of the different sizes of spikes to be made in the machine. The adjustment is effected by means of jam-nuts *f'' f''* on the the opposite end of the tongue *f'*, with a stationary bearing, 7, between the nuts. The cutter or knife G consists of a bar of steel of square section, about one and a quarter inch size, more or less, having a straight groove, *g'*, of uniform curve in its transverse section made across in one of its sides near one end in such a manner that the end of said groove, which is intended to form the cutting-edge of the knife, will be about three-eighths of an inch deep and its width about one inch, more or less, while its other end runs out or ceases to be a groove just at the opposite edge *g'''* of the same side of the bar. (See Fig. 5.) The side of the bar at which the larger end of the groove *g'* opens is cut back sufficiently to bring the central longitudinal line of the bottom of the groove *g'* to an angle of about eighty-two degrees to said cut-back side *g<sup>4</sup>*, thus producing a curved cutting-edge, *g''*, the two sides of which, at the middle of the bottom of the groove, will meet at an angle of about eighty-two degrees, Fig. 7 being a transverse section of the cutting part of the bar along through the middle of the bottom of the groove *g'*. The angle formed by the meeting of the bottom of the groove *g'* and the side *g<sup>4</sup>* will be readily understood without further description. As the practical cutting part of the knife G is intended to be confined to the middle, third, or fourth part of the curved edge, the increase of the angle above and below the said middle portion, consequent upon the flaring form of the groove, does not materially impair the sharpness of the proper cutting-edge, but gives strength and durability to it. After the knife G has been properly hardened and tempered it is intended to be secured vertically in the carrier H in such a manner and position that the side *g<sup>4</sup>* of the cutting-edge will pass in close contact with the face

*b'* of the stationary die B, and with the middle part of the cutting-edge directly opposite to the recess in the said die for receiving the blank, and consequently as the carrier advances the hot blank will be cut off obliquely by the knife, thus giving the required slope or bevel for that side of the sharp end of the spike. (See Fig. 4.)

In my old machine, before named, the cutting-edge of the knife was made by a rectangular groove across the bar of steel, and consequently it was very liable to become broken in use, and also caused a "dragging" on the blank, which had the effect of producing a cracked or porous face on that side of the sharpened end of the spike. Both of these difficulties and objections are entirely obviated by constructing the cutting parts of the knife in the manner herein described, because the rectangles are avoided by the curved form of the groove, and a condensing tendency is produced upon the iron in cutting by an edge which curves from the upper and lower sides of the blank toward its middle.

I claim as my invention—

1. The adjustable arm C and rack D, in combination with the eccentric cylinder *a'* (which forms the fulcrum of the griping-lever A) and with the lever A and its die 3, substantially as and for the purpose hereinbefore set forth.

2. The springs 4 and 5, in combination with the adjustable die in the griping-lever A, substantially as and for the purpose hereinbefore set forth.

3. The adjustable controller of the lateral movement of the header E, the same consisting of the tongue *f'*, jam-nuts *f'' f''*, and stationary parts F and 7, arranged to operate substantially as and for the purpose hereinbefore set forth.

4. The cutter or knife G, consisting of a short bar of steel having the groove *g'* made across near the lower end of its front side, as described, and with the side *g<sup>4</sup>* as cut back to form the described angle of the cutting-edge *g''*, the said cutter or knife G being inserted in the carrier H, so that as the latter moves forward the groove *g'* of the said cutter or knife will be in front, and the side *g<sup>4</sup>* thereof pass in close contact with the beveled face *b'* of the stationary die B, and with the middle part of its cutting-edge *g''* directly opposite to the recess for the point of the spike in said die, substantially as and for the purpose hereinbefore set forth and described.

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Witnesses:

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(66)