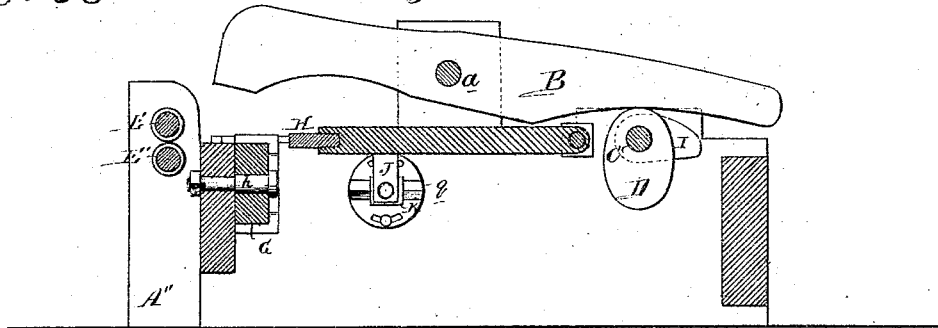


*David Eynon,  
Improved Spike and Bolt Machine.*

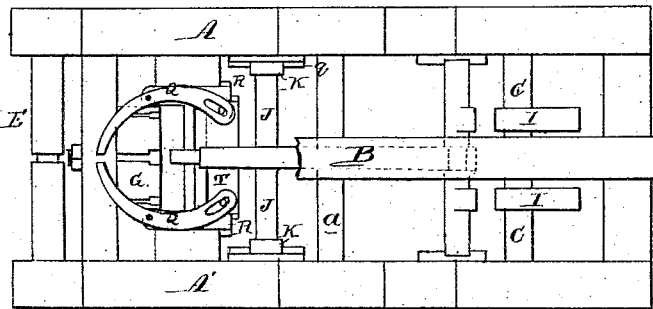
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*Fig. 1.*

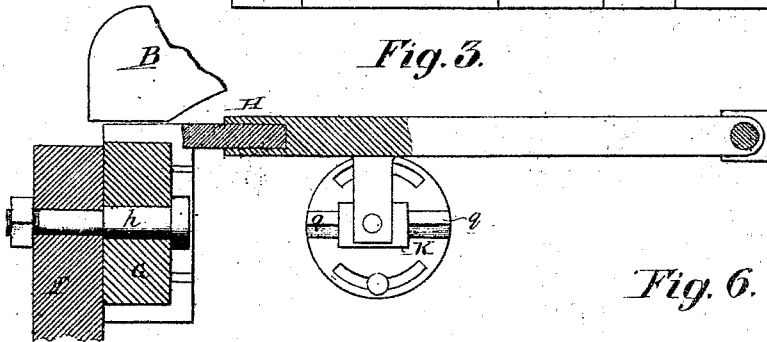
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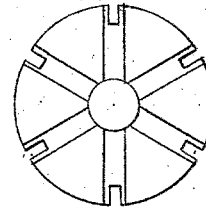
*Fig. 2.*



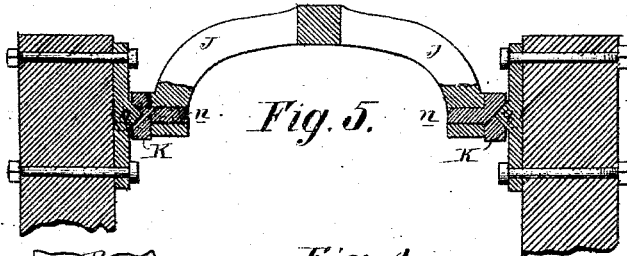
*Fig. 3.*



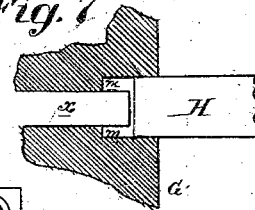
*Fig. 6.*



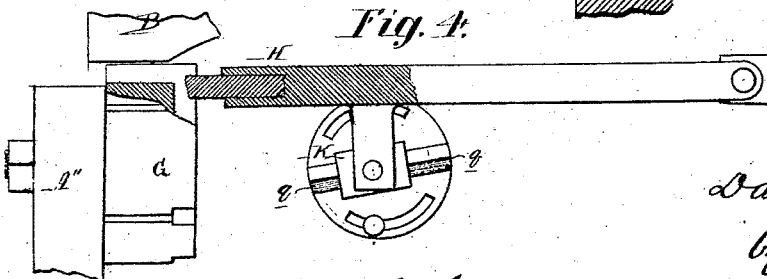
*Fig. 5.*



*Fig. 7.*



*Fig. 4.*



Witnesses { *Jas. B. Harding.*  
*John Parker*

*David Eynon*  
*by his Atty*  
*Houses and Son*

# United States Patent Office.

DAVID EYNON, OF RICHMOND, VIRGINIA.

Letters Patent No. 110,755, dated January 3, 1871.

## IMPROVEMENT IN SPIKE-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

I, DAVID EYNON, of Richmond, county of Henrico, State of Virginia, have invented an improved Spike and Bolt Machine, of which the following is a specification.

### *Nature and Object of the Invention.*

My invention consists of an improvement, too fully described hereafter to need preliminary explanation, in Swett's spike-machine, for which Letters Patent were granted on the 14th day of March, A. D, 1854, and extended March, 1868.

### *Description of the Accompanying Drawing.*

Figure 1 is a vertical section of sufficient of a spike-machine to illustrate my invention.

Figure 2, a plan view of fig. 1.

Figures 3 and 4, vertical sections of part of the machine drawn to an enlarged scale, and showing the heading device in different positions.

Figure 5, a transverse section on the line 1 2, fig. 1.

Figure 6, a front view of the rotating die.

Figure 7, a diagram illustrating part of my improvement.

### *General Description.*

A and A' are the opposite side frames of the machine, to suitable bearings in which is adapted a shaft, *a*, carrying the gripping-lever B, and to the latter is imparted a vibrating motion, the movement in one direction being effected by a cam, D, on the shaft C, and in the other direction by the weight of the lever itself, or, by what I prefer, a spring or springs, as the latter insures a rapidity of action which is desirable in this machine owing to the high rate of speed at which it is intended to operate.

In the frame A', in front of the machine, revolve two rollers, E E', which guide the hot bar, and which are provided with dies for severing or nearly severing a portion to be converted into a spike, this severed portion being seized, torn away, and carried rearward to the under gripping-die by reciprocating nippers, which may be briefly described as follows:

A slide, R, is adapted to guides on the opposite side frames of the machine, and on this slide another slide, T, is arranged to have a limited independent movement.

To pins on the slide R are jointed the nipper-arms Q Q, each of which has an inclined slot for receiving a pin on the slide T. A reciprocating movement is imparted to the slide T, from which the slide R derives its movement.

The opening and closing of the nippers are effected through the medium of the pins and inclined slots during that portion of the movement of the slide T which is independent of the slide R, while the recip-

rocating movement of the nippers is derived from that of the slide T.

These movements of the nippers enable them to seize a nearly severed piece of the hot bar, tear it away, and deposit it on the lower gripping-die.

All the above-described parts can be found in Swett's well-known machine, for which Letters Patent were granted on the 14th day of March, A. D, 1854.

The under gripping-die of Swett's spike-machine, however, is permanent, and becomes hot and expanded and imperfect as a gripping medium, owing to the nearly constant presence on it of hot iron.

Discarding the usual permanent die, I use the disk G, having on its edge a number of recesses or dies, and arranged to turn on a stationary pin, *h*, on the frame A'.

The shape of each die will be best observed on reference to fig. 7, where *x* represents a portion of the spike-bar resting in a recess of corresponding size in the edge of the disk G, this recess being abruptly enlarged at *m* for the twofold purpose of affording room for the spreading of the head, and for admitting the end of the heading-bar H, the rear end of which, jointed to a sliding cross-head, is acted on by cams I I on the shaft C, so as to impart a forward movement, the rearward movement of the heading-bar being accomplished by springs or appropriate cams.

From the heading-bar project two arms, J J, one on each side, the end of each arm having a hole for the reception of a pin, *n*, on a slide, K, adapted to a guide, *g*, on a plate, M, which is so secured to one of the adjacent side frames of the machine as to admit of being turned to a limited extent thereon, and secured after adjustment.

When these plates *g* have been so adjusted that their guides *g* occupy the horizontal position shown in fig. 3, the movement of the header will be horizontal, and adapted to the formation of heads central with the shank, for instance, the heads of bolts; but, when the plates have been adjusted to the position shown in fig. 4, so that the guides are inclined, the outer end of the header will have both a downward and forward movement adapted to the formation of heads which project at one side of the shank, as the beveled heads of spikes.

After the nippers have torn a partially-severed piece from the hot bar, and deposited the same in one of the recesses or dies of the disk, the outer end of the gripping-lever descends and firmly holds the piece in the recess, when the header H, actuated by the cams I I, moves forward, enters the enlargement *m* of the die or recess, and upsets the end of the piece, after which the header retreats, the gripping-lever is raised, and the disk is turned to such an extent that another

empty recess or die is ready for receiving from the nippers another piece of iron to be headed.

One of the important advantages of my improvement is the limited movement of the header compared with that in ordinary spike-machines. In the latter the header must retreat so far out of the way as to permit the formed spike to be discharged from the die in advance of and in line with the piece carried by the nippers, whereas the formed spike in my machine is at once turned out of the way with the disk. This limited movement of the header permits me to run the machine at a much higher rate of speed than ordinary machines.

Another important feature of my improvement, and one which also contributes to an increased speed of the machine, is the facility which the revolving disk affords for maintaining the disk cool. A constant stream of water can play on the under side of the disk, and this stream, independently of cooling the dies, will facilitate the removal therefrom, by any

suitable mechanism, of the formed spikes or bolts, the shrinkage of which, on the application of water, permits them to be easily freed from the recess.

*Claims.*

1. The revolving disk D, having a series of dies arranged as described, in combination with the header H, griper B, and nippers Q Q, operating substantially as described, and carrying the blanks and inserting the same in the dies.

2. The combination of the header H, arms J, and adjustable guides *g g*, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAVID EYNON.

Witnesses:

CHARLES E. FOSTER,  
JNO. B. HARDING.