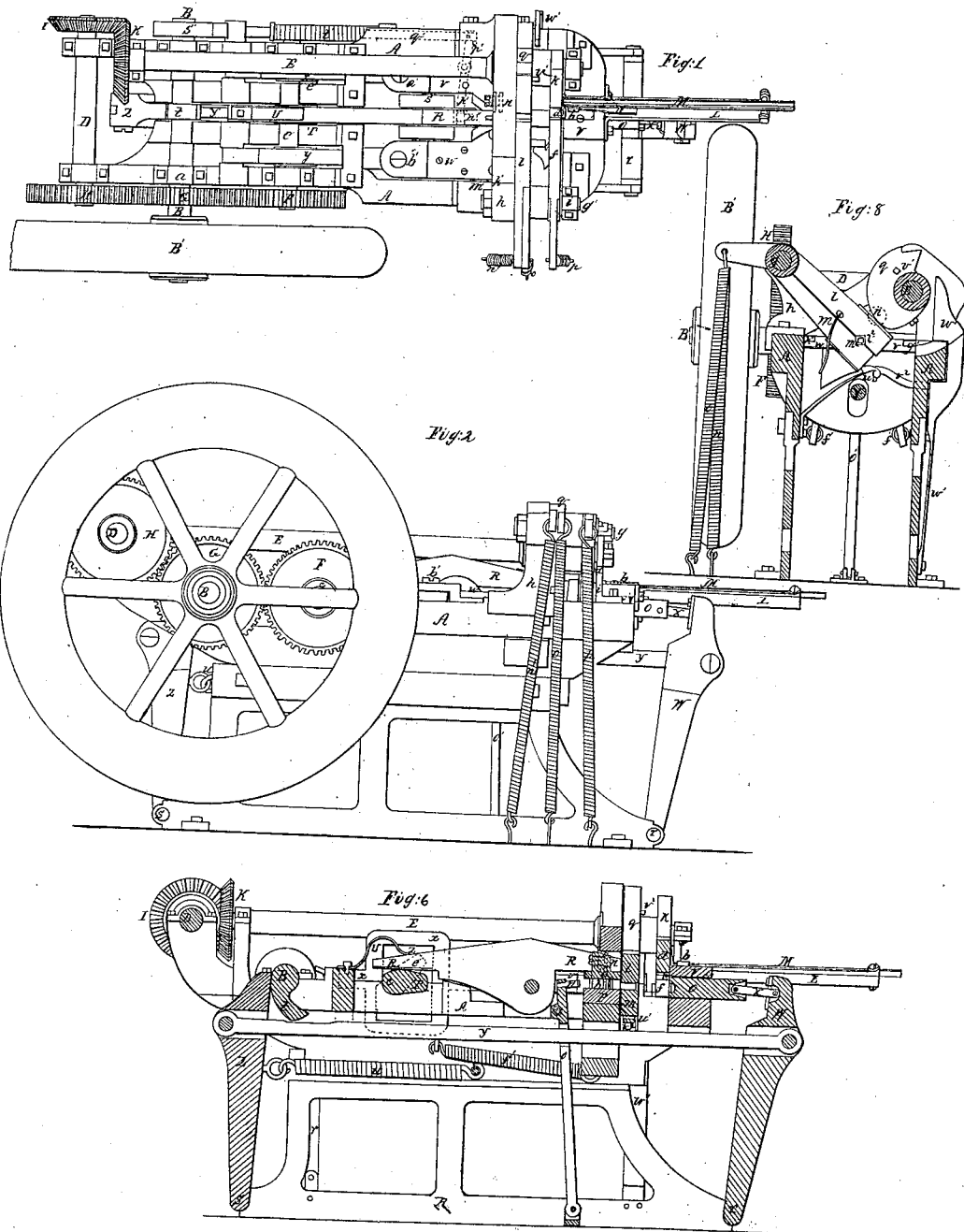


*W. Blake.*

*Making Spikes. 2 Sheets- Sheet 1.*

*N<sup>o</sup> 7,645.*

*Patented Sept. 17, 1850.*



*No. 7,645.*

WILLIAM BLAKE S IMPROVED MACHINERY FOR MANUFACTURING SPIKES FROM WROUGHT METAL.

FIG. 7

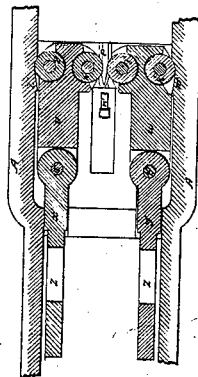


FIG. 10

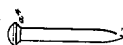


FIG. 9

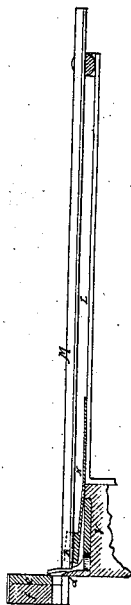


FIG. 3

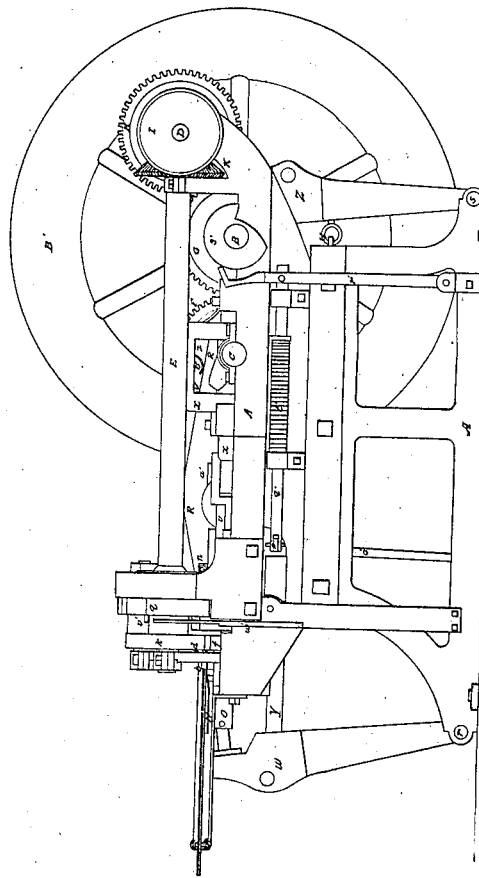


FIG. 5

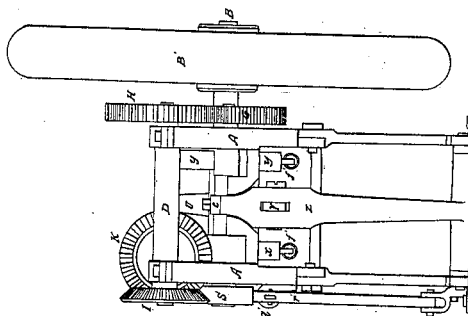
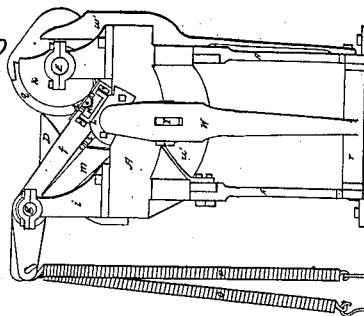


FIG. 4



*2 Sheets-Sheet 2.*

# UNITED STATES PATENT OFFICE.

WILLIAM BLAKE, OF BOSTON, MASSACHUSETTS.

## SPIKE-MACHINE.

Specification of Letters Patent No. 7,645, dated September 17, 1850.

*To all whom it may concern:*

Be it known that I, WILLIAM BLAKE, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new or  
5 Improved Machine for Making Spikes from wrought iron, copper, or any other malleable metal or composition of metals capable of being made into spikes thereby; and I do hereby declare that the same is fully de-  
10 scribed and represented in the following specifications and accompanying drawings, letters, figures, and references thereof.

Of the said drawings Figure 1 denotes a top view of my said machine. Fig. 2 is an  
15 elevation of one side of it. Fig. 3 is an elevation of the other side of it. Fig. 4 is a front end elevation of it. Fig. 5 is a rear end elevation of it. Fig. 6 is a central longitudinal and vertical section of it. Fig. 7  
20 is a horizontal section of the swedging rollers, and their stationary guide cams. Fig. 8 is a transverse and vertical section of it, taken just in front of the carrying pincers. Fig. 9 is a longitudinal section of the rod  
25 spout, and the shears or machinery by which the spike rod is introduced into the machine and a spike blank cut from it.

The machinery by which a spike is made, consists, first, of that by which it is intro-  
30 duced into the machine, seized, and held while being severed by the shears, and afterward moved down to the pointing mechanism; second, of the shears for removing a spike blank from the rod; third, of the head-  
35 ing mechanism and that for moving the spike blank forward between the gripping surfaces; fourth, of the gripping or holding mechanism; fifth, of the pointing mechanism; sixth, of the mechanism for discharg-  
40 ing or expelling the spike from the machine after the completion of the pointing operation.

In the drawings above mentioned the main working parts of the said machine are represented as supported by a strong frame A,  
45 suitably made, which frame has a driving shaft B, arranged at or near its rear end, and supported in suitable boxes one of which is seen at *a*, in Fig. 1. On this shaft a fly  
50 wheel B', is fixed. Besides the main shaft, there are two secondary horizontal shafts C, D, and one tertiary shaft E, all of which derive their motions from the main shaft through three spur gears E, G, H, and two

bevel gears I, K, the shafts and gears being  
55 arranged as seen in the drawings, the gear G, being fixed on the main driving shaft, the gears F, and H, on the shafts C, D, respectively, while the bevel gears I, K, are fixed on the shafts D and E.

From the front end of the frame a bar L, is made to extend horizontally, and to have a spout M, hinged to its outer end in such  
60 manner as to enable the inner end to be raised or lowered; the said inner end being supported upon a spring N, which is fastened to the bar L, and has a notched block or saddle piece *b*, for the spout to rest in.  
65 The inner end of the spout or conductor terminates near a stationary shear or knife *d*, that operates in connection with the movable cutter or shear *e*, which is affixed to a lever *f*, that turns up and down on a fulcrum  
70 or pin *g*, supported by two standards *h*, *i*. A cam *k*, fixed on the tertiary shaft E, operates on one end of the lever *f*, and depresses it during each revolution of the shaft. The spike rod or bar of metal from  
75 which the spikes are to be formed, is laid in the spout or conductor, and its advancing end pressed down, and entered between the shears. The rod or bar is next forced forward longitudinally through the opening of  
80 the shears, and into the opening of the heading nippers *l*, *m*, until its end is brought up against a screw stop *n*, represented in Figs.  
85 1 and 6, by dotted lines. The nippers are two levers placed one above the other, and made to turn on the fulcrum or pin *g*. Their tail or outer ends, as well as the tail end of the upper shear, have retracting springs applied to them, as seen at *n*, *o*, *p*. A cam *q*,  
90 fixed on the tertiary shaft E, depresses the nippers, when the upper shear is moved down, and in accordance with the downward movement thereof; the nippers not only serving to support the spike blank, or piece of metal severed from the spike rod, but to carry it downward into the proper position to be forced partially through them by the  
100 header O, which is next brought or moved up, and pushes the spike blank through the nippers, in such manner as to cause its end which is to be pointed to pass between the gripping surfaces or grippers P, Q. The lower gripper is a steel stationary bed, for the spike blank to rest on, while the upper gripper is a piece of steel attached to the  
105

under side of a lever R, which turns vertically on a fulcrum at S, and is tilted so as to move the gripper Q, down toward the gripper P, by means of a cam T, fixed on the secondary shaft C. A retractive spring U, is applied to give motion to it in the opposite direction.

The header O, slides freely back and forth in a longitudinal direction, and through a box V. It is connected to the upper end of a rocker lever W, by means of a pitman or short connecting rod X, suitably jointed to it and the lever. At the rear end of the machine is another and similar rocker lever Z, which is connected to the first one by a horizontal rod Y, jointed to both. The rocker shafts of these levers are seen at r, s. During each revolution of the shaft B, a cam t, fixed on it, acts against the upper end of the rocker lever Z, and so as to move it back, and thereby draw the rocker lever W, inward and cause it to force the header up toward the nippers. A retractive spring u, afterwards produces motion of the header in the opposite direction.

The next part of the machine is that by which the spike is pointed. Two blocks, or strong frames v, w, are respectively jointed to two horizontal slides x, y, and in such manner as to permit the front or outer ends of these frames to be moved toward or away from each other, the joint pins being seen at a', b'. The two slides x, y, are each of the form vertically as seen in Fig. 6, they being each made with a recess z, for the reception of one of two cams, which are fixed on the secondary shaft C (one of the said cams being shown at e', Fig. 6,) and which serve to act against the rear sides of the recesses of the slides, and force the said slide rearward. To each slide a retractive spring as seen at f', is attached, for the purpose of producing a motion of it in the opposite direction at the proper time. The longitudinal back and forth, and simultaneous movements of the slides, will of course produce similar movements of the frames or blocks v, w.

Two rollers g, h', or i', k', are placed within each frame or block, v, w, as seen in Fig. 7. The two middle rollers h', i', are termed swedging rollers, while the two outer ones g', k', are cam rollers, because they roll against two fixed or stationary cams or vertical curved surfaces l', m', which are each shaped in accordance with the curve or shape we desire to give to the pointed portion of the spike. While the blocks or frames v, w, are simultaneously moved backward, the swedging rollers are brought into contact with the opposite vertical sides of the spike blank, and gradually forced toward one another, so as to swedge, or draw down, or point the end of the spike in the manner required.

The heading of the spike is produced in

the mean time by the action of the header whose inner end is recessed properly for the purpose. The carrying and heading nippers are provided with dies l<sup>2</sup>, m<sup>2</sup>, for forming the spike head where it is joined to the body of the spike into the shape of a frustum of a quadrangular pyramid, as seen at a<sup>4</sup>, Fig. 10, the said figure being a representation or side view of the spike.

After the spike has been made, it is discharged from the machine by the operation of a discharger n', which is arranged as seen in Fig. 6, and is a projection from a rocker lever o', which is jointed to the inner end of a horizontal lever p', (represented in Fig. 1, by dotted lines,) whose outer end is seen in Fig. 3, and as jointed to a horizontal slide rod q'. This rod q', is jointed to a rocker lever r', which is actuated or moved by a cam s', fixed on the secondary shaft B. A retractive spring t', applied to the slide rod q', and the main frame, throws backward the slide rod, when released from the action of the cam against its lever, and thereby causes the discharger to be suddenly moved against the spike, so as to force it forward, and out of the machine, the nippers having been previously separated, or opened wide enough to allow the spike to fall freely through them.

A spring latch or catch u', is so arranged, that while the nippers are being depressed to their lowest position, its hooked end shall be pressed over by the lower nipper, and made to pass into a recess formed in the end of the nipper. This spring catch serves to hold the lower nipper down until the spike has been expelled from the machine. The upper nipper being free to rise upward, it does so immediately after the operation of the heading has been completed, and just before the operation of discharging the spike takes place. As soon as the spike has been discharged the spring catch is drawn away from the end of the lower nipper, so as to enable it to rise upward, or be raised by the action of its retractive spring. The machinery by which the spring catch is drawn away from the nipper, consists of a cam v', (projecting from the side of the nipper cam on the tertiary shaft,) a spring lever w', and a catch hook, or connecting rod v<sup>2</sup>, extending from the spring lever to the spring latch, and properly jointed or connected to the spring lever and the latch. During the rotation of the nipper cam, the cam pin v', meets and presses outward the upper end of the spring lever, and thereby draws the spring catch out of the recess of the lower nipper, so as to allow the said nipper to rise upward.

1. I claim the heading and carrying nippers l, m, in combination with the shears, the header, and the gripping mechanism, the same being made to operate in con-

nection therewith substantially as above specified.

2. And in combination with the lower nipper I claim the spring catches, latching and unlatching apparatus, applied to it for the purpose above specified.

In testimony whereof I have hereto set

my signature this fifth day of June A. D. 1850.

WM. BLAKE.

Witnesses:

R. H. EDDY,  
CHAS. JAS. SPRAGUE.