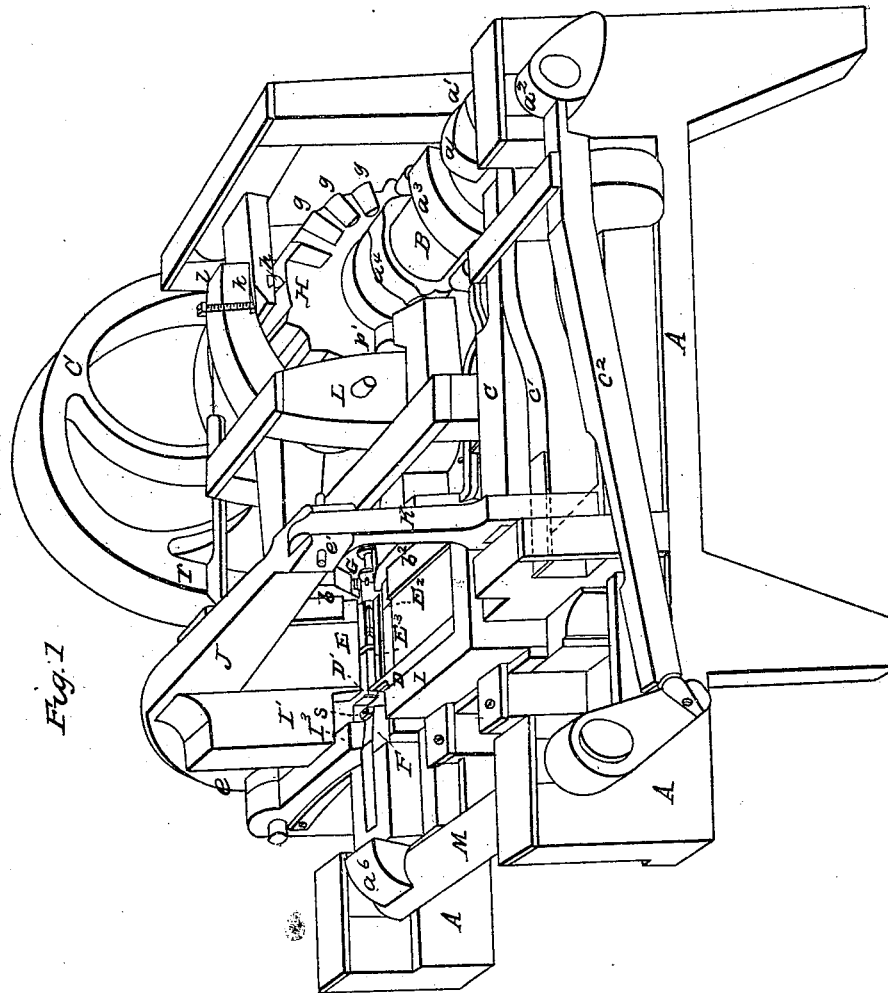


H. A. WILLS.
Spike Machine.

3 Sheets—Sheet 1.

No. 6,950.

Patented Dec. 11, 1849.

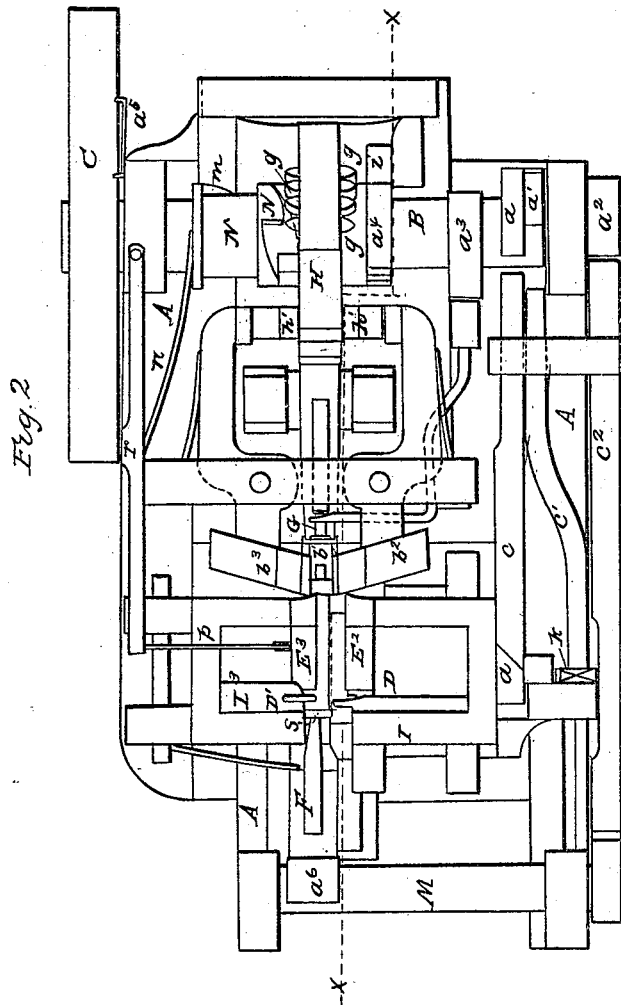


H. A. WILLS.
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3 Sheets—Sheet 2.

No. 6,950.

Patented Dec. 11, 1849.

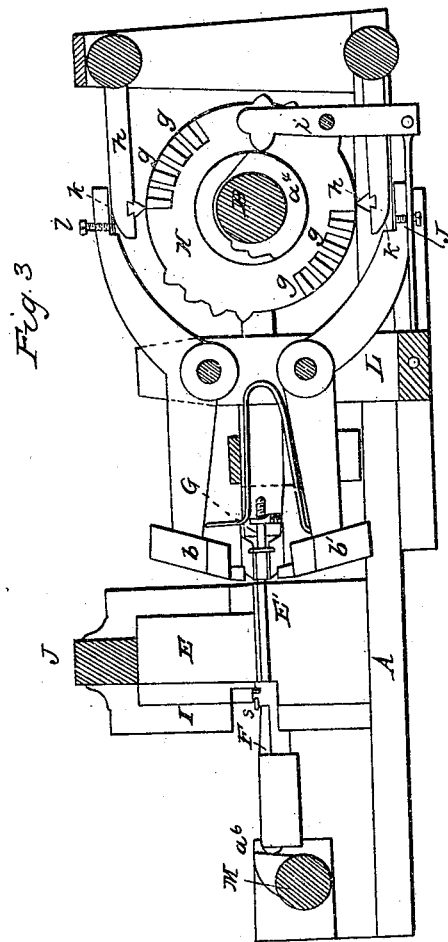


H. A. WILLS.
Spike Machine.

3 Sheets—Sheet 3.

No. 6,950.

Patented Dec. 11, 1849.



UNITED STATES PATENT OFFICE.

HARRY A. WILLS, OF KEESEVILLE, NEW YORK.

OPERATING THE HAMMERS OF SPIKE-MACHINES.

Specification of Letters Patent No. 6,950, dated December 11, 1849.

To all whom it may concern:

Be it known that I, HARRY A. WILLS, of Keeseville, in the county of Essex and State of New York, have invented certain new and
5 useful Improvements in Machines for Manufacturing Wrought Nails and Spikes; and I do hereby declare that the following is a full, clear, and exact description of my invention and of the characteristics which distinguish it from all others heretofore
10 known, reference being had to the accompanying drawing, making part of this specification, in which—

Figure 1 represents a perspective view of
15 my spike machine, Fig. 2 is a plan of the same with some portions removed, and Fig. 3 is a vertical longitudinal section following the line *x x* of Fig. 2.

My invention consists in drawing out the
20 point of the spike by a set of hammers which act on the four sides of the rod, they being so arranged that they are drawn forward along the point between the blows, and at the same time made to strike closer together. The machine is so constructed that
25 the fiber of the steel of which the knives, dies, header, &c., are made is opposed endwise to the pressure.

In the drawing A is the bed plate of the
30 machine on which the other portions are mounted. The cam shaft B revolves in bearings at one end of the bed plate and has a fly wheel C mounted upon it, together with the various cams for giving a direct motion
35 to the several numbers of the machine, while the return motions are effected by springs. Thus the cam *a* operates the moving knife D; the cam *a'* the moving die E; the cam *a²* the header F; the cam *a³* the gage G; the
40 cam wheel H, the pointing hammers *b, b', b², b³*, and the cam *a⁴* moves the hammers toward the cam shaft so as to draw the point of the spike. There are two knives for cutting off the spike one of these, D',
45 is fixed, and the other, D, moves; the latter is secured in a sliding box I, which is operated by the inclined extremity of the bar *c* acting upon the surface of an inclined plane *d*, secured to the sliding box I. The
50 bar *c* is thrust forward by the cam *a* and is withdrawn by a spring, while the moving knife is also withdrawn by a spring acting on the sliding box in which it is secured. The dies which grip the spike are four in
55 number E, E', E², E³, two being stationary and two moving; one (E') of the stationary

ones is immediately below the place where the rod is introduced and is paired with a moving one E immediately above it, the latter is secured in a box I' attached to a
60 lever J extending across the machine, hinged at one extremity *e* to the bed plate, A, and operated through the medium of a connecting rod, K', attached to the other end *e'*, by the rod *c'* which is thrust forward by the
65 cam *a'*. The stationary die, E³, of the other pair is secured in a box, I³, which contains the stationary knife D'; and the moving die, E², is secured in the sliding box I which also contains the moving knife. The header, F, is placed immediately below the entering
70 spike rod, and is operated by the cam *a²* through the intervention of a rod *c²*, rock shaft M, and cam or toe *a⁶*; the return motion being effected as with the other members by a spring. Immediately opposite the header is the gage, G, against which the rod strikes when thrust into the machine, and which regulates the length of the spike. This
75 gage is adjustable so as to vary the length of the point, and is situated between the four hammers, *b, b', b², b³*, which form the point; as soon as the spike is gripped by the dies this gage is withdrawn toward the shaft by
80 a cam *a³* so as to leave the inner extremity of the rod free for the action of the pointing hammers. The latter are four in number the two, *b², b³*, at the sides are operated by the cams *g*, on the sides of the cam wheel
85 H acting through the intervention of hinged brays *h'*, and their faces are sufficiently long to include between them the whole length of the longest point required, these hammers always strike in the same place and when
90 nearest to each other always include the same distance between their faces; their office is to keep the point of uniform width while it is drawn out by the upper and under hammers, *b, b'*, which advance toward and
95 recede from the cam shaft and are operated by cams, *g'*, on the periphery of the cam wheel, H, acting through the intervention of the hinged brays, *h*, on which the tails of the helves slide.

The advance of the two hammers (*b, b'*)
105 is effected by pivoting their helves to a carriage, L, which is drawn toward the cam shaft by the cam, *a⁴*, acting through the lever, *i*, and connecting rod, *j*; its return motion and the consequent recession of the
110 hammers being effected by springs. The tail of each helve is furnished with an adjustable

wiper, k , which can be set by a screw l to accommodate itself to the different sizes of spikes required, and to the differing inclinations of their points; it will be perceived
 5 that these wipers are inclined to the direction in which the carriage moves, hence as the latter is drawn toward the cam shaft the faces of the hammers will continually strike closer to each other, thus drawing out the
 10 point between them in a manner precisely the same as that practiced by a blacksmith in pointing a spike by hand. There are two sets of cams on the periphery of the cam wheel, one to operate each hammer, hence,
 15 if this wheel was secured to the cam shaft, the hammers would make two sets of blows for each revolution of the shaft; this would be worse than useless as they would interfere with the motion of the gage, G , and
 20 prevent the spike rod from entering between them. This difficulty is obviated by making the cam wheel loose on the shaft and connecting it therewith by a sliding clutch N , which is alternately disconnected and connected
 25 with the cam wheel H by a face cam, m , secured to the clutch and running against a snug projected from the bed plate, and by a spring n which forces it against the cam wheel when the cam m has passed the snug.
 30 By this arrangement the cam wheel revolves with the cam shaft but half the time, and remains at rest after each one of its half revolutions until it is siezed again by the clutch. The cams which operate the dies
 35 have a dead motion so that the spike is held securely until the head and point are completed; it is then released and is thrust from the stationary dies by a discharging rod, p , acting against its side, and operated by a
 40 lever, r , and a cam a^5 , secured to the rim of the fly wheel C .

The operation of the machine is as follows: the spike rod previously heated is introduced above the header and between the
 45 moving and fixed knives, being supported above the header by a rest, s ; the rod is thrust into the machine until the end strikes the gage, G , when the closing knife cuts off the portion of the rod between it and the
 50 gage; the severed piece falls upon the lower stationary die where it is immediately gripped between the stationary and moving dies; the header then acting upon its outer extremity forms the head, while the ham-

mers at the same time form the point; the 55 finished spike is released by the withdrawal of the moving dies, and is ejected sideways by the discharging rod from its place on the lower fixed die, when it drops from the machine. As the knives separate, the spike 60 rod is again thrust forward, and spikes are successively made in the same manner until the rod is exhausted.

I have heretofore described two of the pointing hammers as having stationary pivots, but it is evident that in making tapering spikes or nails all four hammers should be drawn toward the cam shaft, and that the tails of their helves should be furnished with the adjustable wipers before described. 65 Cases will also arise in which it is unnecessary to make the pivots of the hammers movable, and then the whole four may be arranged as the side hammers (h^2 h^3) herein described. 70 75

In making different kinds of work it may be found necessary to vary the form proportions and arrangement of the faces of the hammers, and this I contemplate doing. These several modifications which I propose 80 to make in the machine to adapt it to different kinds of work are so obvious and so easily made by any one conversant with the construction and use of such machinery, that I deem a particular description of the 85 same unnecessary and therefore have omitted it.

What I claim as my invention and desire to secure by Letters Patent is—

1. The combination of advancing and re- 90 ceding hammers with their respective adjustable wipers and hinged brays arranged and operating substantially as herein set forth.

2. I claim the adjustable wipers (k) which 95 can be set to cause the hammers to form spike points more or less sharp.

3. I claim drawing the pointing hammers of a spike or nail machine above the rod, substantially in the manner herein set forth, 100 during the operation of forming the point.

In testimony whereof I have hereunto signed my name this 17th day of Sep. 1848.

HARRY A. WILLS.

Witnesses:

P. H. WATSON,
 WM. D. WASHINGTON.