
Lewis Williams, of Johnstown, Pennsylvania.

Spike-Grooving Machine.


Application filed January 7, 1901. Serial No. 42,296. (60 model.)

To all whom it may concern:

Be it known that I, Lewis Williams, a citizen of the United States, residing at Johnstown, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in Spike-Grooving Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in spike machinery, and more particularly to mechanism for grooving the sides of said spike.

My invention may be used as an independent machine, as shown in the drawings, wherein a single operation is performed upon a spike, and which consists in grooving two sides thereof, as will be later referred to, or it may be used in connection with an automatic machine, as shown in my former patent, No. 600,052, and dated March 1, 1898, wherein my present construction would perform one of a series of operations, as will be apparent.

It is the object of my invention to improve the efficiency of mechanism for the purpose specified and to produce a machine which is in every way practicable and reliable and whereby a uniform inward pressure is applied to the spike and tensile strain is avoided.

With the above objects in view my invention resides and consists in the novel construction and combination of parts shown in the accompanying three sheets of drawings, forming a part of this specification, upon which similar letters of reference denote like or corresponding parts throughout the several figures, and of which—

Figure 1 shows a plan view of my novel spike-grooving mechanism, together with connections for operating the same. Fig. 2 is an enlarged front view of said grooving mechanism, the operating-jaws being in an open position. Fig. 3 is a sectional plan view on line 3 3 of Fig. 2, the jaws being in a forward and closed position. Fig. 4 is a similar sectional plan view, the jaws being in an open and rearward position, corresponding with those of Fig. 2. Fig. 5 is a central vertical longitudinal section on line 4 4 of Fig. 2, the position of parts agreeing with Fig. 4. Fig. 6 is an enlarged detail front closed view of a portion of the face of the operating jaws. Fig. 7 is a detail side view of the grooving-jaws in the act of operating upon a spike. Fig. 8 is a similar side view of said jaws but in the act of completing a spike. Fig. 9 shows side views of a spike-blank before and after being operated upon with my machine.

Referring to the characters of reference marked upon the drawings, A indicates a base, forming the lower half of a casing in which my improved mechanism is mounted. B indicates a top section whose internal arrangement is similar to that of the lower section and is secured thereto by suitable bolts C, as shown. The forward end of the casing formed by these two sections is open, as will be apparent from Figs. 2, 3, and 4. The opposite end is provided with a plate D, which is also secured in position by means of screwbolts, as shown, and is provided with four openings E, through which links operate, as will later be more fully described. The construction of the mechanism within the case is such as to require a sliding reciprocating movement, which may be derived from any suitable source—as, for instance, from a slidable rod F, mounted in ways G G and provided with a yoke connection H to a suitable crank I of a rotary shaft, it thus being apparent that with a rotary movement of the shaft the rod will be reciprocated to and fro within its bearings, and by connections, as shown, the grooving mechanism can be manipulated.

Upon the inside of the end plate D is formed a central projection J, to which is pivoted two horizontally-disposed levers K K, each having a link connection L with the radial arms M M of the slide-rod F and by means of which said levers are thrown to and fro upon their pivotal points. These levers K are also each provided with link connections N N to the outer ends of grooving-jaws O O, both of which are provided with hubs L and are horizontally mounted in slideable bearings P P upon each side. These bearings slide upon movable ways Q Q, the operative surface of which is at all times horizontal. The backs R of these ways are inclined, as shown in the drawings, and slide upon a corresponding inclined surface of the casing and are provided with a small rib S to engage a corresponding groove.
upon the inner wall of the casings, which groove serves to guide the wedge-shaped way when the latter is pushed forward or backward, and thereby crowding the operative surface thereof to or from the center of the tool, as the case may be. Between the levers K and the guide bearings F is provided a direct connection in the form of links T, by means of which said bearings are moved to and fro upon the ways. By reason of the foregoing construction it will be seen that the assemblage of links, levers, bearings, &c., operate to and fro by the connections L with the driving medium and that the only fixed bearings are the two between the levers K, K and the projection J.

As before stated, the wedge-shaped ways Q are movable upon an inclined plane in a manner to open and close the operating-jaws O, and as a preferred means for manipulating said jaws I provide an orifice U in each of said ways, into which a pin V of the lever K operates. Said pin projects from each side of said lever and loosely fits into said orifice U of the ways upon each side and serves only to engage the ends thereof when the lever is in its extreme forward or backward positions, thereby moving the ways slightly after the jaws have been rocked. The purpose of this construction, as will be obvious, is to open and close the jaws when in their extreme backward and forward positions respectively. The opening movement releases the engagement of the spike, while the closing grasps the same. The jaws O perform the grooving operation by means of a central rib O' upon the semicircular face thereof, and by reason of the engagement of the outer end of said rib with the upper sides of the spike-blank, as will be apparent from an inspection of Figs. 3, 7, and 8, which illustrate the rolling movement of said jaws upon the blank. The head of the blank will be fixed in any suitable clamp (not shown) in a manner to project outward for engagement by the jaws above mentioned.

In addition to the above pair of grooving-jaws and mechanism for operating the same I provide a similar set of mechanism for operating the top and bottom jaws, which work in conjunction with said grooving-jaws and form the flat side of the spike, which mechanism consists as follows:

At a right angle to the grooving-jaws I arrange a pair of vertically-disposed shaping-jaws a a, which are provided with hubs and are pivoted in sliding bearings b b, mounted upon movable wedge-shaped ways c c and provided with link connections d d to a swinging lever c, pivoted to the central projection J, before mentioned. A link e serves to connect the shaping-jaw and the operating-lever, as will be apparent from an inspection of the drawings. The swinging levers c are pivoted slightly in advance of the levers K, which fact necessitates the shortening of the links f and d and the lengthening of the links g with the radial arms h of the sliding rod F. The levers e are also provided with pin connections i to engage the orifices j in a manner to operate the wedge-shaped slides when in the extreme forward and backward positions, as will be obvious. The foregoing construction, as will be apparent, is substantially a duplicate of that previously described and by means of which the grooving-jaws are manipulated, the principal difference being in the shortness of the connections, which variation is unimportant and is simply done to secure a strong pivot for the vertical levers.

The faces of the operating-jaws (see Fig. 6) are materially different, however, one being adapted to form the grooved sides of the spike, while the other forms the flat sides complete, including the corners thereof.

Referring to Figs. 2 and 6, it will be seen that the connecting-faces of the operating-jaws are specially constructed to snugly fit against each other in a manner to prevent the accidental formation of a fin upon the sides of the spike. Said object is accomplished by forming two square flanges a upon the face of top and bottom jaws, which are of a proper distance apart to form therein the smooth sides of the spike, including the corners of the same. The grooving-jaws are provided with central ribs O, which are of a width and depth to fit between and project upon the inside of the flanges a’ of the top and bottom jaws.

The operation of my invention is as follows:

A spike-blank is placed into the machine between the jaws when the parts are in the position shown in Fig. 4, whereupon by an inward movement of the slide-rod F within its bearings G G (shown in Fig. 1) and its connections, including the ways Q and c, the operating-jaws are rocked forward and closed inward upon the sides of the blank, after which reverse movement is imparted, which rocks the jaws backward and rolls the face of the ribs thereof into two sides of the spike-blank, thus forming grooves in two sides thereof, as shown in Figs. 7, 8, and 9. With the completion of the above operation the ways are moved slightly down the incline, which separates the jaws in a manner to release the spike, which is removed and a second inserted, when the operation is repeated.

During the operation the spike-blank is stationary, and in acting upon it the jaws close by a lateral movement, rock on their axes, and also move longitudinally along the blank, and the construction whereby this is effected is a novel and particular feature of my invention. This novel construction, which permits the blank to be stationary while the jaws close upon it, rock, and move longitudinally without moving the blank bodily in the direction of its axes, is particularly useful in the manufactures to which it applies, and these features make it applicable to turret-machines, in which to avoid other complications the blank is necessarily stationary dur-
ing the time when each one of the series of forming operations is being executed upon it.

A turret spike-machine of the class referred to is shown and described in my prior patent,
No. 606,052, dated March 1, 1898.

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

1. The combination in a spike-grooving machine, of jaws for operating upon the sides of a spike-blank, means for holding said blank stationary, and means for imparting to said jaws rocking, longitudinal and lateral movement.

2. In a spike-grooving machine the combination of swinging laterally and longitudinally movable jaws having suitable operating-surfaces, means for manipulating said jaws upon a spike-blank to produce grooves thereon, and means for holding said spike-blank stationary, substantially as shown and described.

3. In a spike-grooving machine, the combination of swinging jaws having suitable operating-surfaces, movable bearings in which said jaws are pivoted, means for moving said bearings laterally and longitudinally, and for rocking said jaws to produce a grooved spike, substantially as shown.

4. In a spike-machine of the class specified, the combination of swinging jaws having intersecting operating-surfaces, bearings in which said jaws are hung, means for moving said jaws laterally, longitudinally, and operating said jaws, as and for the purpose set forth.

5. The combination in a spike-grooving machine, of grooving and shaping swinging jaws having curved operating-surfaces, laterally and longitudinally movable, and bearings in which said jaws are hung, ways on which said bearings are mounted, mechanism for operating said jaws and bearings, substantially as shown.

6. The combination in a spike-grooving machine, of grooving and shaping jaws having curved intersecting operating-surfaces, bearings in which said jaws are mounted, means for imparting longitudinal lateral and rocking movement to said jaws.

The combination in a spike-grooving machine, of operating jaws for grooving and shaping the spike, reciprocating and laterally-moving bearings in which said jaws are hung, means for rocking or swinging the jaws upon said bearings in a manner to open and close the same.

8. A spike-grooving machine comprising grooving and shaping jaws, laterally and longitudinally movable bearings supporting said jaws, slidable ways upon which said bearings are mounted, an inclined guide to receive a rib of the way, means for operating said jaws, bearings and ways, substantially as shown and described.

9. A spike-grooving machine comprising grooving and shaping jaws, laterally and longitudinally movable bearings supporting said jaws, ways upon which said bearings are slidably mounted, means for imparting to the ways a lateral movement, connections for operating the jaws and movable bearings.

10. A spike-grooving machine comprising grooving and shaping jaws, laterally and longitudinally movable bearings supporting the same, radially-moving ways for said bearings, levers having fixed pivots and provided with suitable operating connections, links connecting said bearings and jaws with the levers.

11. A spike-machine of the class described, the same comprising grooving and shaping jaws, laterally and longitudinally movable bearings supporting the same, ways for said bearings mounted on incline guides, levers pivoted at their inner ends, links connecting said jaws and bearings with the levers, connections between said levers and ways for operating the latter on their incline guides and means for operating the levers aforesaid.

12. A spike-grooving machine comprising a series of radially-arranged pivoted jaws having intersecting operating-surfaces, means for imparting to said jaws rocking, longitudinal and lateral movement, and means for holding the spike-blank in a stationary position, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

LEWIS WILLIAMS.

Witnesses:
HERBERT LUEBBERT,
CYRUS C. HUBBARD.