

Spike-Machines.

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IMPROVEMENT IN SPIKE-MACHINES.

Specification forming part of Letters Patent No. **149,771**, dated April 14, 1874; application filed March 7, 1874.

To all whom it may concern:

Be it known that I, JAMES J. McCARTNEY, of St. Louis, in the county of St. Louis and State of Missouri, have invented a certain Improved Bolt and Spike Machine, of which the following is a specification:

This invention relates to the die-block on which is held the blank for the spike or bolt, to the combined griper and shear, and to the construction of the die-block with a countersunk part for the reception of the "blank," the side of the countersink being "chilled" or provided with a steel cutter, as desired, so as to form the fixed blade of the cutter or shears, the movable jaw being formed by the edge of the griper or holding die, which, in its downward movement, cuts off and holds the severed blank while a head is being formed thereon by the header. The blank-rod is guided into place under the griper by a guide-slot in the die-block, the top portion of said slot being formed by a semicircular throat-piece, the mouth of which is made flaring, and the opposite end thereto having an upturned guide-flange to direct the holding-die in its cutting action, said die being pivoted in its oscillating arm, and being held, by means of a suitable spring, in constant contact with the guide-flange of the die-block, so that in its descent it will be guided by said flange to cut in a plane vertical to the axis of the blank, although the arm moves in the arc of a circle.

The operating mechanism of the machine will be the usual cam, eccentric, and crank movements, &c., substantially as shown.

Figure 1 is a side elevation. Fig. 2 is a sectional elevation, showing the dies arranged for making bolts. Fig. 3 is a detail section, showing the construction of the dies for making spikes.

A is the frame of the machine; B, the main driving-shaft, carrying a heavy driving fly-wheel, B'. C is a crank-disk, which intermittently operates the feed-rollers D D by means of the connecting-rod C', pawl c, and ratchet-wheel c', secured to the shaft of one of the feed-rollers D, the purpose being to feed the blank forward while the header and griper are being retracted, prior to their forward movement in making the next bolt or spike, and at the same time allow the rolls D D to remain sta-

tionary (so as not to feed the blank-rod) while the bolt, &c., is being headed. E is the eccentric, which imparts a forward and backward movement to the header-block F, which moves on adjustable slides F', and is prevented from side movement by guide-lugs G, secured to the frame A of the machine. f is the header-die, the face of which is sunk to the desired shape of the head of the bolt or spike. H is the cam, which operates the oscillating arm I, pivoted at i in the frame A, and having pivoted at its other end the gripping or holding and cutting jaw or die J, the lower end j of which, in addition to the function of holding the blank while being headed, also forms the movable blade or jaw of the cutter or shears that cuts off the blank from the blank-rod a; and said end of the die J is forced out and kept in contact with the vertical flange l of the die-block K by a strong spring, j', so that the cutter-die J will move in a straight direction, though its actuating-arm I oscillates on its trunnions i. K is the die-block, which may form part of or be separate from the supporting-casting K', as desired. Said die-block is so arranged as to receive the blank-rod a from the rolls D D, into a guide-groove in its top face, the end k of the groove forming the fixed blade or jaw of the cutter. The groove is covered over by a semicircular throat piece or cover, L, having a flaring mouth for receiving the blank-rod a, and a vertical flange, l, for the gripping-die J to abut against and be guided by, so that it will descend in a vertical straight line, instead of a circular line, which it (the die J) would do if it were secured fixedly in its oscillating arm I. The objection to the gripping and cutting die J descending in a circular line is, that it cuts off the ends of the bolt on a bevel, in which case not only would the point of the bolt be imperfect, but it would be almost impossible for the header to form a perfect head on the bolt; but by cutting the blank in a line vertical with its axis, a perfect head can be formed by the header. There being no excess of metal on either side, the metal is spread evenly by the header, and the head is evenly balanced. The griper-die J in its descent cuts off the blank a', (which is that part of the bar projecting outside the throat-piece L,) and holds it down against the die-block K, while the

header *F f* moves forward and forms a head on the blank thus held, and on the ascent of the griper-die *J* the headed bolt, &c., is pushed out of the die-block *k* (so as to fall into a receiver underneath the machine) by a pivoted tripper, *m*, arranged in a recess in the die-block *K*, and which is operated by rod *m'*, connected to the fulcrumed arm *M*, which is oscillated by the up-and-down movement of the griper-arm *I* through the connecting-rod *i'*.

Fig. 3 shows the formation of the dies for making spikes. The dies *K J* in this case are formed tapering or inclined at one end, so as to form the tapering point on the spike-blank after cutting it off.

When used for making spikes the die *J* may be fixed in its arm *I*, the curved movement of which is not objectionable in this case, as it is not required to have the blank ends cut square.

The operation is as follows: The heated blank-rod *a* is fed intermittently to the cutting-off mechanism by the feed-rolls *D D*, operated by pawl and ratchet *c c'*, connecting-rod *C'*, and crank-disk *C* on main driving-shaft *B*, the feeding movement taking place while the header and gripping and cutting dies are retracted, and the blank-rod remains stationary

while the cutting and gripping die *J* descends to cut off and hold the blank during the interval that the header is moving forward to form a head on the blank; and during the back and upward movement of the header and die *J*, the finished blank is forced out of the die *K* by the tripper *m M m' i'*, and a fresh portion of the blank-rod *a* is fed (by the feed-rolls *D D* and operating mechanism) under the jaw or die *I*, for the formation of the succeeding bolt or spike.

I claim as my invention—

1. The die-block *K k*, cover *L*, cutter and holder *J j*, arm *I*, and header *F f*, all combined and arranged substantially as set forth.

2. The oscillating arm or holder *I* carrying a pivoted cutting and gripping jaw or die, *J*, in combination with the die-block *K k*, with the guide-flange *l*, and header *F f*, substantially as set forth.

In testimony of said invention I have hereunto set my hand in presence of witnesses.

JAMES J. MCCARTNEY.

Witnesses:

SAML. KNIGHT,
ROBERT BURNS.