

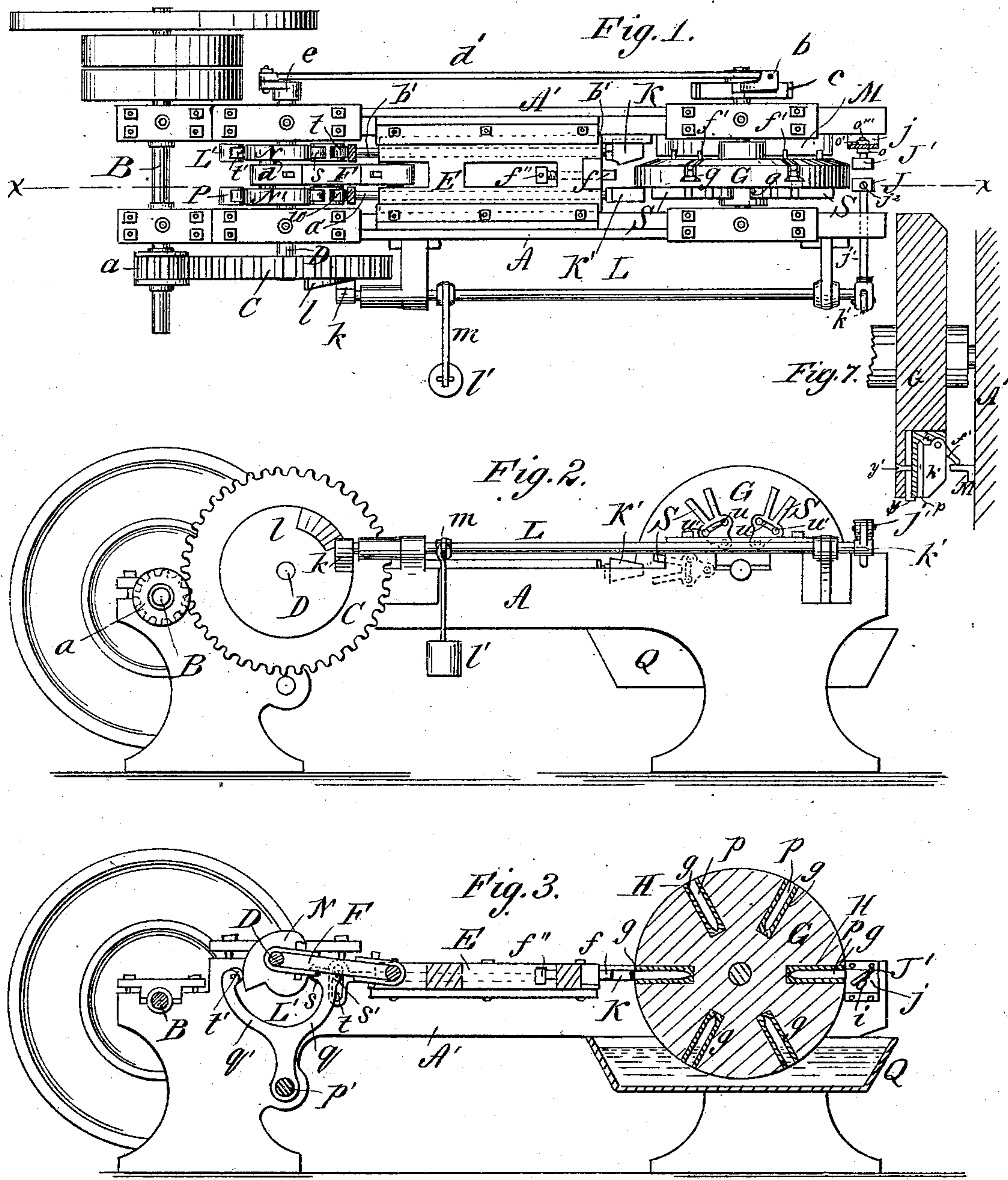
(No Model.)

G. H. WARING.

SPIKE MACHINE.

No. 272,994.

Patented Feb. 27, 1883.



WITNESSES :

Down Twitchell.
C. Sedgwick

Fig. 5.

INVENTOR:

G. H. Waring,

Fig. 6.

BY

Miss H.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE H. WARING, OF INDIANTOWN, NEW BRUNSWICK, CANADA, AS-
SIGNOR TO HIMSELF, AND CHARLES MILLER, OF SAME PLACE.

SPIKE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 272,994, dated February 27, 1883.

Application filed June 6, 1882. (No model.) Patented in Canada August 7, 1882, No. 15,244.

To all whom it may concern:

Be it known that I, GEORGE H. WARING, of Indiantown, in the county of St. John, New Brunswick, in the Dominion of Canada, have
5 invented a new and Improved Machine for Making Spikes, Bolts, Rivets, &c., of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying
10 drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of my invention. Fig. 2 is a side elevation of the same. Fig. 3
15 is a sectional elevation taken on the line $x x$ of Fig. 1. Fig. 4 is a detailed sectional view, showing the construction of the removable dies and the method of securing them in the die-wheel. Fig. 5 shows the form of one of the
20 blanks for railroad-spikes, and Fig. 6 shows the form of one railroad-spike completed. Fig. 7 is a central section through the die-wheel, showing the manner of opening the jaws of the dies and releasing the finished article.

25 The invention will first be described in connection with the drawings, and then pointed out in the claims.

A A' represent the side frame-plates, which hold the operative parts of the machine.

30 B is the main power-shaft, which, through the pinion a and large gear-wheel C, imparts motion to the shaft D, which is formed with the crank or eccentric d in its center.

The sliding head E is placed in suitable ways
35 formed in or secured upon the inside of the side plates, A A', and is reciprocated by the shaft D; the same being connected with the crank or eccentric portion d of the shaft by means of the connecting-rod F. This reciprocating head E carries the bending or heading
40 tool f at its forward end, which bends or forms the blanks in the removable dies H, held in the die-wheel G. This die-wheel G is formed with the chambers or recesses $g g$, in which the said
45 removable dies H are placed. There will be several sets of these removable dies, according to the number of different articles desired to be made with the machine, which dies will be interchangeable with each other in the die-wheel.

50 The bolts, spikes, or rivets are shaped and head-

ed in these dies by the said bending or heading tool f , as just mentioned, and the blanks for the same are cut from a heated rod by the knives J J', the rod being fed between them
into the dies from the rear of the machine as 55 the die-wheel revolves. The die-wheel is revolved intermittingly from the shaft D by means of the crank e , secured thereon, ratchet c , secured upon the shaft of the die-wheel, the pawl b , and the connecting rod d' , which con- 60 nects the pawl with the said crank e , as shown in Fig. 1. The ratchet c has as many notches as there are dies in the die-wheel, and they are so arranged that each movement of the wheel will bring one of the dies on a line with the 65 heading or bending tool f and cutting-off knives J J'.

Each of the dies H is formed of the chambered block h and the jaw h' , hinged therein, as shown in Fig. 4. The cavity p between the 70 face of the jaw and the walls of the chambered block may have the form and size of the bolt, spike, rivet, or other article to be made.

In Fig. 4 a die for making railroad-spikes is illustrated. In this form of die the cavity is 75 made pointed for shaping the point end of the spike. The chambered block is formed with projections or lips at its back edges to fit in under-cuts or grooves formed in the recesses $g g$ of the die-wheel, as shown in Fig. 1, for hold- 80 ing the die from outward or sidewise movement, and on the back of the jaw h' is formed the inclined lug f' , which runs in contact with the cam-plate M, secured in proper position to the inside of the frame-plate A', as shown in 85 Figs. 1 and 7, for opening the jaw for discharging the complete bolt, spike, or rivet.

For preventing the die from moving radially out of the recesses in the die-wheel, I employ the L-shaped key y , which is slipped 90 in the recess back of the die, and held in place by the screw y' , the lip of the key resting upon the edge of the block h , as shown in Fig. 4.

K is a sliding head-block, having a diagonal face, which closes the jaw h' of each of the dies 95 upon the blanks in the die just at the time the dies are brought successively in line with the tool f , thus holding the blanks as in a vise while the head is being bent or formed by the tool. This head-block K is held parallel with 100

the tool *f* by means of the rod *b'*, to the forward end of which the head-block is attached, and which passes back through the reciprocating head E, and this rod and head-block are reciprocated for closing and releasing the said jaws *h'* of the dies by the cam N, fixed upon the shaft D, the rod and cam being connected together for action by means of the divided yoke L', placed upon the small rod or shaft *p'*, as shown in Fig. 3, upon which it rocks as the cam revolves. The member *q* of the yoke is provided with the friction-rollers *s s'*, the former running in contact with the cam, the latter being surrounded by the loop *t*, formed at the rear end of the rod *b'*. This loop accommodates the rocking movement of the yoke L', and causes the cam to impart to the rod *b'* and head-block K only a straight reciprocating motion. The member *q'* of the yoke is provided with the friction-roller *t'*, which runs in contact with the cam, as shown in Figs. 1 and 3.

For causing the dies in the die-wheel to come exactly in line with the tool *f* at the time the head E is moved forward for heading or bending the blank, I provide the machine with the reciprocating wedge-shaped head K', which is moved forward slightly in advance of the tool *f*, and enters at each operation of the machine one of the claw-plates S, secured upon one side of the die-wheel G, as shown in Figs. 1 and 2. There are as many of these claw-plates as there are dies in the wheel, and they are made adjustable upon the wheel by means of the slots *u* and screw-bolts *u'*, and the said wedge-shaped head is held parallel, or nearly so, with the tool *f* and head-block K by means of the rod *a'*, to the forward end of which the said head is attached, and which passes through the head E, and this rod and head are reciprocated by the cam N', fixed upon the eccentric shaft D, the rod and cam being connected by the yoke P, (shown in Fig. 1,) placed upon the shaft *p'*, upon which it rocks. This yoke P is in all respects like the yoke L', and the rear end of the rod *a'* is formed with the loop *w*, Fig. 1, which joins the rod *a'* to the yoke in the same manner that the rod *b'* is joined to the yoke L', as above described, and as shown in Fig. 3, which arrangement causes the cam N' to impart to the rod and wedge-shaped head only a straight reciprocating motion.

The knife J' is a stationary one, having a tang, *o'''*, threaded at its end, held in the inclined slot *i* in the housing-plate *j*, between the shoulder *o* on the tang and the nut *o'*, so that the knife may be raised or lowered or turned axially for cutting the blanks square across from the rod, or at a greater or less angle, according to whether the bolt, spike, or rivet is to be made pointed or not.

The knife J is adjustable upon its rod *j'* by means of the set-screw *j²*, (see Fig. 1,) passing partly through the knife J and bearing against the rod *j'*, so that its edge may be brought to correspond with the position of the edge of the knife J'. This knife is reciprocated once for

every movement of the die-wheel for severing the blanks from the rod of iron being fed between the knives and into the dies, by means of the crank-shaft L, which is rocked by means of the cam *l*, formed on the large cog-wheel C, coming in contact with the arm *k*, formed on the rear end of said shaft. *l'* is the crank at the other end of the shaft, to which the rod *j'*, carrying the knife J, is attached, and *l'* is a weight attached to the arm *m* of the shaft L for returning the shaft and knife to their normal positions after cutting each blank.

If railroad-spikes are to be made by the machine, the knives J J' are to be set at an angle, as shown in Figs. 1 and 3, so that the blanks will not be cut square across from the rod, but will be made pointed, as shown at *n* in Fig. 5. When the spike is completed it will have the form shown at *n'* in Fig. 6. With this form of blank it will be seen that the first effect of the bending or heading tool, when brought against it in the die, will be to shape the point of the blank—that is, to simply bend the point already formed to the center of the blank, and then to bend over the outer end of the blank to form the head of the spike. Both ends of the blank being already pointed, the amount of power required to give this form to the blank is comparatively small.

The tool *f* is made adjustable in the reciprocating head E by means of the screw *f''*, and there will be various forms of tools, according to the articles desired to be made upon the machine.

For keeping the dies and the die-wheel cool and always in good working condition, I provide the machine with the water-trough Q, which is kept filled with water, into which the lower edge of the wheel is submerged, as shown in Fig. 3.

The cavity in the dies for making bolts or rivets will not be made pointed at the bottom, but will be made with a flat bottom, and the knives J J' will be adjusted so as to cut the blanks square across from the rod, and the blanks will not be bent, as in the case of railroad-spikes, but will be simply upset to form the head.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a spike-machine, the intermittingly-revolving die-wheel G, provided with the adjustable claw-plates S, having slots *u* and bolts *u'*, in combination with reciprocating wedge-shaped head K', substantially as and for the purposes set forth.

2. The combination, with the intermittingly-revolving die-wheel G, provided with the claw-plates S, and carrying the dies H, having the hinged jaws *h'*, of the reciprocating wedge-shaped head K' and the reciprocating beveled head-block K, substantially as described.

3. In a spike-machine, the combination, with the housing-plate *j*, provided with an inclined slot, *i*, of the stationary cutting-knife J', hav-

ing threaded tang o''' , shoulder o , and nut o' , and adjustable reciprocating cutter J, substantially as shown and described, whereby the blanks may be cut square or diagonal, as set forth.

5 4. The gear-wheel C, formed or provided with the cam l , in combination with the shaft L, formed with the cranks k and k' , the rod j' , and the knives J and J', substantially as described.

10 5. The die-wheel formed with recesses, in combination with the removable dies H and the keys y and screws y' , for holding the dies in the recesses of the die-wheel, as set forth.

6. In a spike-making machine, the eccentric 15 shaft D, provided with the cams N and N', in combination with the sliding head E, reciprocating head-block K, reciprocating wedge-shaped head K', and intermittingly-revolving die-wheel G, provided with the plates S, and 20 adapted to carry the dies H, formed with the hinged jaw h' , substantially as described.

GEORGE H. WARING.

Witnesses:

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JAMES SIMPSON.