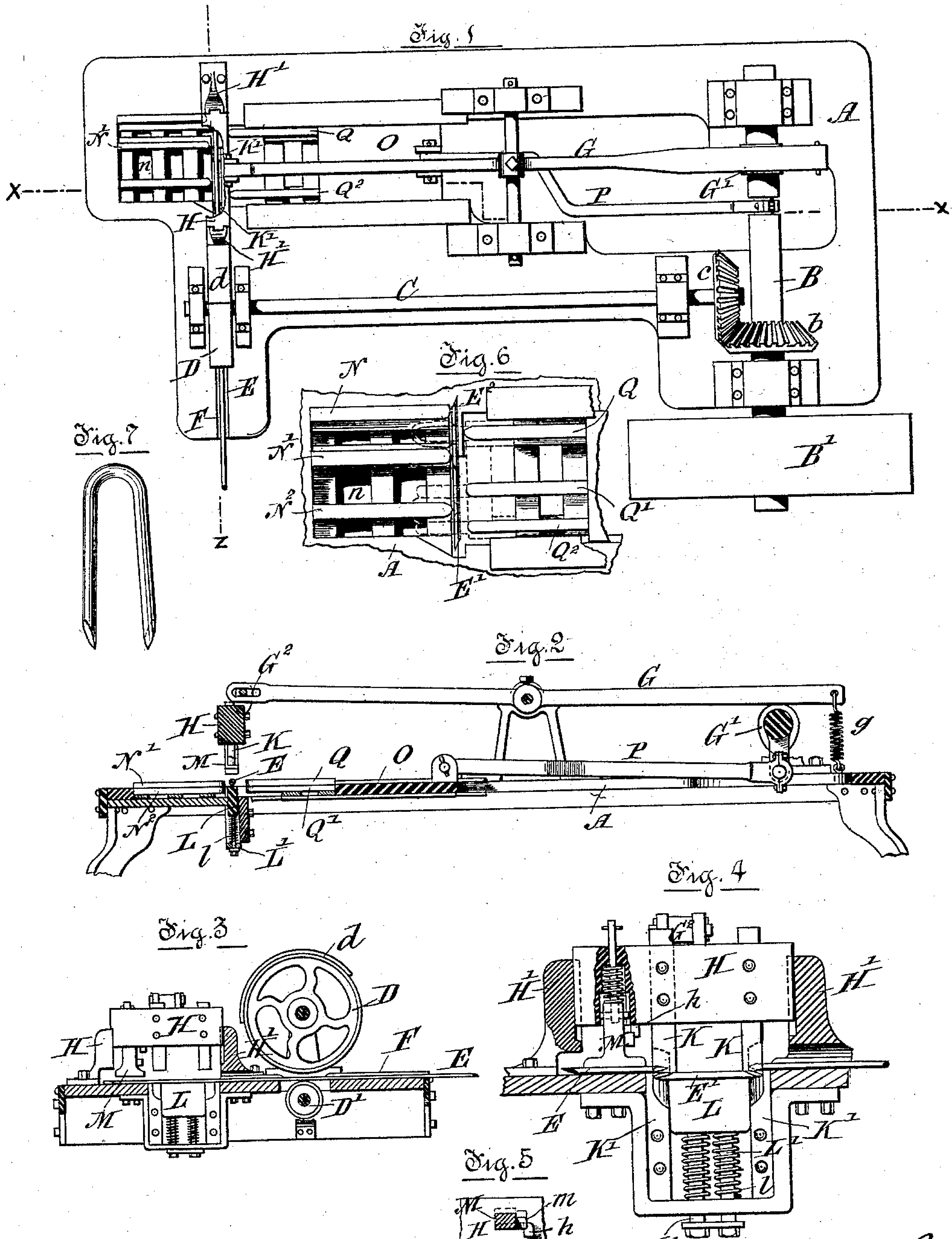
(No Model.)

W. A. ROOT.

MACHINE FOR FORMING STAPLES.

No. 277,615. Patented May 15, 1883.



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MACHINE FOR FORMING STAPLES.

SPECIFICATION forming part of Letters Patent No. 277,615, dated May 15, 1883.

Application filed August 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ALBERT ROOT, of the city of Montreal, in the district of Montreal and Province of Quebec, Canada, have invented certain new and useful Improvements in Machines for Forming Staples; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention, which is applicable to the manufacture of wire staples for fences and all ordinary purposes, has for its object to produce these more quickly and perfectly than can be done by the machines now in use. It comprises the following features, viz: mechanism by which two blanks are cut at the same time from the wire fed intermittently to the cutters, devices for carrying and holding the wire during the operation of cutting, and the arrangement of plungers operating in the same direction, by which the two cut blanks are simultaneously bent into shape with the bevels outside.

For full comprehension of my invention reference must be had to the annexed drawings, forming part of this specification, in which—

Figure 1 is a plan view of the invention; Fig. 2, a sectional elevation on line *x x*, Fig. 1; Fig. 3, the same on line *z z*, Fig. 1; Fig. 4, a detail sectional elevation of cutters, &c.; Fig. 5, a sectional view taken through plunger M; Fig. 6, a plan view, enlarged, of plungers, &c.; and Fig. 7, a view of finished staple.

Similar letters of reference indicate like parts.

A is the bed or table of the machine, of any suitable size and shape, and carried as may be desired. Upon this is mounted, in suitable bearings, the main or operating shaft B, receiving motion through a belt and pulley, B′, or in any other suitable way.

C is a counter-shaft rotated by means of bevel-gears *b c* and carried in bearings secured on A, upon it being mounted a wheel or disk, D, having any desired proportion of its periphery covered with leather, rubber, &c., as shown at *d*. This, as the wheel D rotates, comes in contact with the wire E, lying in the groove F, formed in the projection of the table A, and feeds it forward to the cutters, the length of the intermittent feed, and consequently of the blanks to be cut from the wire, being regulated by the length of the leather *d*. A small roller, D′, grooved or not, as desired, over which the wire passes, facilitates the feed.

G is a lever pivoted in proper bearings and operated preferably by a cam, G′, mounted on the shaft B. To the end of this lever is secured, by a slotted link, G^2, the cutter-head H, moving up and down in guides H′. A spring, *g*, or other suitable device may be used to restore the lever to its normal position when the pressure of the cam is removed.

K K are the cutters, secured firmly, but so as to be capable of adjustment, in the head H, K′ K′ being the lower cutters, operating with the cutters K K to shear the blanks from the wire, the cut being at an acute angle with its axis. It will be seen by reference to Fig. 4 that these cutters do not simply detach the end of the wire fed in, but cut out an intermediate piece, thus making by the one cut two blanks, (marked respectively E′ and E^2.) The wire which forms the blank E′ is, when the cut is to be made, resting on a bed, L, carried in a suitable hanger and supported by spiral springs *l*, coiled around pins L′ L′, so as to oppose a yielding resistance to the action of the cutters and allow them to shear completely through. The blank E^2 is, when detached, held in place by a plunger, M, suitably secured in the head H, and arranged, as shown in Fig. 4, with a spring, so as to afford sufficient pressure to hold the blank in place, but not to resist the action of the forming horizontal plungers now to be described, and shown particularly in Figs. 1 and 6.

Immediately in front of the cutters K, and secured in a recess, *n*, formed in the bed A, are arranged projecting pieces or fingers N N′ N^2.

O is a plunger-head, to which back-and-forth motion is given by means of a pitman, P, actuated by a crank on the main shaft B, or in any other suitable way.

Q Q′ Q^2 are plungers secured to the head O, Q being so placed as to enter the space between N and N′, and Q′ Q^2 as to pass on either side of N^2, space being in every case allowed for the thickness of the wire. When the plunger-head, which is timed to operate directly the

cutters have performed their work, is moved forward the blank E′ is, as shown in Fig. 6, lying with its center opposite the rounded end of N^2, and the blank E^2 with its center opposite to the space between N and N′. The result is that the plungers Q and Q′, in their forward movement, passing on either side of the projection N^2, bend the blank E′ into the form of a staple with the points pointing forward and the beveled edges outside. Simultaneously with this the plunger Q, entering the space between N and N′, has taken with it the blank E^2, bending it across its own end into a staple pointing backward and with the bevels on the outside.

Although the finished staples will, as a rule, fly out of their sockets, I propose to attach to the machine any ordinary device—such as a spring—to eject them in case of difficulty. Should it be desired that the bevels, although on the outside of the staple, should not be opposite to each other, the device shown in Figs. 4 and 5 and now to be described may be employed for this purpose.

Upon the under side of the cutter-head H is formed a lug, *h*, which, as the cutters K come to the full end of their stroke, engages with a similar lug, *m*, on the side of the plunger M, (these lugs having oblique meeting faces,) pushing it a little over in its seat in the head H, and thereby slightly turning over the blank E^2, so that the bevels are not vertical, and, when the blank is bent by the plunger Q, will be, although on the outside of the staple, not opposite to each other. (See Fig. 7.)

In will of course be understood that the plunger Q works in connection with the projecting fingers N N′ at a higher level than that at which the plungers Q′ Q^2 work in connection with the finger N^2. These several projecting fingers and plungers are so secured to the bed-plate and plunger-head as to be capable of adjustment to compensate for wear.

Although special mechanism which will be found very suitable for the purpose has been described as operating the cutters and plungers, it must be understood that I do not confine myself to this, as any well-known equivalent may be employed for the purpose.

Having thus described my invention, I beg to state that what I claim as new, and wish secured by Letters Patent, is as follows:

1. In a wire-staple-forming machine, the combination of two cutters for separating from the wire more than one blank at a time, and a reciprocating plunger for simultaneously bending said blanks into shape, substantially as set forth.

2. In a wire-staple-forming machine, the combination, with the cutter-head, of two cutters, whereby both ends of one blank are cut at once and two blanks detached at the same time.

3. In a wire-staple-forming machine, the cutters arranged to cut the blanks with their oblique ends in opposite directions.

4. In a wire-staple-forming machine, a set of projecting fingers formed in the bed-plate, and a corresponding set of plungers secured in a moving plunger-head, so arranged that one plunger shall fit in between two fingers, and vice versa, as and for the purposes set forth.

5. In combination with the moving and fixed cutters K K′, the bed-plate I, constructed, as shown, and arranged to support the intermediate cut blank.

6. In combination with the cutter-head H and cutters K, the plunger M, carried in the cutter-head and holding detached blank E^2.

7. The combination, with the head H and plunger M, of the lugs *h* and *m*, as and for the purposes set forth.

Montreal, 3d day of August, A. D. 1882.

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