

(No Model.)

H. E. CUNNINGHAM.
STAPLE MACHINE.

No. 387,946.

Patented Aug. 14, 1888.

Fig. 1.

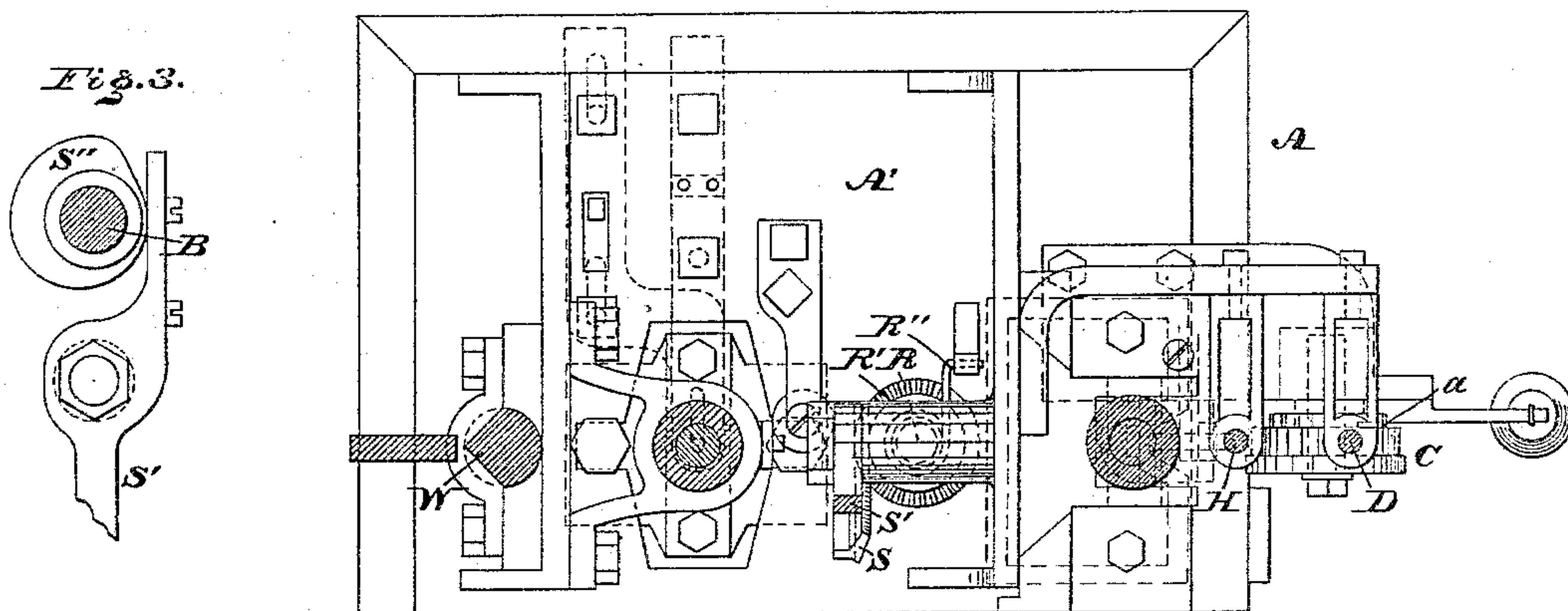


Fig. 3.

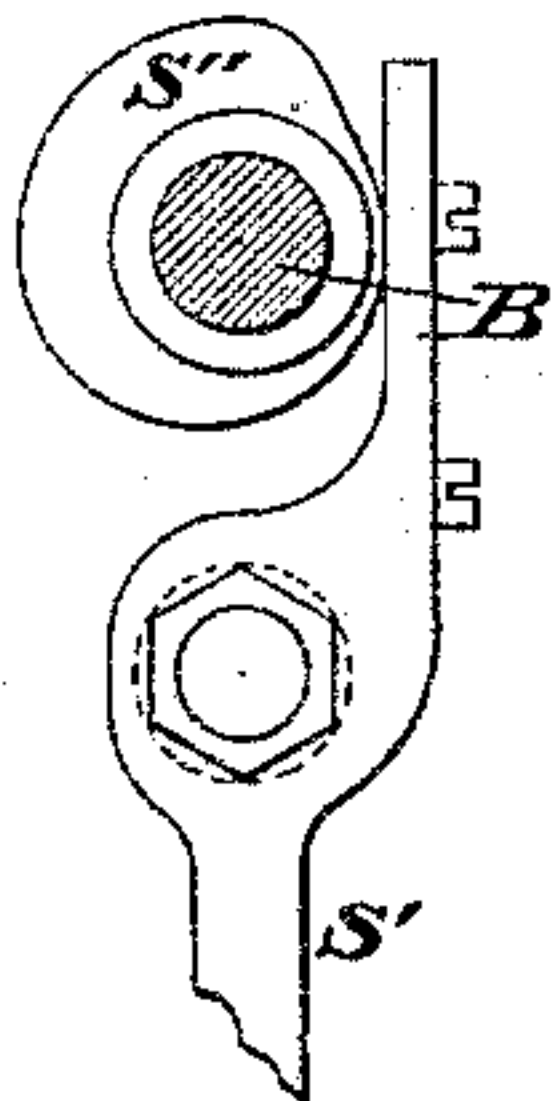


Fig. 2.

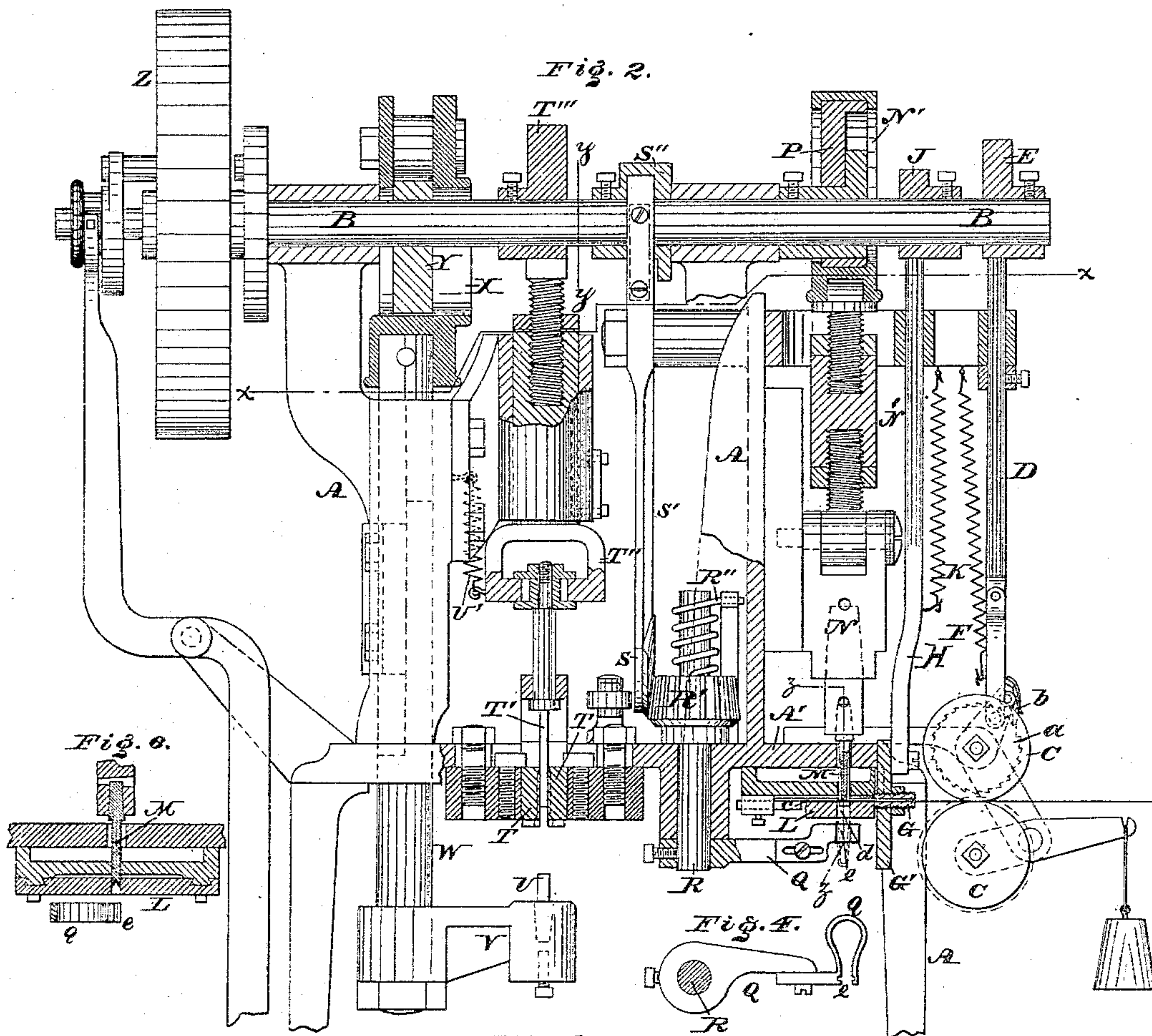


Fig. 6.

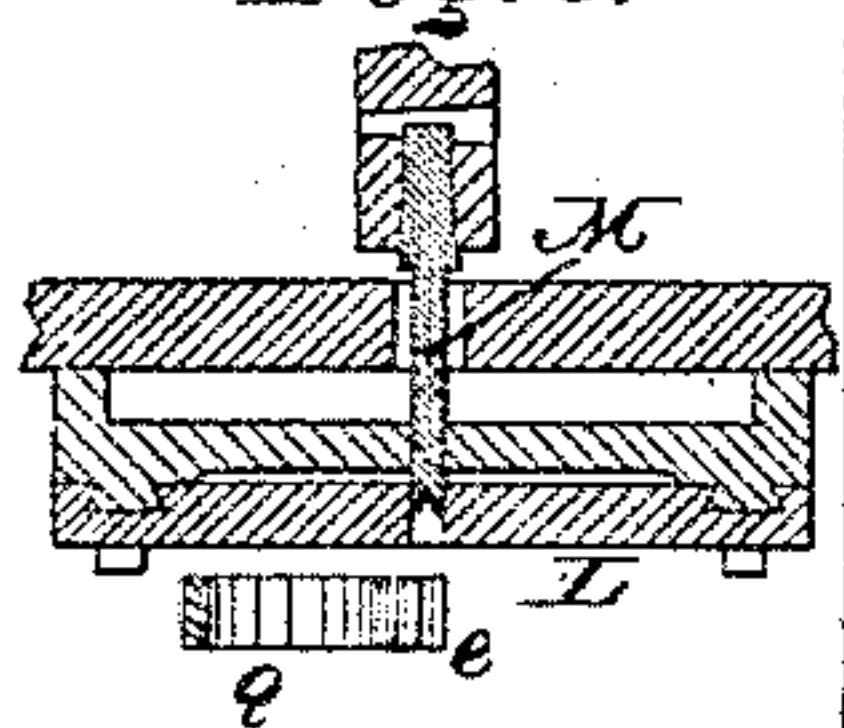
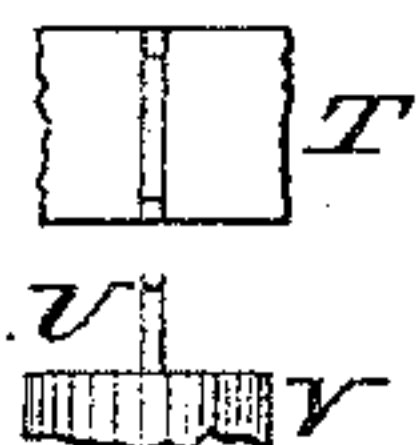


Fig. 5.



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STAPLE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 387,946, dated August 14, 1888.

Application filed May 16, 1884. Renewed June 22, 1886. Again renewed March 3, 1888. Serial No. 265,103. (No model.)

To all whom it may concern:

Be it known that I, HORACE E. CUNNINGHAM, a citizen of the United States, residing at Bridgewater, in the county of Bucks, State of Pennsylvania, have invented a new and useful Improvement in Machines for Making Wire Staples, which improvement is fully set forth in the following specification and accompanying drawings, in which—

10 Figure 1 is a horizontal section in line xx , Fig. 2, of a machine for making wire staples embodying my invention. Fig. 2 is a longitudinal vertical section thereof. Fig. 3 is a section of a detached portion in line yy , Fig. 2. Fig. 4 is a top view of a detached portion. Fig. 5 is a face view of one of the dies. Fig. 6 is a sectional view on line zz , Fig. 2.

Similar letters of reference indicate corresponding parts in the several figures.

20 My invention consists of a machine for making wire staples, embodying devices for feeding, cutting, pointing, and bending the wire, shaping the staple, and discharging the finished article, as will be hereinafter fully set forth.

Referring to the drawings, A represents the frame of the machine, and B the driving-shaft mounted thereon.

30 C C represent the wire-feeding rollers, which are mounted on the frame A below the shaft B, adjacent to the table A' of the frame, the upper roller receiving intermittent motions by means of a ratchet, a , which, secured to said roller or the shaft thereof, is engaged by a pawl, b , the latter being carried by a vertically-moving jointed arm, D, which is properly guided in the frame A, and receives motion in one direction by means of an eccentric, E, on the shaft B, and in the other direction by a spring, F, which is suitably connected with said arm and the frame A.

45 The lower roller is mounted on a weighted arm, so as to be forced toward the upper roller and cause the wire to be properly fed forward to a tubular guide and cutter, G, which is connected with a vertically-movable plate, G', to which is attached an arm, H, which receives motion in one direction by means of a cam, J, on the shaft B, and in the other direction by a spring, K, which is suitably connected with the said arm and the frame A. The plate G'

is guided by the table A', and locates the guide and cutter G in position to direct the wire to a support or die, L, which depends from the table A', and has a horizontal opening, c , to 55 receive the wire, and a vertical opening, d , the latter permitting the wire to be bent by means of a plunger, M, which is attached to a head, N, and passes through an opening in the table A', and is adapted to enter the opening d , said 60 head N being connected with a yoke, N', which is operated by an eccentric, P, on the shaft B, whereby as the plunger is depressed the wire on the die L is bent and forced through the opening d , the bent wire in somewhat staple 65 form then being pushed into a holder and carrier, Q, which consists of a horizontal arm located below the table, formed with a vertical opening, e , and attached to a vertical shaft, R, said opening in one position of the holder 70 being directly beneath the opening d of the support L.

In order to impart rotary reciprocating motions to the shaft R, and thus operate the holder Q, said shaft having its bearings on the table 75 A', I attach to the upper end of the shaft a pinion, R', with which gears a toothed segment, S, and to said pinion is secured one end of a spring, R'', whose other end is fixed to a stationary part of the frame A on the table A'. 8c The segment S is secured to an arm, S', which is pivoted to the frame A and engaged by a cam, S'', on the shaft B, so that when the arm is moved in one direction by said cam S'' the segment rotates the pinion, and this operates 85 the holder Q and winds the spring R''. When the cam leaves said arm S', the spring is permitted to unwind, thus imparting motion to the holder Q in the opposite direction and rotating the pinion R', so as to restore the arm S' 90 to its normal position ready to be engaged by the cam S''.

Connected with the table A' on the under side thereof are shaping-dies T, the faces of which are grooved relatively to the form to be 95 imparted to the staples. Between the faces of the dies is fitted a vertically-moving plunger, T', whose head T'' is engaged by a cam, T''', on the shaft B. Below the dies T is a punch, U, which, attached to a head, V, is located in a 100 right line with the plunger T', said head being attached to a vertically-moving shaft, W, which

is guided in the table A' and frame A and raised and lowered by means of a yoke, X, which, connected with said shaft, is operated by a cam, Y, keyed or otherwise secured to the shaft B.

The head N, holder Q, and head T' are adjustable, in order to properly time the work and adapt the machine to the formation of staples of different lengths.

The operation is as follows: Power is imparted to the shaft B by the pulley Z or other suitable means, and the wire is fed between the rollers C C and directed through the guide G and placed on the block or die L stretched across the opening d. The plate G' is then lowered, and as it passes along the side of the die L it acts as shears, and thus cuts the wire the required length. The plunger M now descends and bears against the wire and bends the same centrally, forcing the bent piece through the opening d, causing the wire to be drawn, instead of having part of its stock cut away, and placing it in the holder, as shown in Fig. 2. The segment S now rotates the pinion R', whereby the holder Q is carried away from the support L and placed beneath the dies T, the plunger T' being in its lowest position. The punch U now rises and presses the bent wire of staple shape upwardly, and simultaneously therewith the holder Q is stripped of the wire and returns to its first position by the action of the spring R''. The punch forces the bent wire into the dies T, the legs of the wire passing between the plunger T' and faces of the dies, and the plunger is caused to rise by the action of a spring, U', whereby the wire receives its complete staple shape. The punch U now lowers, and as the plunger T' is depressed the staple is forced downwardly from the dies and ejected therefrom. Meanwhile another length of wire is advanced by the rollers C into the guide and cutter G, and the subsequent operations are a repetition of those hereinbefore stated.

The guide and cutter G is shown of the form of a tube threaded exteriorly, and engaging with a threaded opening in the plate G'; but it may have a set-screw whereby, when the cutting-edge of the tube wears away, the tube may be readily moved close to the support L, or entirely removed for sharpening purposes.

The contour of the depressions in the faces of the dies T is such that the legs and the crowns of the staples are properly shaped and the legs nicely pointed.

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

1. In a machine for forming wire staples, the die L, having a vertical opening, in combination with a plunger, M, movable arm Q, having opening e, and oscillating shaft R, substantially as described.

2. In a machine for forming wire staples, a holder for the wire, and a bending and reducing plunger, in combination with a movable arm, Q, for carrying the bent wire to the staple-shaping dies, substantially as and for the purpose set forth.

3. In a machine for forming wire staples, a support for the wire, a bending-plunger, and shaping-dies, in combination with an oscillating holder, having adjustable arm, carrying the bent wire as it leaves said die to the shaping-dies, substantially as and for the purpose set forth.

4. In a machine for forming wire staples, a holder or carrier for the primarily-shaped staple, in combination with an oscillating shaft, a pinion, toothed segment, and returning-spring, substantially as and for the purpose set forth.

5. In a machine for forming wire staples, staple-shaping dies, a plunger between the dies, and a punch for forcing the primarily-shaped staple into said dies and completing the shape thereof, combined and operating substantially as and for the purpose set forth.

6. In a machine for forming wire staples, feed-rollers, a cutter, a support for the wire, a bending-plunger, a die, a holder and carrier for the bent wire, staple shaping and pointing dies, a plunger within the dies, and a punch for forcing the bent wire into said dies, said parts being combined and operating substantially as and for the purpose set forth.

7. Feed-rollers, a cutter, a support for the wire, a bending-plunger, a die, a holder, and carrier for the bent wire, staple shaping and pointing dies, a plunger within the dies, and a punch for forcing the bent wire into said dies, in combination with connected arms and heads, and eccentrics and a cam, said eccentrics and cam being on the same shaft, substantially as and for the purpose set forth.

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Witnesses:

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