

(No Model.)

3 Sheets—Sheet 1.

F. PHILIPS.

MACHINERY FOR MAKING STAPLES.

No. 393,482.

Patented Nov. 27, 1888.

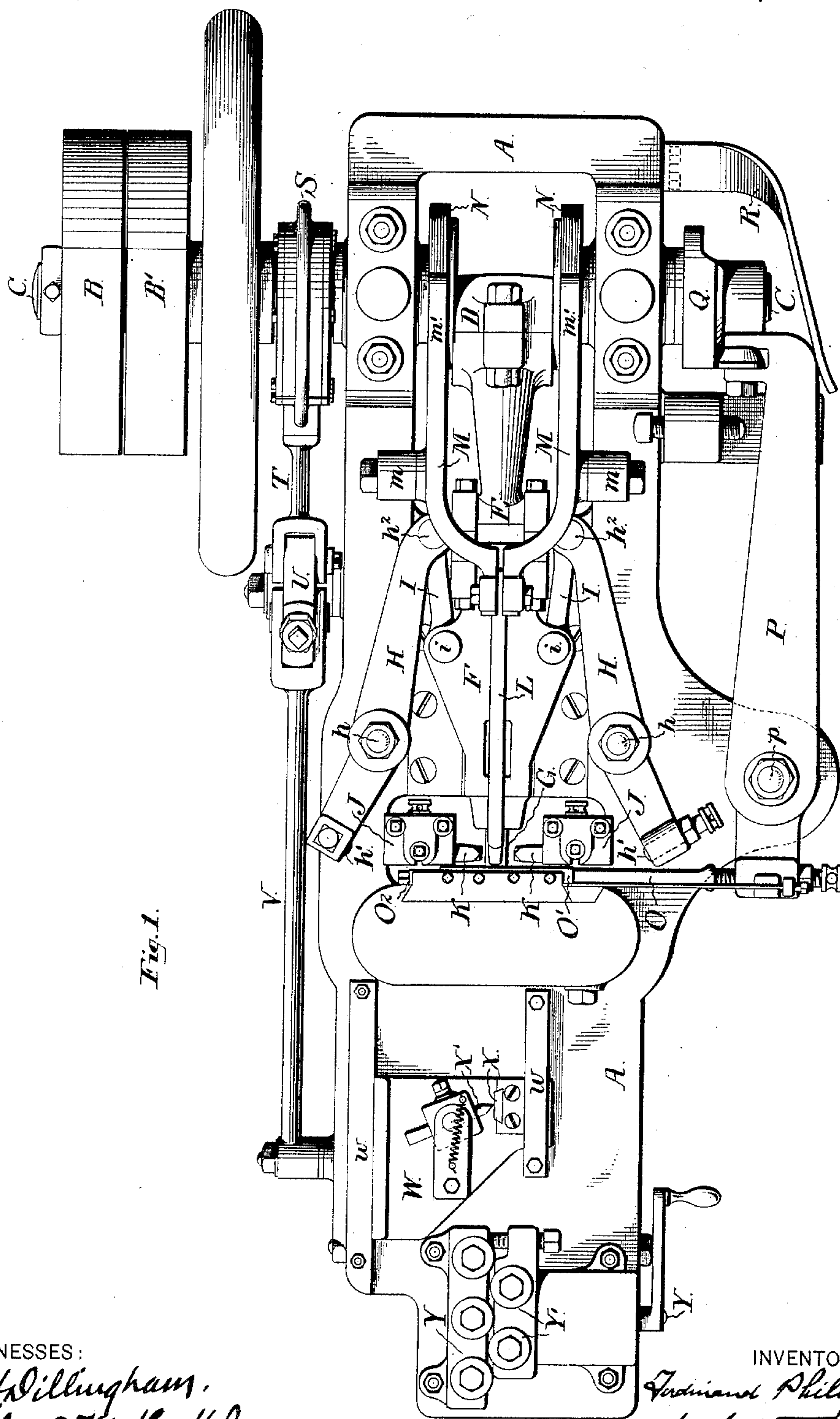


Fig. 1.

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(No Model.)

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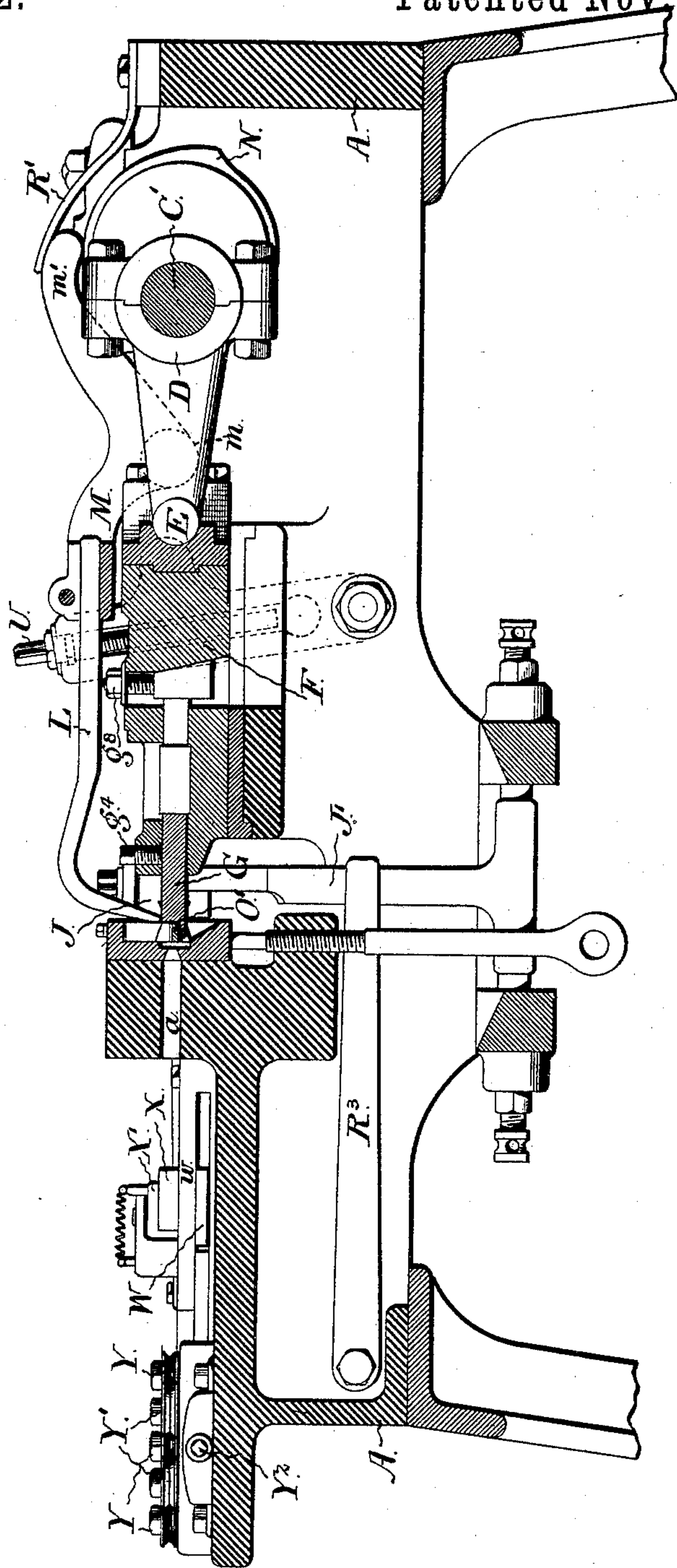
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Fig. 2.



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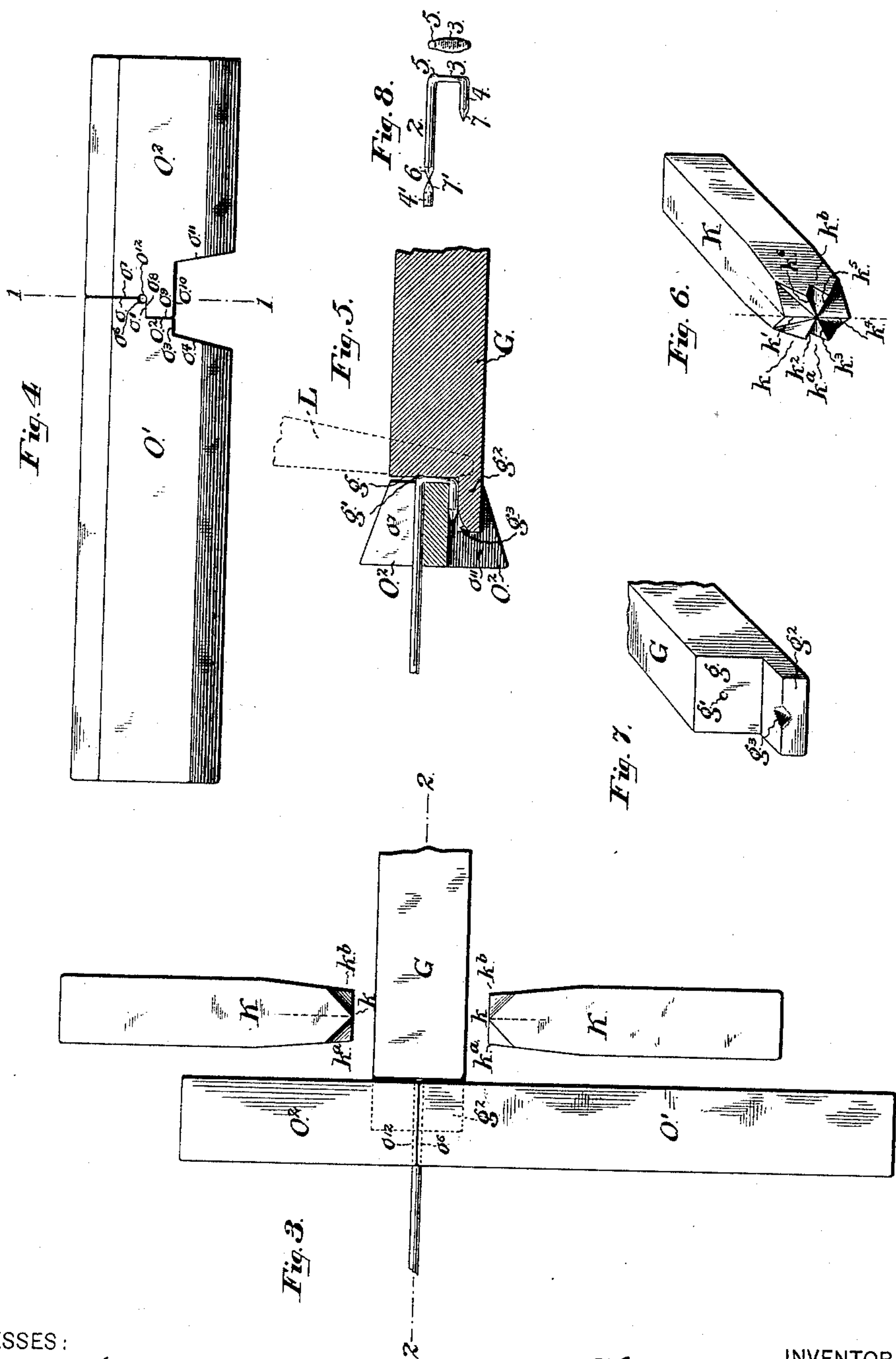
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MACHINERY FOR MAKING STAPLES.

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Patented Nov. 27, 1888.



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FERDINAND PHILIPS, OF PHILADELPHIA, PENNSYLVANIA.

MACHINERY FOR MAKING STAPLES.

SPECIFICATION forming part of Letters Patent No. 393,482, dated November 27, 1888.

Application filed October 4, 1888. Serial No. 287,204. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND PHILIPS, a subject of the Emperor of Germany, residing in the United States, at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Machinery for Making Wire Staples, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to mechanism for making wire staples, and has for its object to adapt the ordinary wire-nail machine to the manufacture of staples.

Reference being now had to the drawings which represent a wire-nail machine such as is shown in my patent, No. 353,585, granted November 30, 1886, provided with the improved mechanism by which I adapt such machines to the manufacture of staples, and in which—

Figure 1 is a plan view of the machine; Fig. 2, a central longitudinal sectional elevation thereof; Fig. 3, an enlarged plan view of the grippers, cutters, and header; Fig. 4, a front elevation of the grippers; Fig. 5, a sectional view of the grippers, header, and striker, on the lines 2 2 of Fig. 3 and 1 1 of Fig. 4. Fig. 6 is a perspective view of one of the cutters; Fig. 7, a perspective view of the header, and Fig. 8 shows in side and end views the wire staple which the apparatus as constructed is especially adapted to make.

A is the frame of the machine; C, the main driving-shaft having a crank, C'.

B B' are fast and loose pulleys on shaft C.

D is a connecting-link fitted in the usual way on crank C' and having at its other end a cylindrical knuckle-joint, E, which abuts against and is connected to the sliding header-block F.

G is the header secured to block F in the usual way and kept in proper position on frame A by set-screws $g^1 g^4$.

H H are the cutter-operating levers pivoted to the frame at $h h$ and connected with the sliding header-block F by the toggle-links I I, pivoted to levers H at $h^2 h^2$ and to block F at $i i$.

$h' h'$ are set-screws in the end of levers H, by which the contact with and stroke of the cutters is regulated.

J J are the cutter boxes or holders. They are secured on the ends of pivoted levers J',

(see Fig. 2,) and are held back by springs R^3 when not pressed together by levers H.

K K are the cutters.

L is the striker, which is held in the end of the pivoted striker-lever M, which is pivoted at $m m$ and has backwardly-extending arms m' , which rest on the cams N N and are held against them by spring R'.

O^2 and O^3 are the grippers, O^2 being stationary and O^3 having a reciprocating motion given it through the rod O and lever P, which is pivoted at p and has its free end in contact with cam Q, the spring R serving to maintain the contact.

S is a yoke fitting over a cam on shaft C and connecting, through connecting-rod T, rocking lever U, and connecting-rod V, with the feed-plate W, which rests on frame A and is guided by guides $w w$.

X is a block secured on feed-plate W, and X' a pivoted pawl with sharp edge, making with block X, a gripping device which can slide back along the wire, but which engages it and feeds it forward when plate W moves forward.

Y are stationary rollers, and Y' adjustable ones, secured on an adjusting-screw, Y², the two sets of rollers making a straightening device for the wire as it enters the machine.

With the exception of the new forms and relative combination and arrangement of the grippers, cutters, header, and knocker, which will be hereinafter described, the machine, so far as already referred to, is identical with the one described in my patent already referred to.

Referring now to those parts of the machine which in themselves possess features of novelty, O^1 and O^2 are the grippers, the abutting ends whereof are formed, as is best shown in Fig. 4—that is, the end of O^2 consists of the plain surfaces or faces o, o', o^2, o^3 , and o^4 , while the end of O^1 is made up of the surfaces or faces $o^5, o^6, o^7, o^8, o^9, o^{10}$, and o^{11} , so formed that the upper vertical face, o and o^5 , come in contact, or nearly so, while the projection bounded by faces o^6, o^7 , and o^{10} fits into the recess bounded by faces o^8, o^9 , and o^{11} , and the faces o^3 and o^{10} are substantially in the same plane, the lower faces, o^4 and o^{11} , being arranged so that they will be substantially equidistant from the plane of faces o and o^5 .

o^6 and o^{12} are grooves formed in the grippers in the line where the wire passes between them.

K K are the cutters which, where a double-

pointed staple like I, in Fig. 8, is to be made, are provided with cutting-faces, such as is shown at k , Figs. 3 and 6—that is, made up, as in Fig. 6, of six cutting-edges, k' to k^6 , inclusive, so as to cut the wire, as is indicated at 6 and 7' in Fig. 8. Where it is only desired to make one end of the wire pointed, the cutter ends are like the parts of the cutter-face marked k^a , the half indicated by k^b being added to make the double-pointed staple.

G is the header, the acting end of which is made up of a plain face, g , and the projection substantially at right angles to it indicated by g^2 . The upper corner of projection g^2 should have a recess or groove, g^3 , formed in it, as shown, to guide and center the wire and to make the projecting head in the staple. A depression should be formed in the face g of the header, as is indicated at g' .

L is the knocker, the end of which should be arranged with respect to grippers $O' O^2$, as is indicated in Fig. 5, and the lower or operating end of which should be curved, as shown.

The operation of the machine is as follows:

25 The wire is introduced between the straightening-rolls $Y Y'$ and passes between the block and pawl $X X'$ through a perforation in the frame, as at a , Fig. 2, between the grippers $O' O^2$. The feeding is done by the cam on shaft C, acting through box S, rod T, rock-lever U, rod V, and feed-plate W, which carries the block and pawl $X X'$. Following the action of the machine we may commence with the cutters, the boxes J J of which are forced together by the ends of levers H H as the header-block F is drawn back, cutting the wire, as is shown in Fig. 8. At or about the same time that the cutters act the wire is gripped between grippers $O' O^2$, lying between the grooves o^6 and o^{12} . Then, the wire having been cut, the cams N act through lever M, causing the knocker L to descend, its edge striking the projecting end of the wire and bending it down over the front faces of grippers $O' O^2$. The knocker then moves up again, and when it is out of the path of the header the crank O' , acting through link E and block F causes the header to advance with great force, its projection g^2 first striking the end of the downwardly-bent wire and bending it again at right angles over the edge of the face o^{10} of die O' , and then its face g , clamping the part 3 of the staple between itself and the point of the gripper, flattening it and forming the projection 5 by means of the depression g' of the header. (See Fig. 5.) After the staple is thus formed, the gripper O' moves away from O^2 , releasing the wire, which is then fed forward by the action of block X and pawl X' , and cut by cutters K K, finishing the staple and leaving the pointed wire ready to be treated as above described.

It is of course not essential that the grippers should extend below the surfaces $o^3 o^{10}$, but it is advisable for strength; and by recessing the

cutters below this plane room is made for the projection g^2 of the header. If it is not desired to make a double-pointed staple, the part k^b of the cutters can be omitted, and if but a single bend is required in the wire, the projection g^2 of the header can be omitted.

My devices can obviously be applied to all machines of the class to which the wire-nail machine of my former patent belongs.

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

1. In a machine for making wire staples, the combination of the two grippers $O' O^2$, one having a projection and the other a corresponding recess below the line on which the wire is clamped, the knocker L, arranged so as to move down in front of the grippers, cutters K K, and mechanism for actuating the said parts and feeding the wire, substantially as specified.

2. In a machine for making wire staples, the combination of the two grippers $O' O^2$, one having a projection and the other a corresponding recess below the line on which the wire is clamped, the knocker L, arranged so as to move down in front of the grippers, a header, G, having a projection, g^2 , arranged to pass under the grippers, cutters K K, and mechanism for actuating the said parts and feeding the wire, substantially as specified.

3. In a machine for making wire staples, the combination of the two grippers $O' O^2$, one having a projection and the other a corresponding recess below the line on which the wire is clamped, the knocker L, arranged so as to move down in front of the grippers, a header, G, having a projection, g^2 , provided with a guiding-groove, g^3 , in its upper edge, and arranged to pass under the grippers, cutters K K, and mechanism for actuating the said parts and feeding the wire, substantially as specified.

4. In a machine for making wire staples, the combination of the two grippers $O' O^2$, one having a projection and the other a corresponding recess below the line on which the wire is clamped, the knocker L, arranged so as to move down in front of the grippers, a header, G, having a projection, g^2 , arranged to pass under the grippers, and a plain face, g , with depression g' , cutters K K, and mechanism for actuating the said parts and feeding the wire, substantially as specified.

5. In a machine for making wire staples, the combination, with grippers $O' O^2$, of cutters K K, provided with six cutting-edges, so as to form points on both ends of the cut wire, and mechanism for actuating said parts and feeding the wire, substantially as specified.

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