

H. A. HARVEY.

MACHINES FOR MAKING CORRUGATED LEGGED STAPLES.
No. 175,087.

Patented March 21, 1876.

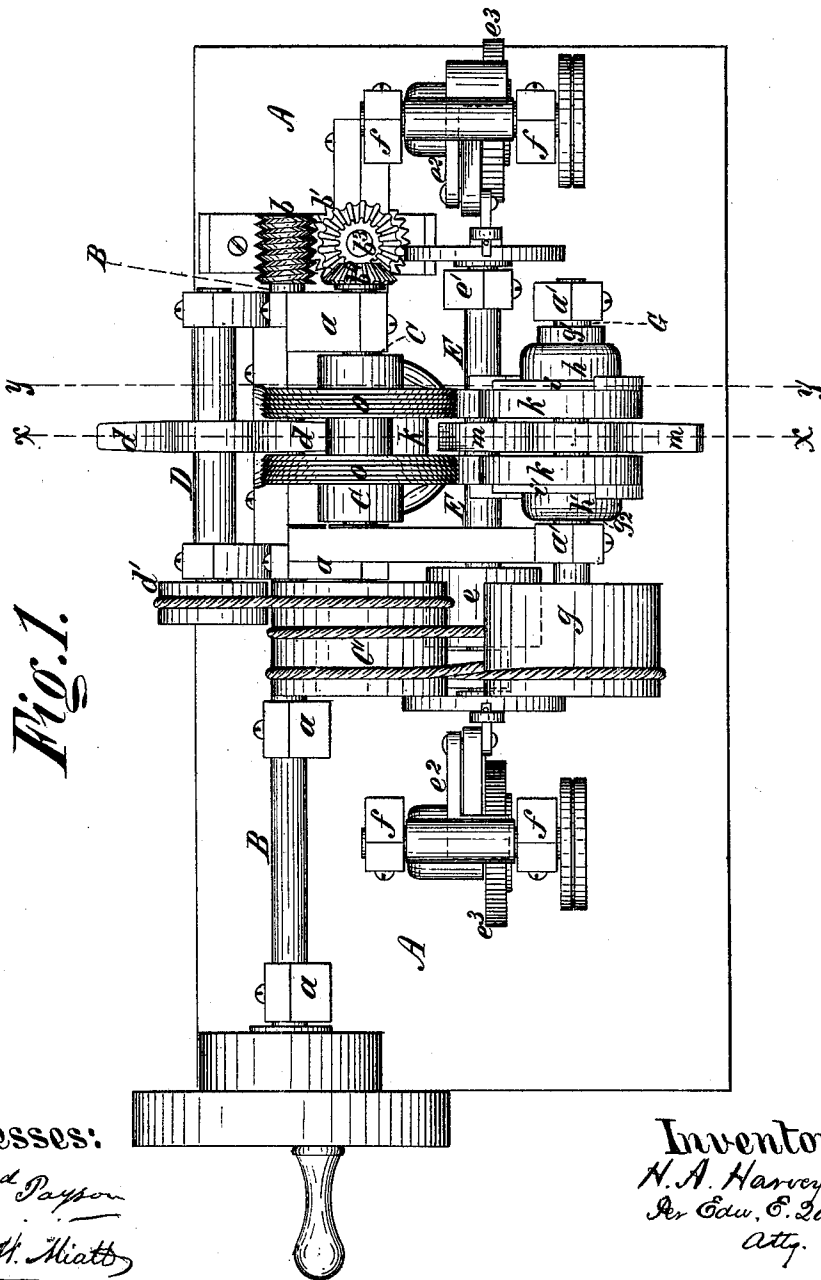


Fig. 1.

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Inventor:

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Fig. 2.

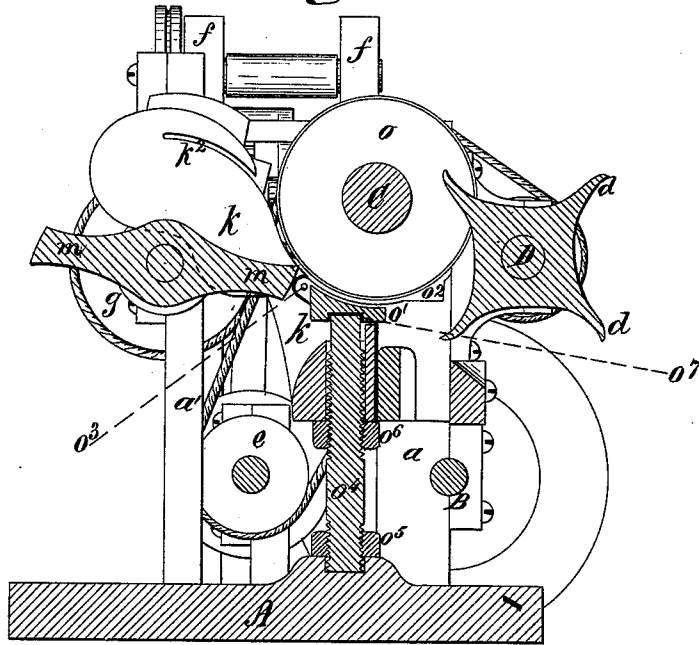
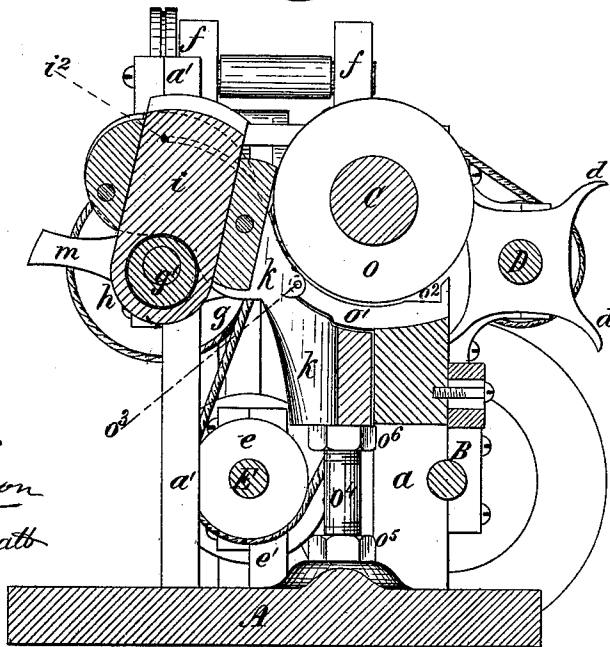


Fig. 3.



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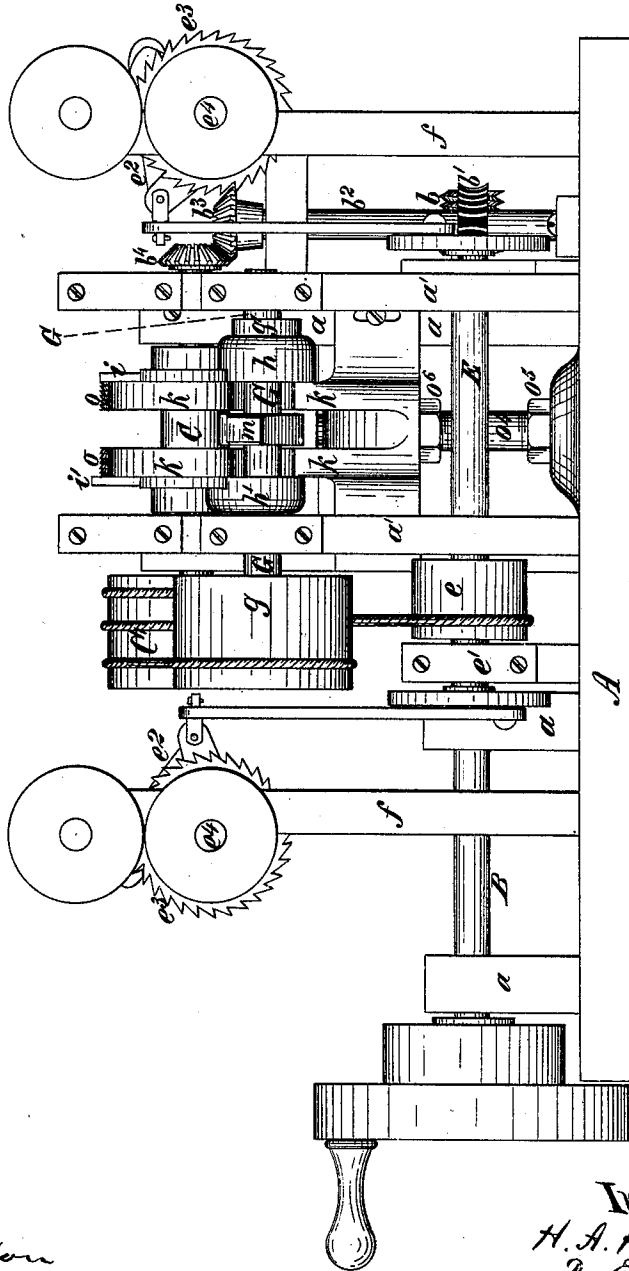
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FIG. 4.



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Fig. 5.

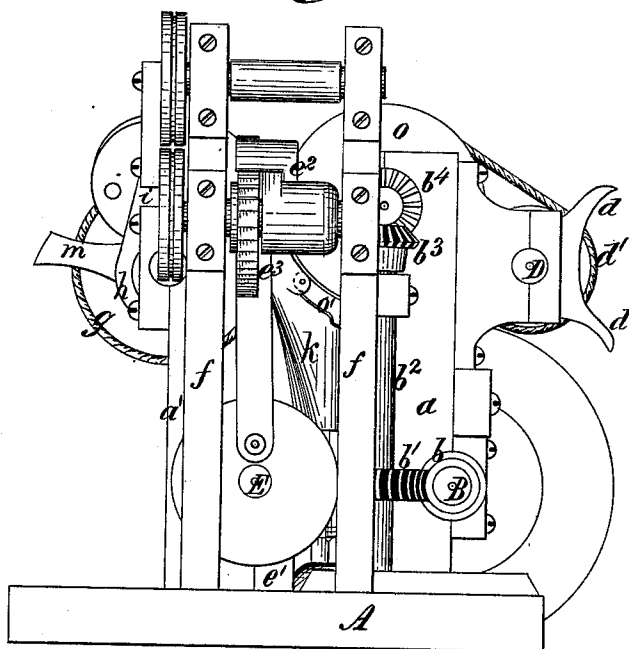
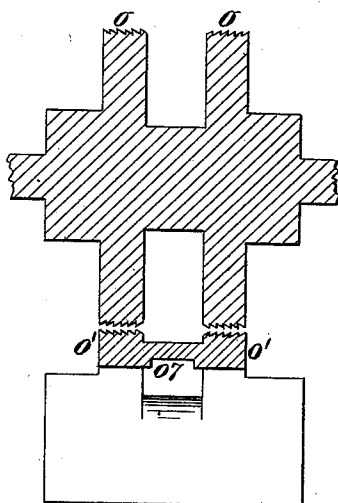


Fig. 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

HAYWARD A. HARVEY, OF ORANGE, NEW JERSEY.

IMPROVEMENT IN MACHINES FOR MAKING CORRUGATED LEGGED STAPLES.

Specification forming part of Letters Patent No. **175,087**, dated March 21, 1876; application filed February 7, 1876.

To all whom it may concern:

Be it known that I, HAYWARD A. HARVEY, of Orange, New Jersey, have invented certain Improvements in Machines for Making Corrugated Legged Staples, of which the following is a specification:

My invention has two distinct features, which may be usefully combined in a single machine, or which may be used separately in combination with other devices. These features are, first, the adjustable dies by which I corrugate blanks; and, secondly, the devices by which wire fed from a coil is cut into suitable lengths, and then formed into staples by the action of revolving hooks. When these features are arranged in combination the corrugating devices intervene between the devices which cut off the lengths of wire and the devices which bend these lengths into the form of staples.

That portion of my invention which relates exclusively to the corrugating-dies consists in the mode of adjusting a stationary die with reference to a rotating die. My stationary die is a concave bed-piece, one end of which is fixed upon a stationary pivot, while the other end is engaged by a set-screw, by the operation of which that end is swung toward or from the periphery of a cylindrical die rotating in fixed bearings.

In applying my invention to staple machines I combine, with each other, two sets of dies, such as I have described, for the purpose of corrugating the opposite end portions of a piece of wire, which, after corrugation, is bent into the form of a staple.

The accompanying drawings are as follows: Figure 1 is a top view of my machine. Fig. 2 is a transverse vertical section through the line *x x* in Fig. 1. Fig. 3 is a transverse section through the line *y y* in Fig. 1. Fig. 4 is a front elevation. Fig. 5 is an end elevation. Fig. 6 is a vertical section of the dies.

My machine consists of a substantial bed, A, provided with the uprights *a a*, which afford the bearings for the driving-shaft B, the die-shaft C, and the bender-shaft D. Motion is transmitted from the driving-shaft B to the die-shaft C by means of the worm-gear *b b*¹, the vertical shaft *b*², and the miter-gears *b*³ and *b*⁴. The end of the die-shaft C opposite

the miter-gears is provided with the pulley C', from which a belt is carried to the smaller pulley *d*¹ affixed to the bender-shaft D. Another belt is carried from the pulley C' to the pulley *e* affixed to the intermediate shaft E. The shaft E has its bearings in the short uprights *e*¹ *e*¹, and at each end has a crank-and-pitman connection with the dogs *e*² *e*², which, respectively engage the ratchet-wheels *e*³ *e*³, affixed to the feed-roller shafts *e*⁴ *e*⁴. The feed-roller shafts are, respectively, mounted in suitable uprights *f f* at either end of the machine. The feeding operation is performed in the usual way, by the action of grooved friction-rollers. For convenience I designate the side of the machine upon which the driving-shaft is located as the back. The opposite side, which I call the front, has two uprights, *a'* *a'*, which afford bearings for the delivery-cam shaft G, which is rotated by means of a pulley, *g*, cross-belted to the pulley C' on the die-shaft. The delivery-cam shaft carries two eccentrics, *g*¹ and *g*², which respectively engage the straps *h* and *h*¹ affixed to the lower extremities of the cut off blades *i* and *i*¹. The delivery-cam consists of two arms extending radially from a hub fastened upon the shaft G. The eccentrics *g*¹ and *g*² are relatively arranged upon the shaft G so that their throw is in opposite directions. The cut-off blades *i* and *i*¹ slide respectively in suitable guides upon the outer sides of the forked arm *k*, which curves downward, and is bolted to the front side of the uprights *a*. The branches of the forked arm *k* are provided with the curved slots *k*¹ and *k*², into the upper ends of which the wire is fed from the feed-rollers. The cut-off blades are provided with perforations *i*², which, at the proper time, respectively assume positions in line with the upper end of the guide-slots *k*¹ and *k*².

When in this position the wire is fed from the friction-rollers through the aperture *i*², and through the slots *k*¹ and *k*². When either of the cut-off blades is in position to allow wire from the friction-rollers to be fed through the perforation *i*² the inner side of the cut-off blade acts as a stop, against which the end of the wire strikes. For example, when the perforation *i*² in the blade *i* is in position to admit the wire the perforation in the opposite blade is

thrown upward, so that the inner face of the blade i^1 acts as a stop, as I have stated. The eccentrics then reverse the blades, and, in pushing up the blades i , cut off the wire which has been fed into the slots, and leave it in a position to be caught by one of the arms m of the delivery-cam. As the delivery-cam revolves the arm pushes the length of wire forward through the slots k^1 and k^2 , and drops it between the grooved peripheries of the rolling-dies $o o$ and the stationary curved dies $o^1 o^1$, which also have grooved faces. The concave faces of the dies $o^1 o^1$ conform to the shape of the rotating-dies. The dies $o^1 o^1$ are capable of adjustment, so that their distance from the rolling-dies may be varied according to the depth of the impressions or corrugations which it is desired to produce upon opposite ends of the length of wire operated upon.

The wire having been corrugated in its passage between the dies is delivered into recesses $o^2 o^2$, where it remains until caught by one of the arms d of the rotating bender affixed to the shaft D. The bender enters the space between the two rolling-dies $o o$ and the two stationary dies $o^1 o^1$, in the ends of which the recesses $o^2 o^2$ are formed, and pulls the length of wire from the recesses, and bends it into U form against the inner sides of the stationary dies. The wire, having been thus formed into a staple with corrugated legs, is thrown by centrifugal force downward from the bender into a box conveniently placed upon the bed of the machine to receive it. The stationary dies $o^1 o^1$ are made of a single piece of metal, which swings upon the pivot o^3 , passing through its upper end, and is adjusted in position by means of the vertical set-screw o^4 , provided with the jam-nuts o^5 and o^6 . The upper end of the set-screw o^4 engages the recess o^7 in the under side of the stationary die-piece. The lower end of the stationary die-piece is, therefore, lowered or elevated by changing the position of the set-screw o^4 .

It will be seen that in the organization of the machine, as shown and described, I have provided for two sets of feed-rollers for delivering wire, respectively, from two coils at opposite ends of the machine. Of course, one of these sets of feed-rollers may be omitted without affecting the operation of the other, nor the relation of the feeding mechanism to the other parts of the machine.

I claim as my invention—

1. In a machine for corrugating pieces of wire, a rotating circular die, in combination with a concave die, pivoted at one end, and provided with the vertical set-screw o^4 , having the jam-nuts o^5 and o^6 , by the operation of which the concave die is swung upon its pivot toward or from the periphery of the rotating die, substantially as shown and described.

2. The combination, with each other, of two sets of corrugating-dies, each set composed of a rotating circular die and a pivoted curved die, substantially such as described, for the purpose of impressing two series of grooves upon the opposite end portions of the periphery of a length of wire introduced between the dies, substantially as shown and described.

3. Two sets of rotating circular dies and pivoted curved dies, substantially such as described, in combination with a device for guiding and delivering a length of wire in suitable position to be seized and acted upon by such dies, substantially as described.

4. The revolving roller-dies $o o$ and stationary dies $o^1 o^1$, in combination with the recesses o^2 in the lower ends of the stationary dies, substantially as for the purpose set forth.

5. The revolving roller-dies and stationary dies, provided with the recesses $o^2 o^2$, in combination with a bender, d , for withdrawing lengths of wire from the recesses and bending them into a U form, substantially as described.

6. In a machine for making staples, substantially such as described, the combination, with each other and with a delivery-cam, of the two sets of feed-rollers at opposite ends of the machine, and the two cut-off blades i and i^1 , reciprocating in opposite directions by the rotation of the reversed eccentrics g^1 and g^2 , substantially as shown and described.

7. Rolling-dies and stationary dies, substantially such as described, for grooving both ends of a length of wire, in combination with a feeding and cutting-off device, and a delivery device for conveying the lengths of wire when cut off to the grooving-dies.

8. A device for feeding, cutting, and delivering length of wire from a coil, in suitable position to be seized and carried between rolling-dies and stationary dies, substantially such as described, in combination with such rolling and stationary dies, and the containing recesses for the reception of the lengths of wire after they have passed through the dies, and the bender operating to withdraw the lengths from the recesses, and at the same time bending them into a U form, substantially as shown and described.

9. Rolling-dies and stationary dies, substantially such as described, with a bending device and a delivery device, substantially such as described, in combination with double feeding and double cutting-off devices, substantially as set forth.

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Witnesses:

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