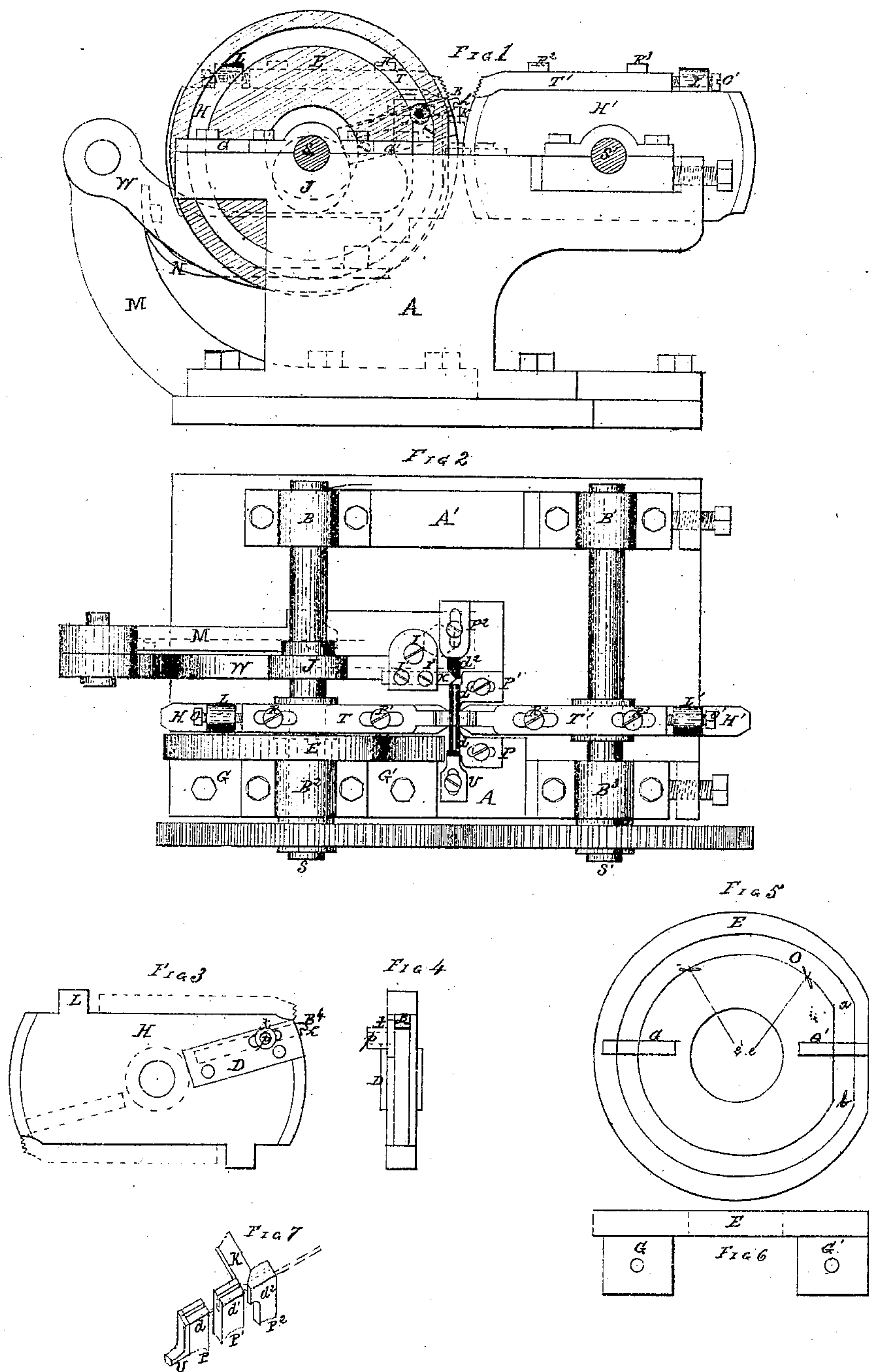


J. T. Darnell,

Staple Machine.

No. 102659.

Patented May 3, 1870.



Witnesses. { Charles H. Evans  
                  { Geo. Nichols

John T. Darnell } Inventor



# United States Patent Office.

JOHN T. DARNELL, OF FLORENCE, NEW JERSEY.

Letters Patent No. 102,659, dated May 3, 1870; antedated April 22, 1870.

## IMPROVED STAPLE-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, JOHN T. DARNELL, of Florence, county of Burlington and State of New Jersey, have invented a new and "Improved Staple-Machine;" and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The object of my invention consists in constructing a simple and effectual machine for making wire staples, whereby the staples are cut, formed, and barbed or notched at one operation.

The machine consists of a housing or framing of suitable form, and provided with bearings, in which are placed and work two horizontal shafts. On the said shafts are secured two revolving heads, made in the form of a zone of a circle. In the end of one of the heads is formed a slot or groove for the purpose of receiving a tool, which is guided so as to slide in and out as the head revolves, by means of an eccentric ring secured to the inner side of the housing. One end of the said tool, which projects out beyond the end of the head, is made somewhat in the form of a hook, and catches over the wire placed in suitable dies, and bends it (the wire) into the form of a staple at each revolution of the head. Secured on one edge of each of the revolving heads are tools which barb or notch the staples, in order to cause them to hold more firmly when once inserted in the wood. The wire to form the staple is cut of the proper length by means of a die, and an arm provided with a cutting-tool, and actuated by means of a cam formed on one of the shafts above mentioned. The said die is provided with an opening, through which the wire is passed, and the side of the die against which the cutting-tool works is formed on an angle corresponding to the angle of the cutting-tool, so that the wire is cut across obliquely, thus forming the points of the staple.

Figure 1 is a front elevation of my improved staple-machine, (with the gear-wheels for driving the same removed.)

Figure 2 is a plan view of same, (with the gear-wheels attached.)

Figure 3 is a side view of one of the revolving heads.

Figure 4 is an end view of same.

Figure 5 is a plan view of the eccentric ring.

Figure 6 is a top view of same.

Figure 7 is a perspective view of the upper part of the dies and cutting-tool.

To enable those skilled in the art to make and use my invention I will now proceed to describe its construction and operation.

The housing or frame-work of the machine consists of two cast-iron sides or frames, A and A', rising above and secured to a horizontal platform or table.

Supported in suitable bearings, B, B<sup>1</sup>, B<sup>2</sup>, and B<sup>3</sup>,

formed on the upper part of the said sides A and A', and revolved by means of two spur-wheels fixed upon their outer ends, are two shafts, S and S'.

Affixed on each of the shafts S and S', and a short distance back of the side A, are two revolving heads, H and H', made of the proper thickness, and in the form of a zone of a circle, with the curved ends slightly tapered, and provided on their flat or parallel edges with tools, T and T'. The inner ends of the said tools, which approach toward the centre of the machine, are barbed or notched, and are slightly turned down, and fit in recesses formed on the corners of the heads.

The tools T and T' are attached to and adjusted on the heads H and H' by means of screws R, R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup>, passed through suitable slots formed in the tools, and set-screws, O and O', which are screwed into lugs L and L', formed on the heads.

The tool B<sup>4</sup>, figs. 3 and 4, used in forming the staple, is inserted, and works in a groove formed on an angle in the head H, and is provided with a pin or projection, p, which extends out and through a slot formed in the plate D inclosing the groove. The end h of the tool, which extends out beyond the head while bending the wire, is made in the form of a hook, which passes over the wire.

The eccentric ring E, made in the form as shown in figs. 5 and 6, is provided with lugs G and G' for securing it in position, and has formed through it an open space, O. The said space is laid off from the centres e and e' with the radius e f, and e' f, and is made perfectly straight and vertical from the points a to b. The pin or projection p on the tool B passes through this space, and is provided with a friction-roller, t, which fits and rolls around in the space, so that, when the ring E is placed in the proper position, the tool B will be guided, (by means of the pin passing through the space O,) and slide in and out on the head H.

The ring E, made in the form above described, is placed over the shaft S, (the opening in the center of the ring being made considerably larger than the shaft,) and between the inner side of the frame A and the head H, where it is secured by means of the lugs G and G' passing over the top of the frame and on each side of the bearing B<sup>2</sup>.

Secured on the platform or table of the machine, and a short distance from the head H, is an arm, M, which extends out and up to the proper height, and has pivoted on its upper end a lever, W. The said lever W curves down under the shaft S, and is actuated by means of a cam, J, secured on the shaft, and working on the upper edge of the lever.

The opposite end of the lever W rises up, and bears on it a cutting-tool, K, which is secured in place and adjusted by means of the screws I, I<sup>1</sup>, and I<sup>2</sup>.

The cam J depresses the lever, and, after it is re-



leased from contact with it, the lever is raised to its former position by means of a spring, N, resting on a lug cast on the side of the lever, and secured to the inner edge of the arm M.

The dies P and P', with their ends, *d* and *d'*, extending up at right angles, are secured and adjusted on the upper part of the framing of the machine, so that the center groove or notch formed in the parts *d* and *d'* is on a line with the center of the machine, and between the approaching ends of the heads H and H'. The ends *d* and *d'* of the dies extend up the proper height, and are placed at sufficient distance apart, in order to allow the hooked end of the bending-tool B to pass between them.

The bottom part of the grooves or notches formed in the dies are rounded off toward the bending-tool so as to form the proper curve to the staple while being turned.

Immediately in front of the die P, and extending up the same distance as the part *d*, is a gauge, U, made adjustable on the frame A, so as to stop off the wire at the proper length for the staple.

The die P<sup>2</sup> is placed at right angles to the dies P and P', and has its end *d*<sup>2</sup> turned up the same distance as parts *d* and *d'*.

Formed through the part *d*<sup>2</sup>, and immediately opposite the grooves or notches in the dies P and P', is a circular opening, through which the wire is passed from the feeding-apparatus connected with the machine.

The tool K, attached to the lever W, is arranged so that the cutting-edge works against the end *d*<sup>2</sup> of the die P<sup>2</sup>. This part of the die, and the edge of the tool, are made on the same angle, in order to cut the wire passed through the opening made in the die P<sup>2</sup> obliquely, and thus form the points on the staples.

The operation is as follows:

The wire to form the staple is passed through the opening made in the die P<sup>2</sup>, and through the grooves in the dies P and P', by means of a feed attachment. The end of the wire, after it passes through the die P, is stopped by means of the gauge U. The machine is then put in motion through the gear-wheels on the

shafts S and S', and the cam J depresses the lever W until the tool K cuts the wire. The hooked end of the bending-tool B<sup>4</sup> catches over the wire between the dies P and P', and bends it down until it assumes the proper form. The barbing-tools T and T' now barb or notch the staple on both sides, after which it drops beneath the revolving heads finished and ready for use.

The object in forming that portion of the open space O of the ring E, between the points *a* and *b*, straight and vertical, is to allow the pin or projection *p* to pass down in it and carry the hooked end of the tool B in a vertical line, thus keeping the staple still remaining on the tool perfectly straight. By forming the ring E eccentric, the tool B is extended to the furthest limit while it is forming the staple, after which it is drawn in by means of the pin *p* following around the circular form of the open space.

In the above description, the revolving heads of the machine have been described as carrying but one barbing-tool each; whereas, in the full-sized machine, two barbing-tools are applied to each head, and one head provided with two bending-tools, one on each side, as shown by dotted lines, fig. 3, so that two complete staples are made at one revolution of the heads.

Having thus described my invention, its construction and operation,

What I claim, and desire to secure by Letters Patent of the United States, is—

1. The arrangement of the heads H and H' on the shafts S and S', the said heads being constructed as herein specified, and provided with barbing-tools T and T', lugs L and L', screws R R<sup>1</sup> R<sup>2</sup> R<sup>3</sup>, and adjusting-screws C and C', so as to operate as and for the purpose set forth.

2. The within-described staple-machine, composed of the parts herein set forth, all combined and operating substantially as specified.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN T. DARNELL.

Witnesses:

CHARLES H. EVANS,  
GEO. E. NICHOLS.