(No Model.)

J. ADT.

MACHINE FOR MAKING STAPLES.

No. 291,659. Patented Jan. 8, 1884.

Fig. 1

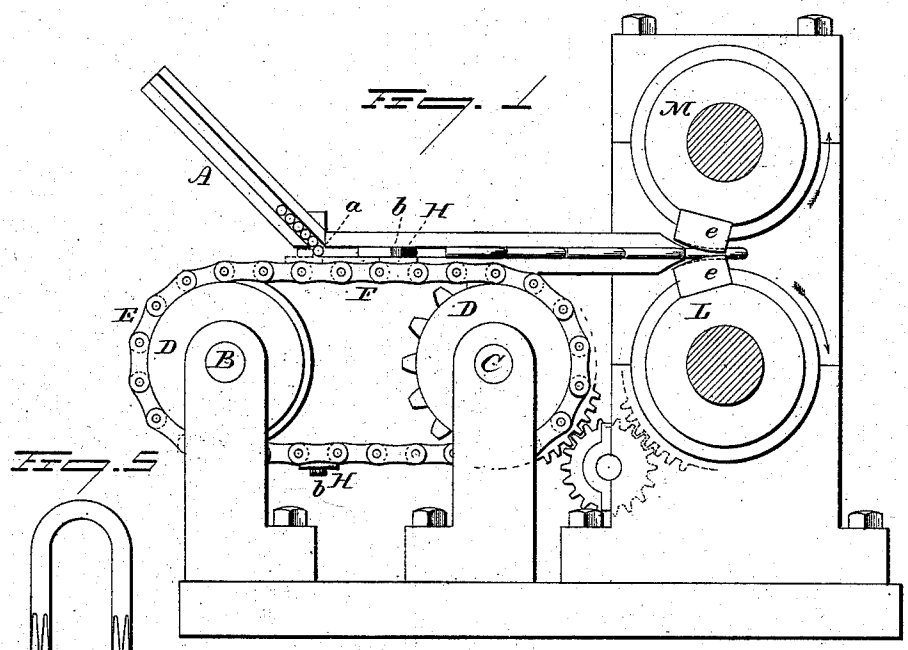


Fig. 5

Fig. 2

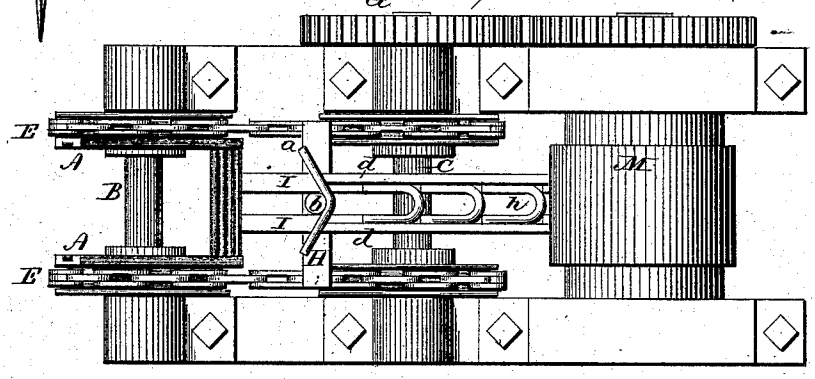


Fig. 6

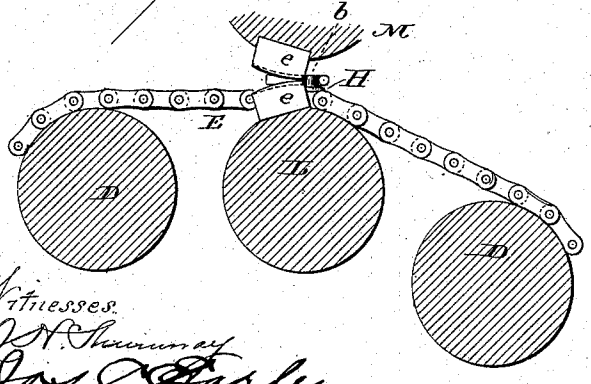


Fig. 3

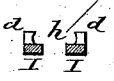


Fig. 4



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MACHINE FOR MAKING STAPLES.

SPECIFICATION forming part of Letters Patent No. 291,659, dated January 8, 1884.

Application filed September 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN ADT, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Machines for Making Staples; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a sectional side view; Fig. 2, a top or plan view; Fig. 3, a transverse section, showing the bender as having entered the channel and completed the bend; Fig. 4, a face view of the dies; Fig. 5, the completed staple enlarged; Fig. 6, a modification.

This invention relates to an improvement in machines for making that class of staples which are of **U** shape and have each leg pointed, used for various purposes, the object of the invention being the construction of a machine to which a succession of blanks cut to length are supplied through a chute or otherwise, and taken therefrom to the pointing-rolls, the blank being bent in its passage from the chute to the rolls, the rolls delivering the finished staple from the machine; and the invention consists, principally, in an endless band or bands carrying a stud which corresponds to the interior of the bend of the staple to be produced, and which stud receives a blank in front of it, and by the forward movement of the stud produced by the movement of the bands the blank is doubled into a channel corresponding to the extreme width of the staple, the continued movement of the band carrying the bent staple forward to a pointing apparatus, where they are successively received, and the legs of each successive staple finished, as more fully hereinafter described. The blanks are cut from wire of the required diameter and to the requisite length. These blanks are fed to the machine through a chute, here represented as composed of two parallel inclined grooved guides, A, supported in a fixed position upon the machine. The blanks are placed therein parallel with each other, as seen in Figs. 1 and 2, and so that their own weight forces them downward, presenting the lower blank, *a*, at the mouth.

B C are two parallel shafts, each carrying two sprocket-wheels, D, and around each pair of wheels is an endless chain or other suitable band, E. Power is applied to rotate these wheels, here represented as by a gear, G, on the shaft C.

H is a bar extending transversely across and connecting the two bands, and is made fast to the bands, so as to travel with them. At the center of this bar H is a stud, *b*, projecting forward, and in diameter corresponding to the internal diameter of the bend to be made. As the shafts B C revolve, the bands bring the bar to a position indicated in broken lines, Fig. 1, where the stud will engage the lowest blank, *a*, in the chute and carry it forward. A support is made, upon which the blank will rest, here represented as a pair of parallel bars, I, one each side the path of the stud *b* and above the bar H. At a little distance from the point where the first blank *a* is first taken, an upwardly-projecting flange, *d*, is made from the bars I, as seen in Fig. 3, distant from each other the width of the staple to be produced, and extending forward to form a channel, *h*, and so that as the blank is forced forward by the stud *b* the side of the blank opposite the stud will strike the end of the flanges or benders *d*, as seen in Fig. 2, and as the stud advances will double the blank around the stud and between the flanges, as seen in Fig. 2, thus bending the blank into the **U**-shaped form required for the staple. As each successive blank is thus formed between the benders, they are carried forward in the channel by the stud until the stud, in passing around the forward wheel, will escape therefrom. Then the blank will be left between the flanges *d d* in the channel, as seen in Fig. 2, and as each successive blank enters the channel it will force the preceding blanks forward toward the end of the channel. The inner side of the flanges or channel should be grooved longitudinally corresponding to the surface of the blank, and so as to prevent the bent blank from being thrown out of position.

At the end of the feeding-channel, rolls L M are arranged, each carrying a die, *e*, set longitudinally in the face of the rolls. The faces of these dies meet in the central plane of the channel, as seen in Fig. 1. Each of

these dies, as seen in Fig. 4, is constructed with two V-shaped cavities, *f f*, corresponding to one-half the point of the legs of the staple to be made. These cavities stand in line with the feeding-channel. The dies project from the rolls so that, except when the dies are together, as seen in Fig. 1, there is considerable space between the periphery of the rolls. The first blank which enters the channel is fed along step by step until finally it stands between the rolls, as seen in broken lines, Fig. 1, at which position the dies come upon its two legs, and, continuing their rotation in the direction indicated by the arrows, the rolls squeeze the legs between the dies and in the cavities, so as to swage or shape the points, as seen in Fig. 5. This operation of the dies forces the staple forward, as seen in Fig. 1, and delivers it finished from the machine. The relative movement of the wheels D D to the rolls should be such that one blank will be bent at each operation of the pointing-rolls. This may be done by gearing the rolls and the wheels D D together, as indicated in Figs. 1 and 2. As shown in Fig. 1, two bars, H, are represented, each carrying its stud *b*, and distant from each other, so as to produce substantially a constant feed—that is, one blank will be presented to the rolls as the dies come around to grasp and point it.

Instead of employing the chute A for the blanks, the wire may be fed to the machine and the lengths successively cut off, leaving the blank at the position shown at *a*, Fig. 1, and in front of the advancing bending-stud *b;* but I prefer to employ the chute to feed the blanks successively thereto.

Instead of compelling each bent blank to force the preceding bent blanks forward to the rolls, the chains may pass beyond the rolls, as seen in Fig. 6, one running each side the rolls, and so that the bar H, carrying the stud *b*, will pass through in advance of the dies, and so that the blank will be left by the stud in the position to be grasped by the dies; but I prefer the first construction, whereby each succeeding blank forces the preceding blanks forward.

Instead of employing rolls to point the blanks, reciprocating swaging-dies may be used, which will meet and point each successive blank as it is presented by the benders. Therefore, while I prefer the revolving rolls for pointing, I do not wish to limit my invention thereto.

Instead of running the endless bands continually, and thereby spacing the bars according to the position of the dies on the rolls, the movement of the endless bands may be intermittent, and so as at the proper time to present the blank. A single band will answer to carry the bending-stud; but in such case the point must be arranged so as to support the stud on an arm projecting transversely from it, corresponding to the bar H; but I prefer two bands, as described.

I claim—

1. In a machine for making staples, the combination of the endless band or bands E E, carrying the bending-stud *b*, stationary benders *d* at each side the path of the bending-stud, and mechanism, substantially such as described, to point the blank as it is delivered from between the benders, substantially as described.

2. In a machine for making staples, the combination of the endless band or bands E E, carrying the bending-stud *b*, stationary benders *d* at each side the path of the bending-stud, and between which the stud will bend the blank and force it forward, a pair of rolls carrying dies *e*, and arranged to receive each blank as it is presented by the bender, the dies constructed with cavities operating to point the blank as it passes between the dies, substantially as described.

3. In a machine for making staples, the combination of the endless band or bands E E, carrying the bending-stud *b*, stationary benders *d* at each side the path of the bending-stud, mechanism, substantially such as described, to point the blank as it is delivered from between the benders, and the chute A to receive the blanks and deliver them successively in advance of the bending-stud, substantially as described.

4. In a machine for making staples, the combination of the endless band or bands E E, carrying the bending-stud *b*, stationary benders *d* at each side the path of the bending-stud, and between which the stud will bend the blank and force it forward, a pair of rolls carrying dies *e* and arranged to receive each blank as it is presented by the bender, the dies constructed with cavities operating to point the blank as it passes between the dies, and the chute A, to receive the blanks and deliver them successively in advance of the bending-stud, substantially as described.

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Witnesses:
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