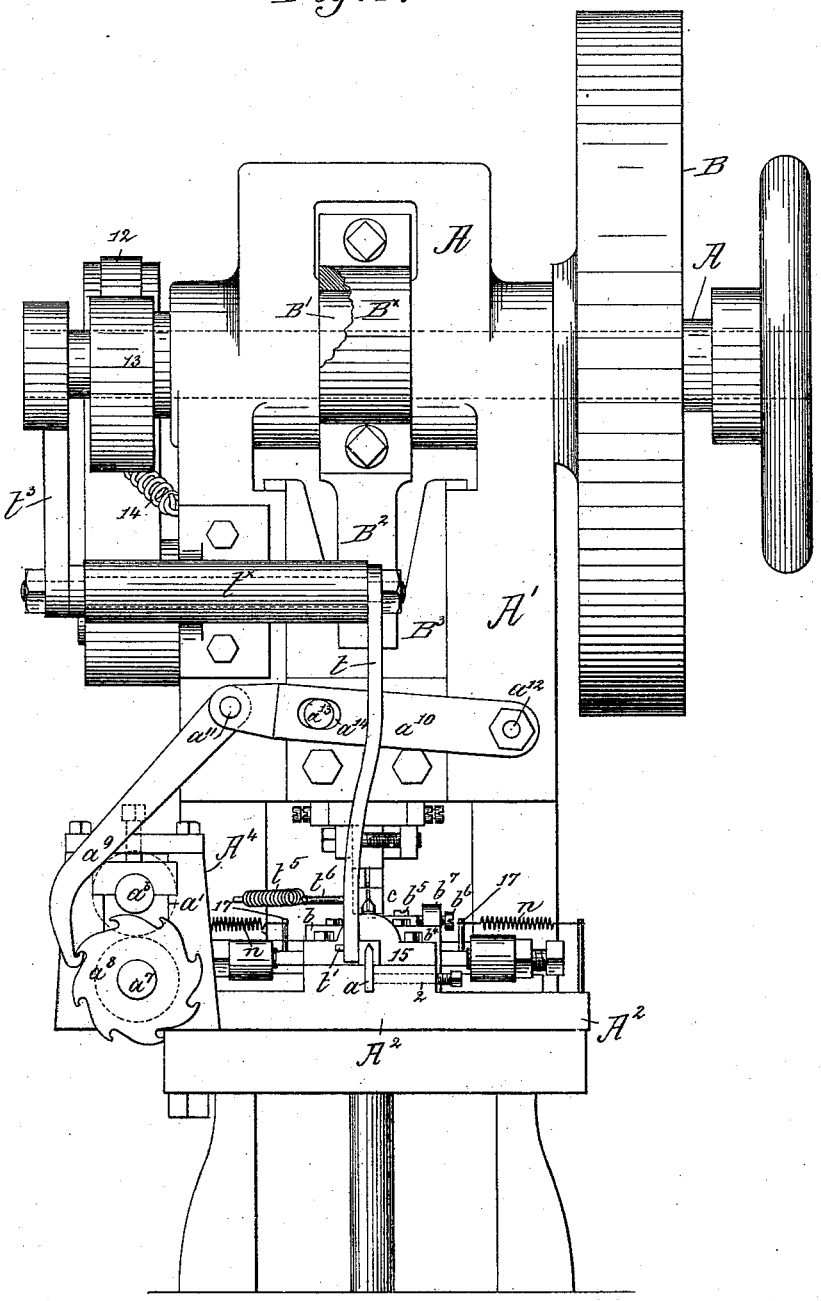
(No Model.) 4 Sheets—Sheet 1.

J. H. VINTON.

STAPLE MACHINE.

No. 345,464. Patented July 13, 1886.

Fig: 1.



Witnesses.
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F. L. Emery.

Inventor.
by John H. Vinton.
Emery & Gregory Atty's.

(No Model.)

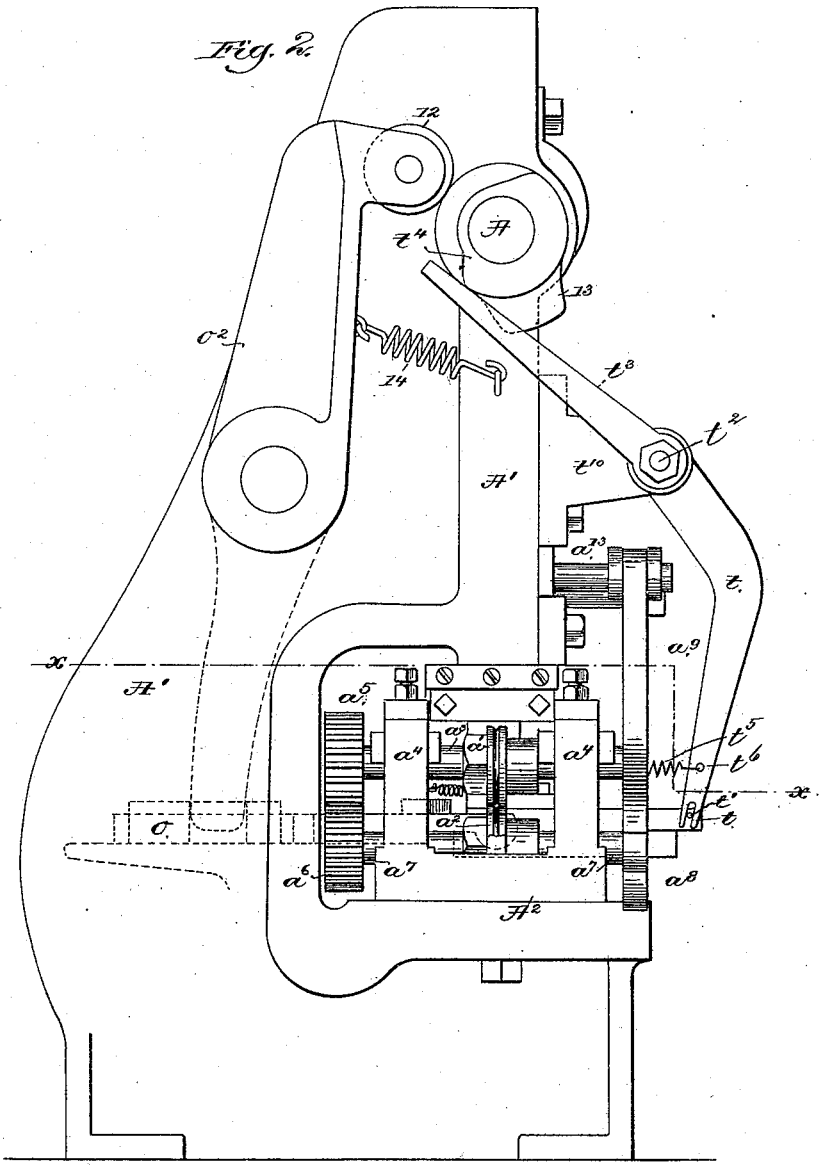
4 Sheets—Sheet 2.

J. H. VINTON.

STAPLE MACHINE.

No. 345,464. Patented July 13, 1886.

Fig. 2.



Witnesses.
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(No Model.) 4 Sheets—Sheet 3.

J. H. VINTON.

STAPLE MACHINE.

No. 345,464. Patented July 13, 1886.

Fig. 3.

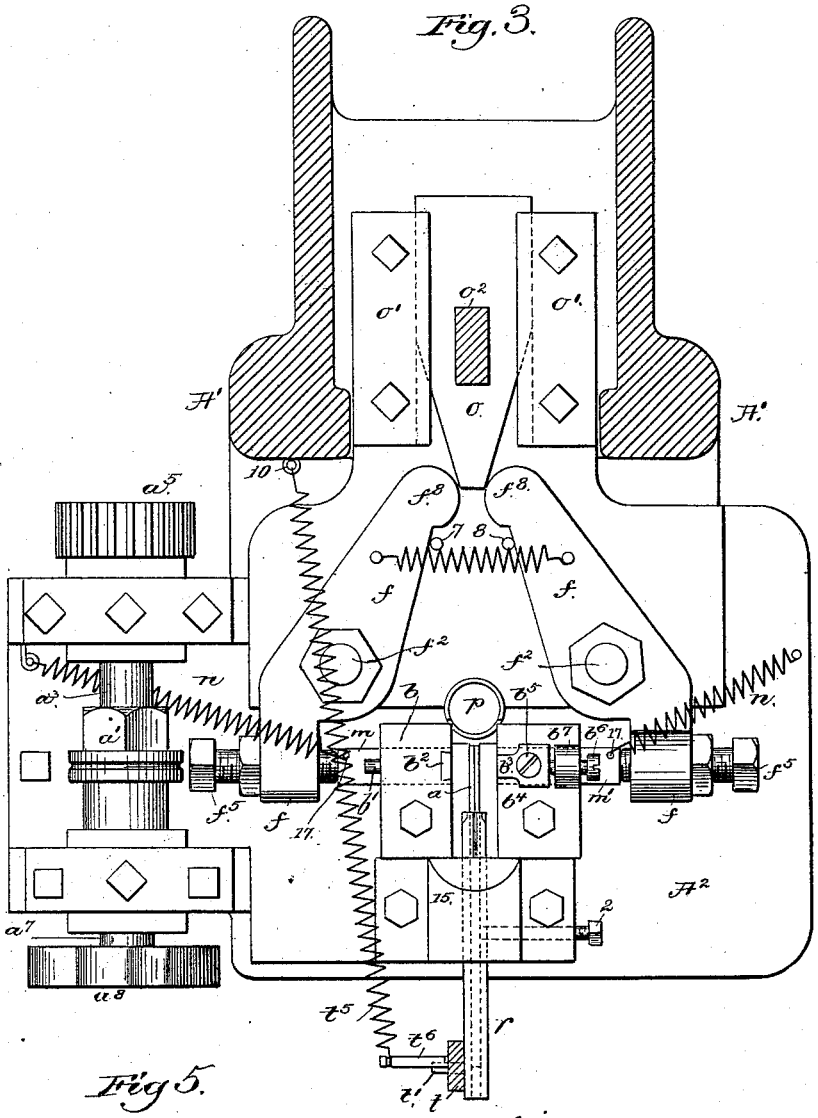


Fig 5.

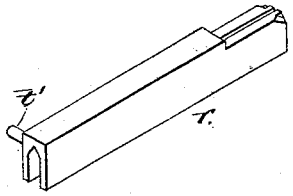
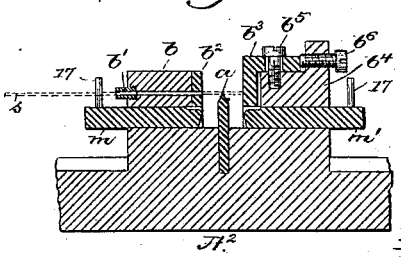


Fig. 4.



Witnesses.
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(No Model.)

4 Sheets—Sheet 4.

J. H. VINTON.

STAPLE MACHINE.

No. 345,464. Patented July 13, 1886.

Fig. 6.

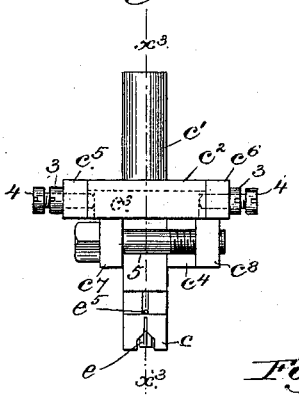


Fig. 7.

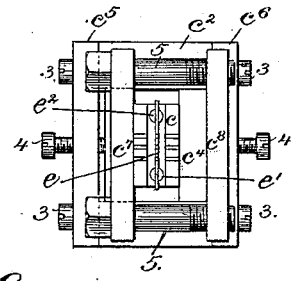
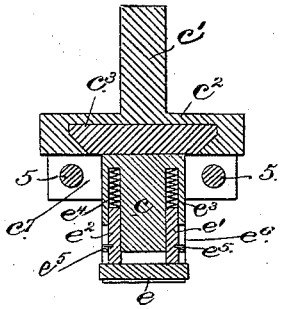


Fig. 8.



Witnesses.
John F. C. Friend Jr.
Arthur Zipperlen.

Inventor.
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UNITED STATES PATENT OFFICE.

JOHN H. VINTON, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE PENINSULAR NOVELTY COMPANY, OF GRAND RAPIDS, MICHIGAN.

STAPLE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 345,464, dated July 13, 1886.

Application filed September 7, 1885. Serial No. 176,346. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. VINTON, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Machines for Making Staples, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to produce a simple and compact machine for automatically making, from a continuous piece of wire staples—such, for instance, as described in Letters Patent of the United States, No. 324,053, granted to me August 11, 1885.

My invention consists in certain combinations of mechanism and details of construction, as will be hereinafter described and claimed.

Figure 1, in front elevation, shows a staple-making machine containing my improvements; Fig. 2, a left-hand side elevation thereof; Fig. 3, a section below the dotted line $x\ x$, Fig. 2; Fig. 4, a cross-section of a portion of the machine, showing the bed, the former, and the hammers; Fig. 5, a detail showing the ejector removed from the machine; Fig. 6, a front elevation of the die and mechanism by which it is attached to the plunger; Fig. 7, an under side view of Fig. 6; and Fig. 8 a section of Fig. 6, taken on the dotted line $x^3\ x^3$.

The main shaft A, having its bearings in the frame-work A′, rising from the bed A^2 of the machine, is rotated by a clutch-pulley, B, of any usual or suitable construction, said shaft also having mounted upon it an eccentric, B′, surrounded by an eccentric-strap, $B^\times$, of a pitman, B^2, connected with a plunger or cross-head, B^3, adapted to be reciprocated in suitable guideways of the frame-work A′, all being substantially as in the Stiles press, of ordinary construction.

The "former" a, over which the wire is bent in the production of each staple, consists of a rectangular plate rigidly attached to the bed A^2 of the machine by a screw, 2, the upper edge of the said plate being of such shape in cross-section as to give to the crown or top of the staple the shape desired.

The wire s, shown only in Fig. 4, by dotted lines and taken from any suitable reel (not shown,) is led between a pair of annularly-grooved feed-rolls, $a'\ a^2$, secured, respectively, to the shafts $a^3\ a^7$, turning in bearings in uprights $a^4\ a^4$. The shaft a^3 has attached to it a toothed gear, a^5, which is engaged and rotated by a toothed gear, a^6, secured to the shaft a^7. The shaft a^7 has secured to it, at one end, a ratchet-wheel, a^8, which is engaged and rotated intermittingly by a pawl, a^9, pivoted to the arm a^{10} by a pin, a^{11}, the arm a^{10} being in turn pivoted to the frame-work A′ by a pin, a^{12}. The arm a^{10} is moved on its pivot to thereby raise the pawl a^9 by a stud, a^{13}, rigidly connected with the plunger or cross-head B^3, and moving with it, said stud entering a slot, a^{14}, in and moving the arm a^{10} and its pawl to rotate the feed-rollers at the proper times and feed the wire forward. The wire is fed forward by the feed-rolls through a hole, b', in a block, b, (see Fig. 4,) and through a hole in a block, b^2, of steel, dovetailed into the block b, the latter serving as the stationary member of the cutting mechanism. After passing through the block b^2 the end of the wire is projected against the face of the gage b^3, mounted on the block b^4, and slotted to receive the set-screw b^5, an adjusting-screw, b^6, being preferably provided to enable the gage to be adjusted to provide for the equal length of the staple-legs and to hold the gage in adjusted position. After the wire has been fed into position over the former a with its end against the gage, as described, the die c, (see Figs. 6, 7, 8,) suitably connected with the plunger B^3, is forced downward by the said plunger upon the said former a, and in its descent one edge of the die c, co-operating with the block or cutter b^2, severs the wire, and the die in its further descent acts to bend the short piece of wire about the former a, thus producing from it a staple, the lower end of the die c being provided with a channeled or grooved face (shown best in Fig. 6) to embrace and conform in shape to the former a.

The die c, having a head, c^3, of dovetail shape, and a flange, c^4, enters a correspondingly-shaped recess in a head-block, c^2, having a stem or shank, c', that enters a hole in the plunger B^3, where it is suitably fixed. After the head c^3 has been inserted the side bars, c^5 c^6, are secured to the head-block c^2 by screws 3. The bars $c^5\ c^6$ are provided with adjusting-screws 4, to act upon and adjust the head c^3 in the head-block c^2. The flange of the head c^3 is brought to bear against one side of the die

c, and the clamping-blocks c^7 c^8 are applied, one against the opposite side of the die c, while the other bears against the opposite side of the flange c^4, the said clamps being drawn together by bolts 5, thus firmly locking the die c in position.

The die c is provided with a clearer, c, to prevent any staples being retained within the die after it had been forced down upon the former and is being removed therefrom, said clearer herein consisting of a narrow strip of metal placed longitudinally within the die c, and connected therewith by rods c' c^2, the ends of which bear against spiral springs c^3 c^4, seated within the said die, (see Fig. 8,) pins c^5, projecting from the rods c' c^2 and traveling in the slots c^6 in the sides of the die, preventing the said clearer from dropping out.

The wire having been cut off and bent by the die over the former a, the ends of the staple, while yet held firmly between the die and former, are acted upon and beveled or pointed by two hammers, m m', fitted to slide in openings in the blocks b and b^4, the acting ends of the said hammers being beveled, as shown in Fig. 4, the beveled ends of the hammers being thrown forward against the sides of the staple-legs near their points and while supported by the former.

Each hammer, normally held back by a spring, n, is acted upon, as herein shown, by an adjusting screw, f^5, carried by a presser-lever, f, pivoted at f^2, each lever having a rounded or inclined end, f^8, which is acted upon by a wedge-block, o, fitted in guides o', and actuated by a lever, o^2, provided with a roll, 12, which is struck by the cam 13, fast on the shaft A, a spring, 14, normally keeping the roll 12 against the said cam.

The screws f^5 are provided to adjust the time of the hammers and their stroke with relation to the former.

After the staple has been formed and its points beveled and flattened upon the former, as described, it is ejected therefrom by an ejecting device, herein shown as consisting of a slide, r, (see detail, Fig. 5,) shaped to conform to and slide upon the former a, the ejector entering a groove in the guide-block 15, secured to the bed of the machine. The ejector is operated upon the former to eject the finished staples, by an arm, t, connected with it by a pin, t', projecting from the ejector and entering the forked end of the said arm. The arm t is attached to a rock-shaft, t^2, having its bearings in a projecting portion, t^{10}, of the frame-work of the machine, an arm, t^3, of the said rock-shaft being acted upon by a cam, t^4, mounted upon the main rotating shaft A. A spring, t^5, is connected to said arm t by a pin, t^6, the other end of said spring being made fast, as at 10. This spring, under the action of the cam t^4 upon the arm t^3 of said arm t, serves to actuate the ejector to remove the staple, and the said ejector is thereafter retracted by the action of the cam. As the ejector removes the finished staples from the former they drop singly into the discharge-opening p, located at the end of the former, and enter any suitable vessel.

The parts herein described are all arranged to operate automatically and consecutively, each performing its own work until the staple is completed and discharged.

It is obvious that any ordinary staple may be made upon this machine, and the mechanism for beveling and broadening the points thereof be omitted, if desired. It is also obvious that any other suitable mechanism may be employed to raise and lower the plunger carrying the die without departing from this invention.

I do not desire to limit my invention to the employment of the exact devices shown for actuating the hammers m m'.

I claim—

1. In a machine for making staples, a former over which the wire is bent and a vertically-reciprocating die to cut off the wire and bend it over the former, combined with hammers to strike and broaden the ends of the wire, and means, substantially as described, to operate the said hammers, as set forth.

2. In a machine for making staples, the former and die, and means, substantially as described, for operating said die, combined with a pair of presser-levers, means, substantially as described, for operating them and the adjusting-screws f^5 f^5, and the hammers m m', as set forth.

3. In a machine for making staples, the former and die, combined with the ejector moving upon the former to free the latter of staples, and means, substantially as described, for moving said ejector positively in both directions, as set forth.

4. In a machine for making staples, the former and vertically-reciprocating die c, combined with the presser-levers f f, and hammers m m', substantially as described.

5. In a machine for making staples, the former and vertically-reciprocating die c, combined with the presser-levers f f and hammers m m', and an automatically-operated ejector moving upon the former, substantially as described.

6. The die c, having a dovetail head, c^3, and a flange, c^4, combined with the plunger, a head-block correspondingly recessed to receive the die-head and fitted to the plunger, side bars, c^5 c^6, clamping-blocks, and adjusting and fastening means, substantially as described.

7. The former and die, combined with the spring-controlled clearer, wedge-block c^4, its side pieces, c^7 c^8, plate c^2, and its side pieces, c^5 c^6, all substantially as described.

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

JOHN H. VINTON.

Witnesses:
G. W. GREGORY,
B. J. NOYES.