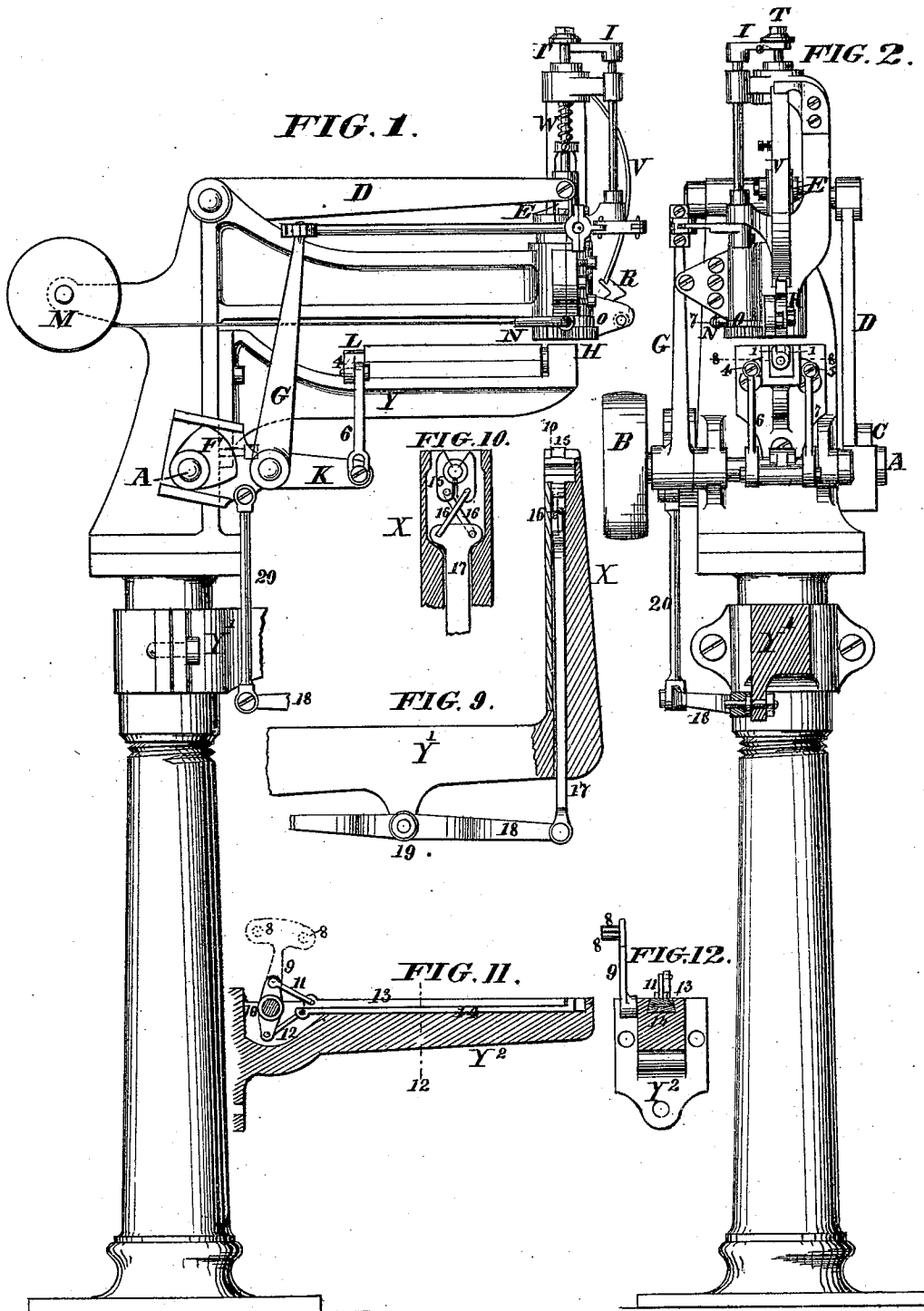


H. R. HEYL.

FORMING AND INSERTING WIRE STAPLES IN PAPER BOXES.

No. 175,457.

Patented March 28, 1876.



WITNESSES

Walter Allen
H. G. Garner

INVENTOR

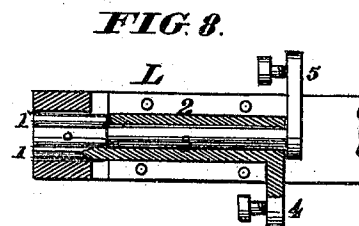
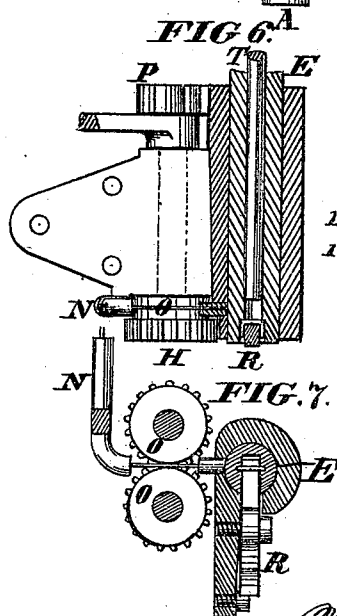
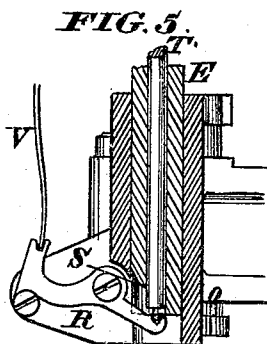
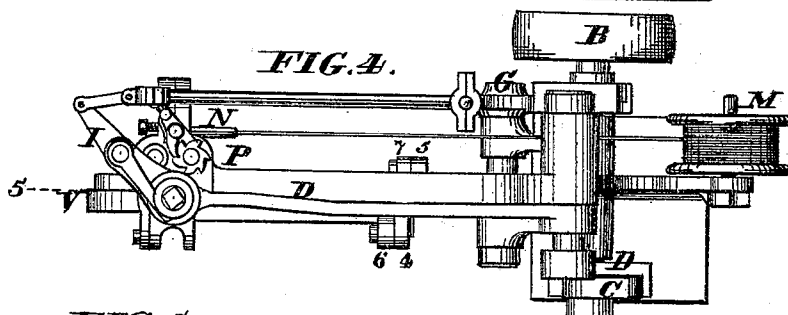
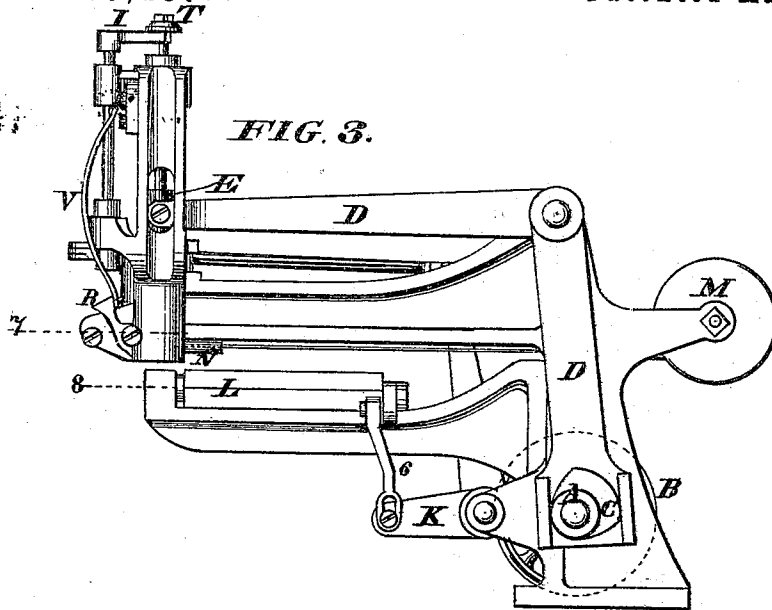
Henry R. Heyl
By Hough & Co. Attorneys;

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INVENTOR

Henry R. Heyl.
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UNITED STATES PATENT OFFICE.

HENRY R. HEYL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
NOVELTY PAPER-BOX COMPANY, OF SAME PLACE.

IMPROVEMENT IN FORMING AND INSERTING WIRE STAPLES IN PAPER BOXES.

Specification forming part of Letters Patent No. **175,457**, dated March 28, 1876; application filed
July 30, 1875.

To all whom it may concern:

Be it known that I, HENRY R. HEYL, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Machines for Forming and Inserting Staples in Making Paper Boxes, of which the following is a specification:

This invention is chiefly a modification of the essential parts of a machine for which a patent was granted to the present applicant and August Brehmer jointly on October 8, 1872, No. 132,078. The purpose of this machine is to provide a way to manufacture, with the use of the wire-staple fastening, as set forth in the patent above referred to, boxes of such sizes and peculiar shapes as are not adapted to the form and limits of said patent machine above referred to; and to attain this end a few improvements have been made in the mechanism, which are the subject-matter of this present application.

In the accompanying drawings, Figure 1 is a side elevation of my improved machine. Fig. 2 is a front view of the same. Fig. 3 is a view of the opposite side from that shown in Fig. 1. Fig. 4 is a plan view. Fig. 5 is a vertical section of the plunger and its accessories on the line 5, Fig. 4. Fig. 6 is a vertical section of the same in a plane at right angles to the above. Fig. 7 is a horizontal section on the line 7, Figs. 2 and 3. Fig. 8 is a horizontal section on the line 8, Figs. 2 and 3. Fig. 9 is a sectional elevation of a modified form of clincher and its accessories, viewed from the side, Fig. 1 showing also a part of the attaching bracket of this clinching mechanism. Fig. 10 is a vertical section on the line 10, Fig. 9. Fig. 11 is a vertical longitudinal section of a clinching mechanism similar to that which is described in the original patent of Heyl & Brehmer, and which may be applied to the present machine, as hereinafter described. Fig. 12 is a transverse section on the line 12, Fig. 11.

By reference to the drawings it will be seen that the plunger and forming-mold of the original machine are dispensed with, and that the hand must perform the labor of folding the box-blank into the required form, and of

placing the parts which are to receive the wire-staple fastening into position between the staple forming and driving device and the clinching device. This process of making boxes, although a somewhat slower one than when they are made by the thoroughly automatic machine, is nevertheless of great advantage in the construction of boxes of large dimensions, which must generally be made from several pieces of paste-board in order to use material economically.

By these same means we are also enabled to construct boxes of peculiar shapes, which to be made on an automatic machine would necessitate an impracticable complication of the parts of the machine. Thus we find the machine which is the subject of this application to be indispensably necessary in the making of all the varieties of boxes required.

The working parts of the machine are mounted upon a pedestal to bring them to a convenient height before the operator, who sits on a high stool in front of the machine, with a pile of box-blanks conveniently placed at his side. The whole mechanism derives motion in proper time through the main shaft A, which is driven by power applied to the pulley B. To the main shaft are fixed two cam-wheels, one marked C, giving movement to the lever D, which operates the wire-cutter E, and the other, marked F, operating through the lever G, the wire-feeding device H, and the hammer-lock I, and, through the lever K, the clinching device L.

The operation of the machine is described as follows: The wire used to form the staple fastening is placed upon a spool, preferably hung on a stud at M. The wire leading to a bent tube, N, is drawn by pressure between the feed-rollers O O, and by them pushed forward directly under the cutting-tube E, the length of wire fed being controlled by the uniform movement of lever D operating the ratchet P, which is fixed on the shaft of one of the feed-rollers O. As the cutter-tube E is forced downward the wire is cut off and bent over the bending-hook R, in the position shown in Fig. 6, forming thus a staple in the tube E, with its points directed downward. This bending-hook is formed with a V-notch at

the point where the wire is to be bent over it, which serves the purpose of a guide to bring the wire under the center of the cutting-tube, so that when the staple is formed it can pass with accuracy into the fine grooves on the inside of the cutting-tube E, which serve as guides in directing the staple into the paste-board. As the tube E continues its descent, the shoulder S in the tube E presses against the bending-hook R below its pivot, and pushes it out of position, so that, at the proper time, the hammer T may drive down through the tube E, and drive the staple into the box lying below the end of the tube E and on top of the clinchers L. The return movement of the bending-hook is compelled by the spring V, which is also stiff enough to hold the bending-hook firmly while the wire is being bent over it. As the staple is driven by percussion, making its own holes through the paste-board, the hammer T is driven down by the spring W as soon as it is released by the withdrawal of the lock I. The return upward of the tube E carries the hammer T also with it, so that no separate device is employed to withdraw the hammer, as in the original machine referred to. As soon as the hammer is carried up to its highest point the lock passes under its head and retains it until its force is again required to drive another staple, when the lock swings out and the hammer is allowed to strike downward with the full force of the spring.

The clincher L, which turns the points of the staple on the inside of the box, is connected with the lever K and cam-wheel F, and is a modification of the original form of clincher, being adapted to clinch the wires at right angles to the bracket Y, which supports the clinching device. The clincher proper consists of two jaws, 1 1, Figs. 2 and 8, one attached to a hollow sleeve, 2, and the other to a shaft, 3, within said sleeve, the sleeve

and shaft having arms 4 5 projecting in opposite directions, and connected by rods 6 7 with the lever K.

In Figs. 11 and 12 I have shown a clinching mechanism similar to that described in the Heyl and Brehmer patent already referred to, but adapted to work horizontally instead of vertically, the staple being in this instance driven vertically instead of horizontally, as in the old machine. The bracket Y², carrying the clinching mechanism shown in Figs. 11 and 12, is attached in the place of the bracket Y, and is worked by the contact of the lever G with studs 8, on a lever, 9, fulcrumed at 10, and connected by links 11 12 with the clincher-slides 13 14.

Still another modification of the clincher is in the form of a post with nippers 15 at the top, as shown at X, Figs. 9 and 10. This post forms part of a bracket, Y¹, which connects it to the pedestal, as shown in Fig. 1. The nippers 15 are connected by links 16 to a vertical rod, 17, jointed to a lever, 18, which is fulcrumed at 19 to the bracket Y¹, and actuated through a rod, 20, from the lever K.

The object of the clinching device last described is to clinch staples at the bottoms of deep boxes which cannot be reached by either of the other forms of clinchers shown.

The following is claimed as new:

1. The combination of the pivoted forming-hook R and annular cutting-tube E, constructed and operating substantially as and for the purposes set forth.

2. The bending-hook R, constructed with a V-shaped notch to receive the staple, in combination with the internally-grooved cutting-tube E, operating substantially as and for the purpose described.

HENRY R. HEYL.

Witnesses:

OCTAVIUS KNIGHT,
WALTER ALLEN.