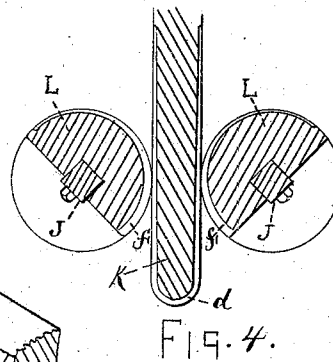
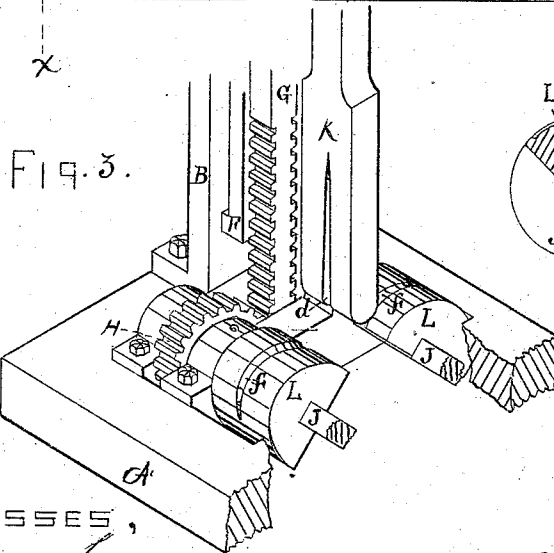
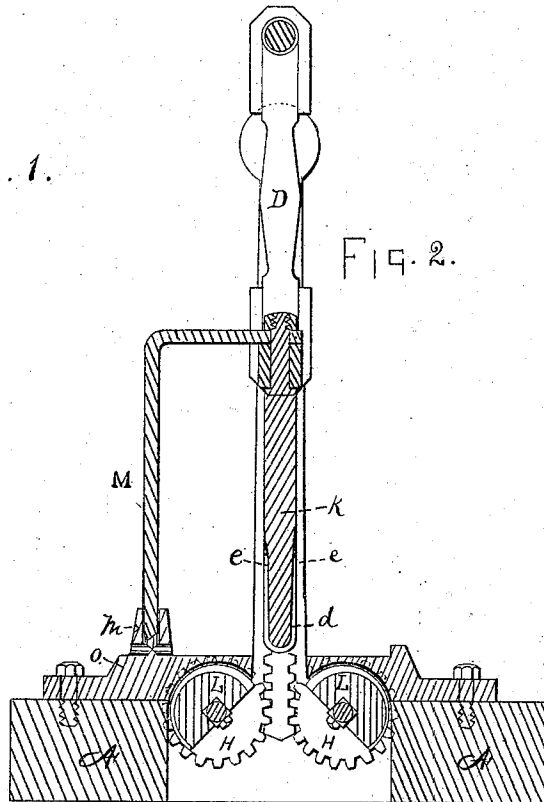
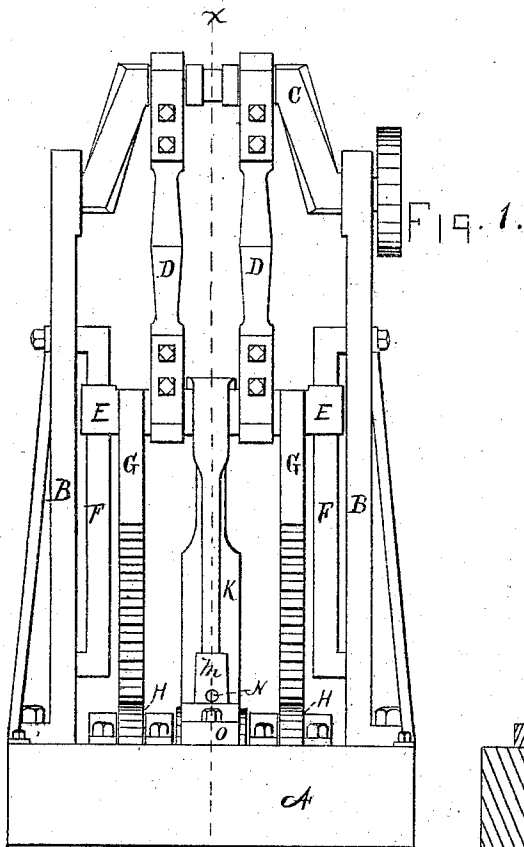


S. S. COUTZ & W. E. RENNARD.

MACHINE FOR MAKING STAPLES.

No. 173,909.

Patented Feb. 22, 1876.



WITNESSES,

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UNITED STATES PATENT OFFICE.

SANFORD S. COUTZ AND WILLIAM E. RENNARD, OF WHEELING, WEST VIRGINIA, ASSIGNORS OF ONE-THIRD THEIR RIGHT TO FREDERICK P. WINGERTER.

IMPROVEMENT IN MACHINES FOR MAKING STAPLES.

Specification forming part of Letters Patent No. **173,909**, dated February 22, 1876; application filed July 17, 1875.

To all whom it may concern:

Be it known that we, SANFORD S. COUTZ and WILLIAM EDWARD RENNARD, of Wheeling, in the county of Ohio and State of West Virginia, have invented certain new and useful Improvements in Staple-Machines; and we do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1 is a front elevation of a staple-machine embodying our said invention. Fig. 2 is a vertical central section, showing those parts which are at the left hand of the line *x x*, drawn across Fig. 1. Fig. 3 is an enlarged perspective view of a portion of the same. Fig. 4 is an enlarged cross-section of the bending-rollers and forming-plunger.

Similar letters of reference indicate like parts in the several figures of the drawing.

Our invention relates to that class of machines employed in bending staples; and its object is to so arrange the operating parts of the machine as to bend and point the staple, completing the same at one operation. To that end it consists in the combination of the bending-rollers and forming-plungers, as will be made fully understood by the following description and claims.

In the drawing, A represents the bed of the machine, and B B the uprights of the frame, which may be as shown, or in any other suitable form that will receive the operating parts of the machine. C is a horizontal crank-shaft, journaled to the uprights B B, and so arranged as to admit of a free and easy rotary movement. Mounted upon one end of this shaft is a suitable wheel, communicating with any proper motor by which power is obtained to operate the machine. D D are pitmen, which are journaled at their upper ends to the crank-shaft, and pivoted or journaled at the lower ends to a cross-head, E, as shown in Fig. 1. This cross-head is mortised or grooved at its ends to fit vertical guides or ways F F, permanently attached to the inner sides of the

uprights B B, and is so arranged as to admit of a free and easy ascending or descending movement. G G are depending racks, which are permanently attached at their upper ends to the cross-head, and so arranged as to ascend or descend with the same. These racks are each provided at the lower end and on opposite sides with cog-gear, adapted to engage with gear-wheels H H, mounted on horizontal shafts J J, journaled to the bed of the machine. The arrangement of these racks and gear is such as to impart a reciprocating rotary movement to the shafts J J by a rotary movement of the crank-shaft. K is the forming-plunger, which is permanently attached at its upper end to the center of the cross-head, and is so arranged as to ascend and descend with the same. The lower end of this forming-plunger is so arranged as to pass between the shafts J J when forced downward by the descending movement of the cross-head. L L are the bending-rollers, which are mounted on the shafts J J, and so arranged as to roll against the sides of the plunger as the latter passes between them. The lower end of the forming-plunger is made round, approximating the shape of the bent portion of the staple, and is provided at its center with a groove, *d*, passing across its end and up the sides, as shown in Fig. 2. The upper ends of this groove are made tapering, approximating the sharpened ends of the staple, as shown at *e e*, Fig. 2. The rollers L L are each provided at the center, around the periphery of the same, with a tapering groove, *f*, corresponding to the groove *d* in the forming-plunger. M is the cutter for cutting the bar in proper lengths to form the staples. This bar is so attached to the cross-head as to ascend and descend with it, and at the same time admit of being moved toward or from the same laterally. The lower end of this cutting-bar is made sharp, and adapted to pass into a movable block, *m*, attached to the bed of the machine. This block is provided with a horizontal aperture, N, through which the bar to be cut is passed. O is an adjustable gage-block, which is attached to the bed of the machine.

The operation of our invention is as follows: The bar from which the staples are to be formed is first heated; then it is passed through aperture N, under the cutter-bar and forming-plunger, against the gage. Motion is then imparted to the machine, which causes the cross-head to descend, and the bar is cut to the proper length, and by a further descending movement of the cross-head the forming-plunger is caused to descend, forcing the heated bar into the groove and between the bending-rollers, and by the descending movement of the racks the rollers are caused to roll against the forming-plunger; compressing the heated metal into the grooves, completing the staple.

The manner of attaching the forming-plunger to the cross-head, and the rollers to their respective shafts, is such as to admit of being

readily removed and different ones attached, when staples of different sizes or different shapes or kinds of points are to be made.

Having thus described our invention, we claim—

1. In the rollers L L, the tapering grooves *f f*, in combination with the tapering groove *d* in the forming-plunger K, as and for the purpose herein specified.

2. In combination with the grooved rollers L L and plunger K, the cutter-bar M and gage N, all arranged for joint operation, substantially as described.

SANFORD S. COUTZ.
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Witnesses;

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