

No. 610,320.

Patented Sept. 6, 1898.

P. A. COUPAL.
STAPLE MAKING AND DRIVING MACHINE.

(Application filed July 14, 1897.)

(No Model.)

FIG. 1.

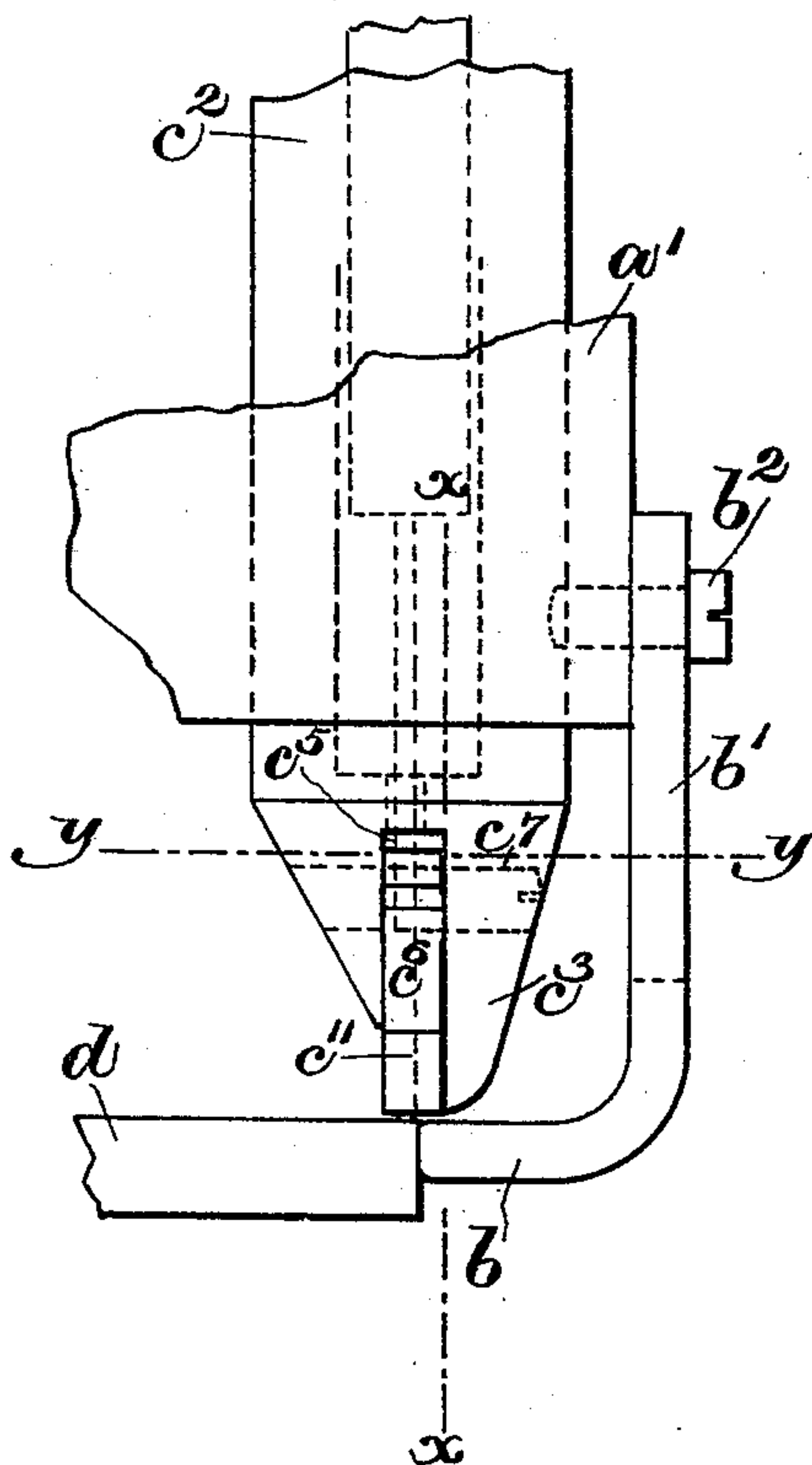


FIG. 2.

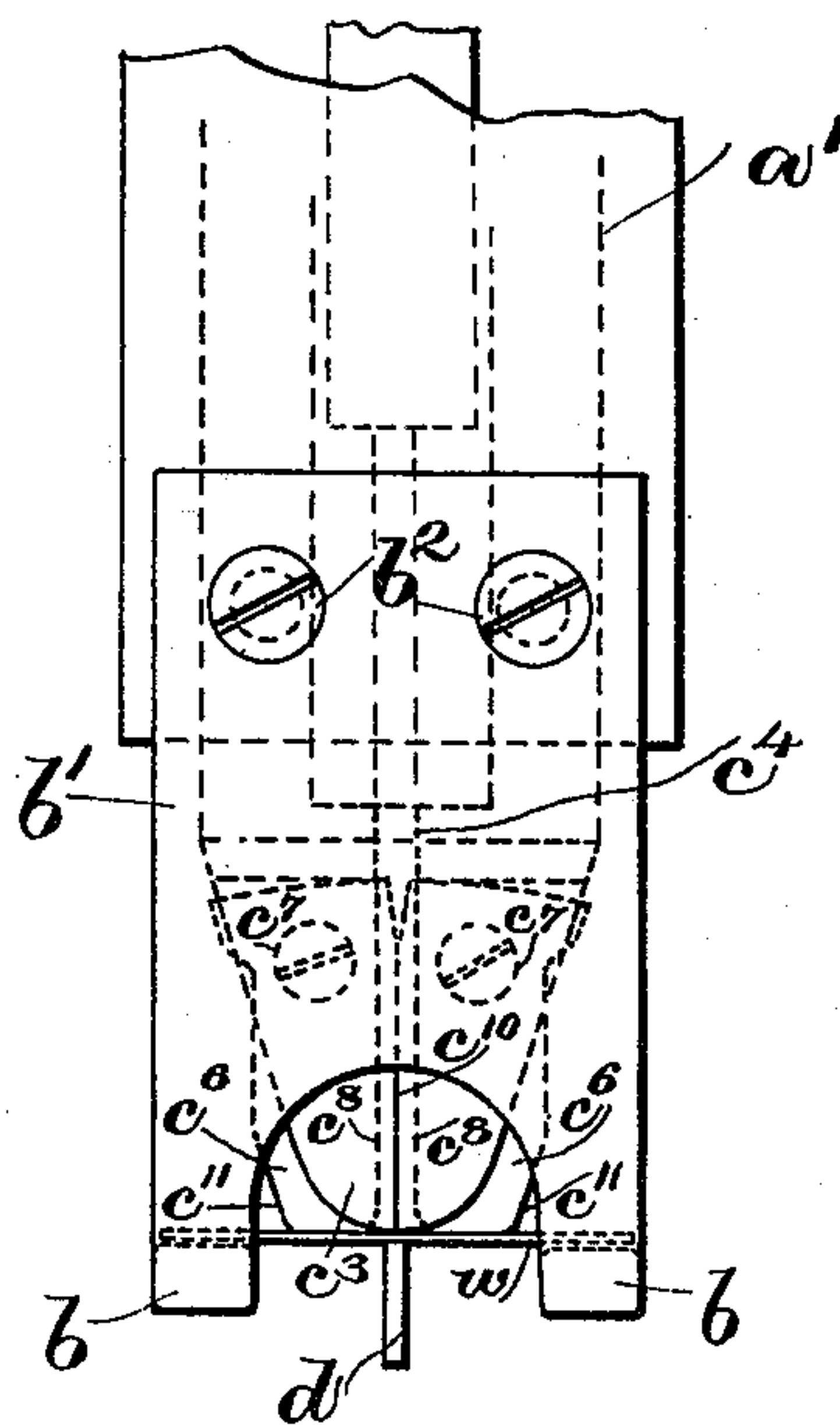


FIG. 4.

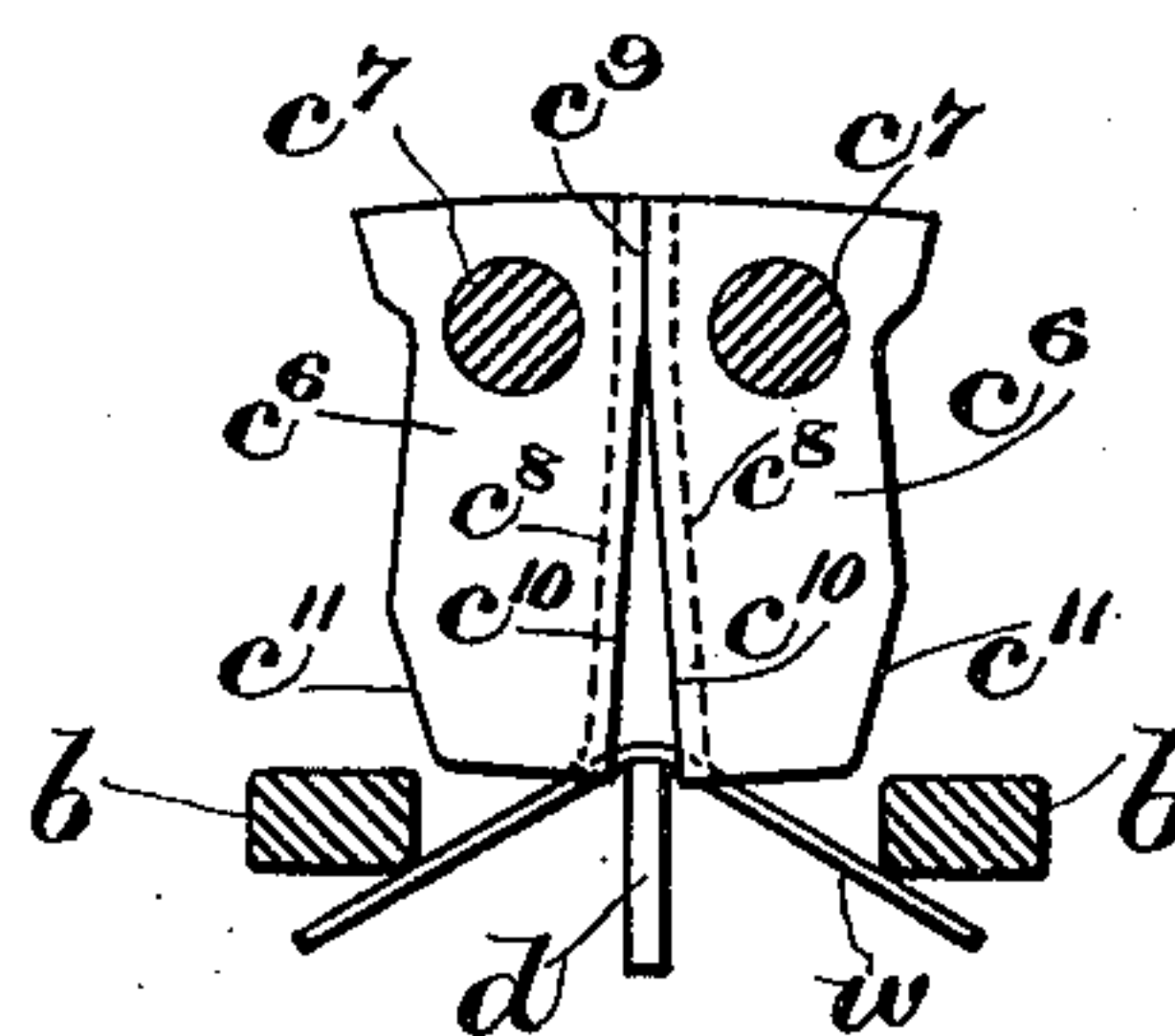
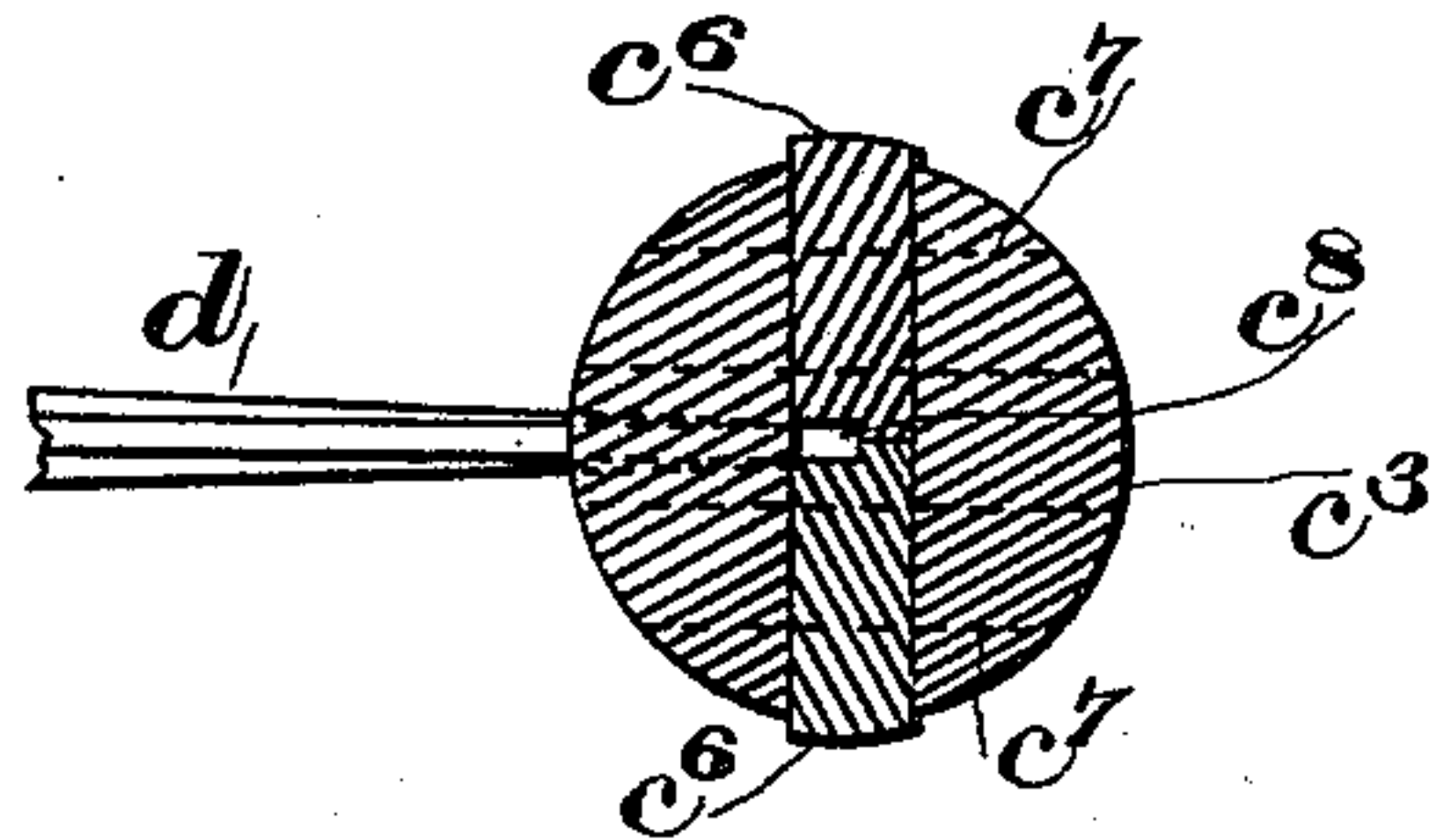


FIG. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

PETER A. COUPAL, OF BOSTON, MASSACHUSETTS.

STAPLE MAKING AND DRIVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 610,320, dated September 6, 1898.

Application filed July 14, 1897. Serial No. 644,493. (No model.)

To all whom it may concern:

Be it known that I, PETER A. COUPAL, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Staple Making and Driving Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in machines for making and driving staples, and more particularly to certain improvements in the staple-forming mechanism of the machine disclosed in Letters Patent of the United States No. 575,296, issued to the Gordon Staple Lasting and Tacking Company, of Portland, Maine, as my assignee.

These machines are used for various purposes in the arts, and they have been found to be particularly useful in the boot and shoe art, they being used to temporarily fasten the upper to an insole during the process of lasting, and they are also used quite extensively in securing the soles to boots and shoes, a shoe having a stapled sole having been found to be very desirable for rough and hard usage.

Someshoes have what are known as "double soles" or "triple soles," which comprise two or more thicknesses of sole-leather, requiring staples very nearly if not quite an inch long, in order that they may pass through the several thicknesses of leather comprising the outer sole and through the insole or welt and be clenched upon the upper surface of the insole or welt. Staples of such length, in order that they may pass through the various thicknesses of stock without bending or buckling, should be made of quite stiff wire, and it has been found in practice that such wire when bent sharply over the anvil to form the crown of the staple is apt to break or become weakened at the bend, so that an attempt to bend such wire will either in the first instance result in the formation of two useless lengths of wire or will after bending break during the driving operation, the pieces of which are liable to become caught in the machine, clogging the same and rendering it liable to be damaged, or if driven into the

stock they would mar the appearance of the shoe.

The object of the present invention is to improve the staple-forming devices of the machine, so that it will be capable of using comparatively stiff wire without breaking or damaging the staple at the bend.

To the above end the present invention consists of the devices and combination of devices which will be hereinafter described and claimed.

The present invention is illustrated in the accompanying drawings, which illustrate my improvements and so much of the adjacent parts of the machine as will serve to explain the same, and in which—

Figure 1 shows in side elevation a broken view of a portion of the staple-forming devices of my machine. Fig. 2 shows the same parts in front elevation. Fig. 3 shows a section upon line *x x*, looking toward the left in Fig. 1; and Fig. 4 shows a section on line *y y* of Fig. 1.

In the drawings, *a'* represents a portion of the fixed guide or framework in which is arranged the vertically-reciprocating carrier *c*², which at its lower end carries a throat or nozzle *c*³, said carrier *c*² being provided with a guide for the driver-bar. (Not shown.) The carrier *c*² has an up-and-down movement imparted to it to bend or form the piece of wire resting upon the anvil *d* into the form of a staple, and said anvil *d* also has a movement in and out toward and away from the plane of movement of the carrier *c*² and the staple-bending throat *c*³, carried thereby. The foregoing elements may be and preferably are of the same form and arrangement as similar parts in the machine of the patent referred to, or they may be of any preferred form and arrangement, and in themselves form no part of the present invention.

In the machine of the patent hereinbefore referred to the staple is formed from a length of wire which is fed by a suitable wire-feed across the anvil, which is arranged to grip and hold the length of wire about at the middle of its length, and the end of the wire, being cut off the anvil *d*, is moved outwardly, so that its outer end and the length of wire carried thereby will be under the nozzle *c*³ of

the carrier c^2 , which then descends and bends the ends of the wire downwardly along each side of the anvil d , forming the staple, the bore or opening in the thread c^3 being of such a size in cross-section that the piece of wire will be sharply bent across the anvil d and the ends thereof bent closely to the sides of the anvil d . This sharp bending of the wire will, as before stated, if the wire be at all stiff, cause said wire to break or become weakened at the bend or crown.

In the present machine the throat c^3 is provided with movable bending-jaws arranged to move laterally relative to each other along the blank of wire held by the anvil d , so that as they come into contact with the wire they will strike the same and will be free to move laterally a limited distance along the wire blank away from the sides of the anvil d and will not sharply bend the wire over the anvil. As the carrier and throat continue to descend to turn downward the legs of the staple they are caused to move toward each other, thus moving the legs of the staple toward the sides of the anvil to bring them into a substantially straight line and parallel with each other. The throat c^3 is provided with the usual driver-passage c^4 , and in the present invention a slot c^5 extends from side to side across the lower end of the throat c^3 , into which the driver-passage c^4 opens. In the slot c^5 are arranged the laterally-movable staple-bending jaws c^6 , which in the machine of the drawings are pivoted upon studs or screws c^7 , fitted in the throat or nozzle c^3 , the adjacent edges of the staple-bending jaws c^6 being so shaped that the opposite ends are permitted to have a limited lateral movement toward and from each other.

The staple-bending jaws c^6 are preferably shaped upon their adjacent faces as shown, they being provided with a groove or rabbet c^8 along the inner edge in which the legs of the staple are arranged to lie and which form a guideway in line with the driver-passage c^4 to guide the staple while being driven from the throat or nozzle c^3 . The meeting edges of the staple-bending jaws c^6 are preferably formed with straight surfaces c^9 and c^{10} at an angle to each other, as clearly shown, so that when the jaws c^4 are spread open at their lower ends the surfaces c^9 will be in contact and when the jaws are closed the surfaces c^{10} will be in contact, the surface c^9 forming stops to limit the outward movement of the jaws c^4 . The above arrangement is such that as the carrier c^3 descends and the ends of the bending-jaws c^6 come into contact with the wire w , held across the anvil d , the jaws c^6 are free to move outwardly along said wire and away from the sides of the anvil d for a limited distance, so as to make an easy and rounded bend at the crown of the staple.

In order to move the lower ends of the bending-jaws c^6 toward each other to straighten the legs of the staple and bring them in substantial parallel alinement with each other,

I have provided the outer edges of the bending-jaws c^6 with the inclined faces c^{11} , which are arranged to contact with the inner edges of the parallel horizontal arms b , extending from a bracket b' , fixed to the front of frame a' in any suitable manner, as by the screws b^2 , the arrangement being such that the inclines c^{11} of the bending-jaws c^6 come into contact with the arms b and move said jaws c^6 toward each other and finally shape the staple just prior to the time it is acted upon by the driver and forced from the throat c^3 into the work.

The operation of my invention is as follows: The anvil d having been moved forward into position and the piece of wire w being in position across the end of the same, the carrier c^2 is depressed and with it the throat c^3 , bringing the ends of the bending-jaws c^6 in contact with the wire w upon opposite sides of the anvil d . The continued downward movement of the carrier and throat causes the lower ends of the bending-jaws c^6 in contact with the wire w to move away from each other, owing to the resistance of the wire, and slightly bend the same, as shown in Fig. 3, thus imparting a comparatively full and round bend to the wire. The further downward movement of the bending-jaws causes the ends of the wire to be bent downwardly into staple form, and the inclines c^{11} , meeting the arms b , cause the lower ends of the bending-jaws to be forced toward each other and toward the sides of the anvil d , bringing the legs of the staple close to the sides of the anvil d and substantially parallel to each other, thus finally shaping and forming the staple. The anvil d is now withdrawn and the completed staple is acted upon by the driver (not shown) and driven into the work.

It will be noted that by my improved staple-forming devices a comparatively full and easy bend is first formed in the wire and that after the legs of the staple have been turned down the staple is given a final shaping to bring the legs substantially parallel with each other, thus enabling a staple to be formed of comparatively stiff wire without danger of breaking it during the bending operation.

Having fully described the construction of my invention and its mode of operation, I claim as new and desire to protect by Letters Patent of the United States—

1. In a staple making and driving machine, the combination with an anvil, of staple-bending jaws arranged to impart a preliminary bend to the crown of the staple, and to thereafter bring the legs of the staple substantially parallel with each other, said jaws when closed forming a driving-passage substantially as described.

2. In a staple making and driving machine, the combination with a staple-driver and an anvil, of staple-bending jaws having a lateral movement toward and from each other and toward and from the anvil, said jaws in their closed position acting to hold and guide the

staple while being driven substantially as described.

3. In a staple making and driving machine, the combination with an anvil, of staple-bending jaws the lower ends of which are movable laterally toward and from each other and toward and from the anvil, said jaws when closed forming a driving-passage substantially as described.

10 4. In a staple making and driving machine, the combination with an anvil, of freely-movable staple-bending jaws free to move outwardly along the wire blank upon contact therewith and means to force them toward
15 each other, substantially as described.

5. In a staple making and driving machine, the combination with an anvil, of freely-movable staple-bending jaws free to move toward and from each other, inclined faces on said
20 jaws and fixed arms arranged to engage said

faces and move said jaws toward each other to bring the legs of the staple parallel with each other, substantially as described.

6. In a staple making and driving machine, the combination with an anvil, of staple-bending jaws arranged to engage the wire blank upon opposite sides of the anvil, and to be moved laterally a limited distance by contact with said blank, means to impart relative movements to the bending-jaws and anvil to
25 bend the blank into staple form, and means
30 to close the jaws upon the staple, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

PETER A. COUPAL.

Witnesses:

A. O. ORNE,
JOHN J. COLLINS.