

(No Model.)

4 Sheets—Sheet 1.

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

No. 347,323.

Patented Aug. 17, 1886.

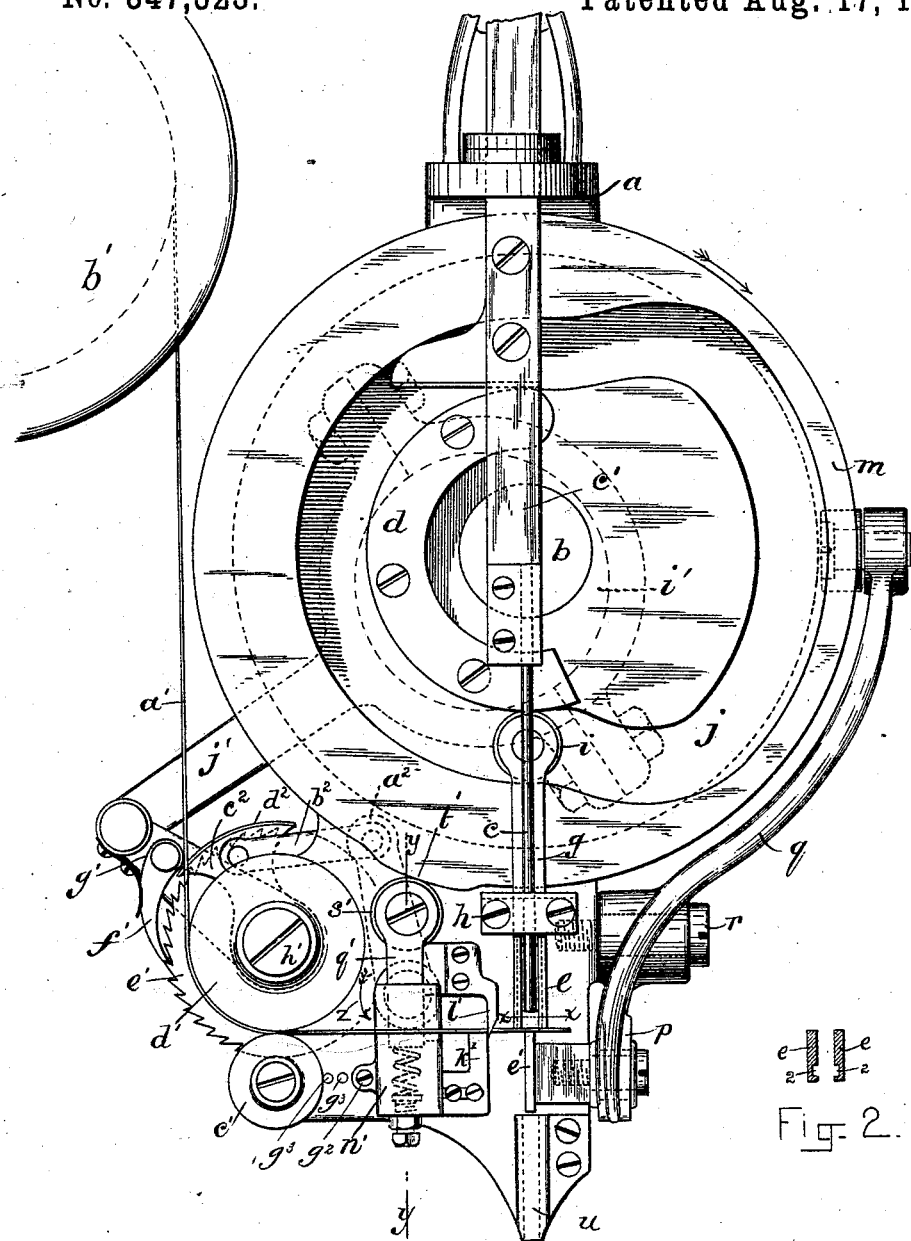


Fig. 1

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A. S. Harrison.

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by Night Brown & Cooley
Atty.

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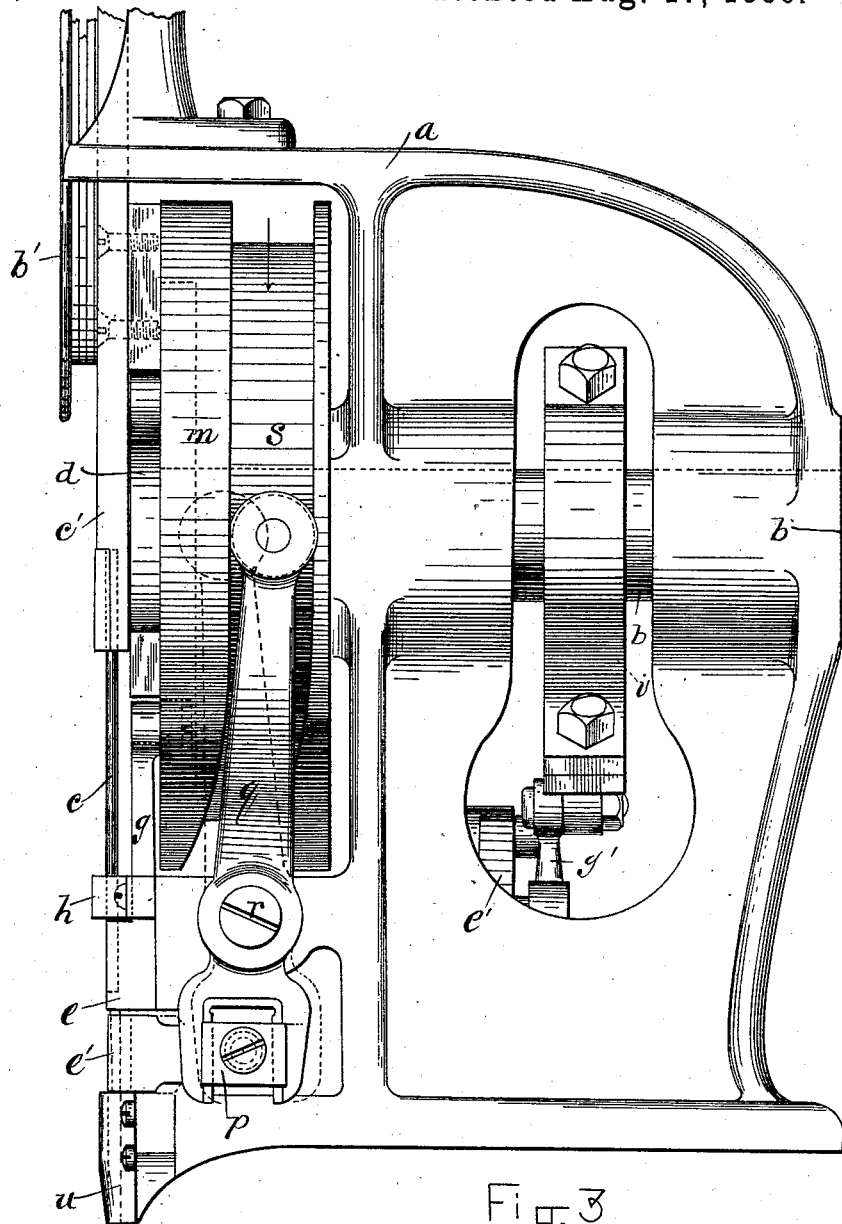


Fig. 3

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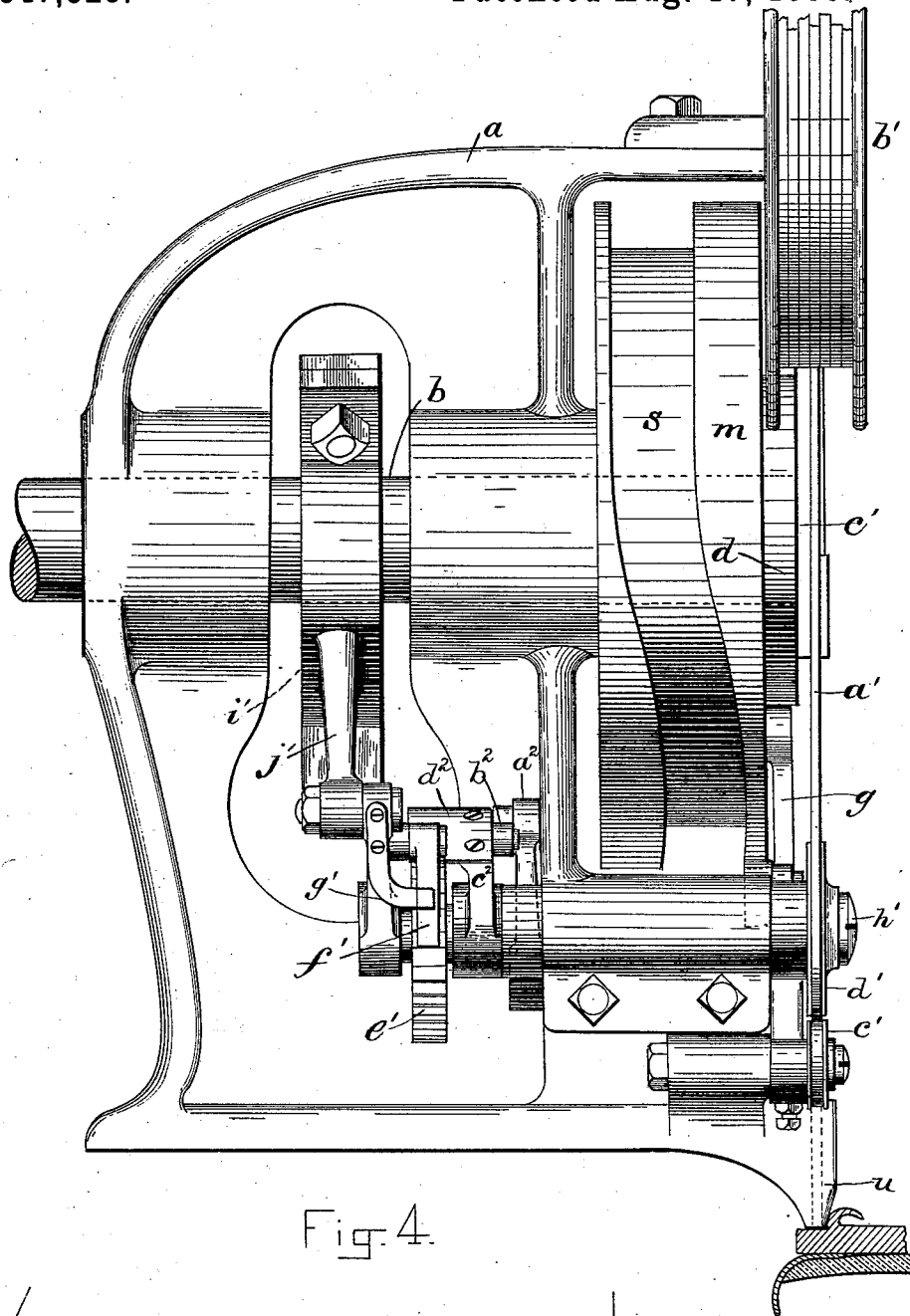


Fig. 4.

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(No Model.)

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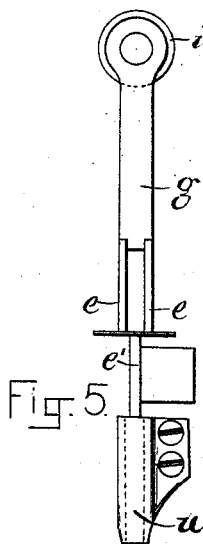


Fig. 5.

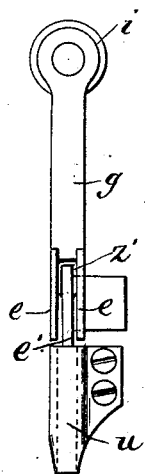


Fig. 6.

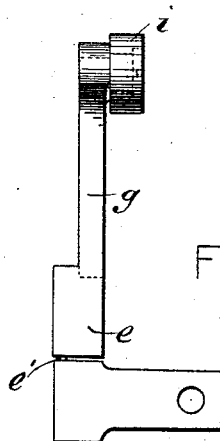


Fig. 7.

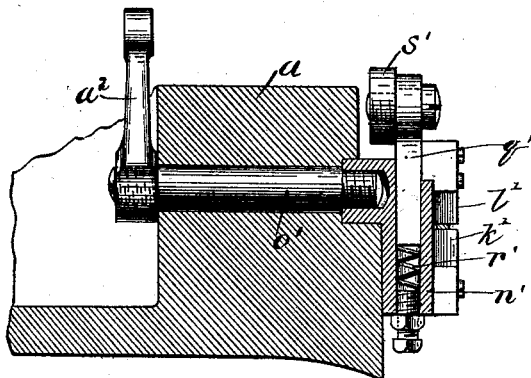


Fig. 8.

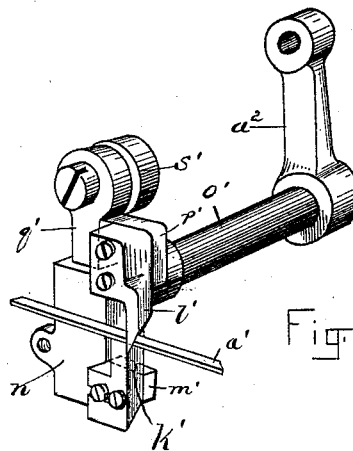


Fig. 9.

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UNITED STATES PATENT OFFICE.

PETER A. COUPAL, OF BOSTON, MASSACHUSETTS.

STAPLE FORMING AND DRIVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 347,323, dated August 17, 1886.

Application filed May 22, 1886. Serial No. 202,953. (No model.)

To all whom it may concern.

Be it known that I, PETER A. COUPAL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Staple Forming and Driving Machines, of which the following is a specification.

This invention has for its object to provide a simple machine for tacking on or temporarily securing the outer soles to a lasted inner sole and upper of a boot or shoe prior to the permanent attachment of the outer sole, the fastening devices employed being staples formed and driven by the machine.

The invention consists in certain improved mechanism for forming the staples and for regulating their length, all of which I will now proceed to describe.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of my improved machine. Fig. 2 represents a section on line *x x*, Fig. 1. Figs. 3 and 4 represent side elevations from opposite sides. Figs. 5, 6, and 7 represent views of the forming or bending devices, detached. Fig. 8 represents a section on line *y y*, Fig. 1. Fig. 9 represents a perspective view of the cutters and their supporting devices.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents the supporting-frame, in which is journaled a shaft, *b*, whereby the moving parts of the machine are operated.

c represents the driver attached to a vertical driver-bar, *c'*, which reciprocates in a vertical guide on the frame *a*, and is alternately raised and released by a cam, *d*, on a disk, *m*, affixed to the driving-shaft, and is forced downwardly to drive the fastenings by a spring (not shown in the drawings) acting on its upper end, said spring being of any suitable kind—for example, that employed to depress the driver-bar in sole-nailing machines.

e e represent two plates or formers, which are rigidly attached to a slide, *g*, which is adapted to move vertically in a guide, *h*, on the frame *a*, and has a roller, *i*, at its upper end entering a cam-groove, *j*, in the disk *m*, whereby the formers *e e* are reciprocated vertically. The formers *e e* are separated from each other

by a space, through which the lower portion of the driver passes in its reciprocating movements.

e' represents a single plate or former, which stands below the formers *e e* and in such position that when the formers *e e* have moved downwardly it (the former *e'*) will stand in the space between the formers *e e*, as shown in Fig. 6. The former *e'* is the outer end of an arm, which is attached at its inner end to a block, *p*, inserted in a slot in the lower end of a lever, *q*. Said lever is pivoted at *r* to the frame *a*, and its upper end is provided with a roller, which enters a cam-groove, *s*, in the periphery of the disk *m*. The lever *q* is oscillated by said groove, and moves the former *e'* out and in, as hereinafter described.

Below the formers *e e* and *e'* is a throat or nose, *u*, having a channel through which the staples formed by the machine are driven into a sole held against the lower end of said nose.

The wire, *w*, from which the staples formed and driven by the machine are made is supplied from a reel, *v*, supported on the frame of the machine or elsewhere, and is delivered to the formers by feed-rolls *c' d'*, one of which, *c'*, is loose, while the other, *d'*, is positively rotated, step by step, by a ratchet, *e'*, affixed to it, a dog, *f'*, engaging the teeth of said ratchet, an arm, *g'*, supporting said dog and journaled on the stud *h'*, on which the roll *d'* is journaled, an eccentric, *i'*, on the driving-shaft, and rod *j'*, connecting the eccentric with the arm *g'*. Between the feed-rolls and the formers are two cutters, *k' l'*, whereby the lengths of wire from which the staples are made are severed from the supplying-wire. The lower cutter, *k'*, is affixed to an arm, *m'*, projecting laterally from a socketed block, *n'*, which is attached to a rock-shaft, *o'*, journaled in the frame *a*. The upper cutter, *l'*, is attached to an arm, *p'*, formed on a slide, *q'*, which is adapted to move vertically in a socket in the block *n'*, and rests on a spring, *r'*, in said socket. (See Fig. 8.) The upper end of the slide *q'* is provided with a roller, *s'*, which is pressed by the spring *r'* against the disk *m*. The periphery of the disk has a cam, *t'*, which depresses the slide *q'* and the cutter *l'* thereto attached once during each rotation of the shaft *b*, thereby causing said cutter to co-operate with the cutter *k'* in severing the wire.

The rock-shaft o' has an arm, a^2 , at its rear end, which is connected by a rod, b^2 , with an arm, c^2 , loosely mounted on the stud N . Said arm is provided with a curved shield, d^2 , which projects over a portion of the ratchet e' , and is adapted to prevent the dog f' from acting on the ratchet during any desired part of its movement, the extent of rotation imparted to the feed-roll d' by the dog f' being regulated by the shield d^2 . It will be seen that by turning the rock-shaft o' in the direction indicated by the arrow z , Fig. 1, the cutters $k' l'$, which are at one side of said shaft, will be moved slightly toward the formers, while the arm c^2 , with the shield d^2 , which is at the opposite side of the rock-shaft from the cutters, will be moved in the opposite direction toward the dog f' . By turning the rock-shaft o' in the opposite direction the cutters are moved away from the formers and the shield away from the dog. The movement of the shield toward the dog causes it to shorten the operating throw of the dog, and thus decrease the movement imparted to the feed-rolls. The described devices are so proportioned that the shield is moved twice as far as the cutters, the result of this arrangement being a movement of the cutters so proportioned to the feed movement that the wire blank formed by the cutters will project equally from both sides of the former e' , any change in the length of the feed movement being accompanied by a proportional change in the position of the cutters. The equal length of the legs of each staple produced is thus assured. The block n' , supporting the cutters, is provided with a screw or pin, g^2 , adapted to enter either one of a series of holes, g^3 , in the frame a , the block being thus held positively in the various positions to which it may be adjusted.

The general operation of the machine is as follows: The formers $e e$ being raised, as shown in Figs. 1, 5, and 7, the wire is fed between the formers $e e$ and the former e' , and then severed by the cutters, the formers $e e$ being depressed and caused to bear on the wire just before or simultaneously with the cutting operation. The formers $e e$ then descend and bend the severed piece of wire into a staple,

as shown in Fig. 6. The inner sides of the formers $e e$ have grooves 2 2, Fig. 2, which hold the legs of the bent staple, and prevent it from being displaced laterally. The former e' is then moved backwardly out of the staple, as indicated by dotted lines in Fig. 3, and then the driver is forced downwardly between the formers $e e$, ejecting the staple and driving it through the nose u into the sole which is held by the operator against the nose. After the driver rises, the former e' is moved forward, and the operation is repeated. The shaft b is provided with a stop-motion, so that after each complete rotation the operation ceases until the operator depresses a treadle and causes another rotation, as is common in nailing-machines.

I claim—

1. The combination, with the driver, the wire feeding and cutting devices, and the former e' and its operating devices, of the vertically-reciprocating formers $e e$, having grooves 2 2 in their inner faces to receive and hold the staples, as set forth.

2. The combination, with the staple forming and driving mechanism, of the wire-severing cutters, the movable support therefor, whereby said cutters may be moved toward or from the formers, the feed-rolls, the dog f' , normally engaging a ratchet on one of the feed-rolls, mechanism for reciprocating said dog, the oscillatory arm c^2 , the shield d^2 on said arm adapted to be interposed between the dog and ratchet, so as to vary the operative throw of the dog, and devices, substantially as described, whereby the movable support for the cutters is connected with the shield, the arrangement being such that a movement of the cutters and their support causes a corresponding movement of the shield, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 24th day of April, 1886.

PETER A. COUPAL.

Witnesses:

C. F. BROWN,

A. D. HARRISON.