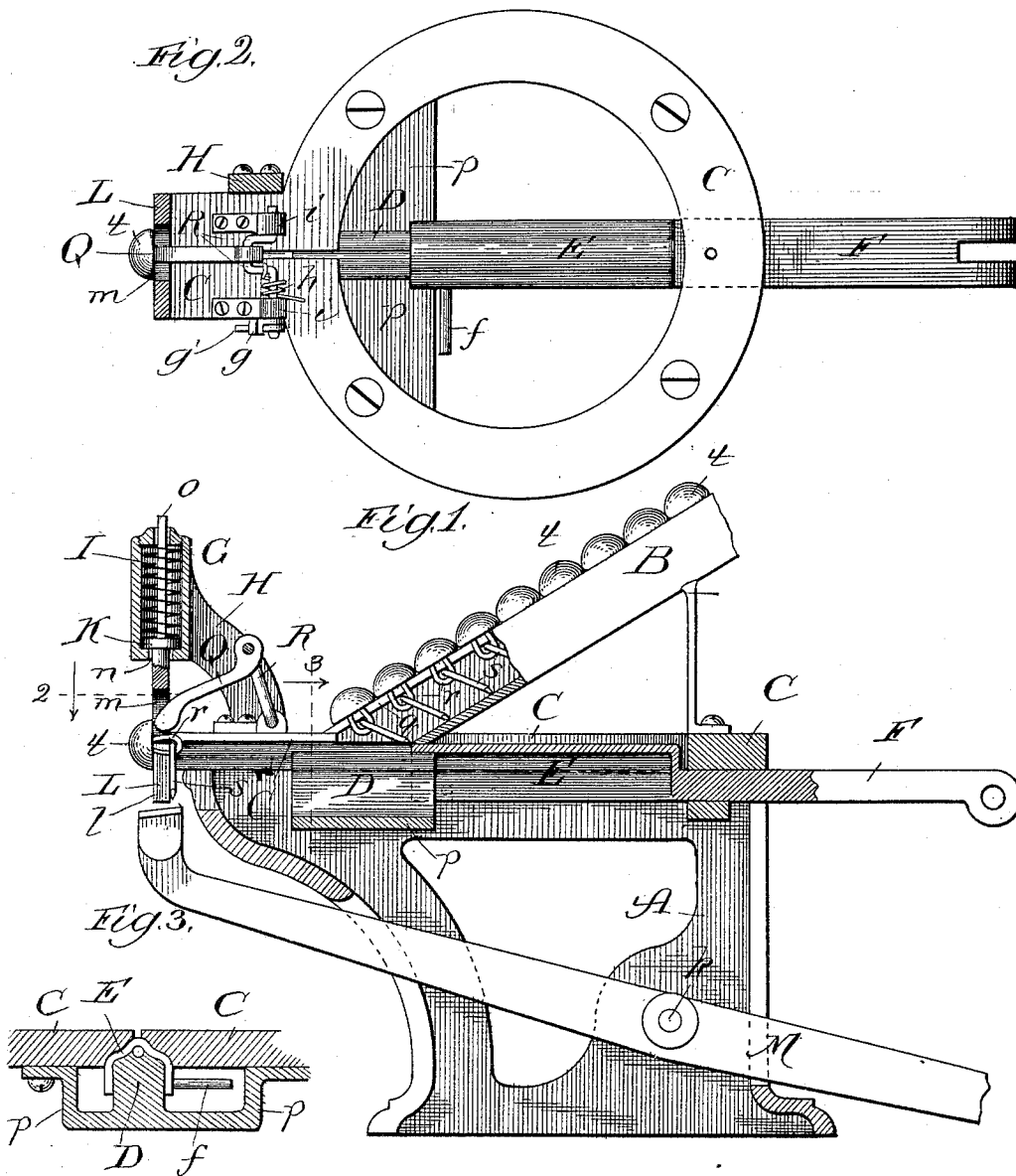


F. A. RAY.
BUTTON SETTING MACHINE.

No. 483,694.

Patented Oct. 4, 1892.



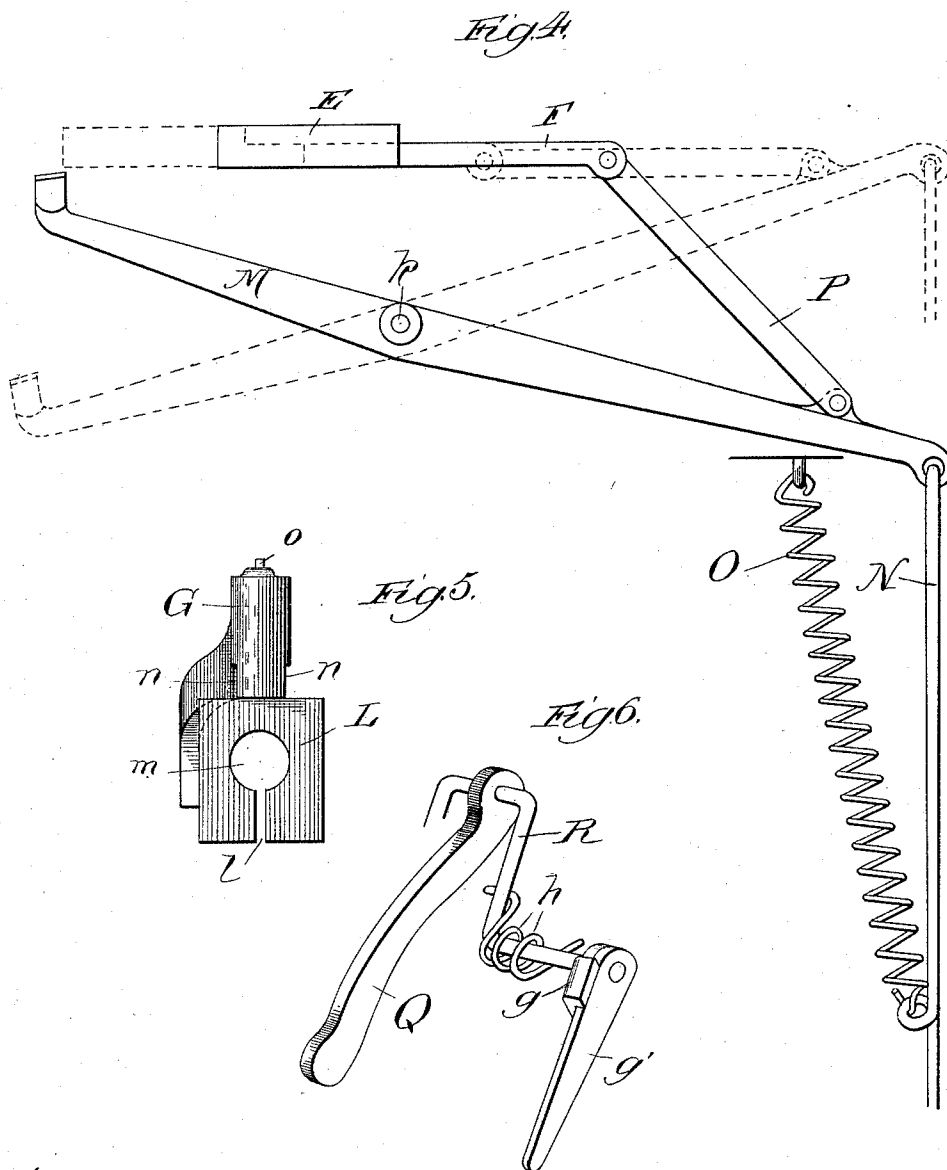
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Inventor:
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UNITED STATES PATENT OFFICE.

FREDERICK A. RAY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE HEATON
PENINSULAR BUTTON FASTENER COMPANY, OF PROVIDENCE, RHODE
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BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 483,694, dated October 4, 1892.

Application filed December 21, 1891. Serial No. 415,743. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK A. RAY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Button-Fastening Machines, of which the following is a specification.

My invention relates to machines for attaching buttons to shoes and other articles by means of metallic fasteners. The machine represented in the accompanying drawings is especially adapted for fasteners in the form of two-prong staples; but with slight modifications, which will readily suggest themselves to any one skilled in the art, the leading features of the machine may be equally adapted for other forms of metallic fasteners.

In securing buttons to shoes and other articles the common practice is to employ buttons each provided with a metal eye and fastened in place to the material by means of a staple passed through the eye of the button and through the material and clinched upon the side opposite the button by pressure exerted against the points. Heretofore the holding of the fastener in place just before and during the impact of the clinching device in such manner as to permit the ready withdrawal of the material and button after the clinching has been effected has been a matter of much difficulty, and more or less complicated and delicate mechanisms, generally involving spring holding devices in different forms, have been employed for the purpose. So far as I am aware none of these devices have accomplished perfectly the object sought and all of them are very liable to become impaired by use even for a short time. These difficulties are overcome by my invention, a description of which is as follows:

In the accompanying drawings, Figure 1 represents in sectional elevation a foot-power machine provided with my improvements; Fig. 2, a sectional plan view of the same, the section being taken on the line 2 of Fig. 1 and viewed in the direction of the arrow; Fig. 3, a vertical section taken on the line 3 of Fig. 1 and viewed in the direction of the arrow; Fig. 4, a view in side elevation and detached

of the lever mechanism, by means of which the button and fastener are pushed into place and clinched, the different positions of the parts being represented by full and dotted lines; Fig. 5, a front view of the parts at the forward end of the machine against which the impact-lever acts, and Fig. 6 a detached view in perspective of the device for tilting the button.

A is the frame of the machine, which serves as the support for the working parts, hereinafter described, and which is provided at its top with a slotted and inclined chute B, down which the buttons *t*, carrying the fasteners *s*, passed through their eyes *r*, slide by the action of gravity, the eyes extending through the slot *q* of the chute. The height of the chute is less than the height of the fasteners, so that the latter trail on the bottom, as shown in the drawings, and thus form no obstruction to the downward progress of the buttons.

C is a magnet rigidly secured upon the frame A and having its legs preferably parallel from the lower end of the chute to their termini, and preferably separated from each other to about the width of the slot in the chute.

D is a rigid bridge extending across the lower opening of the chute longitudinally of the machine and which may be held in place either by being bolted by means of plates *p* to the lower face of the magnet, as shown in Fig. 3, or otherwise directly or indirectly secured to the frame of the machine. The lower edges of the legs of the magnet C, adjacent to the slot which separates them, are cut away to conform in shape with the outside of the tops of the fasteners, and the bridge D conforms to the shape of the inside of the fasteners. When the lower end of a fastener reaches the opening at the lower end of the chute B, the fastener drops to a vertical position, straddling the bridge D, and the space between the magnet and the bridge is sufficient to permit the fastener to pass forward between the two.

E is a reciprocating plate, preferably of non-magnetizable material, having the same con-

formation as the bridge D and moving freely over the bridge below the lower end of the chute and below the magnet.

F is a rear extension of the plate E, serving as a medium for reciprocating the plate. The function of the plate E is to serve as a pusher to drive the buttons and staples successively forward to the end of the machine, where the clinching operation is performed, and the main function of the bridge D is to maintain the staples in alignment with the end of the plate E, even though the eyes of the buttons vary in length, as they usually do. When the tops of the fasteners come into contact with the magnet, they are held up by the latter without aid from the bridge, and hence the bridge may terminate, as shown in the drawings, only a little in advance of the lower end of the chute. An additional function of the bridge is to aid in supporting the plates E and serve as a guide for it. From what has been stated concerning the bridge it will be seen that while it is a very desirable agent it is not indispensable.

G is a spring-casing supported rigidly upon the machine, as by means of one or more arms H, and I is a coiled spring inclosed within the casing and confined between the top thereof and a follower K, preferably provided with a guide-rod *o*, passing through an opening at the top of the casing. The casing G is provided with a slot *n*, extending across its lower end and for some distance up its sides to receive the vertical plate L, which is made, preferably, of iron or steel, so that it may be attracted by the magnet and be held in close contact therewith, and which is attached to the follower K. The plate L is provided with an opening *m* large enough to permit the button to pass freely through it and so located as to be in the line of movement of the button when the plate L is in its lowest position, which by reason of the spring I is its normal position. Extending downward from the opening *m* through the lower end of the plate L is a slot *l* wide enough to permit the free passage of the eye of the button.

M is a lever fulcrumed to the frame A, as shown at *k*, and having its forward arm of such length as when raised to strike the lower end of the plate L and the staple. To the rear arm of the lever M a rod N is connected, at the lower end of which is a treadle. (Not shown.) A spring O, connected to the rod N at its lower end and to the frame A or some other fixed object at its upper end, tends to maintain the forward arm of the lever M at its lowest point, as indicated by the dotted lines in Fig. 4.

P is a link connecting the rear arm of the lever M with the end of the bar F and serving as the medium for imparting a longitudinally-reciprocating movement to the pusher E from the arc described by the point of connection with the lever M.

The three principal positions of the parts

which receive movement from the treadle are indicated by full and dotted lines in Fig. 4.

Q is a finger loosely connected to a crank R, mounted in bearings *i*, secured to the top of the magnet toward its forward end. A spring *h* upon one of the crank-shafts, with its free end bearing upon the top of the magnet, tends to maintain the crank in a position inclined slightly forward from the vertical, as shown in Fig. 1, and hence to maintain the lower end of a loose finger Q at the extreme forward limit of its movement, which, owing to the length of the finger, is within the opening *m* in the plate L. One of the journals of the crank R is provided outside the bearing with a rigid extension *g*, and also with a loose pendent arm *g'*, and the pusher E is provided with a laterally-projecting pin *f* in such position as to engage the arm *g'* in both the forward and backward movements of the pusher. The effect of the engagement in the forward movement is to press the arm *g'* against the rigid extension *g*, and thus send the crank R, and with it the finger Q, backward in opposition to the spring *h*, causing the lower end of the finger Q, by reason of the loose connection of the finger to the crank, to pass over the top and to the rear of the button sent forward by the pusher. Just before the pusher reaches the forward limit of its movement the pin *f* passes beyond the end of the arm *g'*, and the arm being thus released the crank under the action of the spring *h* flies back to its normal position, forcing the finger Q forward, and thereby driving the button through the opening *m* and bringing its eye within the slot *l*, as represented in Fig. 1. Pressure is then exerted upon the treadle to effect the clinching, and this incidentally causes the pusher to retreat to the position indicated by the full lines in Fig. 4. While moving in this direction no resistance is offered to the pin *f* by the arm *g'*, which, being unobstructed on the side opposite the extension *g*, yields freely under the pressure of the pin and when released drops back to its normal position.

From what has been said it will be seen that the purpose of the plate L is in part to serve as a means for holding the button and its eye in such a position that the full action of the lever upon the staple will not be interfered with, and also to stay the staple while the clinching is being performed. The upward movement of the forward end of the lever M drives the plate L upward in opposition to the spring I and bends the lower end of the staples after they have passed through the material, since the top of the staple abuts against the under side of the magnet at the forward end of the latter. As soon as the clinching has been effected the treadle is released, causing the levers and their parts actuated by the treadle to resume their normal position, and in the course of their movement to this position the several operations above described as incident to this movement are

repeated upon the next succeeding button and staple. As soon as the forward end of the lever M is sufficiently out of the way the material, with its attached button, is withdrawn, the force of the magnet being very easily overcome, and when the next succeeding button has been sent through the opening *m* the material is placed in proper position to receive it in turn.

10 The machine above described is suitable for carrying my invention into effect; but it may be variously modified and still contain the broad features of my invention. To obtain the most satisfactory results, it is desirable that the button and its attached staple
15 prior to the clinching be given the movements described above; but modifications of the mechanism for imparting these movements may easily be devised.

20 What I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for attaching buttons to shoes and other articles, the combination, with the supporting-frame, of a magnet secured
25 horizontally thereon, a chute for delivering the buttons, with their attached fasteners, one at a time to the magnet, with the fastener on the under side of the magnet and the button on the upper side thereof, a pusher and actuating mechanism therefor for impelling the
30 fastener to the forward end of the magnet while held to the latter by attraction, and impact mechanism for clinching the fastener to the material while the fastener is being supported by the magnet, substantially as described.

2. In a machine for attaching buttons to shoes and other articles, the combination, with a supporting-frame, of a magnet horizontally secured thereto, a chute for delivering the buttons, with their attached fasteners,
40 one at a time to the magnet, with the button upon the upper side and the fastener upon the lower side thereof, a pusher and actuating mechanism therefor for impelling the fastener and button forward to the end of the magnet, a finger and actuating mechanism therefor for tilting the button over the end of the magnet, and impact mechanism for clinching the fastener while it is supported by the
50 magnet, substantially as described.

3. In a machine for attaching buttons to shoes and other articles, the combination, with the supporting-frame, of a magnet secured thereto in horizontal position, means for delivering the buttons, with their attached fasteners, one at a time to the magnet, with the buttons above and the fasteners below the same, a spring-actuated plate L, having an
60 opening *m* and slot *l*, abutting against the end of the magnet, mechanism for impelling the

button and staple forward to the end of the magnet, mechanism for tilting the button through the opening *m* of the plate L, and impact mechanism operating against the lower
55 end of the plate L and the lower end of the fastener to clinch the latter, substantially as described.

4. In a machine for attaching buttons to shoes and other articles, the combination, with the supporting-frame, of a magnet C, secured thereto, a chute B, delivering the buttons, with their attached fasteners, one at a time to the forward part of the magnet, with the buttons above and the fasteners below the same, mechanism for pushing the buttons and fasteners forward to the end of the magnet, a plate L, having an opening *m* and slot *l*, abutting against the end of the magnet, a spring I, tending to maintain the plate in its lowest position, mechanism for tilting the button through the opening *m*, a lever for clinching the fastener by impact against the lower end thereof, and mechanism for actuating the moving parts, substantially as described.

5. In a machine for attaching buttons to shoes and other articles, the combination, with a supporting-frame, of a magnet C, secured thereto, means for delivering the buttons one at a time to the magnet, with the buttons above and the fasteners below the magnet, a pusher E, impelling the button and fastener forward to the end of the magnet, a spring-actuated plate L, having an opening *m* and slot *l*, abutting against the end of the magnet, a pin *f*, projecting from the pusher, a crank R, supported in bearings and having a rigid extension *g*, an arm *g'*, loosely hung upon the crank-journal adjacent to the extension *g* in the path of the pin *f*, a finger Q, loosely mounted upon the crank R, a spring tending to maintain the crank in nearly-vertical position, an impact-lever for clinching the staple, and means for connecting the moving parts of the machine, substantially as described.

6. In a machine for attaching buttons to shoes and other articles, the combination, with a supporting-frame A, of a magnet C, secured thereto, chute B, delivering the buttons and their attached fasteners one at a time to the magnet, bridge D, supported below the magnet, push-plate E, having the extension F and conforming to the bridge D and reciprocating over the same, impact-lever M, link P, connecting the impact-lever with the extension F, and treadle mechanism for actuating the lever M, substantially as described.

FREDERICK A. RAY.

In presence of—

J. N. HANSON,
M. J. FROST.