

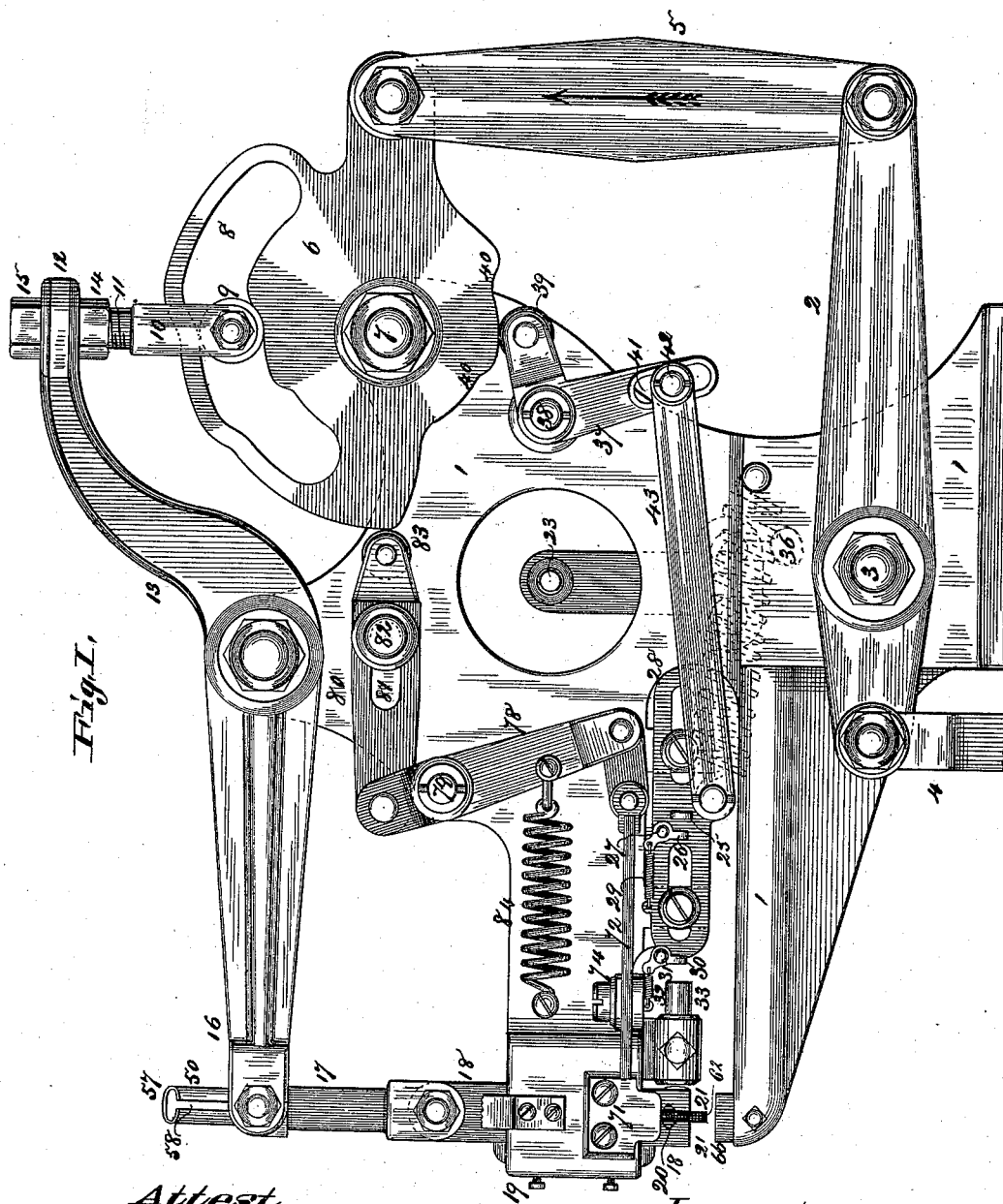
(No Model.)

3 Sheets—Sheet 1.

J. EMERY.  
BUTTON MACHINE.

No. 383,802.

Patented May 29, 1888.



Attest.  
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*Emma Arthur.*

Inventor,  
*Jonathan Emery.*  
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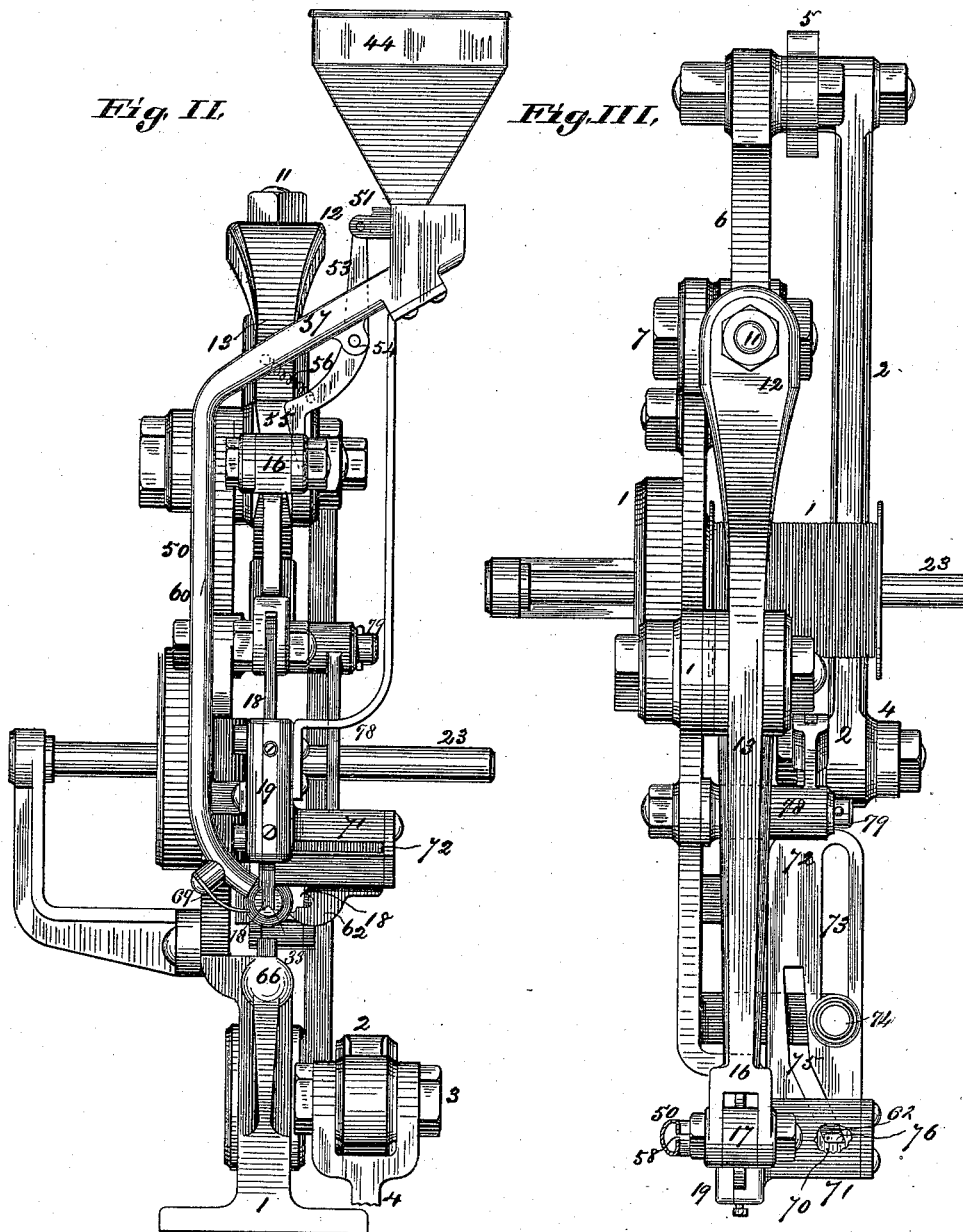
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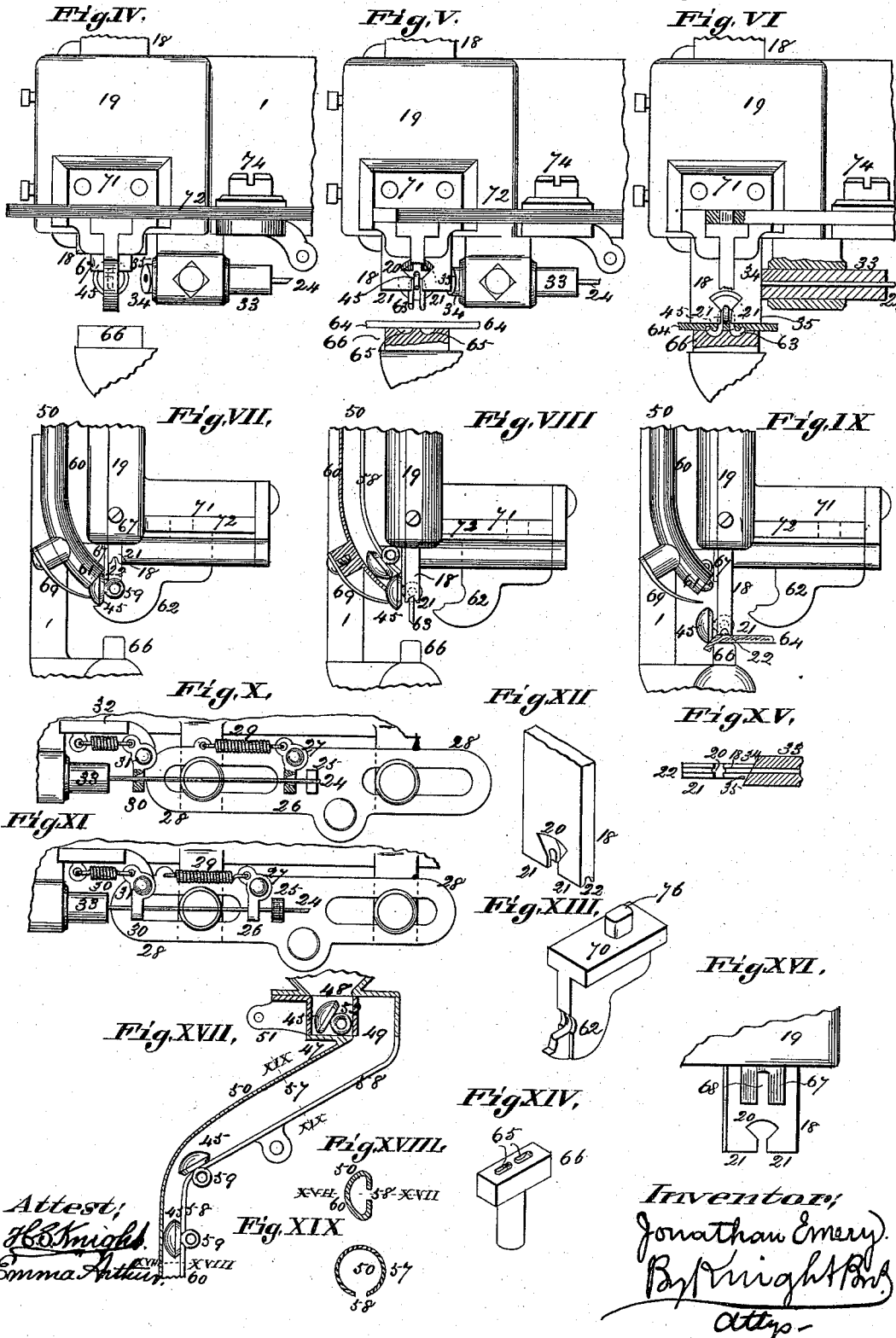
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# UNITED STATES PATENT OFFICE.

JONATHAN EMERY, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO  
GEORGE D. EMERY, OF LE ROY, KANSAS.

## BUTTON-MACHINE.

SPECIFICATION forming part of Letters Patent No. 383,802, dated May 29, 1888.

Application filed June 4, 1887. Serial No. 240,283. (No model.)

### *To all whom it may concern:*

Be it known that I, JONATHAN EMERY, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Machines for Attachment of Buttons, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 In this machine the buttons are fed loose into a hopper, and the wire by which they are attached to the shoe (or other article) taken direct from a coil, and the machine acts automatically to attach the button.

15 Figure I is a side elevation of the machine, with the feed-hopper removed. Fig. II is a front elevation. Fig. III is a top view with the hopper removed and the feed-pipe in section. Fig. IV is a detail side elevation of the front end of the machine, the anvil-block being detached but in position, a button in position to receive the staple wire, and the plunger up. Fig. V is a similar view to Fig. IV, except that the plunger is at half-stroke, the staple formed. Fig. VI is a similar view to Figs. IV and V, except that the plunger is down and the staple clinched. Fig. VII is a detail front view showing the parts in position shown in Fig. IV. Fig. VIII is a detail front view showing the parts in position shown in Fig. V. Fig. IX is a detail front view showing the parts in position shown in Fig. VI. Fig. X is a side view of the wire-feeding device, with the slide back, and Fig. XI is a similar view showing the slide forward. Fig. XII is a perspective view of the lower end of the plunger. Fig. XIII is a perspective view of the holding-finger. Fig. XIV is a perspective view of the anvil-block. Fig. XV is a bottom view of the plunger, showing part of the wire-guide tube, whose end also forms one member of the shears by which the wire is cut. Fig. XVI is a detail side view of the lower part of the plunger and its guide, and also the plate by which the eye of the button is held. Fig. XVII is a detail section of the button-feed pipe and the feed-slide of the hopper, the section being shown at line XVII-XVII, Fig. XVIII. Fig. XVIII is a cross-section of the button-feed tube at XVIII-XVIII, Fig. XVII. Fig.

XIX is a cross-section at XIX-XIX, Fig. XVII.

1 is the body of the machine.

2 is a lever fulcrumed to the body at 3. The lever is operated by means of a crank, eccentric, or other suitable device, which gives reciprocating motion to the pitman 4, connected to one end of the lever. The lever is connected by a pitman, 5, to an oscillating cam, 6, working on an arbor, 7. This cam has a cam-groove, 8, in which works an anti-friction wheel, 9, upon an arm, 10, having a screw-threaded part, 11, passing through the end 12 of the lever 13.

14 15 are nuts bearing respectively against the under and upper sides of the end 12. The other end, 16, of the lever 13 is connected by a pitman, 17, to the upper end of the plunger 18, by which the wire is bent into the form of a staple and then forced through the material to which the button is to be attached, and then clinched by forcing its ends against the anvil-block. The plunger works through a guide, 19, so as to insure it a straight and steady vertical movement.

The plunger has at the lower end a recess, 20, extending transversely, dividing it into two parts, 21 21, each of which has a groove, 22, extending lengthwise of the end. The recess 20 is to receive the eye of the button and the grooves are to receive the staple-wire and prevent its slipping off the end of the plunger while it is being bent into the form of a staple. The grooves 22 are extended up the sides of the recess to the enlarged part thereof to keep the staple in place. The wire coil is placed on a spindle, 23, on which it freely turns as the wire is fed forward and unwound from the coil. From the coil the wire 24 passes first through an eye, 25, and then through pivoted feed-catches, the first, 26, of which is pivoted at 27 to the feed-slide 28. The upper end of this catch is connected by a spiral spring, 29, to an ear on the feed-slide. The spring tends to hold the catch in the position shown, so that it engages the wire when the slide is moving forward, but allows the catch to turn on its pivot when the slide is moving backward, so as to release its hold upon the wire. The wire passes from the catch 26 to a similar

catch, 30, which is pivoted at 31 to the body of the machine, and turned in the same manner by a spring, 32, and for the same purpose—namely, to allow the forward movement of the wire through the eye of the catch, but prevent its retrograde movement. No claim is made on this wire-feeding device, and no detailed description is needed. The wire, after passing through the catches, passes through a guide-tube, 33, whose front end, 34, is inclined and forms one member of the shearing device by which the piece of wire to form the staple is cut off. The plunger forms the other member of the shearing device, its center, 35, moving down in contact with the shearing end 34 of the guide-tube. The cutting-parts 34 and 35 must of course be of hardened steel. The wire-feed slide 28 is moved forward by the cam 6 and moved backwardly by a spring, 36, one end of which is attached to the slide and the other to the body 1.

37 is a bell-crank fulcrumed to the body 1 at 38, and one arm of which carries an anti-friction-wheel, 39, playing against a cam-surface, 40, of the cam-wheel 6. The other arm of the bell-crank is slotted at 41 for the passage of a wrist-pin, 42, which is connected by a pitman, 43, to a pin on the slide 28. The wrist-pin is fixed in the slot by a nut or by any well-known or suitable means. By changing the position of the wrist-pin in the slot the throw of the slide is increased or diminished.

The hopper 44 may be filled with buttons 45. At the bottom of the hopper is a recess, 46, having a bottom, 47, beneath the discharge-opening 49 at the top of the tube 50, down which the buttons pass. In the recess 46 works a slide, 51, made with a recess, 52, open at bottom and top, and which is of such size as to receive a single button, but no more. When the slide is in the position shown in Fig. XVII, the button is received, and when the recess comes in line with the opening 49 the button drops into the tube 50. The slide 51 is connected to the upper end of a lever, 53, fulcrumed at 54, and having its lower end, 55, inclined, and against it the plunger-lever 13 impinges at each upward movement of the plunger and draws the slide 51 outward (to receive a button from the hopper.) As the plunger descends the lower end of the lever 53 is drawn outward by a spring, 56, and the slide is thus carried to the discharging position. The upper part, 57, of the button-tube 50 is circular in cross-section and inclined from the hopper downward. (See Figs. XVII and XIX.) The button-tube has a slot, 58, extending from end to end. This slot is at the lowest part of the inclined part 57, so that while the button is passing through this part the eye 59 shall gravitate into the slot.

The vertical part 60 of the tube is flattened, as seen in the section, Fig. XVIII, so that when the eye has entered the slot it cannot

escape therefrom and the button is held in proper position for attachment until it reaches the discharging end 61 of the tube. When the button reaches this point, it falls out of the tube onto the horn 62, as shown in Figs. IV and VII. Then the wire 24 is pushed through the eye of the button and the plunger descends and cuts off the piece of wire and bends it down each side of the horn into the form of a staple, 63. The plunger remains in this position until the horn is drawn out of the staple, as seen in Fig. VIII, when the plunger moves down, carrying the button and staple with it and forcing the ends of the staple through the fabric 64 and into the recesses 65 of the anvil 66. These recesses are so formed as to cause the ends of the staple to curve first outward and then upward, so that their extreme points are buried in the fabric.

67 is a fixed plate slotted at 68 for the passage of the eye of the button as it drops out of the end of the tube, the plate arresting the button in the position shown in Figs. VII and VIII. 69 is a spring, against which the head of the button falls, and which, with the fixed plate 67, serves to hold the button in position after the horn 62 has been moved back and before the plunger has commenced its final downward movement.

The horn 62 has a head, 70, which works transversely in a suitable guide, 71, which is mortised longitudinally, and in the mortise works the cam-plate 72. The cam-plate has a longitudinal slot, 73, through which passes a guide-screw, 74, so that the cam-plate is confined to a straight endwise movement. The cam-plate has a cam-slot, 75, and the head 70 has a stud, 76, which enters the guide-slots 75, so that as the cam-plate moves longitudinally it causes the horn 62 to reciprocate in a transverse direction. The cam-plate is connected by a link, 77, to the lever 78, fulcrumed to the body 1 at 79, and connected to the link 80 at the upper end, 81.

82 is a screw-stud passing through the slot and screwed fast in the body 1.

83 is an anti-friction wheel journaled in the end of the link and having bearing against the periphery of the cam 6.

84 is a spring secured at one end to the body and at the other end to the lever 78. The effect of this lever is to hold the wheel 83 against the cam, and thus to move the cam-plate forward when it is not held back by the cam 6.

The operation has been described in the body of the specification, but will be briefly described here.

A roll or spool of wire is put on the spindle and led through the fixed eye, feeder, catches, and guide-tube. The article to which the buttons are to be attached is placed on the anvil-block and buttons are placed in the hopper and the machine is started. The buttons—one at a time—enter the feed-tube 50 and their eyes fall into the slot 58 with the eyes edge down, so as to be in proper position for the wire to

pass through them. The buttons fall out of the lower end of the tube into position to receive the wire, when the wire is carried through the eye, and the plunger making its first forward movement, the wire is cut off and bent into a staple over the horn 62. The horn is now moved back and the plunger makes its last downward movement, forcing the ends of the staple through the article and into the clinching-recesses in the anvil-block, by which said ends are curved outward and upward.

I claim as my invention—

1. The combination, in a machine for attaching buttons, of a plunger having a recess to receive the eye of a button, and a groove on its lower edge to receive the staple, a retractile horn for supporting the button, and a fixed slotted plate for arresting the movement of the buttons, substantially as described.
2. The combination, in a machine for attaching buttons, of a plunger, a retractile horn having its end formed with shoulders and curved to conform to the contour of the button, and an anvil, substantially as described.
3. The combination, with the hopper, of a reciprocating slide having a vertical recess through its end for receiving the buttons, and a tube over which said recessed end passes and into which the buttons are discharged, substantially as described.
4. The combination, in a button-attaching machine, of a plunger constructed of a single

piece of metal adapted to cut off a piece of wire, bend it into a staple and force it through the goods, a wire-feeding device, and a retractile horn, substantially as described.

5. The combination, with the hopper and the reciprocating feeding device for removing the buttons from the hopper, of the inclined feed-tube slotted from end to end and constructed with its upper portion substantially cylindrical in shape and its lower portion flattened to prevent the escape of the eye of the button from said slot, substantially as described.

6. The combination, in a button-attaching machine, of the body 1, the cam 6, having the groove 8 therein, the pitmen and levers connecting the same with the motive power, the lever 13, having the anti-friction wheel 9 secured thereto and working on said cam, the plunger 18, and the pitman 17, connecting the plunger with the lever 13, substantially as described.

7. In a button-attaching machine, the combination, with the cam 6 and the lever 13, of the screw-threaded arm 10, having connection with said lever and provided with a friction-wheel, 9, on its lower end, adapted to come in contact with said cam, substantially as described.

JONATHAN EMERY.

In presence of—

SAML. KNIGHT,  
JAS. E. KNIGHT.