(No Model.) 2 Sheets—Sheet 1.

F. A. SMITH, Jr.

MACHINE FOR ATTACHING BUTTONS.

No. 286,741. Patented Oct. 16, 1883.

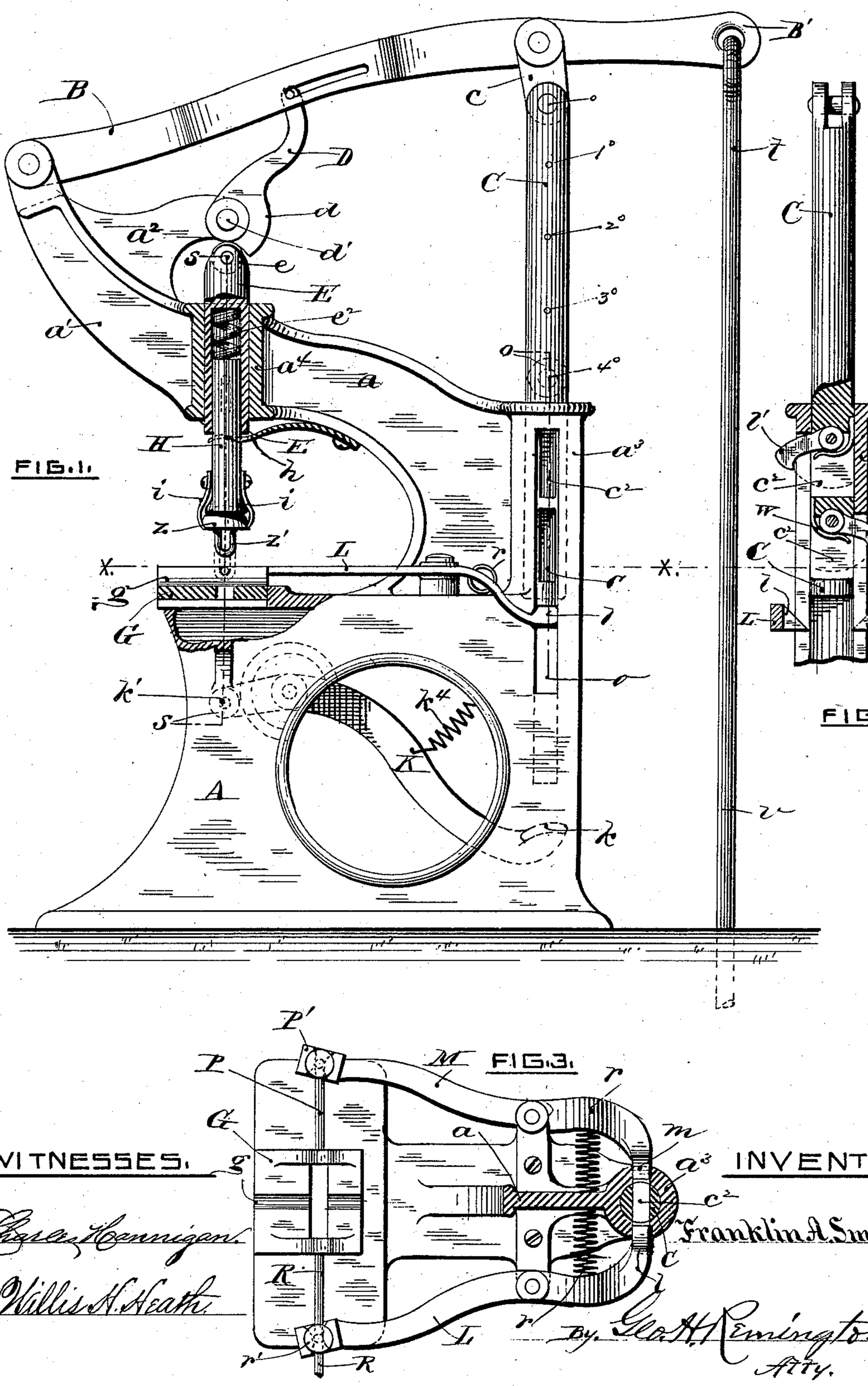

FIG. 1.

FIG. 2.

FIG. 3.

WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

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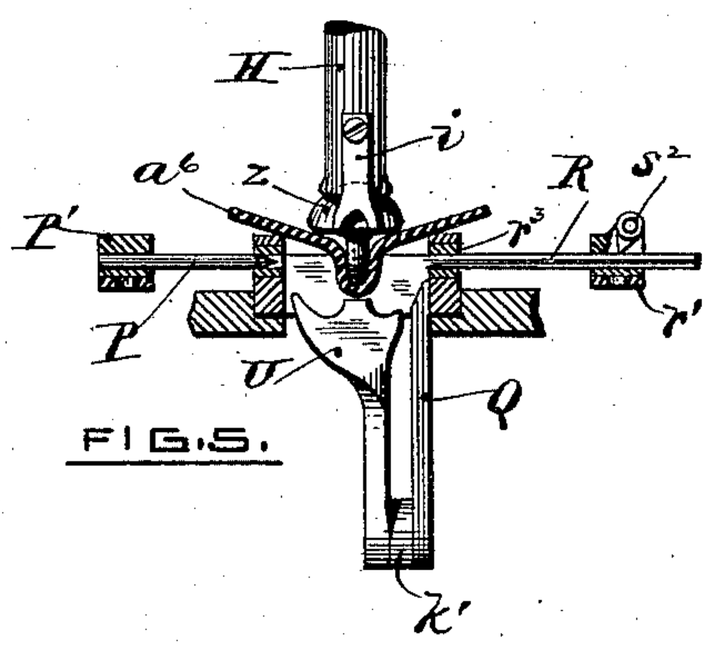

FIG. 5.

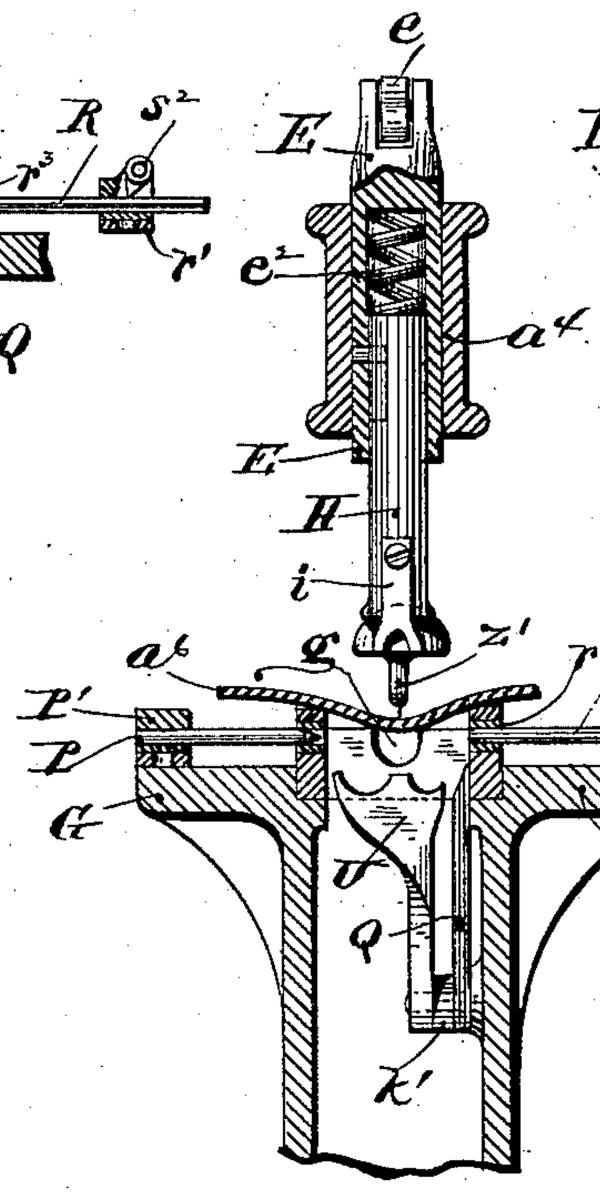

FIG. 4.

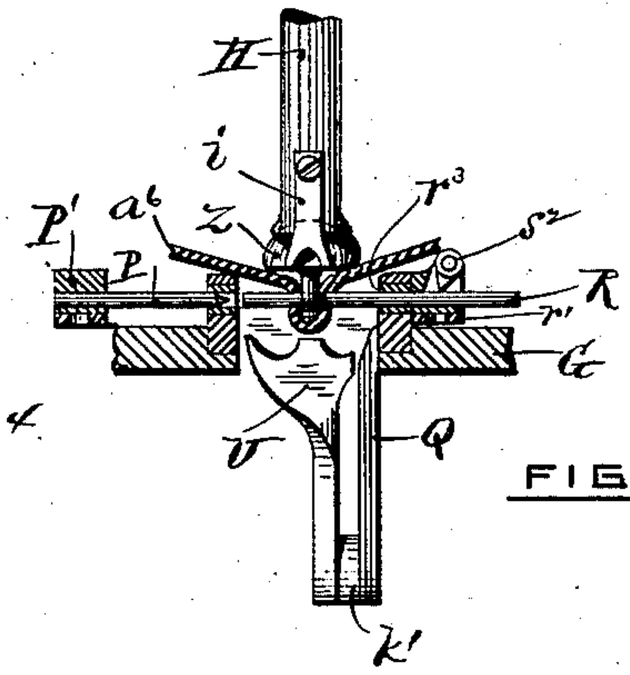

FIG. 7.

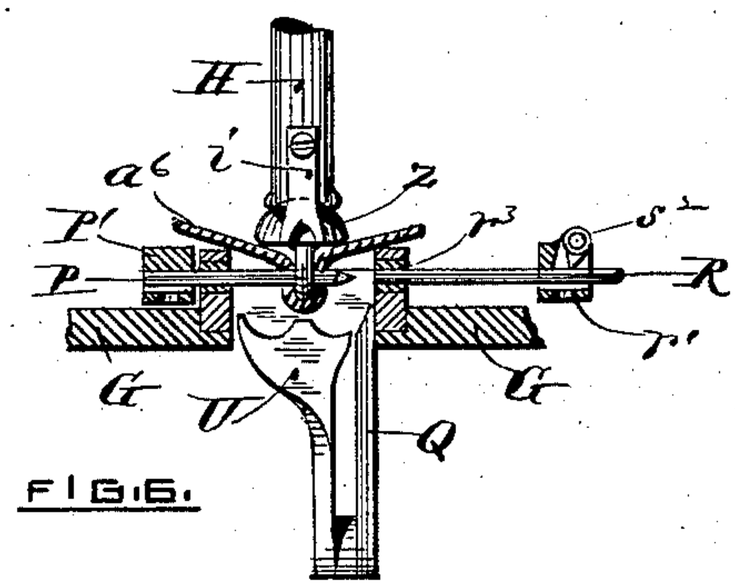

FIG. 6.

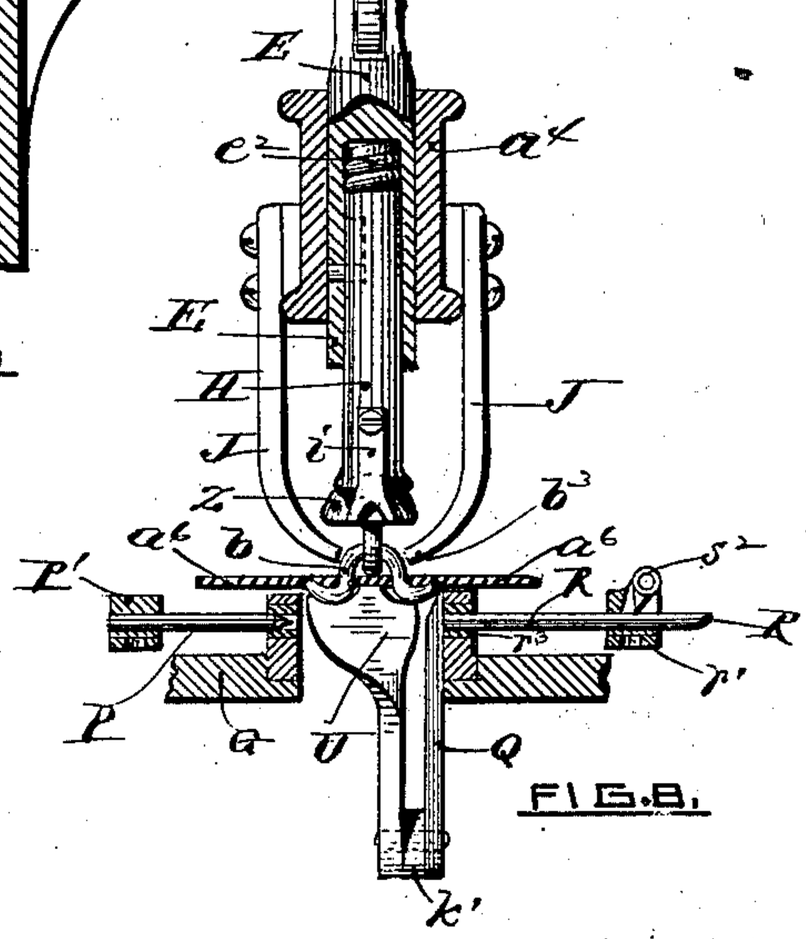

FIG. 8.

WITNESSES.

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UNITED STATES PATENT OFFICE.

FRANKLIN A. SMITH, JR., OF PROVIDENCE, RHODE ISLAND.

MACHINE FOR ATTACHING BUTTONS.

SPECIFICATION forming part of Letters Patent No. 286,741, dated October 16, 1883.

Application filed March 26, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN A. SMITH, Jr., a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Machines for Attaching Buttons; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to a new and improved method of attaching buttons to leather, fabrics, or other material, and also the mechanism therefor.

My invention consists of a machine or implement susceptible of holding the button and fabric in position, while at the same time the end of a coil of wire is inserted through the button-eye and fabric, the wire cut off and suitably clinched, the whole being completed at one operation.

To accomplish the above result I make the machine adapted to perform the following series of movements or operations: First, the button is placed in a suitable holder or plunger, with its eye depending, the leather or fabric at the same time being also placed in position beneath the button, and resting upon and over a groove in the bed or table of the machine, after which the plunger, which is connected by an arm or lever, is forced down until the button depresses the leather into the groove, when, second, the plunger is prevented from farther downward motion by suitable means, and the lever is farther depressed, thereby forcing a sharpened pin laterally through the fabric and button-eye, when, third, the pin is automatically withdrawn and the lever farther depressed, which, by suitable connections, thrusts the end of a coiled wire through the pierced fabric and button, (from the side opposite to the pin,) when, fourth, the lever is still farther depressed, which actuates certain mechanism for cutting off the wire, which latter forms the fastener, and, finally, fifth, the lever is depressed to its limit, which latter movement serves to form the fastener and suitably clinch the same, the plunger at the same time yielding sufficiently for the purpose, when, by raising the lever to its limit, the fabric, with button attached, can be removed, thus completing the operation, which is attained during one stroke or revolution of the machine, the details of which will be hereinafter more fully set forth.

In the accompanying drawings, in which similar letters indicate like parts, Figure 1 represents a front elevation, partly in section, of my button-attaching machine, showing the button in position preparatory to being depressed into the fabric. (The latter not shown.) Fig. 2 represents a partial vertical central section through line *o o* of Fig. 1. Fig. 3 represents a partial top view of the machine through line *x x*, Fig. 1. Fig. 4 represents a partial central section through line *s s* of Fig. 1, and showing both button and fabric in position for the first operation, and also showing the coil of wire from which the fasteners are made. Fig. 5 represents the button and fabric in position ready for piercing, which corresponds to the first operation. Fig. 6 represents the fabric and button-eye pierced by the sharpened pin, and also corresponds to the second operation. Fig. 7 represents the pin withdrawn and the wire inserted in the hole made by said pin, and from the opposite side thereof, which corresponds to the third operation. Fig. 8 represents the wire as cut off, (which is the fourth operation,) and also shows the former or shaper when the stroke of the lever is reached, and also shows the button attached, with fastener complete and clinched, the plunger having been forced up against the spring, and the loop of the fastener formed against the side guides, which completes the fifth and last operation of my improved method of attaching buttons to leather, &c.

The following is a detailed description of the several parts of a machine embodying my invention.

Referring again to the drawings, A represents the base and frame of a vertical button-attaching machine provided with guides a^3 a^4 and arms or projections a a' a^2.

At G is represented a plate or table provided with the groove g, upon which the leather or fabric rests, and into which groove it is depressed during the operation of attaching the buttons.

E is a hollow guide-rod provided with the plunger H, spring e^2, and roll e, the latter adapted to engage with the cam-lever D, which is loosely connected to the arm a^2 by the pin d'. The plunger H is adapted at its lower end to receive and retain the button z in position by means of springs i, &c., as shown.

B is a long arm or lever having its fulcrum at the outer end of the projection a' of the frame A. Said lever is connected to the guide-rod E by means of the cam-lever D, as shown. The said lever B is further connected to another guide-rod, C, by the link c, the whole connected and operated by the rod t in any suitable manner. The guide-rod C is cut away at c^2 for the reception of the cam-dogs l' m', said dogs being attached to the rod C and provided with the springs w, as shown. (See Fig. 2.)

M represents the puncturing-lever, which is attached to the frame A on the back side thereof, one arm of which is adapted to engage with the dog m', the other arm of said lever being adapted to retain the piercing pin or awl P. (See Fig. 3.)

L represents a lever of similar form, attached to the front side of the frame A. One arm of this lever is also adapted to engage with the dog l', the other arm thereof being adapted to feed the fastening-wire R by means of the feed-pawl s^2. (See Figs. 4, 5, 6, 7, and 8.) These two said levers are actuated by means of the said dogs m' l' engaging with cam projections m l of the levers.

K represents a lever which is actuated by the guide-rod C, the lower end thereof being adapted to engage with the long arm k of said lever. The short arm k' of this lever is connected with the cutting-off tool Q and former U.

J J represent formers attached to the frame a^4, (see Fig. 8,) said formers not being represented in the other views.

r^3 represents a hardened-steel bush or thimble, which is detachably secured to the table G, the central opening or hole of said thimble being fitted to the wire R. Various shapes and sizes of wire may be employed for the fastenings. The inner end of said thimble also serves as an anvil, against which the cutter Q severs the wire.

To illustrate more clearly the successive operations which are embodied in my button-attaching machine, I have described the several operations independently, but in their regular series; but of course, practically, the simple and single act of depressing the lever B to its limit will cause all the above-described elements or parts to coact thereby attaching the button to the fabric.

The method and operation of attaching buttons are as follows: The lever B, with its connections, being raised, as shown in Fig. 1, a button z is placed under the plunger H and between the springs i, with the eye or shank thereof depending over and parallel with the groove g, the leather or fabric also being placed on the table G. The lever B is depressed from the point or position o to 1°, which movement actuates the cam-lever D, thereby forcing down the guide-rod E and carrying with it the plunger H, thus forcing the button-shank and fabric a^6 into the groove g, as shown in Fig. 5. The lever B is farther depressed to 2°, (the concentric portion d of the cam-lever D preventing farther movement of the plunger H,) during which movement the cam-dog m', coming in contact with the cam end m of the lever M, forces the puncturing-pin P through the fabric and button-eye, as shown in Fig. 6. Upon the dog m' passing said lever M the latter returns to its normal position by means of the spring r. The lever B is again farther depressed to 3°, during which movement the cam-dog l', coming in contact with the cam end l of the lever L, carries the wire R through the aperture just made by the puncturing-pin P, as shown in Fig. 7. Upon the dog l' passing said lever L the latter is returned to its normal position by means of the spring r, after which the lever B is finally depressed to 4°, during which movement the lower end of the guide-rod C engages with the end k of the lever K, thereby severing the wire from the coil by means of the cutter Q. At the same time the former U forces the plunger H upwardly, thereby compressing the spring e^2 and shaping the fastener against the upper formers, J J, as shown in Fig. 8. The lever B is then returned to its normal position, carrying with it the guide-rods C E, the latter holding the plunger H. At the same time the lever K also resumes its normal position by means of the spring k^*, the rod E being also returned by means of the spring h. The button is then removed from the plunger H, and will be found to be firmly attached to the fabric.

I do not claim the method or system of attaching buttons to fabrics by using a continuous coil of wire from which to form the fasteners, but the machine shown and described, adapted to perform the several functions as set forth. Said machine is adapted to be operated by manual or other power, as circumstances may require.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The machine herein described for attaching buttons to leather or fabrics, consisting of the frame A, provided with a grooved die, G, the plunger H, provided with a receptacle for the button, and arm or extension a, adapted to receive the plunger, and further consisting of the puncturing and feeding mechanism, substantially as described, for piercing the fabric and inserting a length of wire, R, through said fabric and button-shank, and the device shown for severing the wire from the coil and bending it into a fastener, the whole arranged and adapted to be operated substantially as shown and specified.

2. In a machine for attaching buttons to

leather or fabrics, the combination of the plunger H, provided with springs *i* at its lower end, and adapted to receive and retain the button, with the cam-lever D and actuating-lever B, said plunger connected to the hollow guide-rod E, the latter provided with springs e^2 and *h*, substantially as shown and described.

3. In a machine for attaching buttons to leather or fabrics, the combination of the grooved plate G with the frame A, puncturing-pin P, and levers M and L, said levers being adapted to pierce the fabric and insert the wire R, substantially as shown and described.

4. In a machine for attaching buttons to leather or fabric, the table A, carrying the die G, provided with a groove, *g*, adapted to receive the fabric and button-shank, in combination with the cutter Q, former U, and top formers, J, the whole arranged, connected, and adapted for use substantially as shown and described.

5. In a machine for attaching buttons to leather or fabrics, the guide-rod C, provided with spring cam-dogs *m' l'*, in combination with the levers M, L, and K, said guide-rod connected to and actuated by the lever B, substantially as shown and set forth.

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

FRANKLIN A. SMITH, JR.

Witnesses:
GEO. W. PRENTICE,
GEO. A. MUMFORD.