

(No Model.)

2 Sheets—Sheet 1.

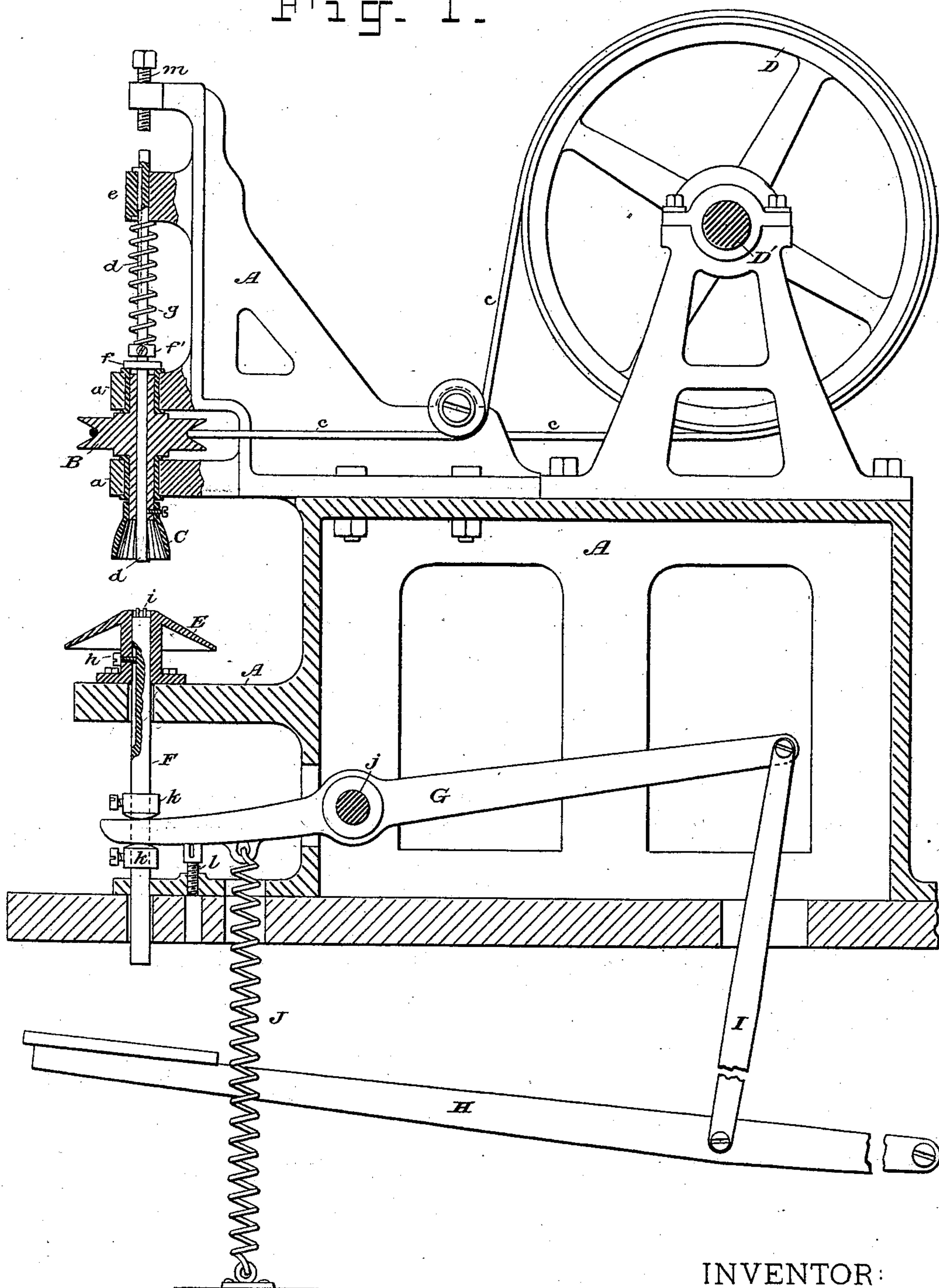
J. NAYLOR.

MACHINE FOR PUNCHING AND TRIMMING BUTTONS.

No. 369,070.

Patented Aug. 30, 1887.

Fig. 1.



WITNESSES:

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INVENTOR:

Joseph Naylor

By his Attorney,

Henry Corning

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

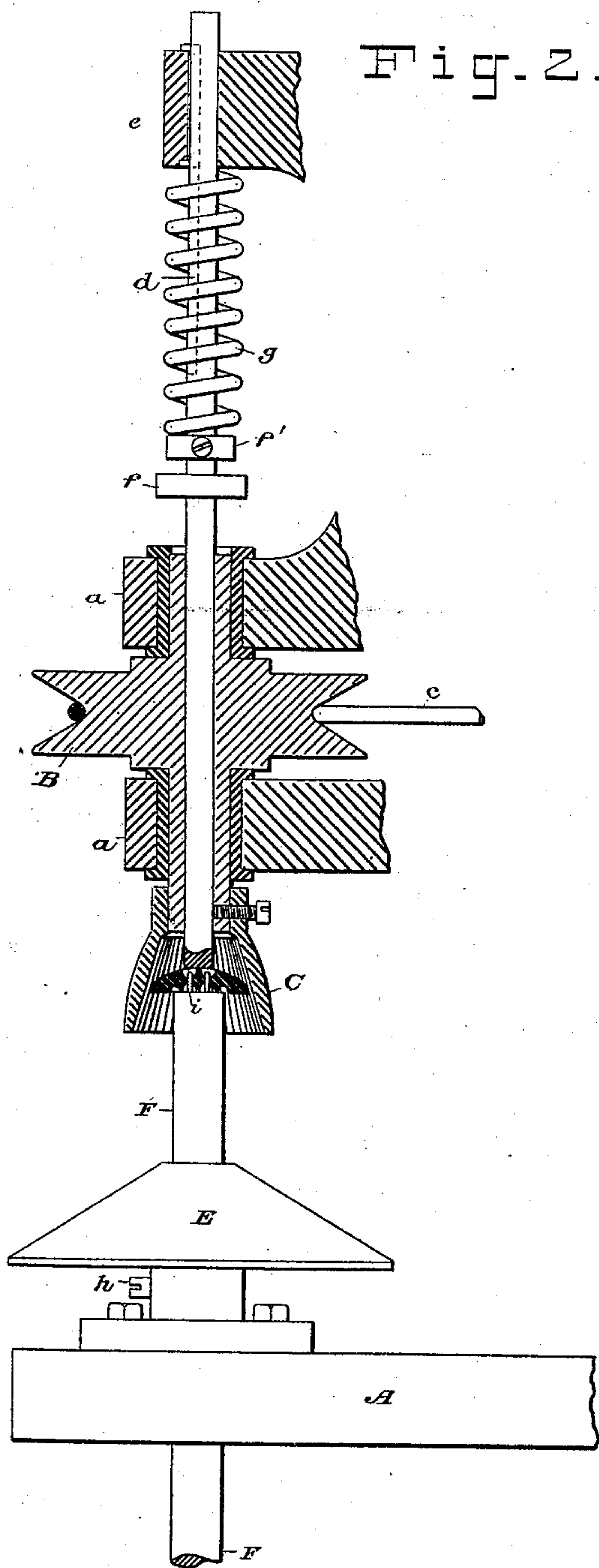
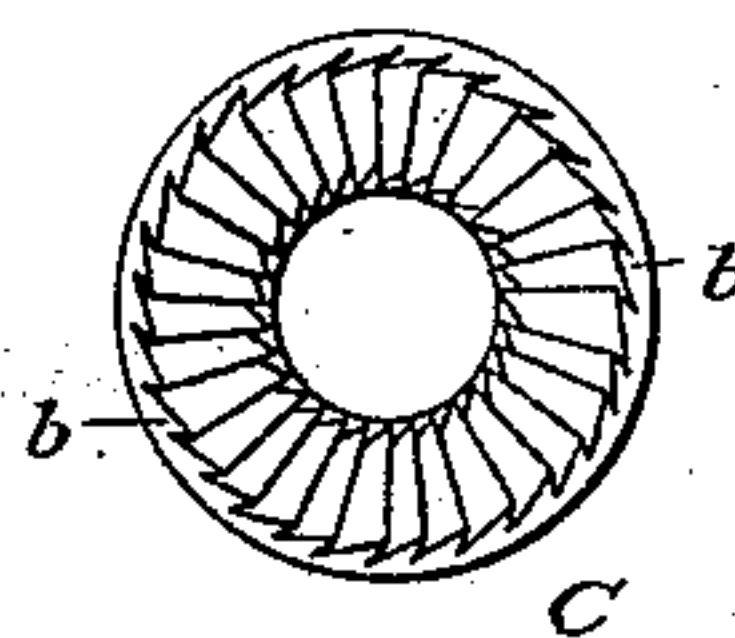


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOSEPH NAYLOR, OF BLOOMFIELD, NEW JERSEY.

MACHINE FOR PUNCHING AND TRIMMING BUTTONS.

SPECIFICATION forming part of Letters Patent No. 369,070, dated August 30, 1887.

Application filed November 26, 1886. Serial No. 219,930. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH NAYLOR, a citizen of the United States, and a resident of Bloomfield, in the county of Essex and State of New Jersey, have invented certain Improvements in Machines for Punching and Trimming Buttons, of which the following is a specification.

My invention relates to a machine for punching out the holes in and trimming the margins or edges of buttons molded from plastic materials, the operations of punching and trimming being performed at the same time, or substantially so, and without shifting the button.

It is well understood that when buttons are molded from plastic materials in dies or molds there is left on the margin or edge of the button a slight fin, which is superfluous and must be removed. The holes in the button, by which it is to be sewed to the goods, are partly formed in the die or mold, usually by indentations in the opposite faces of the button, which indentations coincide, but do not meet. The web or thin material between the opposite indentations must be punched out or removed in some way to fit the button for use.

The object of my invention is to provide a simple machine whereby these operations of punching and trimming may be performed rapidly and by one placing or handling of the button.

My invention will be fully described hereinafter, and its novel features carefully defined in the claims.

In the drawings, which serve to illustrate my invention, Figure 1 is a vertical sectional elevation of my machine. Fig. 2 is a fragmentary sectional view, on a larger scale than Fig. 1, illustrating the position of the button while being held by the punches and operated on by the trimmer. Fig. 3 is an under side view of the trimmer or trimming-cutter detached.

A represents the frame for the operating mechanism of the machine. This frame may have any desired form, and not necessarily that herein shown. In bearings *a a* in the frame is mounted, with its axis vertical, by preference, a sheave, B, with a hollow or bore extending axially through it and its journals. To the projecting lower journal of the sheave

is secured the trimmer C. (Seen detached in Fig. 3.) This trimmer is coned interiorly, and its inner face or surface has formed on it cutting-edges *b b*, as clearly shown in Fig. 3.

The sheave B may be driven in any manner whatever; but I have herein shown it driven by a belt, *c*, and a driving-pulley or sheave, D, the latter on a counter-shaft, D'. This counter-shaft may be driven from the main shaft of the engine through the medium of a belt and pulleys, in the usual way. These I have not shown. The pulley D might be driven by hand, or by any power.

Down through the axis of the sheave B passes a rod, *d*, the upper end of which has a splined sliding bearing in the frame at *e*, whereby it is kept from rotating, and the lower end of which projects down into the hollow of the trimmer C, and usually about to the bottom or mouth of same. On the rod *d* is a fixed flange or collar, *f*, which rests on the upper bearing of the sheave B, and an adjustable collar, *f'*, secured by a set-screw. Around the rod *d* is a spiral spring, *g*, arranged between the collar *f'* and the bearing *e*. This spring exerts an elastic downward pressure on the rod, and this yielding pressure is utilized for a purpose that will be explained hereinafter.

E is a table with a coned or inclined surface, arranged under the trimmer C, and F is a plunger, which is aligned with the rod *d*, and has a sliding bearing at its upper end in the table E and at its lower end in a flange or projecting part of frame A. To prevent the plunger from rotating, I cut a keyway or groove in it and set a screw, *h*, in the bearing, the tip of which engages said groove. Any well-known device may, however, be substituted for this.

In the upper end of the plunger F are fixed the punches *i i* for punching the holes in the button. The construction of these punches is not new with me, and is too well known to require a particular description.

G is an operating-lever fulcrumed at *j* in the frame A. One arm of the lever is forked, and its branches embrace the plunger F between two set collars, *k k*, on the same. To the other end, as herein shown, the longer arm of the lever G is coupled an ordinary treadle, H, by a rod, I. When the operator depresses treadle H with his foot, he drives the plunger F up-

ward, and when he removes the pressure the plunger and treadle are drawn back by a spring, J. A screw, *l*, forms an adjustable stop, whereby the downward movement of the lever is limited.

In Fig. 1 I have been compelled, for lack of room, to break away a part of the connecting-rod I, and to show the treadle H arranged close up under the frame A. In practice, however, the table E will usually stand about three and one-half feet above the floor, and the treadle will be down near the floor, convenient for the foot.

I will now describe the operation of the machine. The workman, with his foot resting on the treadle, takes an unfinished button between his thumb and finger and places it on the punches *i*, which enter the recesses in the button formed in molding, as previously described. At the same time that he is placing the button he is pressing down the treadle, and the plunger F, carrying the button, moves upward until the button strikes the lower end of the rod *d*. The spring *g*' on this rod is strong enough to prevent the rod from yielding until more than enough pressure is exerted to drive the punches *i* through the button. As soon as the punches have passed through the button and bear on the end of rod *d*, the continued pressure on the treadle causes the said rod *d*, which has served as an abutment, to yield, and the button, rod, and plunger rise together into the cavity of the rapidly-revolving trimmer C until the sharp cutters on the latter are brought into contact with the edge of the button. The cutters instantly trim off the "fin" and leave the button smooth. When the button has been raised high enough for the converging cutters in the trimmer to cut deeply enough, the upper end of the rod *d* strikes the tip of a screw, *m*, in a projecting part of the frame, and all further upward movement is arrested. The work is now done, and the operator eases the pressure on the treadle and allows the spring J to draw down the plunger. The stop-screw *l* permits the plunger to descend or withdraw into the table E far enough for the button to be lifted off the punches by catching on the margin of the hole in the table through which the plunger plays. The purpose in giving the table E an inclined or coned surface is that the button, when freed from the punches, may roll down out of the way. Except for convenience in resting the hand of the workman, however, the projecting flange-like portion of table E might be wholly removed.

Although I have described the various steps in the upward movement of the button in the punching and trimming operation, it must be understood that the movements are so rapid and continuous that the punching and trimming may be considered practically as simultaneous operations. Indeed, the whole operation is embraced in one rapid reciprocating movement—too rapid to be readily followed by the eye.

In carrying out my invention I am aware

that many of the minor details of construction may be varied somewhat and mechanical equivalents, well understood by skilled workmen, be substituted for some of my features. For example, weights might be substituted for the springs *g* and J, and particularly the latter. For the two set-collars *k*, between which plays the end of the lever G, I might substitute a pin in the plunger arranged to engage a slot in the lever. Other minor changes or substitutions not affecting the principle of the invention will readily occur to the skilled workman. The fixed collar *f* on rod *d* serves to limit the downward extension of said rod, while the adjustable collar *f*' serves to vary the tension of spring *g*. The screw *m* serves to limit and regulate the extent of the upward movement of the button into the hollow of trimmer C. Any other form of stop may be employed in lieu of this, as a collar on the plunger F above the upper collar, *k*, for example. The conical form of the trimmer adapts it to trim buttons of various sizes, as well as to make a deeper or shallower cut on buttons of the same size.

By recessing the lower end of rod *d*, so that the punches *i* could pass entirely through the button and into this recess, the indentations in the button for marking the positions of the holes need only be formed on one side thereof. However, I prefer to indent them on both sides, as producing a better finish at the margins of the holes.

While my machine is principally designed for operating on buttons, it may be employed for operating on other things of a kindred nature and form.

Having thus described my invention, I claim—

1. A machine for punching and trimming buttons, comprising a rotatively-mounted trimmer provided with interiorly-arranged cutting-edges, a yielding abutment arranged within the hollow of said trimmer, a plunger provided with punches, said plunger being mounted in guides or bearings and axially aligned with the trimmer, and means for moving said plunger and punches carrying the button into the hollow of the trimmer and against the said yielding abutment, substantially as set forth.

2. The combination, in a machine for punching and trimming buttons, &c., of a rotatively-mounted trimmer having interiorly-arranged cutting-edges, a yielding abutment arranged in the axis of said trimmer and provided with a spring, *g*, a plunger, F, mounted in suitable bearings or guides axially aligned with said trimmer and provided with punches *i*, and means for imparting an endwise movement to said plunger, whereby the button, mounted on the punches *i*, may be moved into contact with the cutters in the trimmer and against the end of rod *d*, as set forth.

3. The combination, in a machine for punching and trimming buttons, of a rotatively-mounted conical trimmer, a plunger provided with punches and axially aligned with said

trimmer, means for operating said plunger, a yielding abutment for the button to press against, arranged in the trimmer, and a stop to prevent the button from entering the trimmer too far, substantially as set forth.

4. The combination, with the plunger F, provided with punches *i*, of the table E, in which the said plunger is mounted, and which forms a slide-bearing therefor, said table having an inclined upper surface, as set forth.

5. The combination, with the plunger F, provided with punches *i*, of the table E, in which said plunger is mounted, and which forms a slide-bearing for said plunger, said

table having an inclined surface, means for giving to said plunger an endwise movement through its bearing in said table, and a stop, *l*, to limit and regulate the extent of retraction of said plunger, whereby the button is pushed off from the punches by the margin of the table around said plunger, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH NAYLOR.

Witnesses:

HENRY CONNETT,
J. D. CAPLINGER.