

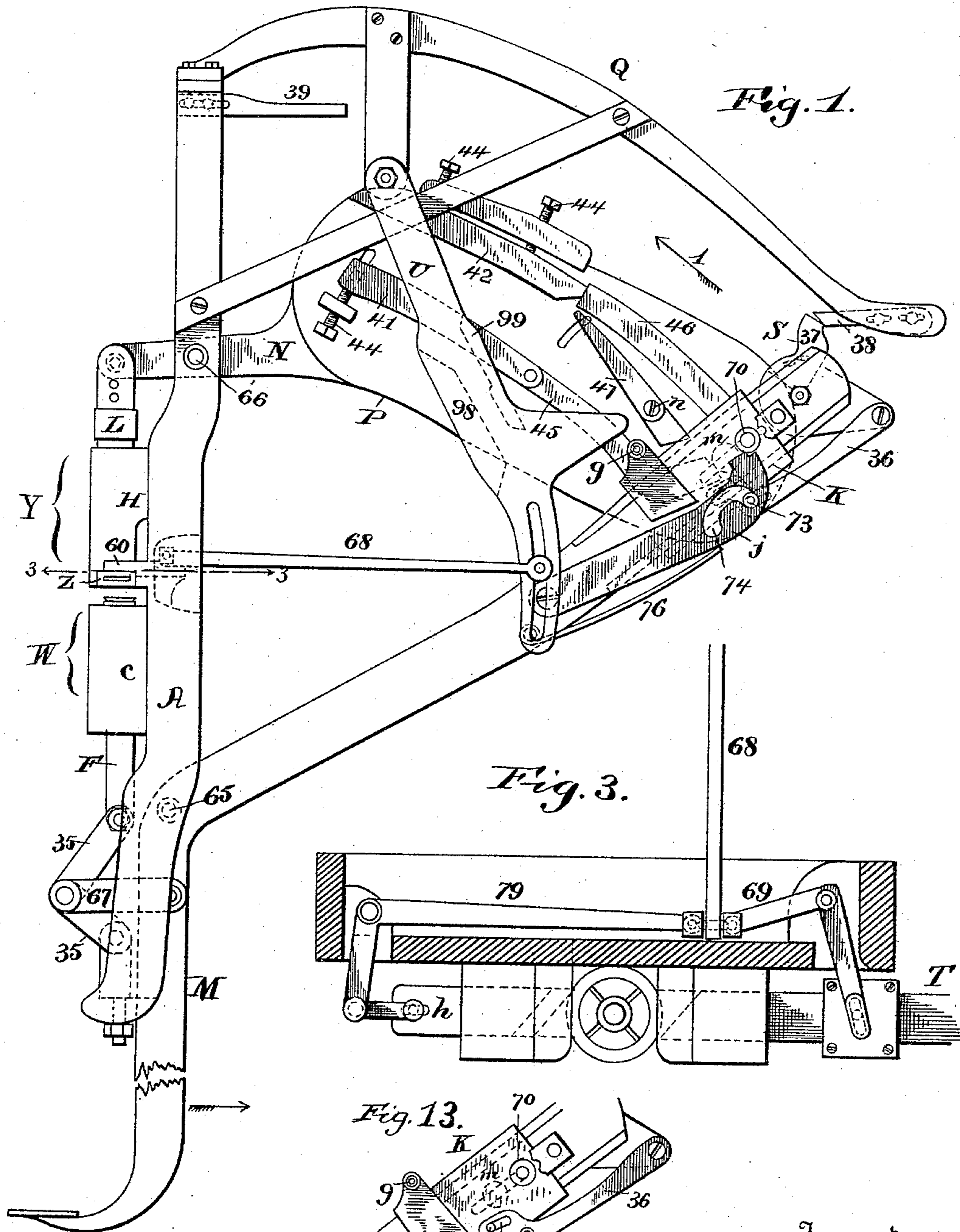
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4 Sheets—Sheet 1.

W. H. HUTCHINSON & H. A. CABLES.  
MACHINE FOR MAKING TUFTS OR BUTTONS.

No. 440,708.

Patented Nov. 18, 1890.



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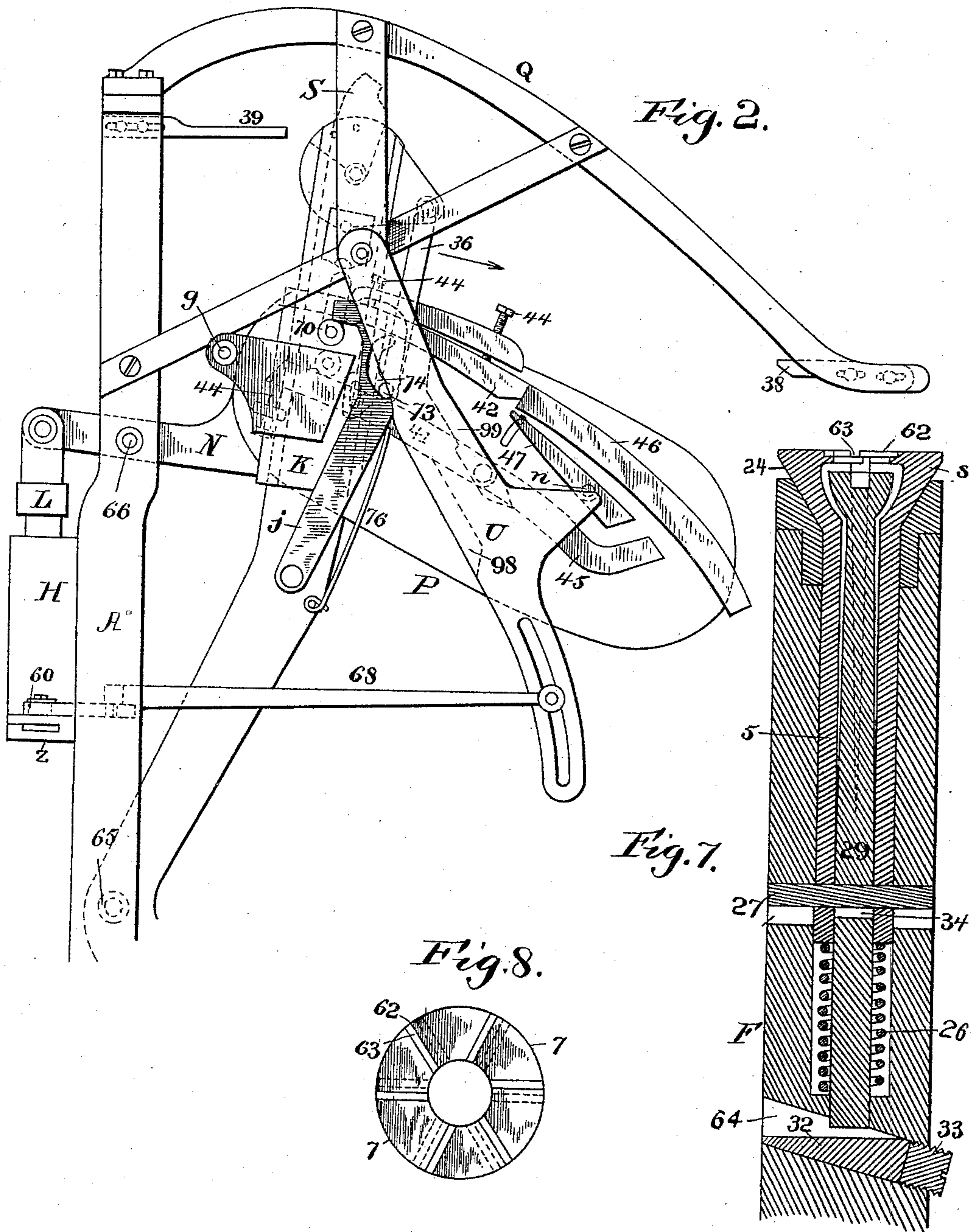
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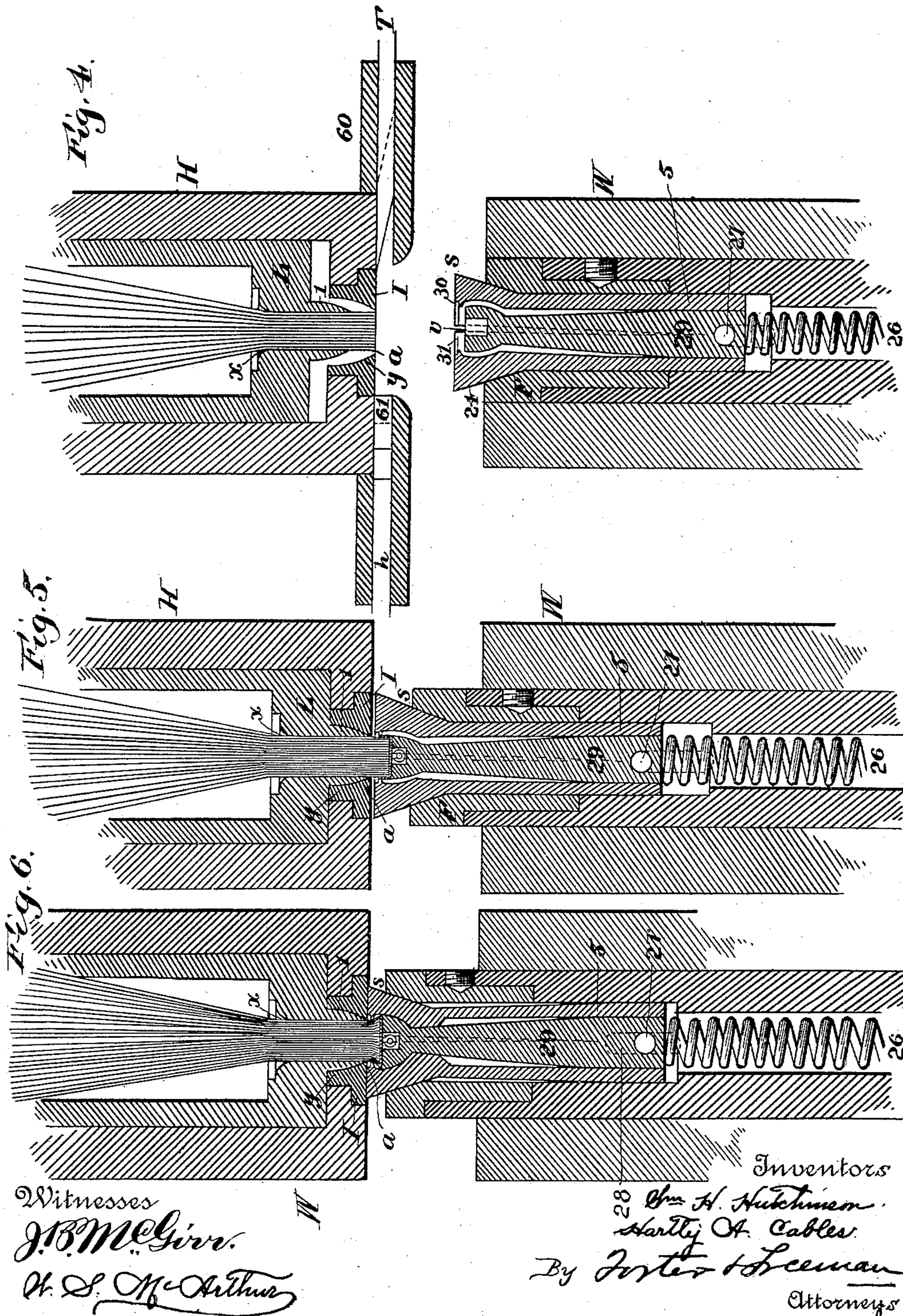
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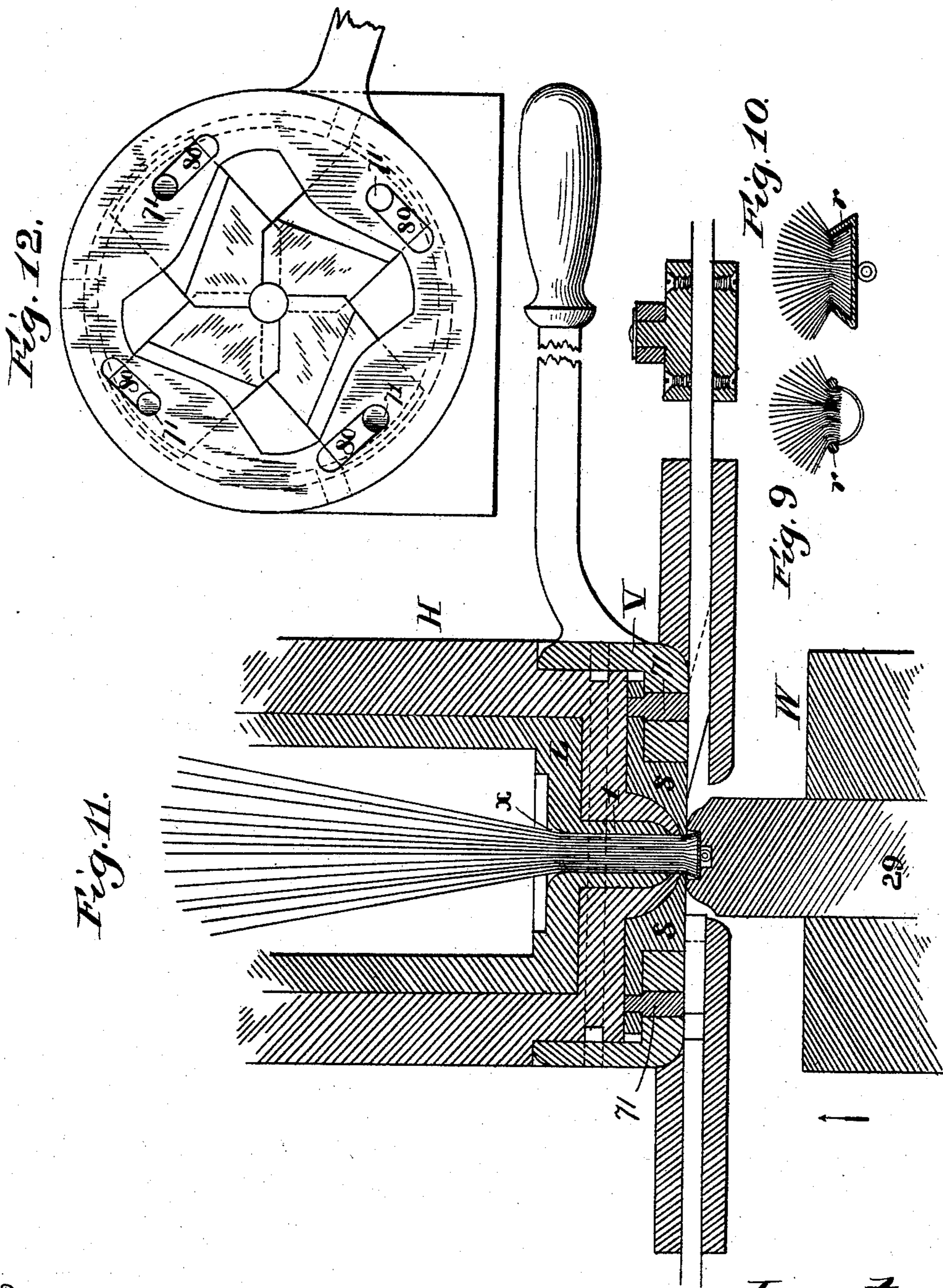
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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR MAKING TUFTS OR BUTTONS.

SPECIFICATION forming part of Letters Patent No. 440,708, dated November 18, 1890.

Application filed January 28, 1890. Serial No. 338,360. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM H. HUTCHINSON and HARTLEY A. CABLES, citizens of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Machines for Making Tufts or Buttons, of which the following is a specification.

Our invention relates to machines for making tufts or buttons; and it consists in certain devices for supporting and moving the bundle of yarn or stock, for applying the binder thereto and compressing the same, and for shearing the stock, as fully set forth hereinafter, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of an organized machine embodying our improvements. Fig. 2 is an enlarged view of the upper portion of the machine; Fig. 3, a section on the line 3 3, Fig. 1, the holder omitted; Figs. 4, 5, and 6, sectional views illustrating the construction and operation of parts that act directly upon the stock and binder. Fig. 7 is a longitudinal section of the jaws and operating appliances, illustrating a modification; Fig. 8, a plan view of Fig. 7; Figs. 9 and 10, sectional views illustrating different forms of tufts; Fig. 11, a sectional elevation showing a modified arrangement of the jaws; Fig. 12, an end view of the parts supported by the holder, looking in the direction of the arrow, Fig. 11. Fig. 13 is a detail of part of the actuating mechanism.

We will refer in the first instance to those parts of the machine which operate directly upon the bundles of fibers or "stock" to form the same into tufts, reserving for latter description the operating appliances which may be varied to an indefinite extent.

The main parts of the tuft-forming mechanism consist of the "holder and feeder" Y, which supports the stock and feeds it at intervals, the "binder" W, by means of which a suitable binder is applied about the stock near the end, and a "cutter device" Z, which severs the terminal portion from the body of the stock after such portion has been bound, thereby completing the formation of the tuft.

The character of these devices will vary to a certain extent, according to the character of the tuft, and more especially of the binder that is used, the said binder in some instances consisting of a wire ring *r*, Fig. 9, clamped around the mass of fibers or stock, and in other cases of a flat ring *r*, Fig. 10, separate or forming the flange of a cup. The eye in either case may consist of fibrous strands extending from side to side, or may be formed in any other manner. The holder and feeder Y is provided with a head-stock H, secured to the frame of the machine and serving as a guide for a hollow slide L, closed at the end, with the exception of an opening *x*, constituting a short channel extending through a terminal boss *l*, and opposite the latter in the head-stock H is supported the die I. In the die I is a central opening *y*, in line with the channel *x*, to receive the boss *l*, said opening contracting toward the outer face of the die, where it is of the same diameter as the channel *x*, and the front face of the die is flat, forming a sharp cutting-edge *a*, across which shears the inclined edge of a reciprocating knife T, sliding in a guide 60, and opposite said knife is a slide *h*, at the edge of which is a block of lead, leather, or other material 61, against the edge of which the knife-blade may cut to secure a proper shearing action. By thus condensing the stock to the plane of the knife-edge *a* and shearing directly across the latter and against a block of proper material the stock is cut clean across without any dragging or spreading the fibers, so that the end of the stock has a solid outline and will pass without dragging into the binder. By forming a short channel *x* to receive the condensed portion of the fibers the friction upon the stock is less than when the condensing-channel extends the whole length of the slide. The binder *r* is supported by or between jaws, which hold it in position for the entrance of the stock, and then move radially inward, compressing the ring upon and into the stock. There may be two or more of such jaws, and they may be supported and operated in any suitable manner, so as to receive between them the end of the stock and then contract the binder thereon.

As shown in the drawings, in Figs. 4 to 6 there are two jaws *s*, and in Figs. 7 and 8 six jaws, which may be made and mounted in different ways, but are preferably formed by  
 5 slitting a hollow cylinder for a portion of its length longitudinally and radially, the remaining portion 5 of the cylinder constituting a "carrier" for the jaws, each of the latter having an outer beveled face 24, whereby the  
 10 jaws may be brought together by pushing upward a surrounding sleeve *F*, having a beveled mouth bearing against the inclined faces of all the jaws. In the forms shown in Figs. 4, 5, and 6, as well as in Figs. 7 and 8, the  
 15 jaws are held normally open by a spring 26, which bears on the sleeve *F* and on the carrier 5, as shown in Fig. 7, and tends to force the latter outward to the extent limited by the movement of a pin 27, extending from the  
 20 carrier into a slot 28 in the sleeve, and through the carrier and between the jaws extends a bar 29, the outer end of which is formed in different ways, according to the tuft to be made, but is shown in Figs. 4 to 6 with a recess  
 25 *v* to receive the eye on a button-back when the latter is supported upon the bar between the jaws. The jaws are provided with inturned lips 30, and the latter may have a groove or channel 31 in which to put a wire-  
 30 ring binder *r* when desired.

In Figs. 7 and 8 each jaw has a side lip 62 extending into a recess 63 in the adjacent edge of the other jaw, one thus overlapping the other, so as to leave no space for the metal  
 35 of the binder to pass into and preventing its entrance into the slots.

When a binder is to be applied to the stock to make a tuft or button, the said binder, whether in the form of a ring or a cup, is  
 40 placed within the open jaws in the position shown in Figs. 5 and 6, and the stock is within the holder and feeder *Y*, as shown in Fig. 4. The sleeve *F* is now moved forward to carry the jaws toward the die *I* until the outer face  
 45 of each jaw is in contact with said die, when the slide *L* moves forward and the end of the stock is passed into or through the binder and held in that position. As the slide *L* continues its movement after that of the jaws  
 50 is arrested, the ends of the jaws will be forced radially together, compressing the binder and forcing it into the mass of fibers constituting the stock. The slide *L* is then drawn back to any desired extent, (the stock being held  
 55 by the jaws and ring, so that the slide slips over the stock,) after which the sleeve *F* and jaws are drawn out of the way and the slide *L* is thrown forward a partial stroke to the position shown in Fig. 4, and the stock is cut  
 60 off, thereby completing the tuft, the slide afterward completing its stroke, so as to bring forward into the binder next applied a portion of the stock.

In the construction shown in Figs. 7 and 8 the bar 29 extends beyond the end of the carrier into a slot 64 in the sleeve *F* and above a wedge-shaped bearing 32, which may be ad-

justed to different positions by a screw 33, and the pin 27 extends through a slot 34 in the bar 29, so that after the movement of the  
 70 jaws is arrested and after they are forced together to a certain extent the contact of the wedge with the bar 29 moves the latter with the sleeve *F* and forces the metal of the cup upward and imparts to the same the conforma-  
 75 tion of the end of the bar 29.

In order to operate the above-described parts in proper time by means of a treadle or other reciprocating device, we combine the  
 80 said parts with others, constituting an operative machine, as illustrated in Figs. 1 to 3. In said figures, *A* represents a part of the frame of the machine, which is shown as vertical, although it may be horizontal, and to  
 85 which are secured the head-stocks *H C* in line with each other, and also the guides 60. To the frame is pivoted at 65 a treadle-lever *M*, and at 66 a lever *N*, which is connected with the slide *L*. The lever *M* is connected by a  
 90 link 67 with the joint of two toggle-links 35 35, one pivoted to a bearing upon the frame *A* and the other to the end of the sleeve *F*, so that by swinging the treadle-lever in the direction of the arrow the toggle is straightened and the sleeve forced upward. The lever *N*  
 95 carries a cam-plate *P*, the cams of which are suitably constructed and arranged to be acted upon by contacts carried by the lever *M*, so that as the latter swings to raise and lower the sleeve *F* the lever *N* also will be vibrated  
 100 to first carry down the slide *L* and then raise the latter, and as the lever *M* swings back to its first position the lever *N* is moved to carry the slide *L* downward to an extent sufficient to project the stock the length required to  
 105 form the tuft. The appliances for operating the lever *N* from the movements of the lever *M* may be varied; but we will now describe those which we have found to be effective.

The cam-plate *P* is provided with two movable cam-ribs 41 42, the rib 41 being pivoted  
 110 at one end and adjustable at the other by means of a set-screw 44, and the rib 42 being adjustable at both ends by similar screws 44. The cam-plate *P* is also provided with fixed  
 115 cam-ribs 45 46, and with a switch 47, pivoted at *n* between the two ribs 45 46. Upon the end of the lever *M* is mounted a slide *K*, which is connected by a link 36 to one arm of an L-shaped lever *S*, the other arm 37 of  
 120 which is arranged in position to make contact with adjustable stops 38 39, carried by an overhanging arm *Q* of the frame *A*. The slide *K* carries a roller *m* (shown in dotted lines) for engaging the cam-ribs, and a  
 125 locking device in the form of a lever *j*, engaging with a stud 70 on the slide, is pivoted to the lever *M*, and serves to hold the slide in either position in which it may be adjusted.

The link 36 has a slot 71, Fig. 13, receiving  
 130 a pin 72 on the slide, so that the link has a limited longitudinal movement independently of the slide, and this serves to carry a stud 73 on the link along a U-bent slot 74 in the

lever *j* and to swing the latter into and out of position beneath the stud 70. Thus when the arm 37 of the lever S strikes the stop 39, the lever is swung to thrust down the link 5 36, which first by the action of the stud 73 swings the lever *j* in the direction of the arrow 2, Fig. 2, to carry the end from below the stud 70, releasing the slide K, which then moves down as the end of the slot in the link 10 36 makes contact with the pin 72. As the slide reaches its lower position, the stud 73 passes into the lower curved end of the slot 74, and the lever *j* swings in under the action of a spring 76 and again locks the slide. 15 Upon the reverse movement of the lever S the slide is first unlocked, lifted, and then again locked.

As the lever M moves in the direction of the arrow 1, Fig. 1, the roller *m* traverses the 20 lower edge of the rib 46 and forces out the switch 47 without imparting any movement to the cam-plate until the sleeve F has been elevated to bring the faces of the jaws against the die I. The roller *m* then makes contact 25 with the cam-rib 42, and thereby lifts the plate P and vibrates the lever N sufficiently to carry the stock downward onto or through the binder, while the toggle is straightened and the jaws brought together. When the 30 arm 37 of the lever S makes contact with the stop 39, the slide K is unlocked and forced downward, so that the roller *m* makes contact with the cam-rib 41 and depresses the rear end of the lever N and carries upward the 35 slide L its entire stroke. As the lever M swings back, the roller *m* will make contact with the under side of the switch 47, thereby lifting the lever N and throwing down the slide L and feeding the stock forward to a 40 limited extent.

The movements of the cutter and blade *h* are effected from a swinging arm U, connected by a link 68 with two crank-levers 69 79, pivoted to the frame and connected one with the 45 cutter-blade T and the other with the blade *h*, as shown in Fig. 3. The arm U is vibrated by the contact of a roller *g*, carried by the lever M, with ribs 99 99 upon the arm. (Shown in dotted lines.)

50 As the upper part of the arm M attains its rearmost position, the arm 37 of the lever S makes contact with the stop 38, and the lever S is vibrated so as to raise the slide K and lock it in its upper position.

55 When the machine is to be operated by power other than that applied to a treadle, it may be provided with a shaft and cams suitably connected with the parts to impart the desired movements at the proper times.

60 Although we have described the slide F as bearing against the inclined edges of the jaws as an effective means of closing the latter, it will be evident that other devices may be employed for imparting the radial movements 65 to the jaws at proper intervals, and while we have described the jaws *s* as carried to and from the die I we do not limit ourselves to

this arrangement, as the said jaws may be arranged in positions adjacent to the said die and capable only of radial movement im- 70 parted by a cam-ring V, having slots 80, receiving pins 71 on the jaws, as shown in Figs. 11 and 12. This particular construction we do not claim here.

Without limiting ourselves to the precise 75 construction and arrangement of parts shown, we claim—

1. In a button or tuft making machine, a holder provided with a channel in which to receive and retain a condensed mass of fibrous 80 threads constituting the stock, combined with movable jaws constituted and arranged to compress a binder upon and into the stock, and mechanism for actuating the jaws, substantially as and for the purpose set forth. 85

2. The combination, with a holder for the stock, of jaws arranged to receive and compress the stock and apply the binder, a cutter for the stock, and mechanism for actuating the jaws and cutter, substantially as set forth. 90

3. The combination, with the holder having a longitudinal channel for the stock, of jaws adapted to compress the binder, movable to and from each other, means for so moving the jaws, and a carriage for moving the jaws 95 to and from the stock-holder, substantially as set forth.

4. The combination, with the holder for the stock, of the radially-movable jaws, each having an inturned lip, a cutter, and mechanism 100 for moving the jaws and cutter, substantially as set forth.

5. The combination of a longitudinally-reciprocating holder for the stock, jaws, and means for moving the same radially, and a 105 cutter, substantially as set forth.

6. The combination of a holder for the stock, movable longitudinally, jaws, and a longitudinally-reciprocating carrier therefor, and means for moving the jaws radially, substan- 110 tially as described.

7. The combination, with the holder for supporting the stock and with radially-movable jaws, of a bar arranged to support the binder within the jaws, and means for reciprocating 115 the holder and actuating the jaws, substantially as and for the purpose set forth.

8. The combination, with the stock-holder and actuating devices and radially-movable jaws and actuating devices, of a bar 29, hav- 120 ing a recess in the outer end, substantially as and for the purpose set forth.

9. The combination, with the longitudinally and radially movable jaws and means for actuating the same, of a bar 29, movable longi- 125 tudinally independently of the jaws, substantially as set forth.

10. The combination of the longitudinally and radially movable jaws and means for actuating the same, bar 29, means for moving it 130 longitudinally, and an adjustable bearing for the end of the bar, substantially as set forth.

11. The combination of the head-stock C, sleeve F, jaws and carrier sliding in the sleeve,

and spring 26 and bar 29, substantially as set forth.

12. The combination, with the stock-holder, of jaws provided with recesses 63 and overlapping projections 62, and means for moving the jaws longitudinally and radially, substantially as and for the purpose set forth.

13. The combination of the radially-movable jaws, each having an inclined outer face, a slide receiving said jaws and having a flaring mouth, a spring 26, and a head-stock supporting a die-plate to and from which the jaws move, substantially as set forth.

14. The combination of the die with a cutting-edge at the plane of the outer face, a cutter moving across said face, and a movable slide with a channel for the passage of the stock, substantially as set forth.

15. The combination of the longitudinally-moving slide supporting the stock, a die having a contracted opening, and a cutter moving across the face of the die and shearing with the edge of said opening, substantially as set forth.

16. The combination of the die I, cutter, and slide h, carrying a cutting-block, substantially as described.

17. The combination of the die supported in a fixed position, with a recess reduced in diameter at the face of the die, and the slide movable to and from the die formed with a channel for the passage of the stock, and with an annular boss constructed to extend to the contracted portion of the recess in the die, substantially as set forth.

18. The combination of the die supported in a fixed position, jaws movable longitudinally to and from the die, and means for actuating the jaws and the stock-holder, and the stock-holder also movable to and from the opposite side of the die, substantially as set forth.

19. The combination of the jaws to contract the binder, a support for the binder, and toggles and connections for actuating said parts, substantially as set forth.

20. The combination of the stock holder and feeder, the cutter, and jaws for contracting the binder, of a reciprocating lever, and intermediate connections whereby said parts are operated from said lever, substantially as set forth.

21. The combination, with the holder, of a cam and connections, substantially as set forth, whereby the stock is automatically fed forward to form the tuft and after the latter is cut from the stock the stock is fed to a partial extent to pass it into the binder, substantially as described.

22. The combination, with the movable stock holder and feeder, cutter, and binder-sup-

port, of a single reciprocating lever, and connections between said lever and said other parts for imparting automatically to each of said parts its proper movement in relation to the others on the vibration of the lever, substantially as set forth.

23. The combination, in a button or tuft making machine, of a holder for the stock, jaws, and a carrier supporting the same, movable to and from the holder, toggles, and connections between the same and said carrier, and operating means connected with said toggles, substantially as set forth.

24. The combination of the head-stock supporting a jaw-carrier, a head-stock supporting a sliding stock-holder, a lever connected to move the carrier, and connections between the lever and the stock-holder arranged to move the latter back and forth, substantially as set forth.

25. The combination, with the holder and feeder, and the support for the binder longitudinally movable to and from the feeder, and with the jaws and actuating appliances, of toggles and a lever connected to move said support, substantially as set forth.

26. The combination, with the frame, the holder and feeder, and reciprocating carrier, of a lever provided with a treadle connected with toggles which are connected with said carrier, a lever connected with the slide of the holder and feeder and provided with cams, and a contacting device carried by the treadle-lever for operating on the said cams, substantially as set forth.

27. The combination, with the slide L, carrier, toggles, and levers M and N, of a cam-plate carried by the lever N, a contacting-piece carried by the lever M, a cutter device, and connections whereby the same is operated upon the reciprocation of the lever M, substantially as set forth.

28. The combination of the lever N, cam-plate P, provided with cam-ribs, lever M, slide K, provided with a contact-piece m, a locking device for said slide, lever S, and stops 38 and 39, substantially as set forth.

29. The combination of the cutter device, arm U, connected to the said cutter device, roller g, arranged to engage said arm, and means for reciprocating the roller, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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Witnesses:

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