(No Model.) 4 Sheets—Sheet 1.

C. S. GOODING & R. L. ELLERY.

EYE FORMING MECHANISM FOR BUTTON MACHINES.

No. 459,372. Patented Sept. 8, 1891.

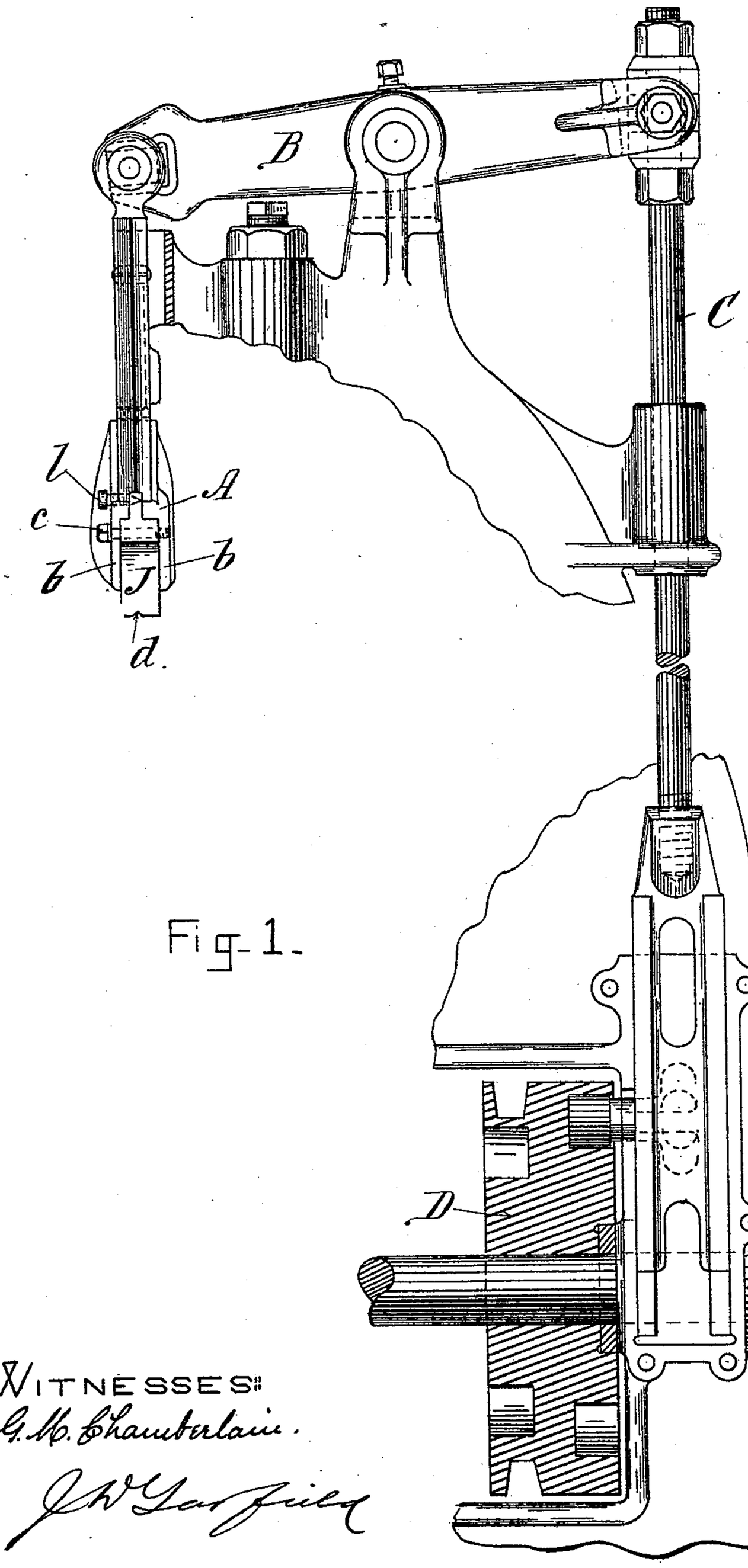

Fig. 1.

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J. W. Garfield

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C. S. GOODING & R. L. ELLERY.

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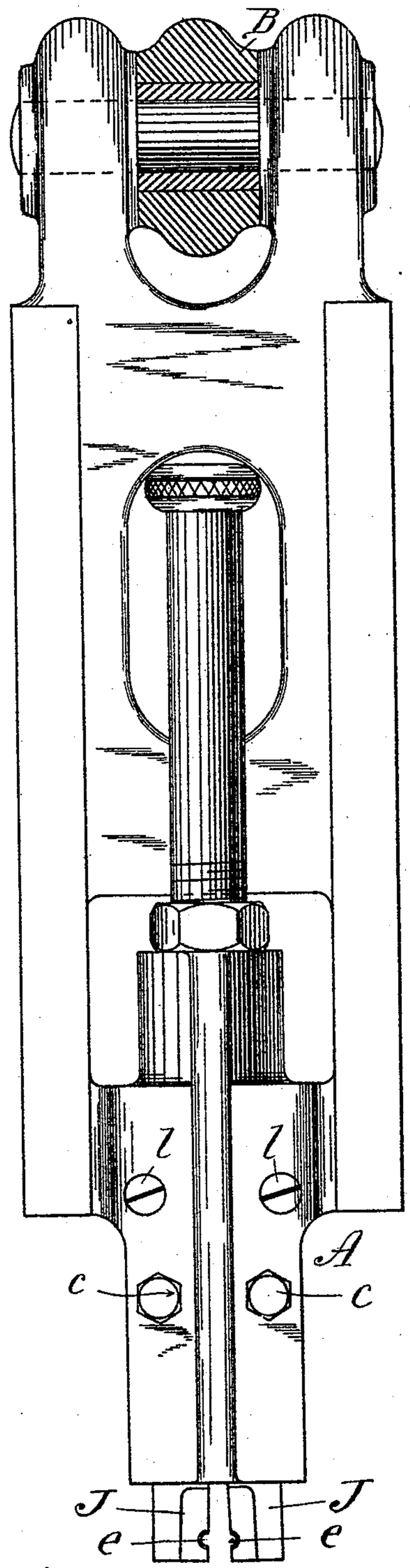

Fig. 2.

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C. S. GOODING & R. L. ELLERY.

EYE FORMING MECHANISM FOR BUTTON MACHINES.

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Fig. 3.

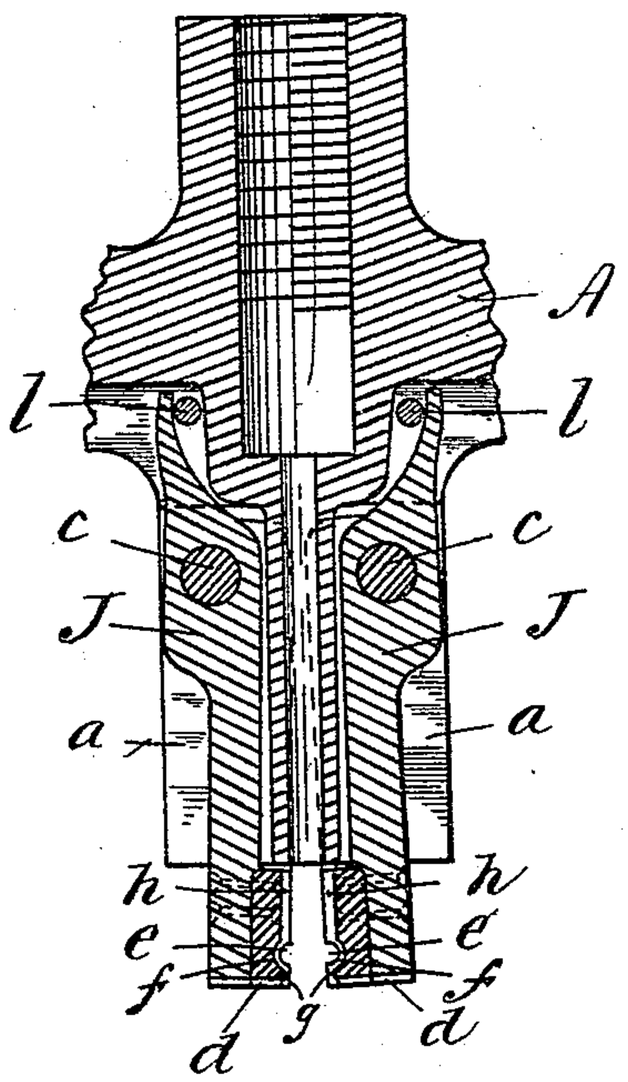
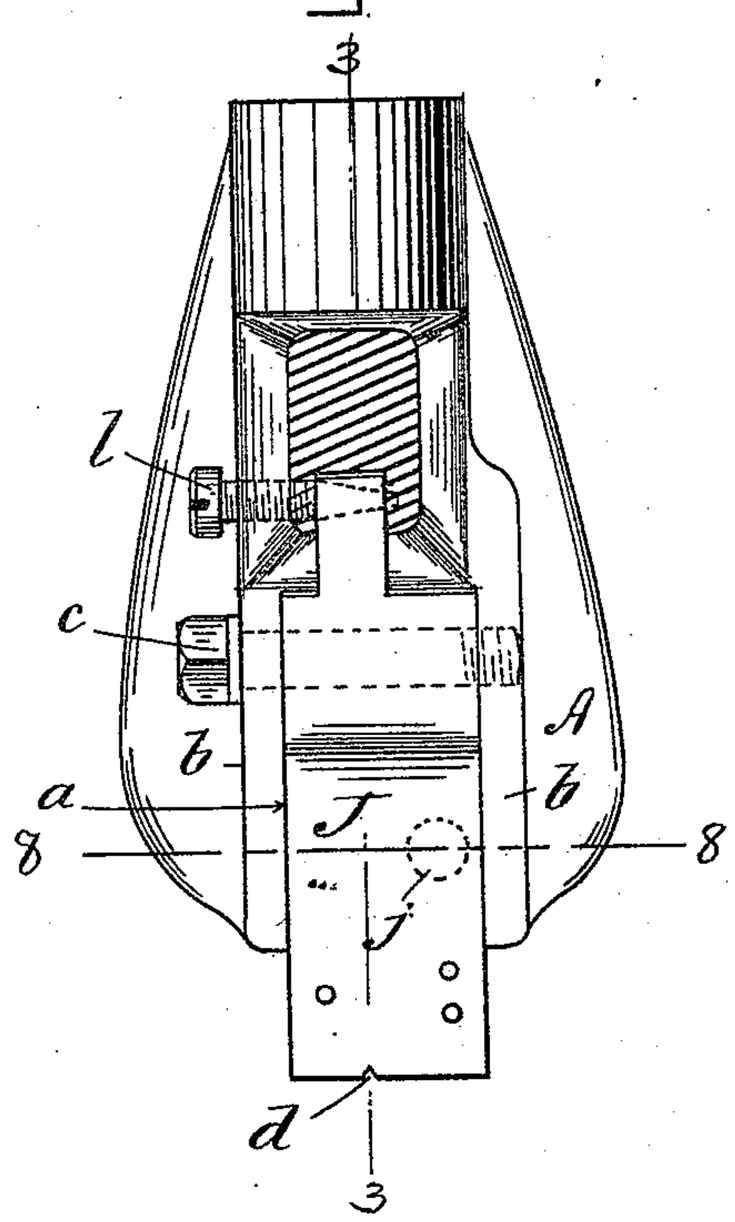


Fig. 4.



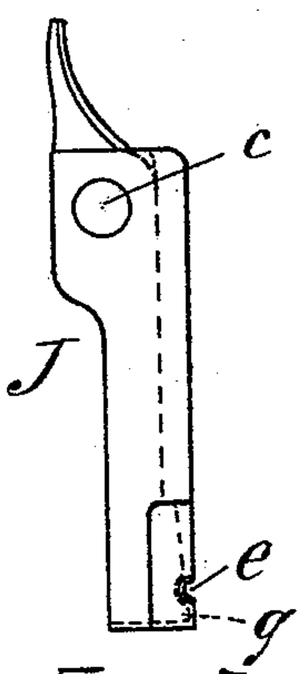


Fig. 5.

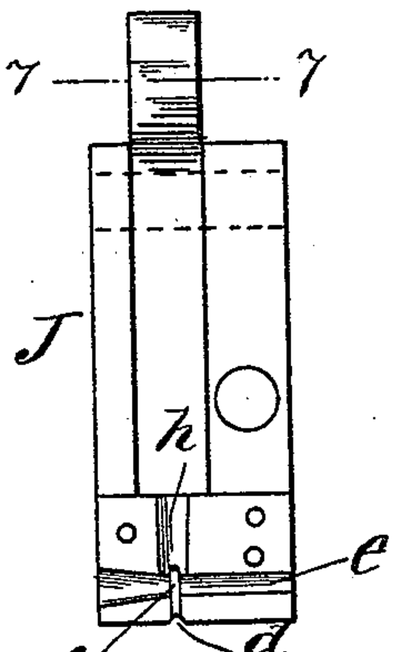


Fig. 6.

Fig. 7.

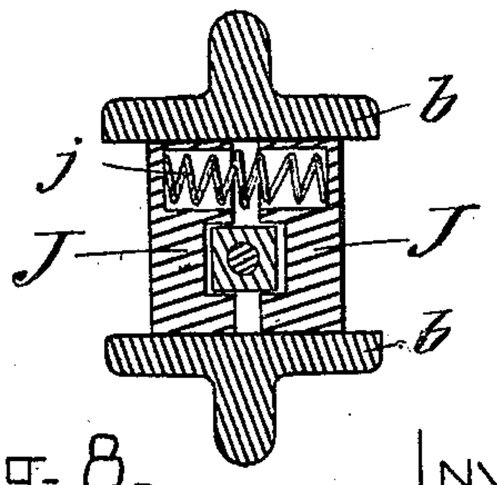


Fig. 8.

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EYE FORMING MECHANISM FOR BUTTON MACHINES.

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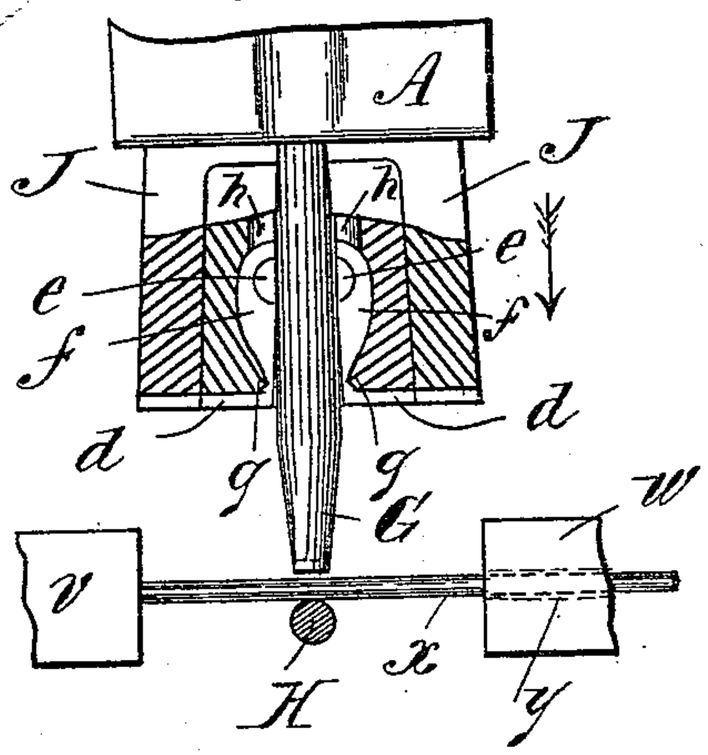

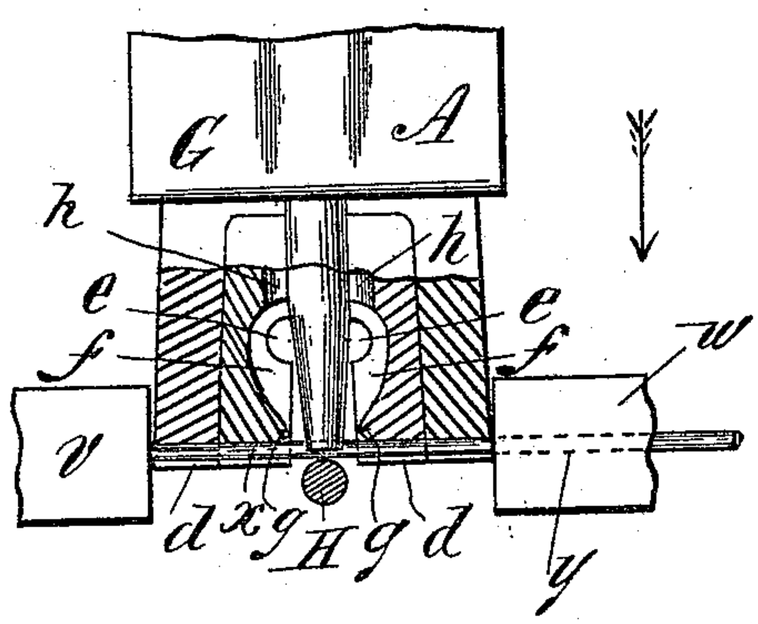

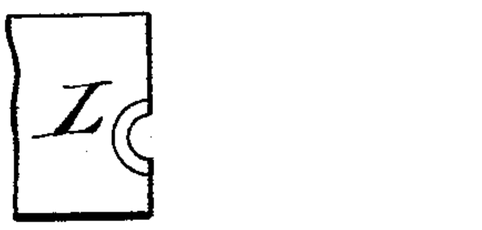

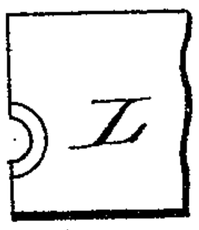

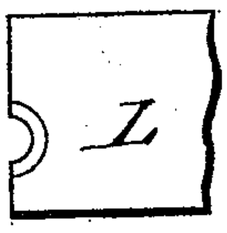

Fig. 9.

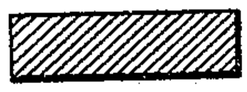

Fig. 10.

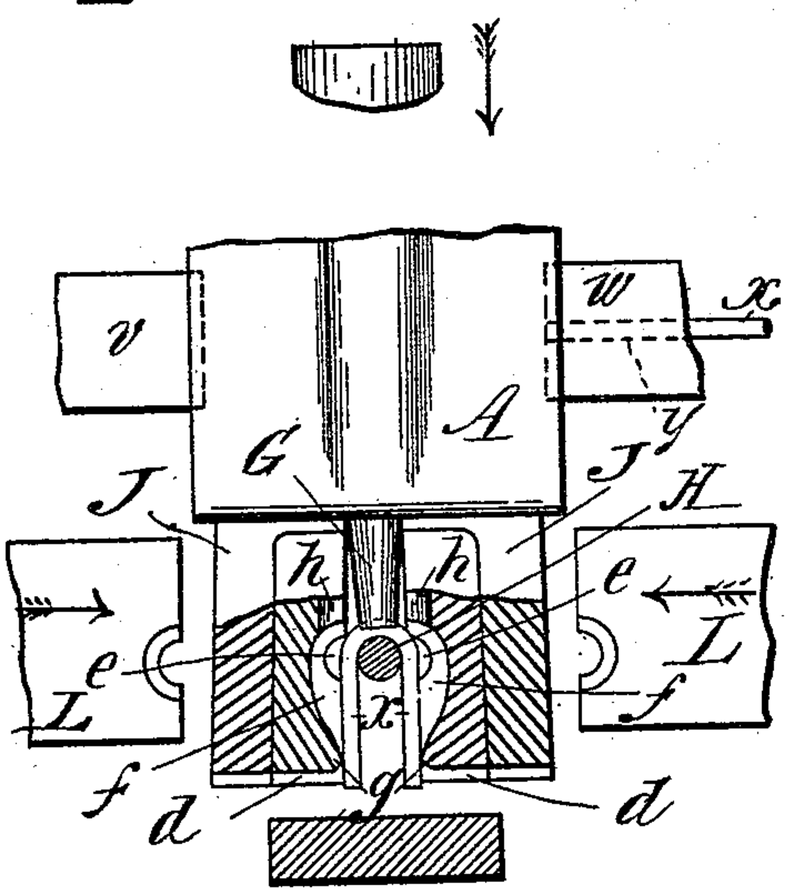

Fig. 11.

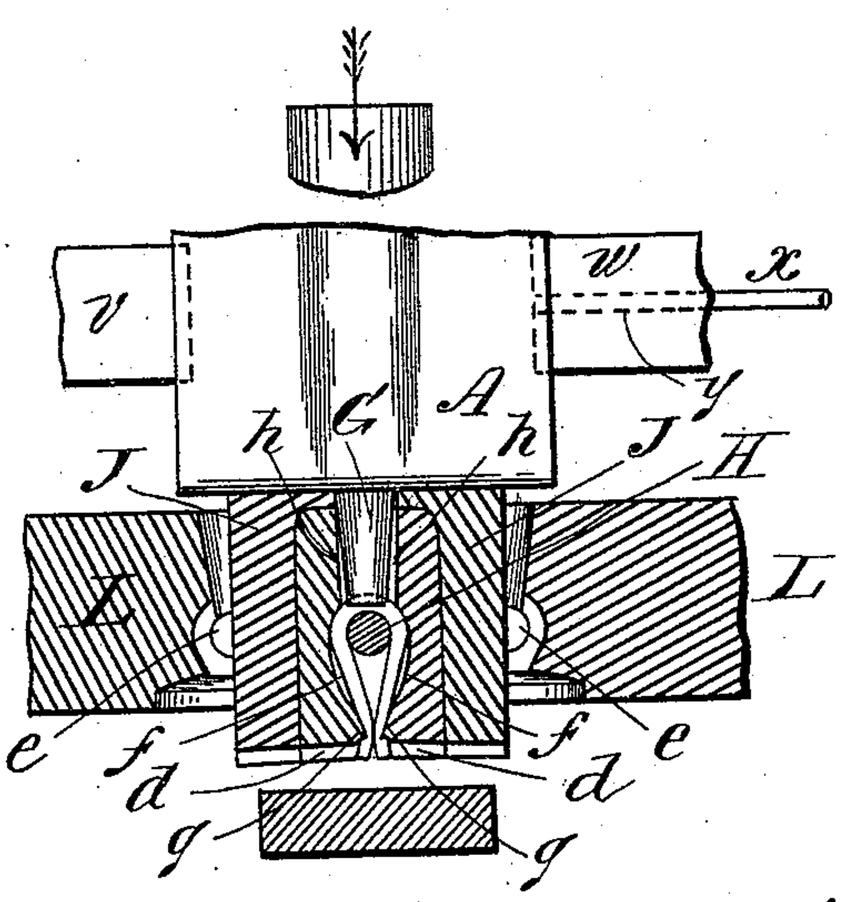

Fig. 12.

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by
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UNITED STATES PATENT OFFICE.

CHARLES S. GOODING, OF BOSTON, AND ROBERT L. ELLERY, OF TAUNTON, ASSIGNORS TO THE MORLEY BUTTON MANUFACTURING COMPANY, OF BOSTON, MASSACHUSETTS.

EYE-FORMING MECHANISM FOR BUTTON-MACHINES.

SPECIFICATION forming part of Letters Patent No. 459,372, dated September 8, 1891.

Application filed December 6, 1890. Serial No. 373,831. (No model.)

To all whom it may concern:

Be it known that we, CHARLES S. GOODING, residing at Boston, in the county of Suffolk, and ROBERT L. ELLERY, residing at Taunton, in the county of Bristol, State of Massachusetts, citizens of the United States, have invented new and useful Improvements in Eye-Forming Mechanism for Button-Machines, of which the following is a specification.

This invention relates to improvements in eye-forming mechanism for machines for making eye-shank buttons, such as shoe-buttons, wherein the wire is fed into the machine from a piece of indefinite length, is successively cut off into suitable lengths or sections from which to respectively form button-eyes, such sections being formed into eyes and held while the button-bodies are successively formed from papier-maché on or about and engaged with the leg portions of said eyes.

The invention consists in the construction and combination of parts constituting eye-forming devices, the same essentially embodying pincher-dies, all substantially as will hereinafter more fully appear and be set forth in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a portion of a button-making machine in which pinchers or pincher-dies of the present invention may be embodied, the arrangement and connection of the pincher devices and the carrier therefor relative to certain of the other parts of said machine being shown. Fig. 2 is an enlarged front elevation of the pinchers and its carrier as seen at right angles to the view, Fig. 1. Fig. 3 is a central vertical section taken on a larger scale through both pinchers and a portion of the carrier therefor. Fig. 4 is a side elevation of the pinchers and carrier similar to the view thereof, Fig. 1, but on a larger scale. Fig. 5 is a front view of one of the nipper-jaws, and Fig. 6 is an elevation of the inner face thereof. Fig. 7 is a transverse section on line 7 7, Fig. 6. Fig. 8 is a transverse section on line 8 8, Fig. 4. Figs. 9, 10, 11, and 12 are views in the nature of diagrams, to be hereinafter referred to, wherein the pinchers and a portion of their carriers are shown, the former in partial vertical section, together with parts of a button-machine, the relations of the said several parts being varied in the different views in accordance with different stages in the formation of a button-eye.

In the drawings, A represents the carrier on which the pinchers are mounted, the same being adapted for a vertical reciprocatory movement in fixed ways of the machine, the motion of said carrier being imparted by the connection therewith of the pivoted lever B, to the end of which is secured the upper extremity of a plunger-rod which receives its motion from its engagement with the cam D. The carrier at each side is provided with the recesses *a a*, each formed by the opposing walls *b b*, within which the nippers or pinchers J J are intermediately thereof pivotally hung upon the studs or bolts *c c*, which pass laterally through said walls. The lower arms or portions of said pinchers, which are extended below their supporting-pivots and also below the end of the carrier, directly form the pincher or nipper jaws of the device. Both jaws on their ends (the lowermost and also the forward ends, as the pinchers are used in the automatic machine) have aligned grooves *d d* therein, extending in the direction corresponding to the movement of the said jaws as they swing, the transverse contour of said grooves being of V form and otherwise to correspond or conform longitudinally to the surface of the straight section of wire to be worked upon. Such form serves to center the wire. Each of the proximate or opposing inner faces of the jaws is formed at a suitable distance above its grooved end with the groove or channel *e*, which extends from side to side of the jaw and transversely of the said direction of its swinging movement. Each jaw is also provided with a recess *f* therein, which is formed across its said channel *e* and extended coincident with said direction of the jaw's movement, the recess being continued downwardly to the lower end of the jaw, and while said recess is transversely, preferably, of sub-

stantially a semicircular or trough form its course vertically is more or less nearly in conformance with half of a button-eye, it being noted that the base of the recess near the lower end of the jaw has a protuberance *g*, below which the base of the recess recedes, as shown particularly in the last four figures of the drawings. Each jaw above said recess *f* is also grooved vertically, as shown at *h*, for the accommodation of the eye-holding pin G when the jaws above the said channels *e* are so nearly approached that such vertical grooving is necessary to permit of the disposition between the jaws when in their most approached relations of said holding-pin. The jaws are normally separated by the interposed spring *j*. As particularly shown, the application of the spring is made by drilling opposing sockets in the jaws below their pivots, into which the spiral spring under compression is placed.

It will be here explained, referring to Figs. 9, 10, 11, and 12, that in the operation of the pinchers when embodied in the wire-bending mechanism of a button-making machine, while the pinchers and carrier are in their uppermost position, the wire *x* is horizontally fed by its forward portion through a passage *y* in a part *w*, here sufficiently indicated by the term of a "block," against the vertical side of another block *v*, suitably separated and serving as a gage and in contact with the eye-forming bar H, which is horizontally supported midway of and at right angles to the run of said wire. As the carrier moves downwardly, the eye-holding pin G, supported on said carrier, also moves down to a spring bearing upon said wire, holding it upon the former-bar H. The carrier further moving downwardly, the pincher cuts off as much of the wire as is between said blocks, the right-hand jaw by its corner acting as a shear working in conjunction with the face of the block, while the corner and outer side of the left-hand jaw moves in contact with the vertical face of the block *v*. The jaws descending to contact with the wire overly and engage by the grooves *d d* therein, whereby liability of the wire to turn or swing on the former-bar is decreased. As the jaws further move vertically from the position of Fig. 10 to that of Fig. 11, the terminals of the cut-off section of wire are disposed in parallel relations to form a staple, as seen in said latter figure. In said Fig. 11 the separated jaws of the pinchers are within and opposite the ends of movable die-blocks L L, which, given their approaching movements through any suitable actuating means, force the pinchers together and effect the shaping of the button-eye, as seen in Fig. 12. It will be particularly noted, referring to said figure, that the protuberances *g g* press the legs of the eye-shank to contact near their ends, the forcible pinching or nipping at such portions causing the spread, as shown in Fig. 12, of the extremities, there being also usually formed a slight indentation on the legs where borne upon by said protuberances. These features in the button-eye shank are deemed of advantage and importance as contributing to the production of a very superior and strong button.

It being desirable that the nipper-jaws be governed or limited as to their separation, and also adjustable as to the degree of such separation there is a stop for each nipper-jaw, which is so applied in relation thereto that as the nipper is swung outwardly under the reaction of its spring it comes at a proper instant to an abutment on said stop, and by properly moving the said stop the pincher-jaw may swing more or less before coming to the abutment. As particularly shown in the drawings, the adjustable stop for each nipper consists of a screw *l*, entered through one side wall, forming part of the carrier, and at one side of the recess within which the said nipper is to be disposed, the line of said screw being at a right angle to the plane of swing of the jaw, and the extremity thereof is tapered. The side of the jaw borne upon by the tapered extremity of the screw is preferably inclined to correspond to the screw-taper, as seen in Fig. 7, although this is not essential, while on the other hand with the provision of such inclined jaw-surface the extremity of the screw need not be tapered, for it will be clear that in any event where one or the other of the contacting surfaces is inclined on the turning of the screw the adjustment may be effected.

Having fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In an eye-forming mechanism for a button-machine, the combination, with a reciprocatory carrier having pivoted thereon a pair of opposing nipper-jaws, of a stop for one of said nippers, whereby the separation thereof from its fellow may be limited, for the purpose set forth.

2. In an eye-forming mechanism for a button-machine, the combination, with a reciprocatory carrier having pivoted thereon a pair of opposing nipper-jaws, of an adjustable stop for one of said nippers, whereby the separation of said nipper from its fellow may be regulated and limited, for the purpose set forth.

3. In an eye-forming mechanism for a button-machine, the combination, with a holder or carrier, of a pair of nipper-jaws pivoted thereon and provided in their ends with aligned grooves extended in the direction of their opening and closing movement, substantially as described.

4. In an eye-forming mechanism for a button-machine, the combination, with a holder or carrier, of a pair of separable nipper-jaws pivoted thereon and provided in their proximate faces with grooves or channels extending transversely to the direction of movement of said jaws, for the purpose set forth.

5. In an eye-forming mechanism for a but-

ton-machine, the combination, with a holder or carrier, of a pair of separable nipper-jaws pivoted thereon and provided in their proximate faces with grooves or channels extending transversely to the direction of movement of said jaws and with the recesses *f f* extended coincident with such direction of movement, for the purpose set forth.

6. In an eye-forming mechanism for a button-machine, the combination, with a holder or carrier, of a pair of separable nipper-jaws pivoted thereon and provided in their proximate faces with recesses *f f*, extended coincident with the direction of movement of said jaws, each having a contour substantially corresponding to that of one-half a button-eye, the base of each recess being provided at or near its outer extremity with the protuberance *g*, substantially as and for the purpose set forth.

7. In a button-machine, in combination, a carrier and a nipper-jaw intermediately thereof pivotally mounted on said carrier, an abutment with which an extension of said jaw beyond its pivot has a rest, the faces of one of said contacting parts being inclined and said abutment being adjustably movable angularly relative to the plane of said incline, substantially as and for the purpose described.

8. In a button-machine, in combination, a carrier or holder and a pair of nipper-jaws, each intermediately thereof pivotally mounted on said carrier to swing toward and away from each other and provided in their ends with the aligned grooves extended in the direction of their opening and closing movements, provided in their proximate faces with the grooves or channels extending transversely to the said direction of movement, and also having the recesses *f f* extended coincident with such direction of movement, for the purposes set forth.

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