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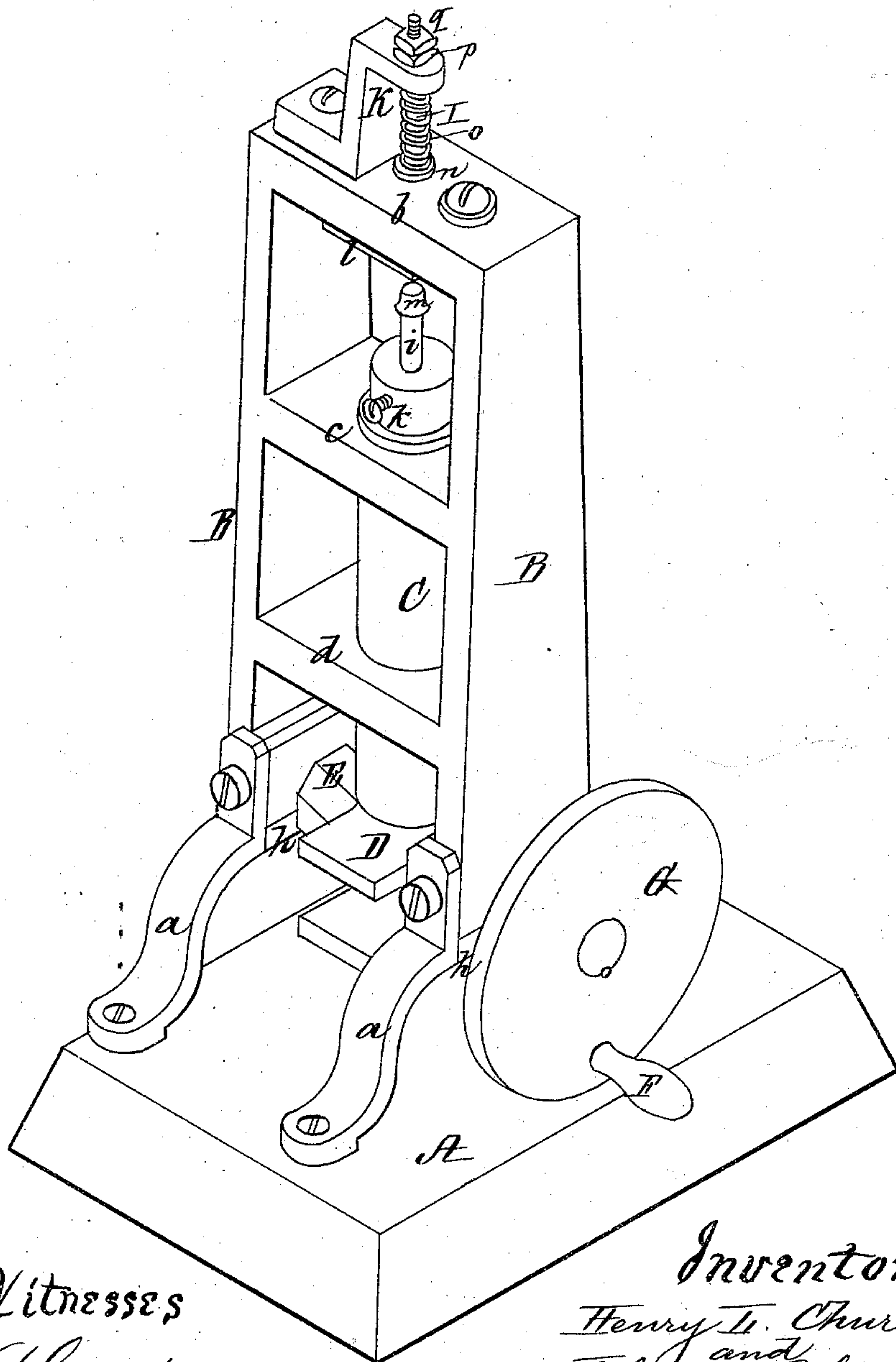
H. L. CHURCHILL & J. D. ROBINSON.

Eyelet-Making Machines.

No. 143,274.

Patented September 30, 1873.

*Fig. 1.*



Witnesses  
W. J. Cambridge  
G. S. Hill

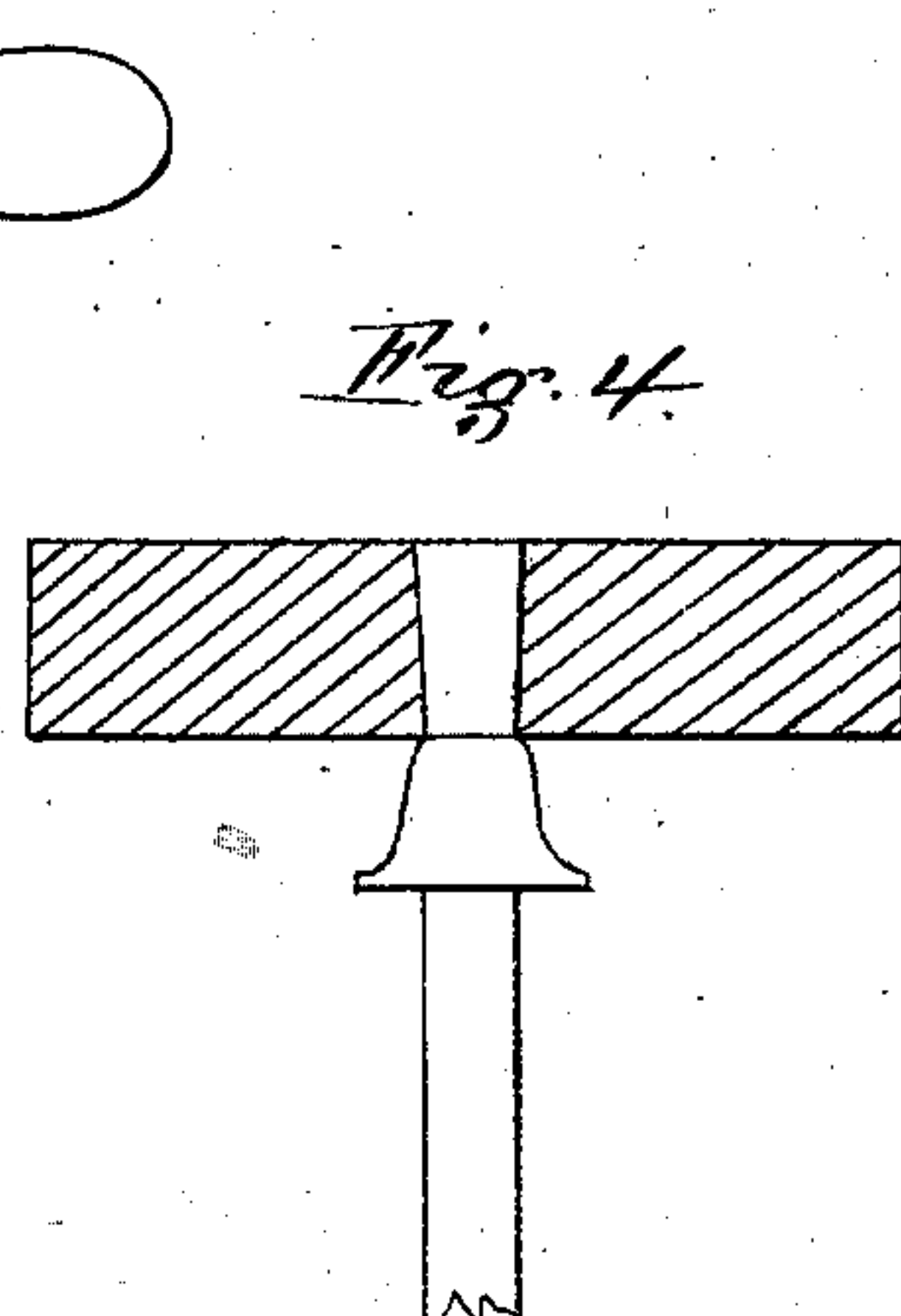
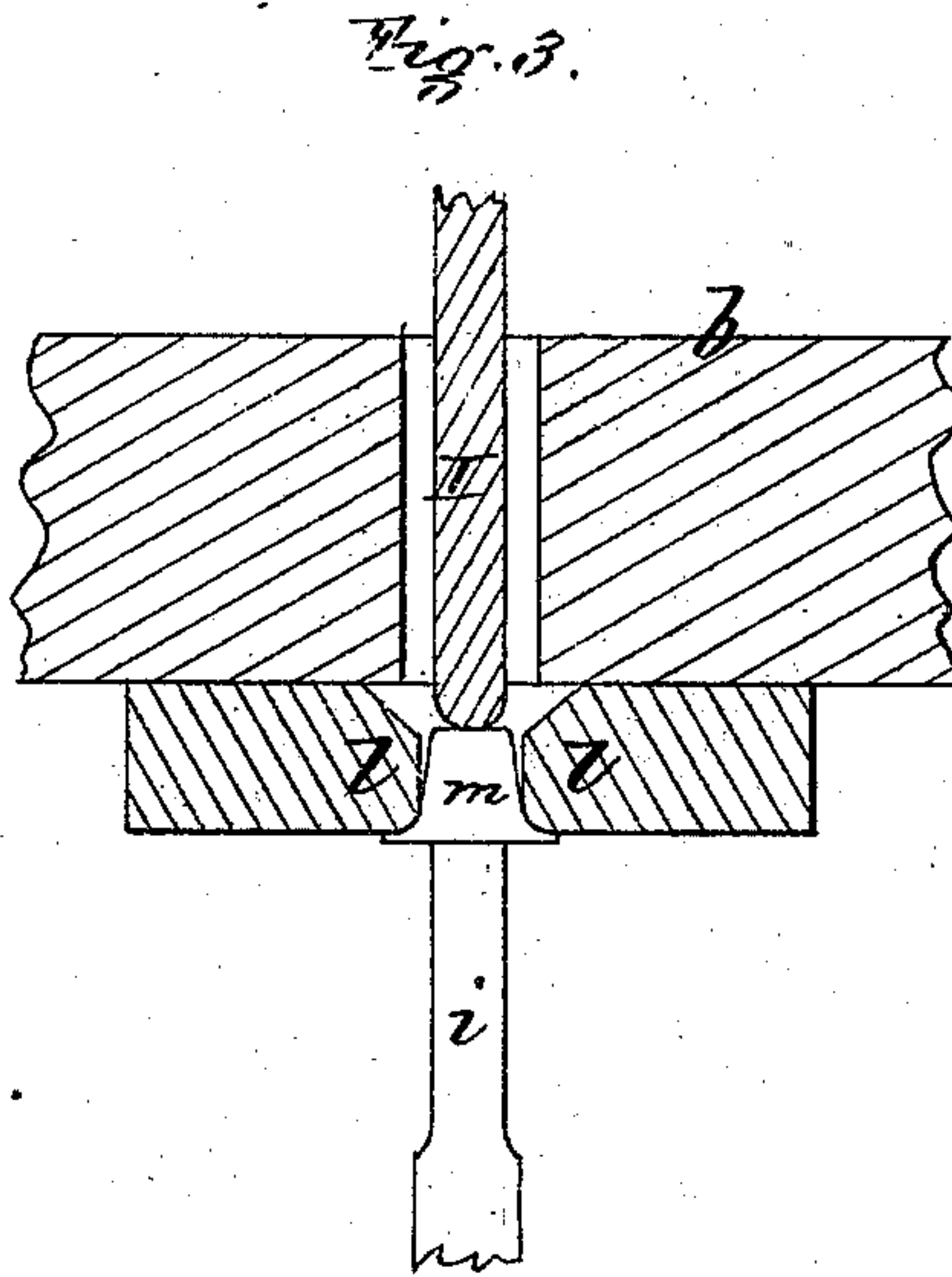
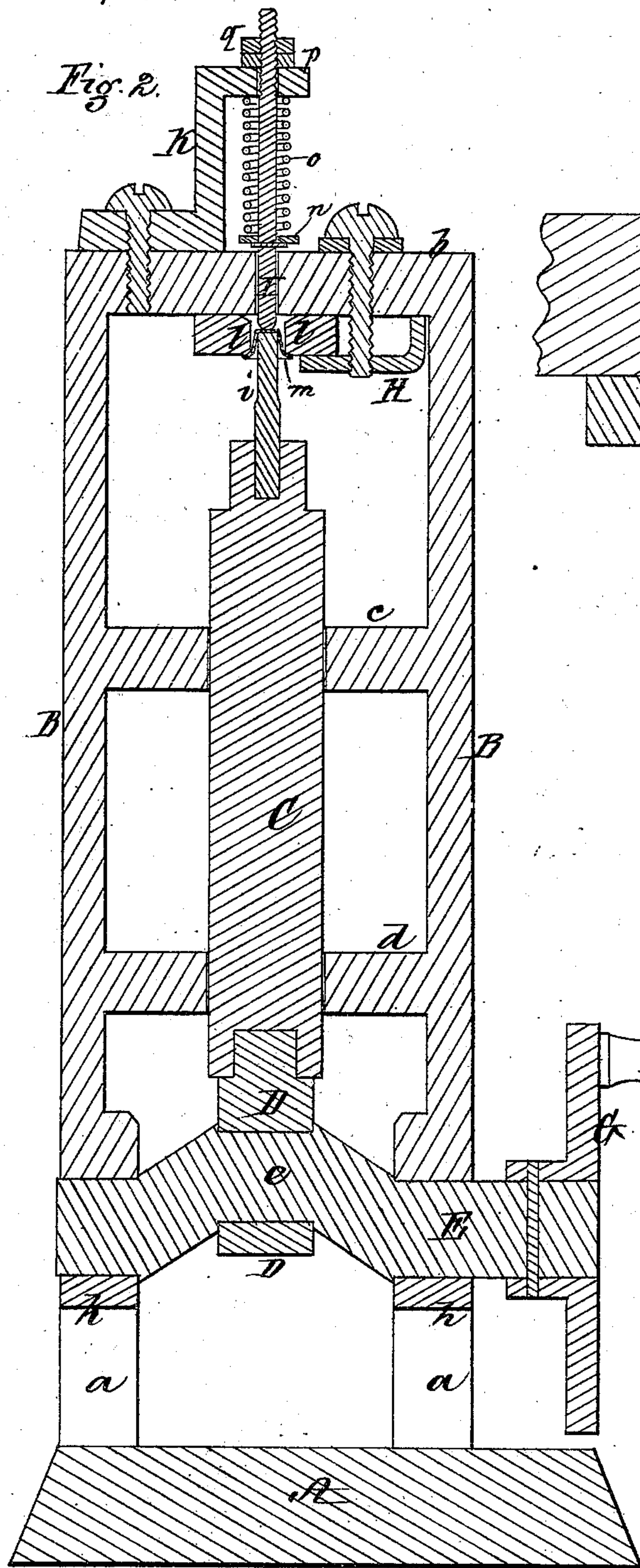
Inventors  
Henry L. Churchill  
and  
John D. Robinson,  
Per their Attorneys  
Teschmacher & Stearns.

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# UNITED STATES PATENT OFFICE.

HENRY L. CHURCHILL AND JOHN D. ROBINSON, OF TAUNTON, MASS.

## IMPROVEMENT IN EYELET-MAKING MACHINES.

Specification forming part of Letters Patent No. 143,274, dated September 30, 1873; application filed September 8, 1873.

*To all whom it may concern:*

Be it known that we, HENRY L. CHURCHILL and JOHN D. ROBINSON, both of Taunton, in the county of Bristol and State of Massachusetts, have invented certain Improvements in Machines for Making Eyelets, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a perspective view of a machine used in the manufacture of eyelets, constructed in accordance with our invention. Fig. 2 is a vertical section through the center of the same. Fig. 3 is a sectional detail, enlarged. Fig. 4 is a section illustrating the ordinary construction of the punch and die.

In machines as heretofore constructed for making eyelets, the top has been removed by a punch made to snugly fit the die, the edges of both of which were rapidly worn away, and they were frequently required to be sharpened, which operation, together with that of their removal and replacement, and the occasional substitution of new dies and punches rendered necessary thereby, involved considerable labor and expense. Moreover, as the forming-tool wears away, the interior of the top of the eyelet becomes smaller than the diameter of the punch, and the eyelet does not bear squarely and with a uniform pressure thereon; and an irregular and uneven cut is thereby made, in which case the punch is liable to be sprung to one side, which injures it and the die, in consequence of which great care and attention are required on the part of the attendant to prevent the sticking of the eyelet in the die when thus injured, and also to prevent a double eyelet being formed by the punch carrying up and depositing another eyelet in the one thus previously stuck within the die. To obviate the above-mentioned difficulties is the purpose of our invention, which consists in a die having a flaring mouth corresponding in shape and size to the "bell" of the eyelet, which is centered and supported thereby, in combination with a punch of less diameter than the die and a yielding pressure-rod, which bears on the top of the eyelet while it is being removed by the punch, by which construction the entire edge of the punch is

made to bear with a uniform pressure upon all points in the periphery of the inside of the top of the eyelet, thus insuring the instantaneous cutting away and separation of the top of the eyelet, as desired.

To enable others skilled in the art to understand and use our invention, we will proceed to describe the manner in which we have carried it out.

In the said drawings, A represents the base of the machine, upon braces *a* secured to which is supported the frame-work B, the sides of which are connected by parallel cross-pieces *b c d*, within the lower two, *c d*, of which are formed circular openings for the passage of a cylindrical plunger, C, secured at its lower end to an open socket or plate, D, within which turns the portion *e* of the crank-shaft E, which is revolved in bearings *h* secured to the bottom of the sides of the frame-work by turning the crank or handle F projecting from the outside of a circular plate or disk, G, secured to the outside of the crank-shaft, by which construction the plunger is made to rise and fall in a vertical plane. The upper extremity of the plunger is turned down, and provided at its center with a circular opening for the reception of a cylindrical punch, *i*, secured in place therein by means of a set-screw, *k*. On the under side of the upper portion *b* of the frame-work, secured by means of a clamp, H, is a rectangular block, through the center of which is formed the die *l*, of the shape seen in Fig. 3, its lower portion or mouth being rounded outwardly, or made flaring, to correspond exactly with the size and form of the lower or bell portion of the eyelet *m*, the remaining portion of the die being of larger diameter than that of the exterior of the corresponding portion of the eyelet, whereby it is kept from contact with the die, excepting at and near the flaring mouth, where it is centered and supported, the diameter of the punch being exactly equal to the inside of the top or closed end of the eyelet, and, consequently, less than that of the die, so that it may not press the upper portion of the eyelet laterally out into contact therewith. I is a short vertical rod passing through the top *b* of the frame-work, and through a bent arm, K, secured to the upper side thereof, the rod being



provided with a circular enlargement, *n*, upon which rests the bottom of a spiral spring, *o*, surrounding it, the top of the spring bearing against the under side of the bent arm *K*. This rod is situated directly in the prolongation of the axis of the punch, and, when the closed top of the eyelet is brought into contact with its rounded bottom by the ascent of the punch, the rod is made to yield and rise against the resistance of the spring *o*, the pressure of the rod on the center of the top of the eyelet, however, being sufficient to hold it firmly, so as to insure the entire edge of the punch acting squarely on the inside of the top of the eyelet, whereby it is cut away and separated instantly at one operation; and the upper edge of the eyelet is left in a perfectly smooth and finished condition. The strength of the spring *o* is regulated by a nut, *p*, and its check-nut *q*, which are turned down on the upper portion of the rod *I*, which is provided with a screw-thread for this purpose. Owing to the diameter of the punch being less than the interior of the upper portion of the die, the latter is not dulled by contact of the punch therewith, and the delay, labor, and expense incident to the removal, sharpening, and replacing of the dies, as heretofore constructed, and the substitution of new dies therefor, are

thereby obviated. Moreover, for the same reason, a die constructed in accordance with our invention does not require to be made so carefully as where the die and punch snugly fit each other, as heretofore, (see Fig. 4,) whereby economy is effected in the original cost of forming the punch and die.

In addition to the above-mentioned advantages resulting from our construction, one attendant is enabled to take care of more machines than was possible where those of the old style were employed, thus materially reducing the cost of manufacture.

What we claim as our invention, and desire to secure by Letters Patent, is—

The die *l*, having a flaring mouth corresponding in form and size to the bell of the eyelet, in combination with the yielding pressure-rod *I* and punch *i*, of a less diameter than the interior of the die, operating substantially in the manner and for the purpose set forth.

Witness our hands this 1st day of September, 1873.

HENRY L. CHURCHILL.  
JOHN D. ROBINSON.

In presence of—

JOHN L. MERIGOLD,  
ALBERT F. SHAW.