

(No Model.)

F. H. HARDMAN.
BUTTON MACHINE.

No. 477,115.

Patented June 14, 1892.

Fig. 1.

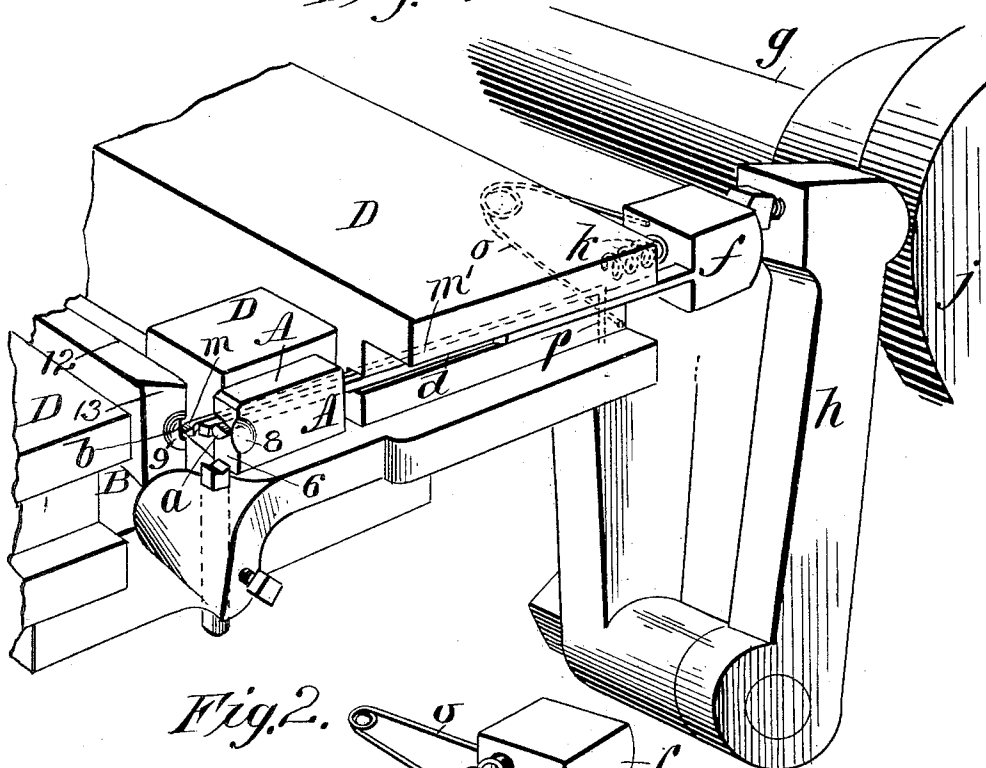


Fig. 2.

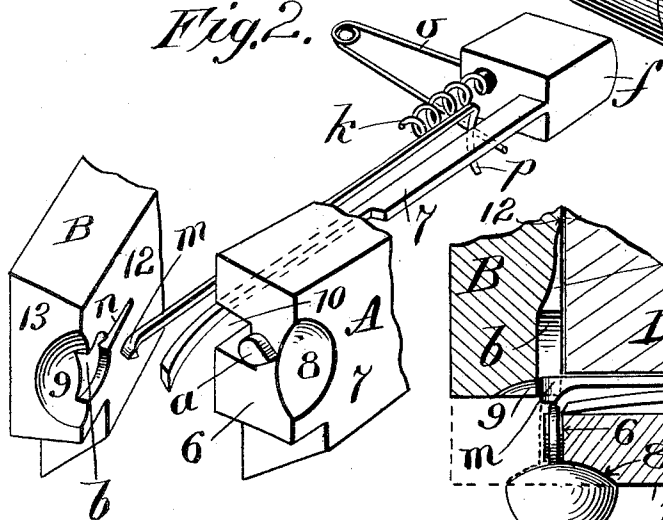


Fig. 3.

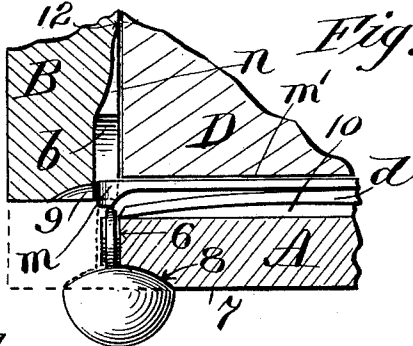
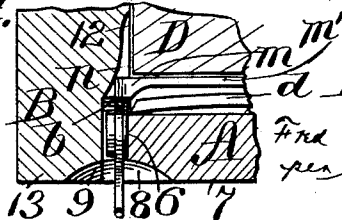


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRED. H. HARDMAN, OF BEVERLY, ASSIGNOR TO WALTER E. BENNETT, OF BOSTON, MASSACHUSETTS.

BUTTON-MACHINE.

SPECIFICATION forming part of Letters Patent No. 477,115, dated June 14, 1892.

Application filed August 21, 1891. Serial No. 403,366. (No model.)

To all whom it may concern:

Be it known that I, FRED. H. HARDMAN, a citizen of the United States, residing at Beverly, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Button-Machines, of which the following is a specification.

This invention relates to improvements in wire-bending or eye-forming mechanism for button-machines, the improvements in some respects relating to other features of the machine, as will hereinafter be made to appear.

The objects of the invention are the provision of efficient devices for the ejection of the completed eye from the devices on which the eye is formed, or, more generally, of the eye and the button-body also formed thereon, and, secondly, the provision of a guard device which serves to retain the partially-formed eye on the forming-stud at the time one of the eye-forming dies recedes, so that the wire or eye will not recede therewith, said latter device further serving to reinforce the support for the eye at the time the paper or other stock material from which the button-head is formed is crowded upon and about the eye-shank legs.

The invention consists in the construction and combination of parts, all substantially as hereinafter described, and covered by the claims.

In the accompanying drawings the present improvements are illustrated.

Figure 1 is a view in perspective, showing the fixed die and one of the movable dies, the ejector and actuating devices therefor, and the guard. Fig. 2 is a perspective view of the parts shown in the preceding figure, but as more or less separated from each other to more clearly indicate details of construction. Figs. 3 and 4 are horizontal sectional views through the fixed die and movable die, the latter being shown in different positions, as occupied thereby at different times in the eye or button forming operation of the machine.

The present improved devices are particularly designed for operation in connection with an eye and button forming machine which constitutes the subject-matter of a separate application for Letters Patent of the United States, filed by me of even date herewith under Serial

No. 403,365, although features of the present invention may be applicable to other eye-forming or button-making machines, and, as in the machine forming the subject-matter of said application, I here show two of the dies which coact in the formation of the eye and button-head, the third die, however, not being shown, and A represents the fixed die-block, having at its end the V-stud *a*, which is formed as a short oval projection from said end, corresponding substantially to the eye-opening in the button-shank. The said block in its side 7 is provided with the die depression 8, and in its rear side, or side opposite the one 7, the block A has the longitudinal groove or way 10, which extends to the end face of the block with the innermost border thereof in a plane coincident with or near to the edge of said stud *a*, as shown.

The movable die B has its movement at right angles to the length of the die-block A, with its inner side 12 in the plane of the end 6 of the block A. The block B, when moved to its forward limit, has its end 13 coincident with the side 7 of block A and has the die depression 9 therein to match and correspond with the one 8 in the other block, which two depressions 8 9 form the opening for molding and shaping the under portion of the button-head.

Within the face 12 of die-block B the U-opening *b* is formed, which merges by its wider section into the said depression 9, and the width of said opening *b* is enough wider than the widest part of the stud *a* to correspond to the thickness at each side of the stud of the wire from which the button-eye shank is to be formed, and all so that the wire having been fed down vertically behind and next to the stud *a* at the time the die B is receded the die B in its forward movement will transform the straight section of wire of suitable length into the form of a staple, the legs of which may protrude within the die opening formed by depressions 8 and 9, and, if desired, beyond the plane of the die-faces 7 and 13. The staple-legs are next, by suitable mechanism not necessary to here describe, forced together at points somewhat within their ends, the very extremities being spread or divergent. The stock material may now

be crowded over and upon the eye-shank legs and molded and compressed to the form desired for the button-head. The button having been made, the ejector then operates, and, as particularly shown, the said ejector consists of the rod *d*, which lies within the grooveway 10 in the rear side of die-block A, and is properly extended and provided with the block or enlargement *f*, which is borne upon by the head of the adjusting-screw *g*, which is in engagement with the swinging lever *h*. The movement of said lever in one direction is imparted by the cam *j* and effects the shoving of the ejector-rod *d* against the eye of the button to force it off the stud. The ejector is quickly returned, so that the working extremity is drawn within the end face 6 of die A by the spring *k*, which is applied between the fixed part D of the machine and the enlarged part *f* of the ejector. By turning the screw *g* the limit of the outward movement of the ejector-rod *b* may be a greater or less distance from the end face of the die-block A.

The function of the guard member, which is indicated at *m*, is to serve as a safeguard during the continued and rapid running of the machine—for instance, in the event of the failure, after the die B has gone forward to form the wire into staple shape and before it recedes, of the devices of the button-machine which close the legs of the staple upon the tapered part of the V-stud *a* or of the blank-applying and head-forming mechanism to act before the bent piece of wire could be ejected to clear the dies for the next button-forming operation, the bent wire might be carried back with the die B in the U-opening thereof, and manifestly on the next button-forming operation the presence of the staple in the U-opening would result disastrously. The part of the member which directly constitutes the guard is located within the face 12 of die B in the central line of the U-opening *b*, said guard member not having necessarily any movement, and the said guard-constituting portion *m* of this member is by its forward face held just back of and slightly separated from the rear edge of the V-stud *a*, so that no impediment will be offered to the free passage of the wire down back of and next to the rear edge of the V-stud. It will be seen that the guard member is, as shown, in the form of a rod *m'*, which lies back and along side of the ejector-rod *d* and against a solid wall of a fixed part D of the machine, except the extremity *m*, which when the die B is receded lies against the innermost wall of the U-opening *b* therein, and when the said die is forward in its working position the said extremity is within the groove *n* at the rear of and which communicates with the said U-opening, all as will be clear from the drawings. (See particularly Figs. 3 and 4.) The recess *n* in the present construction and arrangement necessarily being provided for the accommodation of the

extremity of the guard when die B is forward and working, the said guard extremity nevertheless serves to efficiently reinforce the eye-shank in its confinement on the V-stud at the time the stock material is being forced upon and molded around the legs of the eye-shank.

The making of the guard member in the form of a rod is a convenient means of construction and renders easy the application of the guard in the mechanism for the extended or rod portion *m'*, which lies along the rear side of the ejector-rod within the groove 10 and is by the spring *o* inwardly forced, so that the guard extremity *m* will always remain in contact with the inner wall of the U-opening or the groove *n*. The die B, while it has sufficient rearward movement, as indicated in Fig. 3, to permit of the unimpeded ejection of the eye or button, never moves rearwardly so far that it is carried out of the line of the said guard-rod. The spring *o* is shown as applied between the enlarged part *f* of the ejector and the angular extension *p* of the rod *m'*.

What I claim as my invention is—

1. In an eye-forming mechanism of a button-machine, the combination, with a block having a forming-stud projecting from one side face thereof, of another block movable with one side face in bearing upon the face of the first block from which said stud projects and having a forming or die opening of U form within said bearing-face which extends to the end of the block and to coact with said stud, and a guard-piece provided to extend within said U-opening and to lie just back of said stud and serving after the formation of the eye-staple as the movable die retreats to prevent the staple from being carried rearwardly with the movable block and off from the stud, as set forth.

2. In a button-machine, the combination, with a block having a stud *a* extended from the face thereof, of another die-block movable by one side along the side of said first block and having the U-opening *b* within said side and the rearwardly-extended groove *n*, and a guard member extended to lie just back of and slightly separated from the said stud, substantially as described.

3. In a button-machine, the combination, with the die A, having the V-stud *a* in its end and the groove 10 in its rear side, and the die B, movable as specified and provided with the U-opening *b*, and the groove *n*, of the ejector located for play within the said groove, and means for moving it endwise back and forth, and the guard-rod supported alongside of and at the rear of the ejector-rod and limited at its inner end by walls of the openings in said die B, and a spring for maintaining the guard inwardly, as described and shown.

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