W. R. Landfear,

Mang Eyelets.

No. 110,979. Patented Jan. 17, 1871.

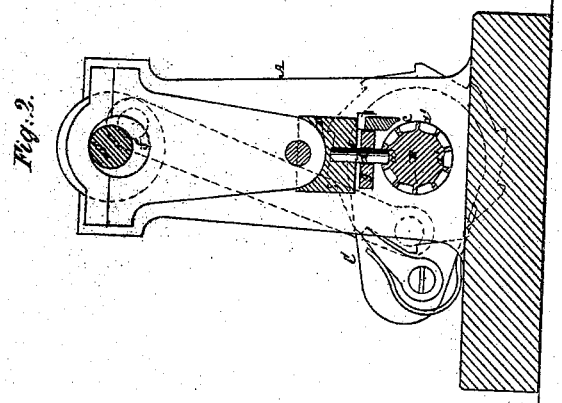

Fig. 2.

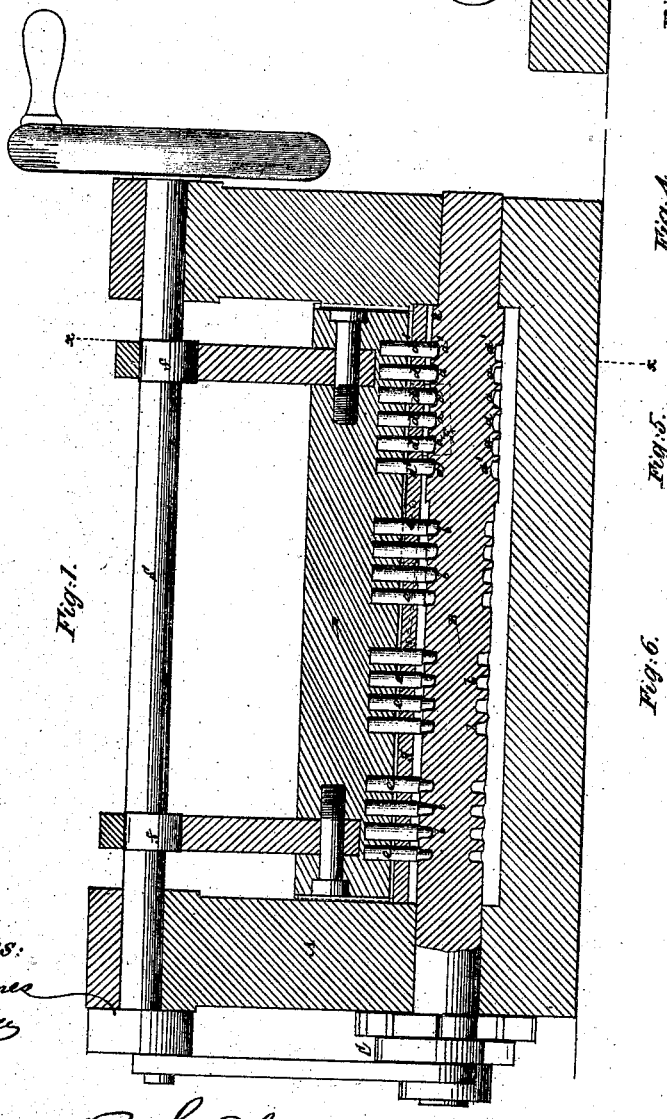

Fig. 1.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

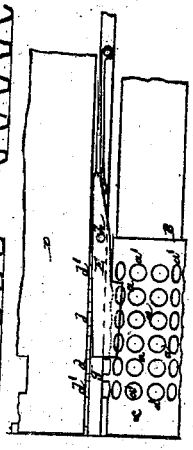

Fig. 7.

Witnesses:
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WILLIAM R. LANDFEAR, OF HARTFORD, CONNECTICUT.

Letters Patent No. 110,979, dated January 17, 1871; antedated January 5, 1871.

IMPROVEMENT IN THE MANUFACTURE OF EYELET-BLANKS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM R. LANDFEAR, of the city and county of Hartford and State of Connecticut, have invented a new and useful Improvement in the Manufacture of Eyelets, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a longitudinal sectional elevation of an eyelet-machine constructed to carry out my improvement.

Figure 2, a transverse vertical section of the same taken as indicated by the line *x x* in fig. 1.

Figures 3, 4, 5, and 6, represent the work at different stages of its progress.

Figure 7 is a view of a latch attachment for holding the sheet until the first set of punches get hold of it.

Similar letters of reference indicate corresponding parts.

My invention consists in a process of manufacturing eyelets by subjecting a strip or sheet of metal to the combined action of punches in sets, each set of varying sizes, and a roller or series of rollers containing molds in sets of varying sizes, to correspond with the punches, the first set of molds having a quicker roller-feed, and the metal sheet, having the eyelet sunk in it by the successive action of the sets of punches and molds, being afterward punched to cut out the eyelets, as required.

In this way the draw on the sheet is effectually provided for, and perfect eyelets produced at a reduced cost of manufacture.

Referring to the accompanying drawing—

A represpresents the frame of the machine, and

B, a roll, or it may be a series of rolls, for operation in connection with a series of punches.

Said roll, which is carried by the frame A, has an intermittent rotary motion communicated to it by a revolving driving-shaft, S, and a pawl and ratchet, or other suitable feeding mechanism, C, arranged at either end of the roll.

Said roller is provided with four or more distinct series of dies or molds extending around it circumferentially, each series being composed of any number of sets or longitudinal rows of dies corresponding to the diameter of the roll, and each set being composed of four (more or less) dies corresponding to the width of the sheet or ribbon of metal which it is designed to use.

The portion *c* of the roll, which contains the set *a* of the molds, is of slightly larger diameter than the remainder of the roll, in which are arranged the sets *b* of molds. The number of these last-named sets *b* will vary according to the length of the eyelet to be made.

The set *a* of molds in the larger portion *c* of the roll are larger and shallower than the succeeding sets of molds, and each successive set *b* therefrom deeper and narrower than its preceding set. There is, however, the same number of rolls in each set.

Corresponding with this arrangement of molds in sets are punches in series or sets *d* and *e*, the first set *d* being larger and shorter, to work in concert with the molds *a*, and the other punches *e* being also made successively larger and smaller, to operate in unison with the molds *b*.

The punches *d* and their molds *a* operate merely as preparatory formers, and are larger in proportion than the other molds; also, the portion of the roll in which are arranged the molds *a*, being of larger diameter, feeds faster than the remainder of the roll.

Such enlarged construction and increase in the feed provide for the main draw on the metal, which takes place during the first passage of the strip or sheet that is fed over the portion *c* of the roll before the metal is annealed.

In the first formation of the caps there is a gathering action on the plate; the first set of punches, acting upon the plain sheet, draw heavily on the metal to form cups; consequently the surface-speed of the roll is quickened to provide for such draw. This is done by making the portion *c* of the roll larger in diameter.

The after series of punches act more upon the metal in the cups than on the main surface of the sheet; hence, there is not that draw on the sheet which there was in first indenting it.

There are two more circumferential rows of molds, *a' a'*, in the set *a*, and two more punches, *d' d'*, to match, than in the other sets of molds and punches. The object of this addition is to bend over the edges of the strip or sheet of metal to prevent it from entering the eye of the eyelet, and from crinkling the metal around the eyelets, or certain of them.

The punches *d*, *d'*, and *e*, are carried by a vertically-sliding bar or frame, D, which is operated by eccentrics *f* on the driving-shaft S, or otherwise, and said punches made to work through a stripper, *g*, arranged above the roll.

E is a spring or weighted latch, which may be pivoted, as at *h*, to the stripper opposite the portion *c* of the roll, to hold the strip or sheet in place till the punches *d d'* get hold of it, but afterward yielding to allow for the draw which takes place in the first stage of the work, that is, the preparatory shaping of the eyelet in the plate by the punches *d* and molds *a*.

After the metal strip has had the eyelet preparatorily shaped in it by the successive action of the punches *d* in concert with the molds *a*, as shown in fig. 3 of the drawing, it is annealed and passed over the portion of the roll containing the first set *b* of the molds, and so on successively over the remaining sets

b for operation on it by the punches *e*, the metal being annealed prior to each of such feeds, and the eyelets being gradually formed in the plate by the successive actions of said molds and punches, as indicated by figs. 4, 5, and 6, which show the strip at the close of each successive stage, as it comes from the mold-portion *b* of the roll.

By this process the production of the eyelet is a gradual one, and the cost of manufacture small, while the eyelets, which are afterward cut, stamped, or punched from the sheet are free from crack or breakage, and of the smoothest and most perfect kind.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The process, substantially as herein described, of making connected series in ribbons of eyelet-blanks, that is to say, the order of and the several successive operations on the ribbon or strip of metal of the several sets of punches acting in conjunction with corresponding sets of the several series of dies or molds in the surface of the roll, the series first operated with being on a portion of the roll that is of greater diameter than the remaining portion, in order that greater speed of surface rotation may be imparted to said series, to compensate for the draw of the metal, substantially as specified.

2. The combination of the latch E with the intermittently-revolving mold-roll B, stripper *g*, and reciprocating punches *d*, substantially as described.

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Witnesses:
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