D. K. Hoxsie,

Eyelet Machine,

No. 106,939. Patented Aug. 30. 1870.

FIG 6.

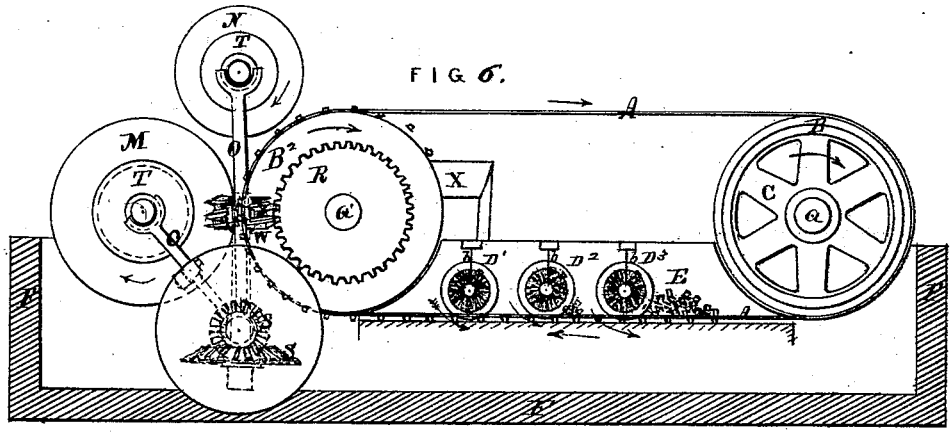

Fig 8.

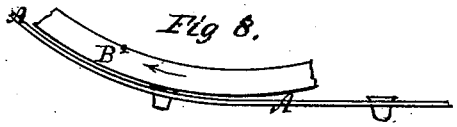

Fig 9.

nº 1. nº 2.

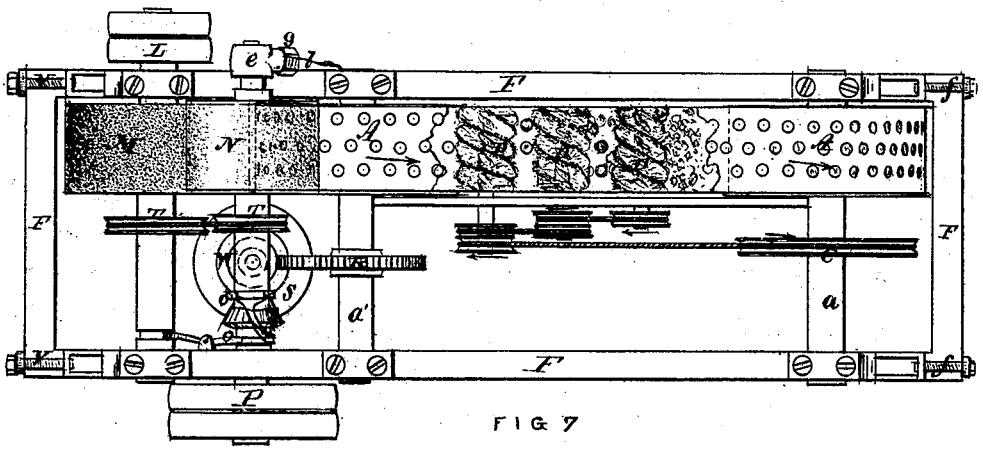

FIG 7

WITNESSES.

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UNITED STATES PATENT OFFICE.

ESEK TALLMAN AND NICHOLAS G. HOXSIE, OF PROVIDENCE, RHODE ISLAND, ADMINISTRATORS OF DAVID K. HOXSIE, DECEASED, ASSIGNORS TO WATERBURY BRASS COMPANY AND AMERICAN FLASK AND CAP COMPANY, OF WATERBURY, CONNECTICUT.

IMPROVEMENT IN MACHINES FOR CUTTING OUT THE ENDS OF EYELETS.

Specification forming part of Letters Patent No. **106,939**, dated August 30, 1870.

DAVID K. HOXSIE, deceased, late of the city and county of Providence, in the State of Rhode Island, during his life-time invented certain Improvements in Machinery for the Manufacture of Metallic Eyelets, of which the following is the specification, reference being had to the accompanying drawing, making part of the same.

The said invention relates to improvements in the manufacture of eyelets, by which the metal is first converted into a bell-shaped piece or cap, by suitable means, in one machine or class of machinery, and afterward, by other means or by another and distinct class of machinery, which removes the material from the closed or small end of the bell-cap, it is converted into an eyelet of the proper form.

The invention, in this instance, relates particularly to the means by which the closed or small end of the bell-cap is removed.

The first part of this invention relates to the means employed to remove the metal at the closed end of the bell-cap, to open it and convert the cap into an eyelet, and also to flatten the flange or flaring open end of the same. The opening part of this operation has heretofore been performed by cutting or punching out a chip at the closed end by means of the end of the forming-punch at the bottom of the die from which it receives its eyelet form, or by like means in a separate machine. By the means employed in this invention, however, the bell-caps or pieces are delivered in a mass, and fed, by suitable means, to a device which holds the same by the flaring open end, while the small closed end is removed by grinding off the metal; and this part of the invention consists of a perforated endless apron or belt of metal on a pair of straining-wheels, to regulate the tension in the perforations of which the bell-caps are inserted, point foremost, and held firmly by their flange between the wheel's face and the edge of the perforation in the apron, and so carried by the movement of the apron, and presented to the device which removes the material to open the closed end and complete the eyelet, and afterward delivers the eyelet from the apron into a suitable receptacle.

This part of the invention includes a device for feeding the bell-caps to the perforated apron, consisting of one or more moving brushes, which sweep the caps that are deposited in a mass on the apron in an opposite direction to its carrying movement, and by so doing stir the mass sufficiently to present some of the caps in proper position to insert themselves in the perforations, and be delivered from the mass and carried by the apron to the device which removes the material from their end.

This part of the invention also comprises the device for grinding off the small end of the caps as they are presented by the moving perforated apron; and consists of one or more grinding-wheels, of suitable gradations of cut, which revolve with a laterally-vibrating movement close to that portion of the apron's surface which is around the straining-wheel, where the caps are more firmly held, and are adjusted with respect to said surface to a degree that will permit the grinding off of enough material from the protruding ends of the caps to open the same, and also determine the length of the eyelet.

In the accompanying drawing, Figure 6 is a side elevation and section of the machine which grinds off the small end of the bell-cap. Fig. 7 is a plan of the machine, some unimportant parts of which are omitted to give an unobstructed view of those of more consequence. Fig. 8 represents a section of the straining-wheel and apron, showing the manner of flattening the flange of the eyelet. Fig. 9, No. 1 represents the bell-cap before the small end is removed, and No. 2 the cap with its end ground off and flange flattened to complete the eyelet.

Similar letters denote like parts in the several figures.

F is the frame of the machine, upon which are mounted on the shafts *a a'*, turning in suitable bearings, the straining-wheels B B^2, over which is placed the endless metallic apron A, which is strained to a suitable degree of tension by means of the screws *f f*, Fig. 7, which draw the bearings of the wheel B apart from those of B^2 until the requisite tension is obtained. These wheels are also provided with

a slight flange on each side of their face, to keep the apron in line and upon the wheel under the circumstance of its use.

The apron A is best made of sheet-steel, as most capable of resisting the strain and wear to which it is subjected, and it is regularly perforated over its entire surface with holes of suitable size to receive the bell-caps point foremost, and hold them by their flange, as shown in Figs. 6 and 8, between the edge of the perforation in the apron and the face of the wheel B^2, to which a slow rotative movement is imparted, in the direction indicated by the arrows, by the inner wheel R and arm W, which are operated through the bevel-gears S by the driving-pulleys P, Fig. 7.

The bell-caps are deposited in a mass at E on the lower straight surface of the apron, between the two wheels, and nearest to wheel B. Between this point and the wheel B^2 are arranged a number of revolving brush-cylinders, D^1 D^2 D^3, on suitable spindles, that are driven by bands connecting with the wheel C on the same shaft with the straining-wheel B, and like bands connecting the movements of each with the other. These brushes revolve in one direction, as indicated by the arrows, and in opposite direction to the apron A, against which they sweep, and with a more rapid movement.

By this arrangement the mass of bell-caps on the apron are swept back from moving with it, and are stirred and tumbled thereon, so that some out of the mass are presented to the passing perforations point foremost, and are held in the apron supported by their flanges, and carried past the brushes to the position on the wheel B^2. (Shown in Fig. 6.) A mass of caps may be placed behind each brush, and thereby more be inserted in the apron should the operation of one brush be found inadequate to fill all the perforations.

In case any of the caps should catch upon the brush, they may be removed by a comb or clearer, *b*, consisting of a set of pins or teeth on a cross-bar extending lengthwise of their cylinder, and with their ends penetrating a short distance into the brush, the said teeth being so closely set as to prevent the caps from passing between them. They will by this means be readily stripped from the brush and drop back into the mass.

As the flange of the caps in the perforations come in contact with the face of the wheel B^2, owing to the tension of the apron they become slightly flattened by being pinched firmly between the edge of the perforation and the face of the wheel, as shown in Fig. 8, in which condition they are presented to the grinding-wheels M N, the former being mounted in adjustable bearings on the frame of the machine in line with the wheel B^2, and the latter in like bearings above it. These wheels may be of metal, with their faces coated with emery, that on the face of the wheel M being of coarser grade than that on wheel N, the former serving to remove the material on the end of the bell-cap, while the latter serves only to buff off the end of the eyelet smoothly.

The wheel M is adjusted to the requisite position with respect to the protruding cap ends on the wheel B^2 by means of the screws V V at this end of the frame, and the wheel N is adjusted to its position by means of the nut *g* on the stands *l* beneath the bearings *t* on the top of the stand, in which the spindle of this wheel revolves.

The motion of the two grinding-wheels is communicated by means of a band over the pulleys T T, and both are driven by the pulley L. These grinding-wheels have end-play in their bearings, and have a quick vibratory movement laterally therein, produced by the two clutch-levers O O, the forked end of which straddles a groove in the spindle of each wheel, while the other end of each is operated by a groove-cam on the shaft of the driving-pulley P.

The several parts being thus arranged, the operation is, that the bell-caps are deposited on the apron at E, and, by means of the brushes D, they are inserted in the perforations, as shown at *t t*, Fig. 6, and are carried along to the wheel B^2, where they are griped by their flange between the face of the wheel and the apron, and the flange flattened.

As the caps ascend with the face of the wheel B^2, their protruding ends come in contact with the grinding-wheel M, in passing which the closed end is ground off and opened. Thence passing on, the open ends are brought into contact with the grinding-wheel N, when the rough ground end is smoothed off, after which, on passing over the top of the wheel B^2, the now completed eyelets drop by their own gravity from the perforations into the receptacle X, whence they are taken in quantities and subjected to the subsequent operation of annealing and coloring, preparatory to being packed for sale.

Claims.

What is claimed as the invention of the said DAVID K. HOXSIE is—

1. The combination of the endless perforated belt or apron A, the brush or brushes D, and the grinding wheel or wheels M N, substantially as and for the purpose specified.

2. The mode herein described of making eyelets, by first converting the metal into detached bell-shaped pieces or caps, and afterward opening the end and flattening the flange of the caps to convert them into eyelets, in the manner and by means substantially as specified.

In testimony whereof we, said administrators, have hereunto subscribed our names this 8th day of April, A. D. 1870.

ESEK TALLMAN,
NICHOLAS G. HOXSIE,
Administrators.

Witnesses:
ISAAC A. BROWNELL,
E. F. PHILLIPS.