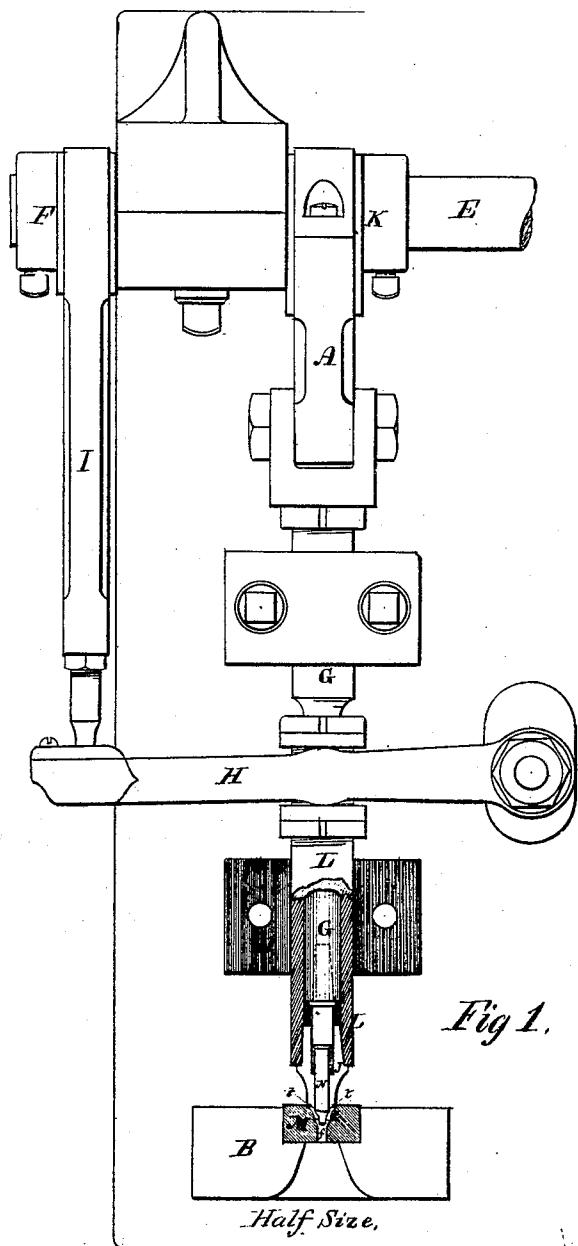


*D.K. Horsie,*

*Making Eyelets.*

*NO. 106,938.*

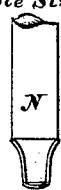
*Patented Aug. 30, 1890.*



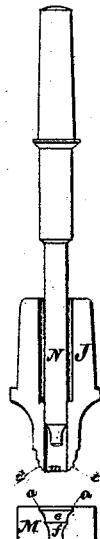
*Fig 5.  
Double Size.*



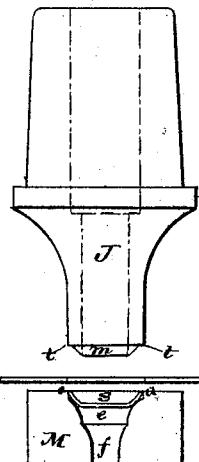
*Fig 4.  
Double Size.*



*Fig 2.  
Full Size.*



*Fig 3.  
Double Size.*



*Witnesses.*

*E. H. Phillips*

*Isaac A. Burnside.*

*Geeky Tallmond  
Nicholas G. Horsie*

*Administrators of the Estate of David K. Horsie*

# UNITED STATES PATENT OFFICE.

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

## IMPROVEMENT IN DIES FOR FORMING EYELETS.

Specification forming part of Letters Patent No. **106,938**, 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 other and separate classes of machinery, which removes the material or chips from the closed or small end of the bell-cap, it is converted into an eyelet of the proper form.

The invention herein described relates to the means by which the peculiar bell-cap is made.

The first part of this invention relates to the means by which the metal is cut from the sheet and converted into the bell-shaped cap; and consists of a compound former and cutting-punch, that co-operates with the cutting orifice or portion of the die in such a manner that the metal is depressed into the entrance of the die in the form of a dish or saucer by the projecting former on the end of the punch, and cut from the sheet and deposited in the cutting-orifice in suitable condition to be carried accurately into the forming part of the die by another punch, which co-operates therewith, and connects this dish into the bell-cap by carrying it into the forming-die.

The second part of this invention relates to the construction of the drawing portion of the said die, or portion between its cutting-orifice where the dish is deposited and that where the bell shape is given to the piece; and consists in forming this part of the die with a swell or annular cushion, upon which the dish is first deposited, and over which its flaring edge is drawn as it is carried into the bell-shaped mold beneath, to facilitate the stretching of the dish-piece equally from the center to its circumference as it is converted into the bell-cap.

In the accompanying drawing, Figure 1 is a plan of the essential parts of a machine suited to operate the improved tools or implements which make the bell-caps, and which are shown in cross-section arranged therewith. Fig. 2 represents, by cross-section, the same tools, full working size. Figs. 3 and 4 represent, by cross-section in part, the essential parts of the same, double size, as exhibiting their important features more clearly and appreciably. Fig. 5 represents the two stages of the operation of forming the eyelet by the improved devices described.

Similar letters denote like parts in the several figures.

As represented in Fig. 1, the cutting-punch J is held in a tapering socket in the end of the plunger L of the machine, which plunger slides in the bearing D by means of the lever H, the connecting-rod I, and the eccentric F on the driving-shaft E.

The forming-punch N is held in a tapering socket in the end of the plunger G, which slides within the plunger L by motion derived from the eccentric K on the same shaft and its connecting-rod A. Such mechanism being common and well-known for the purpose, no part of it is herein claimed.

The die M is firmly fixed in the block B, which forms part of the frame of the machine, and directly in line with the axis of the two punches J and N.

On the end of the cutting-punch J there is the usual square cutting-edge *t* for cutting out the piece of metal which is to make the eyelet. Within the circumference of this cutting-edge *t*, on the face of the punch, is formed an annular protuberance or former, *m*, which in the operation first meets the metal and presses it into the cutting-orifice of the die until the cutting-edge *t* of the punch meets the cutting-edge *a* of the die, when the portion of metal beneath the punch is severed from the sheet and converted into a dish shape, *s*, as seen in the die, Fig. 3, and separately in Fig. 5.

When this dish is thus cut out and deposited in the die, it will be seen that the flaring edge rests upon the swell or cushion *e*, with its periphery filling closely the cutting-orifice,

and the curving is of a form to mold and deliver the dish-piece *s* accurately to the bell-cap-forming die *f* beneath it when carried by a suitably-shaped punch, like *N*, pressing against its center.

The dish-piece *s* thus formed and deposited in the entrance of the die is converted into a bell-cap by means of the forming-punch *N* and the bell-forming shape *f* in the bottom of the die, directly beneath the cushion *e*, which serves to draw and close the dish's center quickly around the end of the punch before it enters the forming-die *f*, and by that means to center the piece accurately, and to draw the piece considerably before it reaches the point where it receives its bell or eyelet shape.

The forming-punch *N* is of the shape of the interior of the bell-cap, and the die *f* is of the shape of the exterior of the same, and the dish-piece *s* is converted by the co-operation of the two parts into the bell-shaped cup shown in Figs. 4 and 5, or that of an eyelet with the small end closed, the metal being without any appreciable difference of thickness throughout. This bell-cap is cleared from the end of the punch *N* as it is withdrawn from the die into the cutting-punch *J* in the usual way, and afterward the metal at the closed end is removed by grinding it off, while the cap is held by suitable means.

Thus it will be seen that the sheet metal is first converted into a saucer-like dish by means of the former *m* and cutting-punch *J* with the cutting-orifice of the die, and then this dish is converted into a long bell-shaped cap by the peculiar formation of the cushion *e*, the forming-die *f*, and forming-punch *N*.

*Claims.*

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

1. The compound tool herein described, consisting of the punch *J*, with the annular cutting-shoulder *t* and annular projection *m*, and the forming-punch *N*, for the purpose set forth.

2. The die *M*, provided with the cutting-orifice *a*, the swell or cushion *e*, and the forming-die *f*, as and for the purpose herein described.

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. BRUMELL,  
E. F. PHILLIPS.