

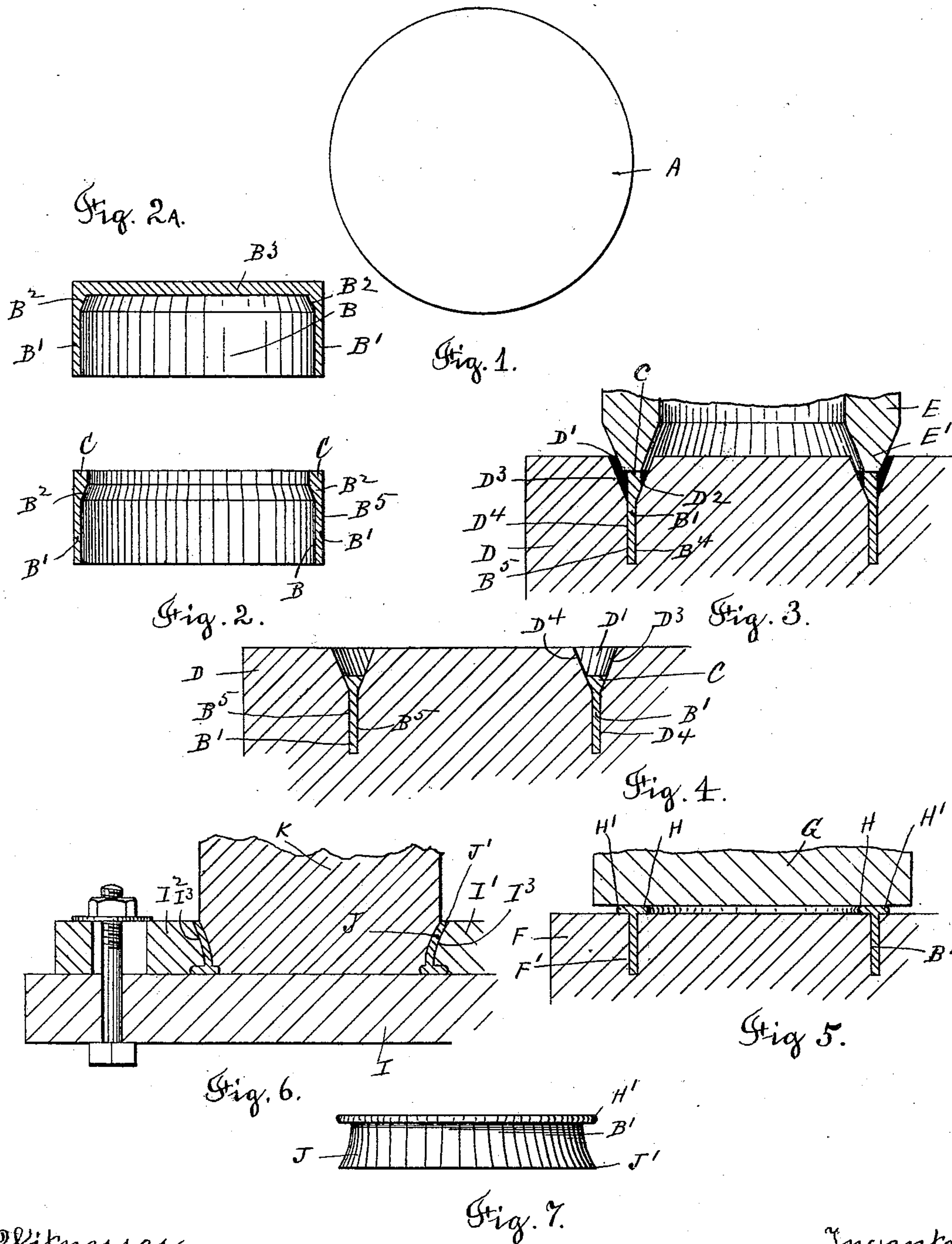
(No Model.)

M. D. MARCY.

DIE FOR SHAPING SPINNING RINGS FROM SHEET METAL.

No. 515,403.

Patented Feb. 27, 1894.



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# UNITED STATES PATENT OFFICE.

MERRICK D. MARCY, OF WORCESTER, MASSACHUSETTS.

## DIE FOR SHAPING SPINNING-RINGS FROM SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 515,403, dated February 27, 1894.

Application filed July 7, 1893. Serial No. 479,796. (No model.)

*To all whom it may concern:*

Be it known that I, MERRICK D. MARCY, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Dies for Shaping Spinning-Rings from Sheet Metal, of which the following is a specification, accompanied by drawings, representing a completed spinning-ring made by my improved method and also illustrating the several steps in the process, and in which—

Figure 1 represents a circular disk of sheet metal from which the ring is made. Fig. 2 represents in central, sectional view the cup-shaped form into which the disk is drawn by the action of a die press with the sheet metal forming the sides of the cup reduced in thickness and with a fillet in the corner between the annular side and bottom of the cup. Fig. 2<sup>a</sup> represents the ring formed by removing the bottom of the cup. Fig. 3 represents in central sectional view the punch and die with a sectional view of the ring as shown in Fig. 2<sup>a</sup> held therein and showing the first operation of upsetting the thick edge of the ring in forming the flanged track for the traveler. Fig. 4 represents the die, shown in Fig. 3, with the ring therein, both shown in central sectional view with the ring represented in the form produced by the action of the punch as shown in Fig. 3. Fig. 5 represents a die and punch in central sectional view, with a sectional view of the ring at the completion of the operation of upsetting and having the thick edge of the ring as represented in Fig. 4, compressed to form the flanged track for the traveler. Fig. 6 represents in central sectional view, the punch and sectional die, with the ring held therein by which the base of the ring is expanded and Fig. 7 is a view of the completed ring.

Similar letters refer to similar parts in the different figures.

My present invention relates to an improved method of making a spinning ring from sheet metal, having flanges forming the track for the ring traveler, integral with the cylindrical body of the ring and composed of a single thickness of metal corresponding in size and shape to the spinning rings now in

general use and adapted to be used with the ordinary ring traveler.

My invention relates to an improved method of shaping spinning rings from sheet metal and consists in providing means for holding the body of the ring against bending, or spreading, while its edge is compressed, or upset, by the reciprocating action of a compressing die, acting against an inclined surface in the ring holding die, whereby the edge of the ring is crowded to one side, during the action of upsetting and also in providing said ring holding die with a restraining wall, or surface, opposite said inclined surface, so as to make the edge of the ring symmetrical with the body of the ring, and these results I secure by means of the dies hereinafter described.

The method of making a spinning ring from sheet metal by means of my improved dies is as follows:

A circular blank A, Fig. 1 is cut from a sheet of sheet metal and drawn into the cup-shaped form represented at B, Fig. 2, that portion of the metal forming the annular vertical side B', being reduced in thickness by the drawing operation of the punch and die by which it is stamped into the cup-shaped form. The plunger, or male die, by which the interior of the cup is formed, is chamfered at its end so as to leave a fillet B<sup>2</sup> between the annular side B' and the bottom B<sup>3</sup> of the cup. The bottom B<sup>3</sup> is then removed from the cup forming a ring consisting of the annular side B' of the cup, provided with a thick edge C as represented in central sectional view in Fig. 2<sup>a</sup>. The punch and die by which the next operation is performed is represented in central sectional view in Fig. 3; the die D being provided with an annular channel, or groove D' provided with tapering or inclined sides D<sup>2</sup>, D<sup>3</sup> and terminating at the bottom in an annular channel D<sup>4</sup> having vertical opposing walls and being of the proper size to receive and support the vertical sides B<sup>4</sup> and B<sup>5</sup> of the body B' of the ring. The ring in the form represented in Fig. 2<sup>a</sup> is placed within the annular channel formed in the die D as represented in Fig. 3 with the side B' held in the channel D<sup>4</sup> and with the thick edge of the ring in the beveled channel D' with the inclined side of the fillet B<sup>2</sup> resting against the inclined side



D<sup>3</sup> of the channel D'. An annular punch E provided with a beveled end E' adapted to enter the channel D', is then brought down upon the thick edge C of the ring, upsetting it between the inclined sides D<sup>2</sup>, D<sup>3</sup> into the form shown in Fig. 4 with the thick edge of the ring pressed into a wedge shape between the inclined sides D<sup>2</sup> and D<sup>3</sup>. The straight portion B' of the ring is then placed in an annular channel F' of a die plate F, with the wedge-shaped edge C projecting above the face of the die F. A plunger G is then brought down upon the edge C compressing it into the form shown in Fig. 5 having an interior flange H and an exterior flange H' lying in the same plane and integral with the body B' of the ring; the flanges H and H' forming the track for the ring traveler. The ring is then placed upon the anvil block I and between the fixed jaw I' and a movable jaw I<sup>2</sup> having flaring faces I<sup>3</sup>, I<sup>3</sup>, and the body B' of the ring is then expanded, forming a flaring base J, as shown in Fig. 6 so that the outer edge J' of the flared section is preferably of the same diameter as the outer edge of the exterior flange H'; this operation is accomplished by a suitably shaped plunger K.

The several operations I have described are performed in a die press employed in sheet metal work and as the operation of such a die press is well understood, I have not shown or described the same.

I do not confine myself to the specific form of the dies as shown, nor to the exact successive steps in the process as described, as both can obviously be varied somewhat without departing from the scope of my present invention. After the expansion of the base of the ring, the edge J' and the edges of the external and internal flanges H and H' are trimmed, in order to form a track for the ring traveler of uniform width and having concentric edges.

During the operation of stamping and upsetting it will be probably found necessary to anneal the rings and after the edges have been trimmed as above mentioned, the completed ring is hardened by case hardening, or otherwise, and the surface of the flanged track thoroughly polished to fit it to receive the ring traveler.

I am aware that a method of forming a spinning ring from sheet metal was shown and described in Letters Patent of the United States, No. 216,731, issued June 24, 1879, by which the edge of an annular ring was bent over upon itself to form an outer and inner flange for a ring traveler, one of said flanges being formed of two thicknesses of metal and I do not claim the method described in said patent, as the process herein described is one of upsetting and not bending.

I am also aware that a method of upsetting a spinning ring from sheet metal was described in Letters Patent No. 216,730, issued June 24, 1879, in which an annular ring having a thick edge was held in a die, which restrained the

body of the ring from bending, while the thick edge of the ring was pressed into an outer and inner flange forming a track for the ring traveler, and my present invention consists of an improvement in the process of upsetting the flanges described in said patent. My process involves an intermediate step, not shown in said patent, whereby the thick edge of the annular ring which overhangs upon the inside of the ring is upset, so as to form a V-shaped edge, by being compressed between the inclined walls D<sup>2</sup>, D<sup>3</sup>, of an annular channel D'; the inclined walls D<sup>2</sup> pressing against the inclined side of the fillet B<sup>2</sup>, while pressure is applied to the edge of the ring, which crowds the metal against the inclined side D<sup>2</sup>, causing it to flow outwardly, at the same time restraining the outward flow of the metal, by means of the inclined side D<sup>3</sup>, so as to form a V-shaped head symmetrical with the body B' of the ring. The method described in Patent No. 216,730 upsets the thick edge of the ring overhanging upon the inside of the ring, into a flanged track extending equally and symmetrically upon both sides of the body of the ring, by a single operation while the method forming the subject of my present invention, first forms a symmetrical V-shaped edge, by means of upsetting the inwardly overhanging edge between the inclined restraining walls D<sup>2</sup>, D<sup>3</sup>, and subsequently compressing said symmetrical V-shaped edge into a flanged track, as described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a die for shaping a spinning ring from sheet metal, provided with an annular channel having its lower section provided with opposing walls adapted to bear against the opposite sides of the ring, whereby said body of the ring is restrained from bending, or spreading, and having the upper section of said annular channel provided with an inclined surface upon one of its sides, whereby the edge of the ring is crowded toward the opposite side of the channel by the movement of the metal along said inclined surface, by means of pressure applied to the edge of said ring, and in a line parallel with its axis, and a compressing die by which pressure is applied to the edge of the ring in a line parallel with the axis of the ring, substantially as described.

2. The combination of a die for shaping a spinning ring from sheet metal, provided with an annular channel having its lower section adapted to fit the body of the ring and having its upper section provided with an inclined surface on one side to crowd the edge of the ring toward the opposite side of the channel, and having the opposite side of the channel correspondingly inclined, so that the edge of the ring when upset between said inclined sides, be symmetrical with the body of said ring as held in the lower section of said channel, and a compressing die by which the



edge of the ring is upset between said inclined sides, substantially as described.

3. The within described dies for forming a spinning ring from sheet metal and consisting of a ring holding die D having an annular channel D' formed with inclined sides D<sup>2</sup> and D<sup>3</sup>, said inclined sides terminating in an annular channel D<sup>4</sup> and an upsetting die E, provided with an annular beveled edge E', adapted to enter between the inclined

sides D<sup>2</sup> and D<sup>3</sup> and upset the edge of an annular ring into a V-shaped edge, symmetrical with the body of the ring, substantially as described.

Dated this 5th day of July, 1893.

MERRICK D. MARCY.

Witnesses:

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