

(No Model.)

M. D. MARCY.
METHOD OF MANUFACTURING SPINNING RINGS.

No. 532,174.

Patented Jan. 8, 1895.

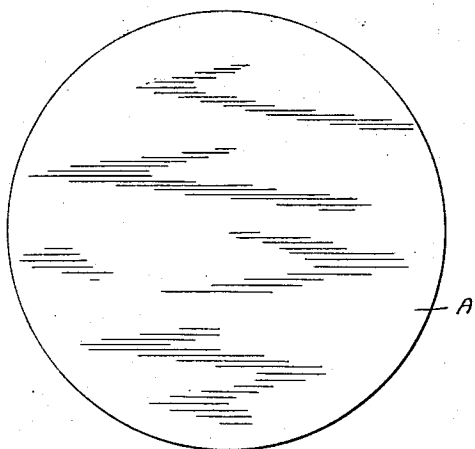


Fig. 1.

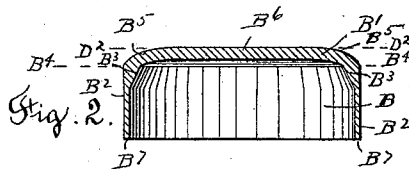


Fig. 2.

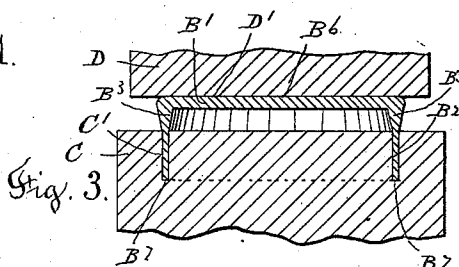


Fig. 3.

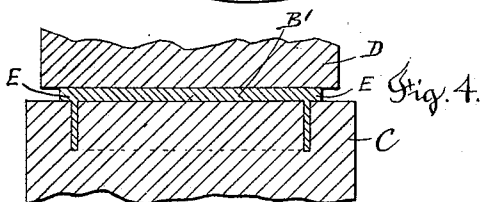


Fig. 4.

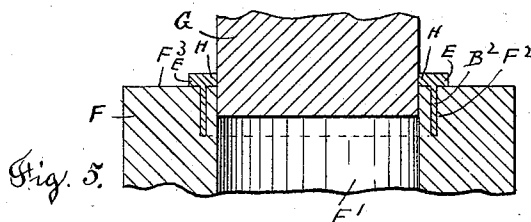


Fig. 5.

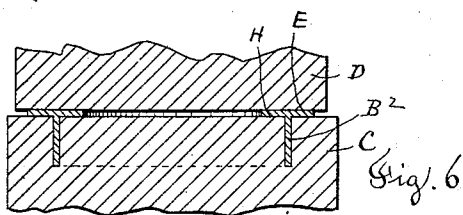


Fig. 6.

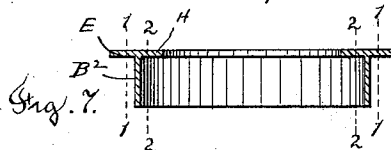


Fig. 7.

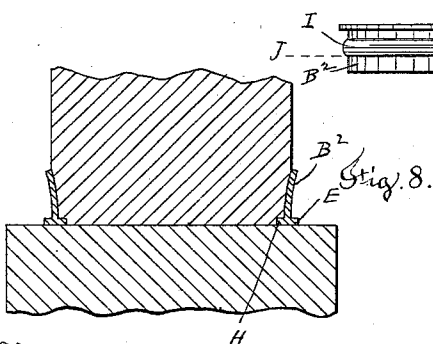


Fig. 8.

Fig. 10.

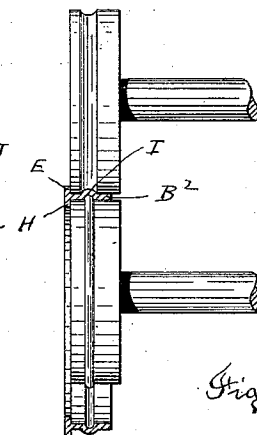


Fig. 9.

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METHOD OF MANUFACTURING SPINNING-RINGS.

SPECIFICATION forming part of Letters Patent No. 532,174, dated January 8, 1895.

Application filed October 23, 1894. Serial No. 526,779. (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 Methods of Manufacturing Spinning-Rings, of which the following is a specification, accompanied by drawings representing my improved method of making spinning-rings from sheet metal and 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 having a fillet in the corner between the side and bottom of the cup and with the bottom of the cup made slightly crowning for the purpose hereinafter described. Fig. 3 represents, in central sectional view, the punch and die by which the first operation is performed upon the cup-shaped blank which is also shown in said Fig. 2 in central sectional view and in the shape which it assumes when first acted upon by the punch and die. Fig. 4 represents the same punch and die and cup-shaped blank all in central sectional view as represented in Fig. 3, but at the end of the action of the punch and die. Fig. 5 represents a punch and die by which a disk is cut from the central part of the bottom of the cup-shaped blank forming a ring with vertical walls having exterior and interior flanges at one edge. Fig. 6 represents, in central sectional view, the same punch and die as shown in Figs. 3 and 4, said figure illustrating the next succeeding step in my improved process by which the flanges of the ring are reduced in thickness and increased in width. Fig. 7 represents, in central sectional view, the ring as removed from the die shown in Fig. 6, the broken lines 1, 1 and 2, 2 in said Fig. 7 indicating the dimensions by which the flanges of the ring are trimmed by the action of a die press in the usual and well known manner. Fig. 8 represents, in central sectional view, the punch and die with the ring held therein by which the base of the ring is expanded.

Fig. 9 represents a pair of beaded rolls by which the bead is formed upon the base of the ring in lieu of the expanded base, as shown in Fig. 8, and Fig. 10 is a view of the completed ring having a beaded base as formed by the rolls represented in Fig. 9, one-half of the ring being shown in central sectional view.

Similar letters refer to similar parts in the different figures.

My improved method of making a spinning-ring from sheet metal is as follows:

A circular blank A, Fig. 1 is cut from sheet metal and drawn by means of appropriate dies into the cup-shaped form represented at B, Fig. 2, in which the bottom B' is of the same thickness as the sheet metal blank A, but the vertical sides B² are reduced in thickness by the action of the punch and die in which the blank is stamped into its cup-shaped form in the usual and well known manner.

The punch, or male die by which the interior of the cup is formed, being chamfered at its end so as to form a fillet B³ between the bottom B' and the vertical sides B². The punch and die are also suitably shaped to form the bottom B' slightly convex or crowning, so as to bring the bottom B' slightly above the plane indicated by the broken line B⁴, B⁴, which passes through the upper edge of the fillet B. I prefer to raise the bottom out of the plane B⁴, B⁴ by making the bottom convex or crowning, at an annular section B⁵ near the edge of the bottom leaving the central section B⁶ of the bottom flat or substantially parallel with the plane B⁴, B⁴ as represented in Fig. 2.

The cup-shaped blank formed as above described and as represented in sectional view in Fig. 2 is then operated upon by a punch and die which are shown in central sectional view in Fig. 3; in which C denotes the die provided with an annular channel C' fitted to receive the vertical wall or sides B² of the cup shaped blank.

The depth of the channel C' is equal to the distance from the lower edge B⁷ to the lower edge of the fillet B³ so that when the cup-shaped blank is placed in position in the die C, its lower edge B⁷ will rest upon the bottom of the annular channel C' and the sides of the annular channel will inclose the vertical

wall B² of the cup-shaped blank from its lower edge B⁷ to the point where its thickness begins to increase in order to form the fillet B³.

D denotes a reciprocating punch having a plain face d' parallel with the face of the die C.

The cup-shaped blank B is placed in position within the annular recess C' of the die C and the face D' of the reciprocating punch is brought down upon the bottom B' and in contact with the central section B⁶ of the cup-shaped bottom as indicated in Fig. 2 where the broken line D² indicates the position of the face of the punch D. The downward motion of the punch D is continued, flattening the crown-shaped bottom B', as represented in Fig. 3, thereby expanding or crowding outward the upper, or filleted, edge of the vertical wall, or side, B²; the convexity or crowning of the bottom B' being just sufficient when flattened, to cause the filleted edge of the vertical wall B³ to be crowded over just far enough to bring the filleted edge symmetrical with the wall or side B²; that is, so the metal forming the body of the fillet shall overhang equally upon both sides of the vertical planes bounding the sides of the wall B² when the face of the punch has been brought into contact with the entire extent of the bottom B'. The downward movement of the punch D is still further continued bringing it into the position represented in Fig. 4 upsetting the metal forming the filleted edge into the body of the bottom and expanding the same laterally to form the exterior flange E, said exterior flange E and bottom B' still retaining the same thickness as the original bottom of the cup-shaped blank represented in Fig. 2. A circular disk is next cut from the bottom B' by means of a punch and die, as represented in Fig. 5, where F denotes a die having a central hole F' and a concentric annular recess F² to receive the vertical wall or side B² and hold it concentrically with the central hole F' and with the bottom of the blank lying in contact with the face F³ of the die. A reciprocating circular punch G is then employed in the usual manner to cut a circular disk from the center of the bottom, leaving an interior flange H. The ring is then transferred back to die C to be acted upon by the reciprocating punch D to which a downward movement is given sufficient to compress the flanges E and H and reduce them in thickness by a lateral expansion as represented in Fig. 6, forming a ring which is shown removed from the dies and in central sectional view in Fig. 7. The edges of the flanges E and H are then trimmed by suitable

dies in the usual and well known manner on the broken lines 1, 1 and 2, 2, Fig. 7, making the flanges E and H of the desired width and with their edges concentric with the vertical wall or side B² and forming a suitable track for a ring traveler.

The vertical wall or side B² forms the base of the ring which is adapted to rest upon, or be attached in any of the well known methods to the rail of a spinning frame.

Fig. 8 shows a method by which the base of the ring is expanded or made into flaring shape and Fig. 9 shows a method by which a bead I can be formed in the base of the ring to rest upon the upper surface of the rail when the lower edge of the base is inserted within the hole in the rail; the broken lines J, J, Fig. 10, denoting the upper surface of the rail and said Fig. 10 representing, partly in elevation and partly in central sectional view, one of my completed rings with a bead I formed in the base.

The processes illustrated in Figs. 8 and 9 of the accompanying drawings, form no part of my present invention, but are represented in order to illustrate the complete process from the cup-shaped blank to the completed ring.

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

The within described method of forming a spinning ring from sheet metal and consisting (first) in forming a cup-shaped blank having a side B² and a bottom B' thicker than said side, said bottom being crowning or convex in an annular section and having a flattened central section, said cup-shaped blank having a fillet B³ upon its inner side by which the side B² is thickened next said bottom, (second) expanding the thick portion of the side B² by a pressure applied to flatten the crowning or convex portion of said bottom, in order to bring the thick, or filleted, edge B³ symmetrical with the side B², (third) upsetting the thick, or filleted, edge B³ to form an exterior flange E in the same plane and of the same thicknesses as the bottom B', (fourth) removing the center of said bottom to form an interior flange H adapted with said exterior flange E to form a track for a ring traveler, substantially as described.

Dated this 15th day of October, 1894.

MERRICK D. MARCY.

Witnesses:

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RUFUS B. FOWLER.