(No Model.)

O. W. SWIFT.

DIE FOR SHAPING SHEET METAL.

No. 383,081. Patented May 15, 1888.

Fig. 1

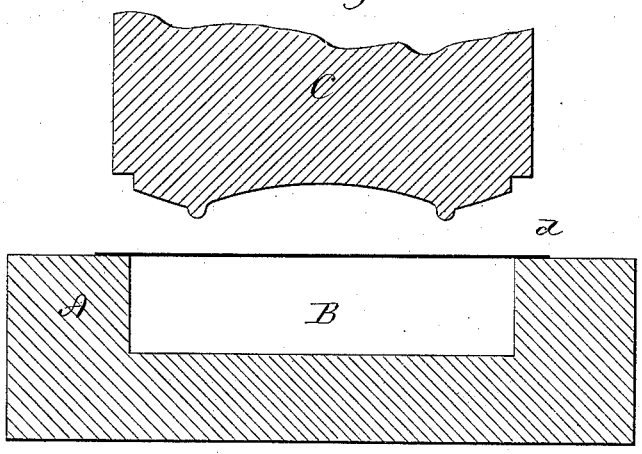


Fig. 3

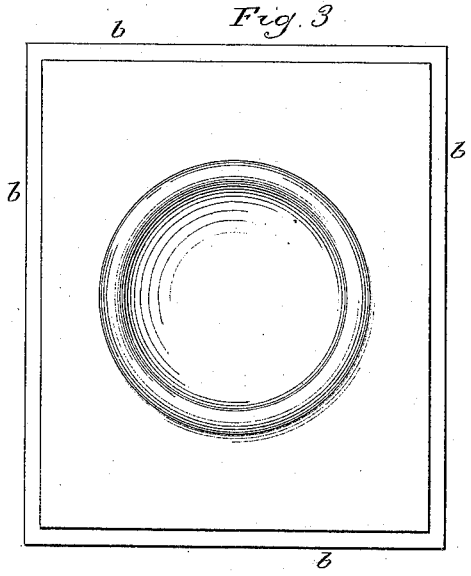


Fig. 2

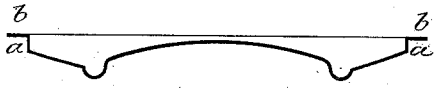
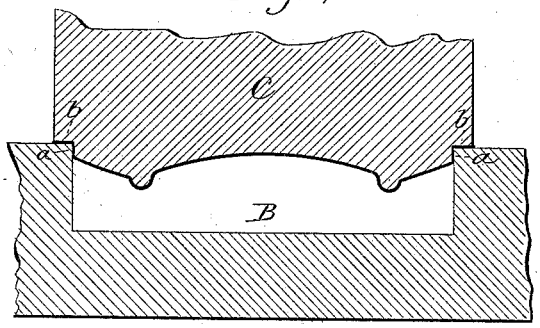


Fig. 4



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UNITED STATES PATENT OFFICE.

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DIE FOR SHAPING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 383,081, dated May 15, 1888.

Application filed August 29, 1887. Serial No. 248,106. (No model.)

To all whom it may concern:

Be it known that I, ORRIN W. SWIFT, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Dies for Shaping Sheet-Metal Articles; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a vertical section through the die and punch separated; Fig. 2, a transverse section through a carriage-lamp reflector; Fig. 3, a face view of a carriage-lamp reflector; Fig. 4, a vertical section through the punch and die in the closed position.

This invention relates to an improvement in dies for shaping articles from sheet metal, such as are to a certain extent cup-shaped, and in which it is desirable to make the face of an ornamental or irregular character, the invention being specially adapted to the formation of reflectors for carriage-lamps. These reflectors are usually drawn up in dies, the faces of the two dies being of a shape corresponding to the outer and inner surfaces of the reflector. In so striking up the reflector the contact of the face with the metal portion of the die defaces it to such an extent that subsequent polishing is necessary, and it is impracticable under such method of manufacture to produce the reflectors from metal which has been previously burnished.

The object of my invention is to avoid contact of the face-surface of the sheet metal with the metal of the die, whereby I am enabled to produce the reflectors from sheet metal previously burnished, and so that coming from the dies the same burnished surface is retained and without defect; and the invention consists in construction of the dies, as hereinafter described, and particularly recited in the claim.

A represents the lower or stationary die, which may be fixed upon the anvil of a press in the usual manner. In this die is a recess, B, the outline of which corresponds to the outer edge of the article to be produced—say square, as is the usual shape for a carriage-lamp reflector. The bottom of this recess may be flat or of any desirable shape, but the depth of the recess must be greater than the depth of the article.

Above the die A the punch or follower C is arranged. The diameter of this punch is less than that of the cavity B below by the thickness of the metal to be struck.

The under face of the punch C corresponds in shape to the inner surface of the reflector.

In Fig. 2 I illustrate a transverse section of the reflector, and in Fig. 3 a front view of the same. The surface of the reflector usually presents a concave center with a bead surrounding it, and the surface outside the bead being of a convex shape, as shown, the edge of the reflector being turned back from the front, as at *a*, with usually a flange, *b*, around the edge.

The blank of sheet metal from which the reflector is to be produced, having a finely polished and burnished surface, is laid upon the die A over the cavity B, the burnished side downward, and, as indicated in Fig. 1, *d* representing the blank. Then the follower is forced downward upon the blank, carrying it into the die, as indicated in Fig. 4. The metal of the blank as it is pressed into the die forms a complete close packing between the follower and die, so that the air in the die cannot escape. This confined air becomes a cushion in the die to resist the descent of the blank and punch. The compression of this air forces the sheet metal to perfectly conform to the shape of the face of the punch, and thereby causes the under or burnished surface of the blank to assume the same shape, and this without bringing the face of the metal into contact with the surface of the cavity. The compressed air alone acting upon the surface cannot deface that surface. Therefore when the punch is withdrawn and the formed reflector removed its face-surface retains the finely-burnished character which it originally possessed and any subsequent operation of finishing is avoided. Again, whereas in striking the metal between a punch and die of corresponding faces more or less wrinkling of the metal will be produced, by employing the cushion of compressed air as the resisting-surface upon which the metal is shaped all wrink-

ling is avoided, the drawing of the metal being perfectly regular and uniform. This illustration of dies for shaping a reflector will be sufficient to enable those skilled in the art to shape other articles. One essential point to be specially noticed is that the cavity in the die must be deeper than the article, so that when the punch and the blank are forced into the recess there will be a space in the recess below the face of the article where the air is compressed as a cushion upon which to shape the metal.

I claim—

The herein-described improvement in dies for shaping sheet metal, consisting of a die having a cavity in outline corresponding to the outline of the article to be produced, but of a depth greater than such article, combined with a follower or punch, having its under face shaped corresponding to the shape of the reverse or inner side of said article, the said punch adapted to close a cavity of the die and force the sheet metal placed between it and the said cavity into said cavity and upon the air normally in the said cavity, the said air forming a cushion to resist the descent of the punch and the metal and cause the metal to conform to the irregular shape of the face of the punch, substantially as described.

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