(No Model.)

F. C. CANNON.

CUSHIONED DIE FOR SWAGING SHEET METAL ARTICLES.

No. 385,905. Patented July 10, 1888.

Fig. 1

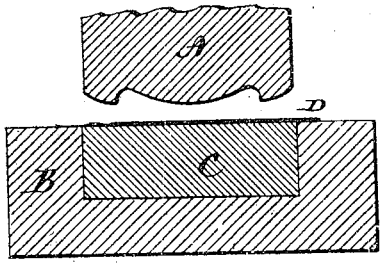


Fig. 2

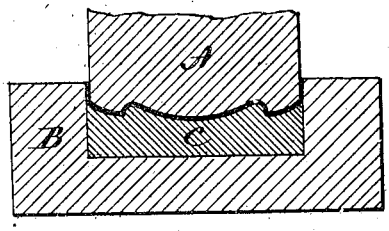


Fig. 3

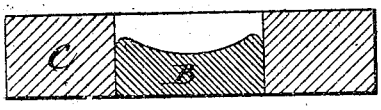
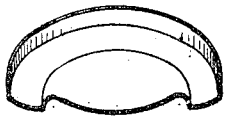


Fig. 4



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CUSHIONED DIE FOR SWAGING SHEET-METAL ARTICLES.

SPECIFICATION forming part of Letters Patent No. 385,905, dated July 10, 1888.

Application filed April 16, 1888. Serial No. 270,811. (No model.)

To all whom it may concern:

Be it known that I, FRED. C. CANNON, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Dies for Swaging 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 central section through the two dies and cushion, the dies in position before commencing operation; Fig. 2, the same as Fig. 1, with the swaging operation complete; Fig. 3, a modification in the construction of the cavity or lower die; Fig. 4, a perspective sectional view of a coach-lamp reflector such as may be produced under this invention.

This invention relates to an improvement in swaging articles from sheet metal.

In the more general practice the dies for swaging articles from sheet metal are prepared the one the reverse of the other, one—say the lower and stationary die—having a cavity the bottom of which corresponds to the outer surface of the article to be produced. The other—that is, the upper die or follower—has its under face the reverse of the face of the lower die, and corresponds to the interior surface of the article to be produced, so that the blank of sheet metal is forced down into the die and brought to shape between the working-faces of the two parts of the die; but in thus swaging the article the surface finish of the metal is unavoidably effected by coming in contact with the surface of the lower die, so that a sheet-metal article thus swaged requires to be finished and burnished after it comes from the die, for if the surface of the blank be first burnished the luster or brilliancy of the surface will be so much affected by coming in contact with the surface of the lower die that reburnishing is necessary.

The object of my invention is the construction of dies in which the face or outer surface contact with the sheet metal may be of a non-metallic character, and so that while it will work in conjunction with the upper die, to give the required shape, the said non-metallic material will not detrimentally affect the surface of the metal; and the invention consists in an india-rubber resistance or cushion, arranged within the cavity of one die to operate against the movement of the other die or follower, the said rubber yielding to the irregularities of the other die or follower, but yet offering sufficient resistance to cause the blank between the said die or follower to assume the shape of the surface of said die or follower, and whereby metallic contact with the outer surface of said blank in its shaping is avoided.

In illustrating the invention I show it as adapted to the formation of a reflector for coach-lamps.

A represents the movable or follower die, the under face of which corresponds to the shape of the reverse side of the reflector or article to be produced.

B represents the stationary die. This die is formed with a cavity corresponding to the outline of the follower-die A, and so that the said follower-die may enter the said cavity; but the cavity is considerably deeper than the extent to which the follower-die is to enter. This cavity is filled with india-rubber, C, and preferably so that normally the upper surface of the rubber is flush with the upper surface of the die B, and so that as the follower descends it will compress the india-rubber, the rubber under such compression assuming a shape corresponding perfectly to the face of the follower-die, as indicated in Fig. 2.

The blank from which the reflector or article is to be produced is laid upon the lower die in the proper position, over the india-rubber C. D, Fig. 1, represents the blank thus placed upon the die; then the follower-die descends in the usual manner, forces the metal into the die, the india-rubber yielding accordingly, and the compression between the follower-die and the rubber causes the sheet metal to assume the shape of the face of the follower-die, as indicated in Fig. 2, it being understood that the movement of the follower-die is to be sufficient to so compress the rubber that the resisting force of the rubber will be sufficient to bring the sheet metal to the said corresponding shape of the follower-die.

In some cases the central portion of the reflector is spun into shape, and then the surrounding surface struck to shape in dies. In this case the india-rubber in the die may be be made in the form of a ring, as indicated in Fig. 3—that is, with a central opening through it of a diameter corresponding to the already finished central surface of the reflector; then, as the partially-formed reflector-blank is forced into the die upon the india-rubber ring, the corresponding surface is shaped as before; or the central portion within the ring may present a metal surface corresponding to the required shape of the center, and this central portion may be struck between the follower and this central portion of the die, the surrounding portion being shaped by the india-rubber ring.

In Fig. 4 I represent an inverted perspective view of one-half of a reflector such as this invention is designed to produce, this illustration showing a diametrical section of the reflector.

The illustration of the invention as applied to swaging coach-lamp reflectors will be sufficient to enable those skilled in the art to apply the invention to the swaging of other articles, it being understood that my invention is not to be limited to the swaging of any particular article.

By the employment of india-rubber within the die as the resistance for the follower the rubber presents a surface to the finished surface of the metal which does not detrimentally affect it, but, on the contrary, leaves the surface with the same degree of finish as before the swaging operation took place. The metal therefore employed in the manufacture of the swaged articles may be highly burnished or plated and burnished, so that when the article comes from the die its surface will be as perfectly finished as when the swaging first takes place between metal surfaces, and is afterward polished and burnished, the finishing and burnishing of metal in the sheet being very much cheaper than the finishing or burnishing of the articles after swaging. The elasticity of the rubber permits it to assume its normal shape after the withdrawal of the follower-die and the swaged article, so that it is always ready to receive a new blank. As the rubber also forms a full surface bearing contact with the face surface of the blank, it prevents the metal from wrinkling, as it will often do, when being drawn into shape between two metallic surfaces.

I claim—

In dies for swaging sheet metal, the combination of the die or follower A, having its face of a shape corresponding to the reverse side of the article to be swaged, and the other die, B, having a cavity corresponding to said follower, but of greater depth than the required entrance of the said follower into the said die, with an india-rubber cushion, C, in said cavity to yieldingly resist the entrance of the follower into the die, substantially as and for the purpose described.

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