

(No Model.)

C. R. LEWIS.

MECHANISM FOR SHAPING HOLLOW METAL ARTICLES.

No. 455,047.

Patented June 30, 1891.

Fig. 1

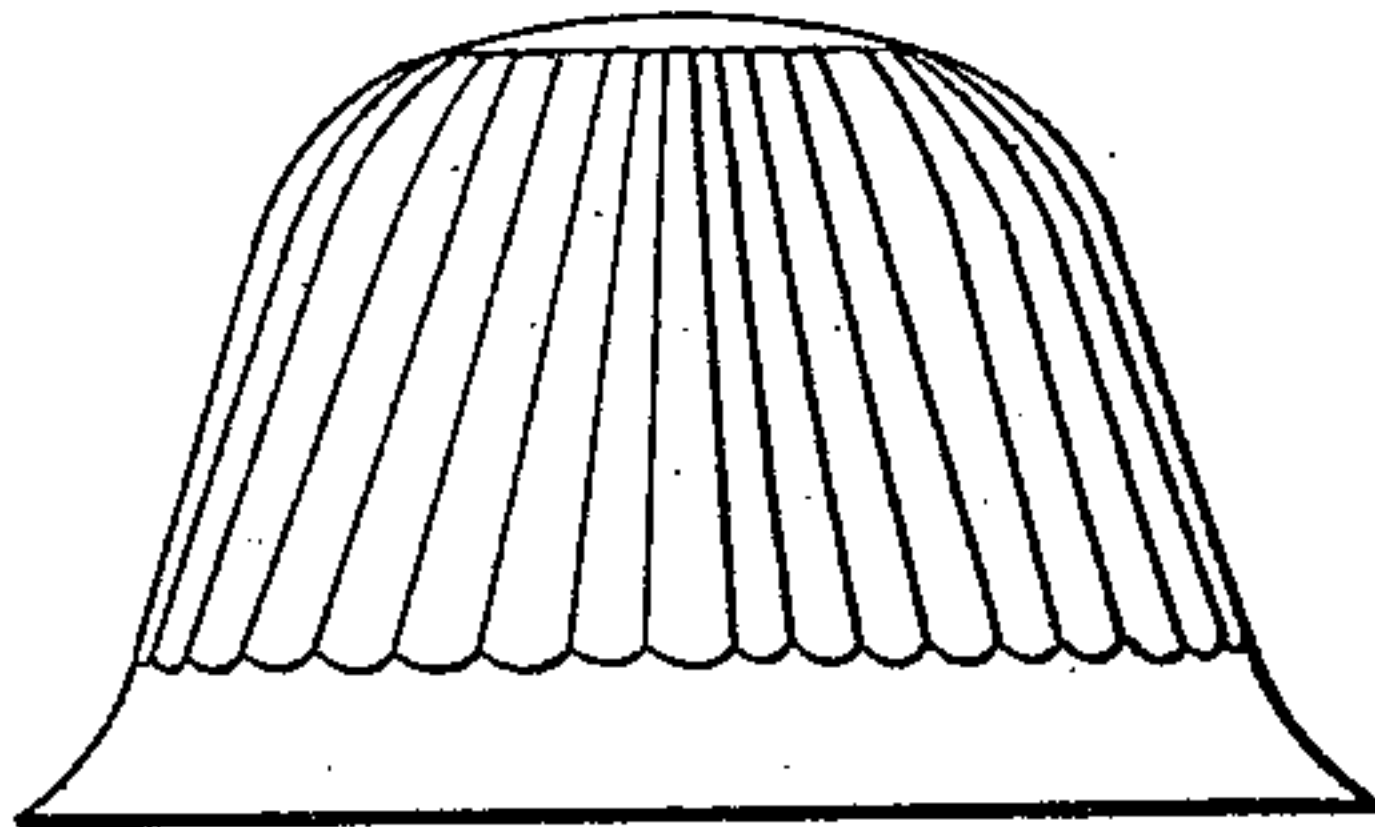


Fig. 2



Fig. 3

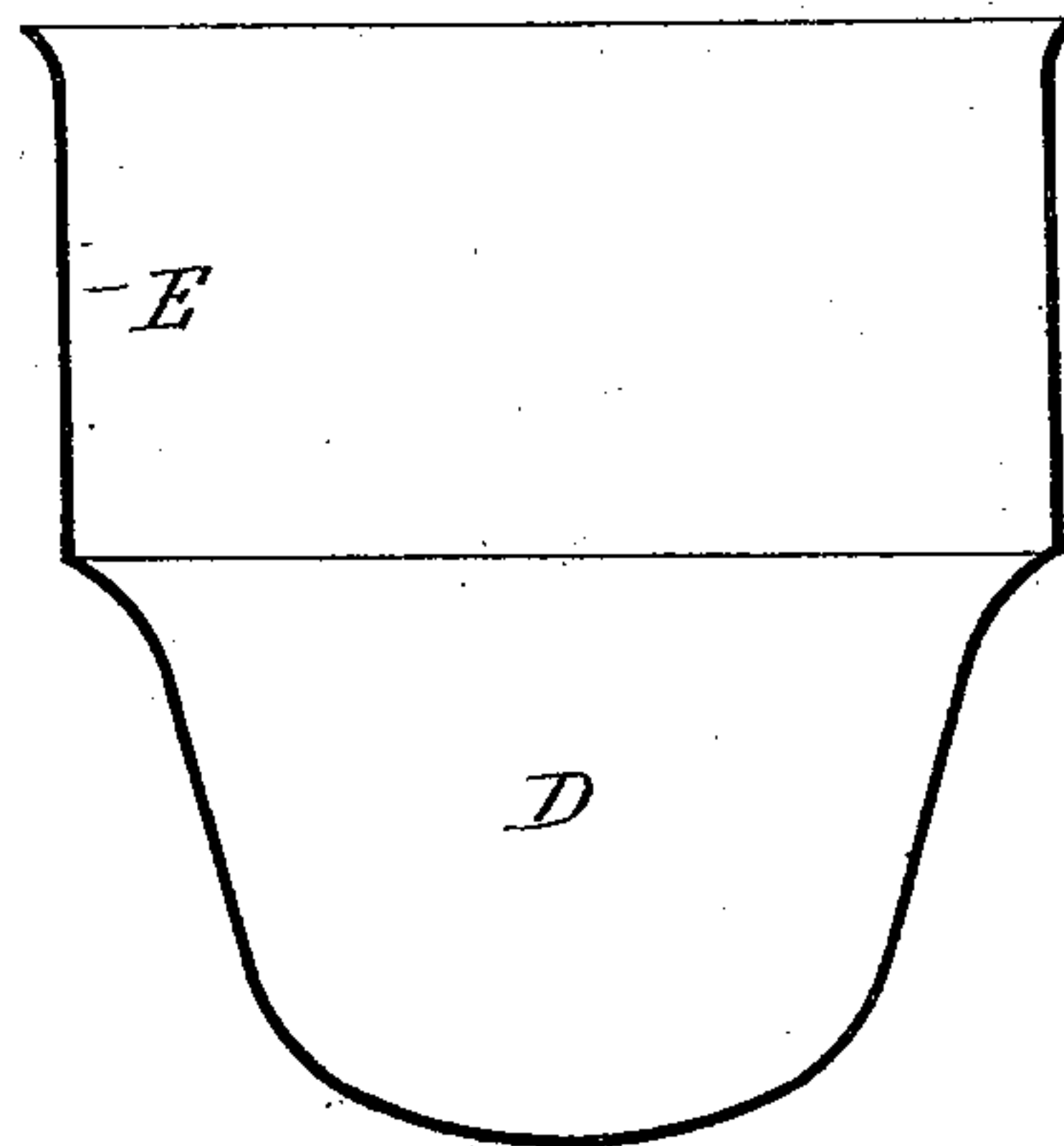
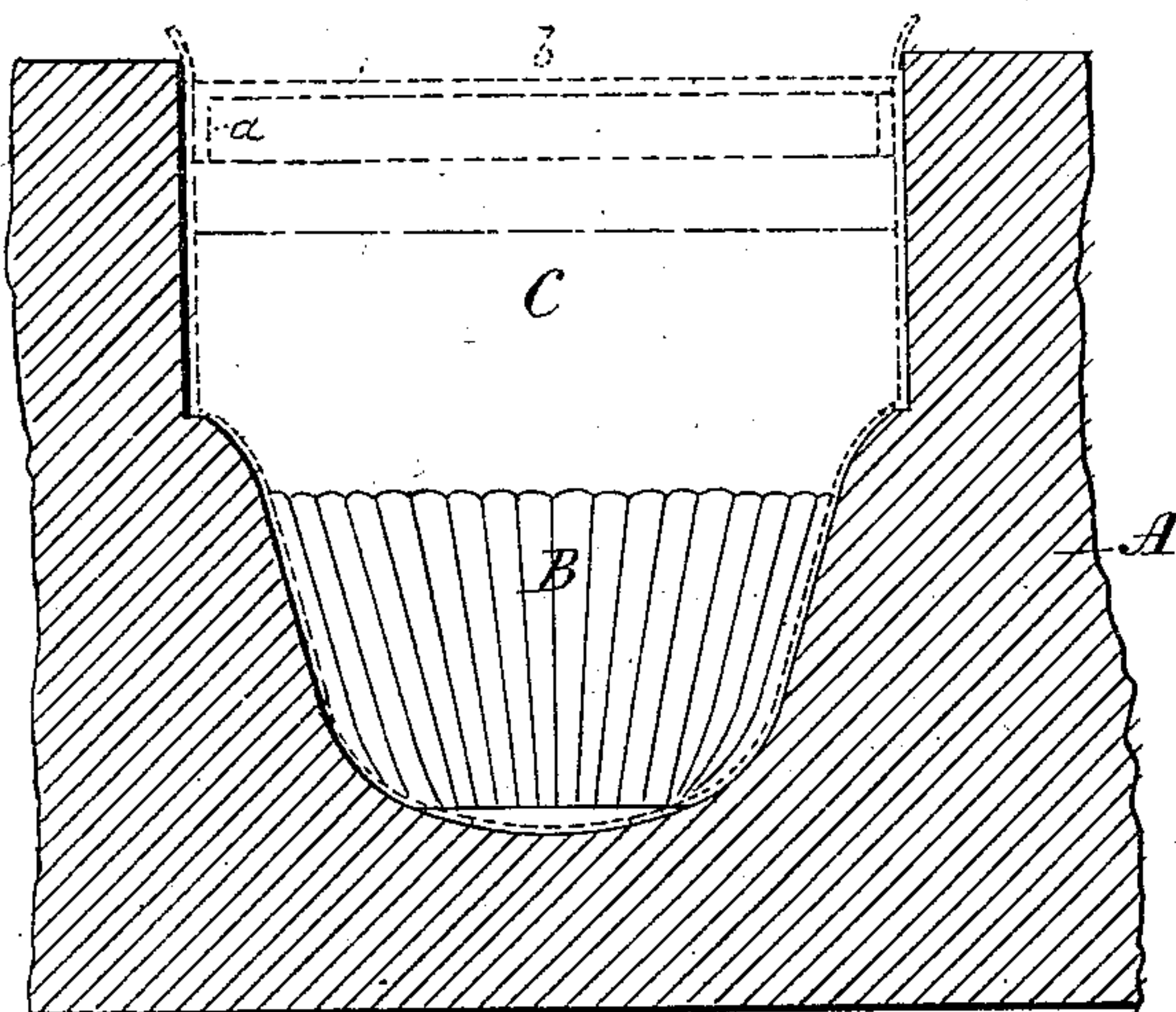


Fig. 4



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MECHANISM FOR SHAPING HOLLOW METAL ARTICLES.

SPECIFICATION forming part of Letters Patent No. 455,047, dated June 30, 1891.

Application filed March 2, 1891. Serial No. 383,470. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. LEWIS, of Middletown, in the county of Middlesex and State of Connecticut, have invented a new
5 Improvement in Mechanism for Shaping Hollow Metal Articles; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of
10 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 side view of the body of a tea or coffee pot as an illustration of the use of
15 the invention; Fig. 2, a vertical section through the die and a portion of the follower; Fig. 3, vertical section of the blank as prepared for introduction to the die; Fig. 4, vertical section of the auxiliary follower detached.

20 This invention relates to an improvement in apparatus for shaping and ornamenting hollow ware, such as tea and coffee pots and like articles of table-service, and for other purposes. In the more general practice of
25 shaping and ornamenting such articles of hollow ware a die is prepared the reverse of the outer surface of the article or the portion of the article to be shaped, and a metal blank introduced into the die is expanded by a force
30 from the inside, so as to cause the metal to conform to the shape of the die in every detail of shape and ornamentation. A common means for applying the force to thus expand the metal has been to fill the blank with a
35 liquid, or material of a semi-liquid character, and apply pressure upon such filling within the blank. Difficulties arise in this process of shaping the metal, owing to the escape of the expanding medium from the inside of
40 the article to the outside and between it and the surface of the die. Such entrance of the medium between the metal and the die produces a fatal defect in the surface.

The object of my invention is to prevent
45 the possibility of the escape of the expanding medium from within the blank or article after the pressure commences.

To this end the invention consists in constructing the die with a margin or extension
50 around its open side, and making the blank with a corresponding extension adapted to

fill the extended portion of the die, and combining with such die an auxiliary follower, made of leather or other flexible material, of inverted-cup shape, the exterior
55 of the sides of the cup corresponding to the interior of the extended portion of the blank, and so as to fit closely therein, and so that as the follower with force applied thereto comes upon the said auxiliary follower, the
60 expanding medium within the blank will cause the sides or walls of the said auxiliary follower to pack so closely against the surface of the blank as to prevent the escape of any portion of the expanding medium within
65 the blank as the forcing operation continues.

In describing the invention I illustrate it as applied to the formation of the body of a tea-pot, such as represented in Fig. 1, and in which the ornamentation is a succession of
70 flutes running from near the bottom to the top.

A represents the die, the portion B of the cavity corresponding to the exterior of the article to be produced, the portion B of the
75 cavity being formed at the lower end of a cavity or cylinder C, which forms an extension from the portion B upward, it being understood that the shaping of the article is produced in an inverted position. The cylinder C is of equal diameter, so that the walls
80 are vertical. The blank from which the article, Fig. 1, is to be shaped is constructed as seen in Fig. 3, the part D of the blank of a shape approximating the final shape required,
85 or shape of the portion B of the die, but around the edge of this portion D of the blank is an extension E, of a shape corresponding to the cylinder C of the die, and preferably at its open side is made slightly flaring, but
90 so that the blank may set into the die, as represented in broken lines, Fig. 2. The die is placed in a press of common construction, having a follower which is adapted to enter the die within the portion E of the blank, but
95 before the follower is applied the blank is partially filled with any suitable medium for forcing the metal—may be a fluid, semi-fluid, or a plastic material—preferably soft clay. The forcing medium fills the blank up into the
100 cylindrical portion of the blank, and preferably to about midway of the depth of the

blank, as indicated by broken line, Fig. 2. Before the forcing commences the auxiliary follower is introduced into the blank. This auxiliary follower is made from a suitable flexible material, preferably leather, and is of inverted-cup shape, as seen in Fig. 4, the external diameter of the sides a corresponding, substantially, to the internal diameter of the cylinder E of the blank. The top b of the auxiliary follower is close and tight. It is first thoroughly moistened, so as to be soft and flexible, and set into the cylindrical portion of the blank within the die, as seen in Fig. 2, the sides a of the follower fitting closely against the walls of the blank, and then the principal follower F is forced down thereon, which presses the auxiliary follower onto the medium below, it producing a pressure upon the medium upon the inside of the follower, which presses the sides a of the follower close against the surrounding walls of the cylindrical portion of the blank, and so as to make a perfectly-tight packing against the escape of the expanding medium within the blank below the follower, and the pressure is continued until the metal of the blank has been forced to conform to the shape of the die. Then the principal follower is withdrawn and the auxiliary follower and the shaped article removed from the die and separated. The cylindrical portion of the blank in which the auxiliary follower works is cut off in the usual manner of trimming hollow articles shaped in dies. The auxiliary follower may be used many times.

I have termed that portion of the die in which the auxiliary follower works the "cylinder" of the die; but the shape may be varied. In some cases it will be cylindrical, in others elliptical, in others angular. By the term "cylinder," therefore, I do not wish to be understood as limiting the invention to making the follower portion of the die of a true cylindrical shape; but in all cases the auxiliary follower and corresponding portion of the blank will be made of a shape to correspond to the auxiliary portion of the die and so that the sides of the auxiliary follower may expand to form a close packing within the cylindrical portion of the blank.

The auxiliary follower may be attached to the principal follower and so as to enter the die and be drawn from it with the principal follower.

It will be understood that the operation may be inverted—that is, that the follower may be stationary, while the die moves—a well-known expedient in this class of work.

I do not wish to be understood as claiming, broadly, a die adapted to receive a hollow article to be expanded within the die and the said article expanded by the introduction therein of a semi-fluid material, and so that the punch brought to bear upon the contents of the said hollow article will cause it to expand and conform to the interior shape of the die, as such, I am aware, broadly considered, is not new.

I claim—

The herein-described improvement in mechanism for shaping hollow articles from sheet metal, consisting of a die having a cavity corresponding to the shape of the article to be produced and constructed with a projection around the said cavity forming a cylinder, the blank constructed with a cylindrical projection corresponding in external diameter substantially to the internal diameter of the cylindrical portion of the die, combined with a follower adapted to enter the cylindrical portion of said blank with a pressing force, and an auxiliary follower made of flexible material of inverted-cup shape, the sides of the follower corresponding in shape to the shape of the interior of the cylindrical portion of the blank and adapted to be introduced into the cylindrical portion of the blank in advance of the principal follower, substantially as described, and whereby the said auxiliary follower operates as a packing between the principal follower and the cylindrical portion of the blank to prevent the escape of the pressing medium from within the blank.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHAS. R. LEWIS.

Witnesses:

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THOS. B. BARBOUR.