

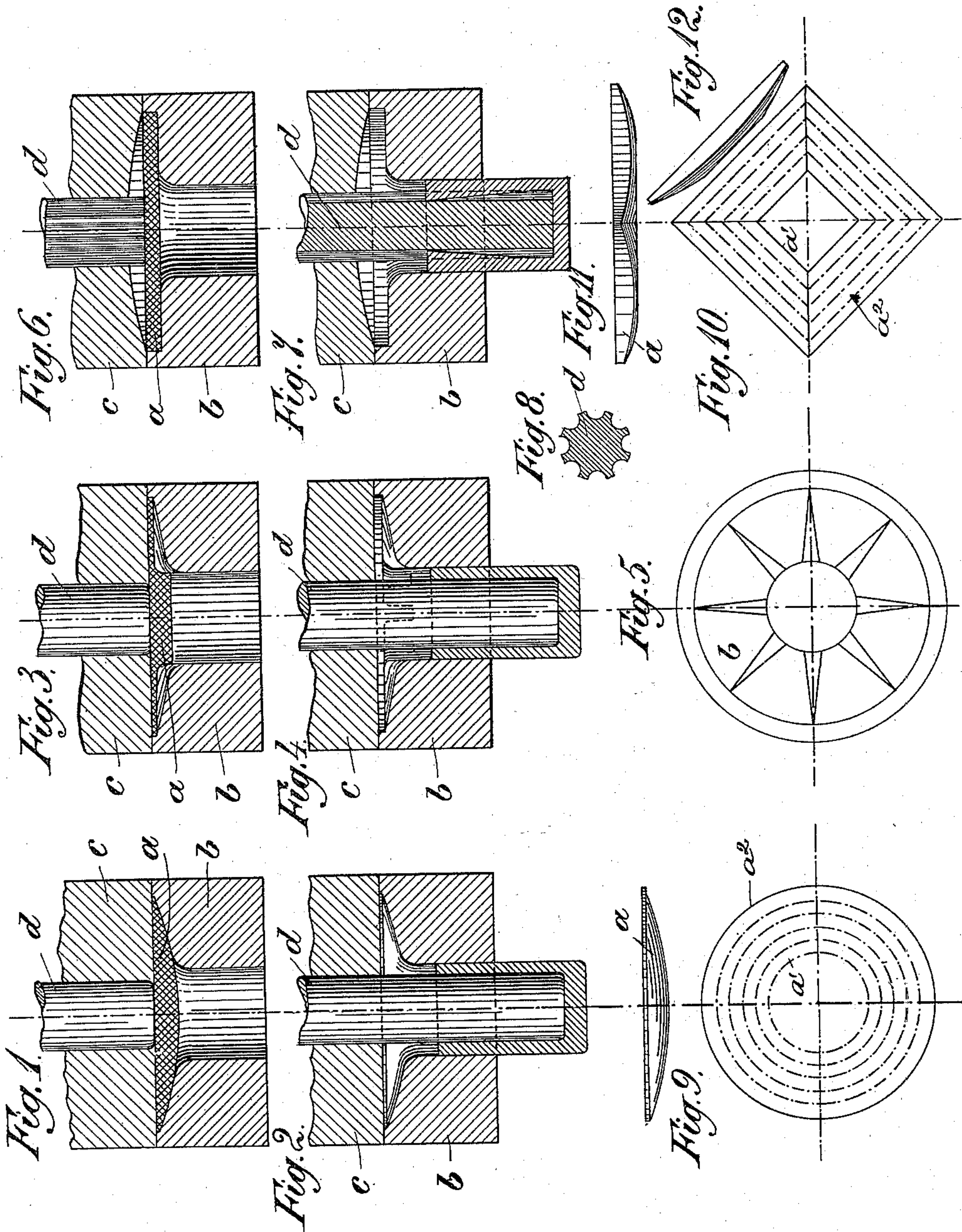
(No Model.)

C. MEYER.

BLANK FOR MANUFACTURING HOLLOW BODIES.

No. 598,800.

Patented Feb. 8, 1898.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

CARL MEYER, OF DORTMUND, GERMANY.

## BLANK FOR MANUFACTURING HOLLOW BODIES.

SPECIFICATION forming part of Letters Patent No. 598,800, dated February 8, 1898.

Application filed April 21, 1897. Serial No. 633,197. (No model.) Patented in Germany July 23, 1895, No. 86,277.

*To all whom it may concern:*

Be it known that I, CARL MEYER, a subject of the King of Prussia, and a resident of Dortmund, in the Kingdom of Prussia, Empire of Germany, have invented new and useful Improvements in the Manufacture of Hollow Bodies, (which have been patented in Germany, No. 86,277, dated July 23, 1895,) of which the following is a full, clear, and exact description.

My invention relates to the manufacture of seamless hollow bodies, and has for its object to produce such bodies from plates or sheets without materially altering the original distance of the particles of material in a radial direction—that is, in a direction outward from the central portion of the blank.

To this end my invention consists in the novel features hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a diagrammatic section of a hydraulic press with a blank in position. Fig. 2 shows the same parts at the end of the operation. Figs. 3 and 4 are views corresponding to Figs. 1 and 2, showing a different form of blank. Fig. 5 is a plan of the matrix employed in the construction illustrated by Figs. 3 and 4. Figs. 6 and 7 are analogous views with still another form of blank, also with a different mandrel. Fig. 8 is a cross-section of a grooved mandrel such as shown in Figs. 6 and 7. Fig. 9 is a side elevation and a plan of a blank such as shown in Figs. 1 and 2; and Figs. 10, 11, and 12 are a plan, an edge view, and an elevation at a right angle to one of the side faces of a square blank shaped according to my invention.

In carrying out my invention I may employ any suitable form of press or die. The drawings show a matrix *b*, upon which is adapted to descend the stamp *c*, receiving the independently-movable mandrel *d*. The blank *a* is adapted for insertion between the stamp *c* and the matrix *b*, the latter having a suitable cavity for this purpose.

The blank I employ is of peculiar formation. The thickness or shape of the central portion *a'*—that is, the portion adapted to

come directly under the mandrel *d* and of equal area with the end thereof—may be uniform or not, as desired; but the marginal portion *a''* of the blank—that is, the portion which is bent toward the mandrel during the operation of the press—is so reduced in thickness outwardly that within said marginal portion the area of similar concentric cross-sections taken at any distance from the center of the block shall be constant, or approximately so. These cross-sections are to be taken parallel to the outline of the mandrel, or of the central portion of the blank, which, as a rule, is parallel to the outline of the blank proper. Thus with a blank having a circular outline, as in Fig. 9, the cross-sections above mentioned will be cylindrical. When the blank has a square outline, the cross-sections will be according to quadrilateral (square) prisms, as indicated by dotted lines in Fig. 10.

The operation simply consists in heating the blank, (although this step may be omitted,) inserting it in the press, (see Figs. 1, 3, and 6,) and actuating the mandrel to force the central portion of the blank through the matrix. The said central portion substantially retains its shape; but the marginal portion, which at first is not directly engaged by the mandrel, is gradually forced inward to engage the peripheral surface of the mandrel. (See Figs. 2, 4, and 7.) In this operation the metal is not materially stretched in a radial direction—that is, the length of the hollow body produced is substantially equal to the width of the annular marginal portion of the blank. The blank, however, is contracted, the contraction obviously being greatest near the outline and least at the junction of the marginal portion with the central portion. The reason for making the marginal portion of the blank decreasing in thickness outwardly will now be obvious. Where the contraction is greatest it causes the greatest increase in thickness, and therefore the blank should be of less thickness at such places if it is desired that the finished article should have walls of uniform thickness. The thickness of the blank at different points therefore is such as would be produced by stretching the finished tubular article of the form shown into a substantially plane article.

The blank need not have a flat or absolutely



plane surface to be engaged by the mandrel, as shown; but the blank may be somewhat funnel-shaped. Furthermore, instead of moving the mandrel until the article is cylindrical or prismatic, as shown, the operation may be discontinued while the body is still conical or pyramidal—that is, widened or flaring at the top; also, by making the blank of sufficient diameter a flange may be produced at the open end of the finished article.

The blank may be provided with ribs, preferably radial, as shown in Figs. 3, 4, and 5. In the operation of the press these ribs are united with the remainder of the material, so that they will no more project therefrom; but they will materially strengthen the finished article. Such ribs may of course be provided as well on polygonal or other blanks.

I may also employ a blank with plain surfaces and produce thereon at the same time the hollow body is formed longitudinal ribs, either interiorly or exteriorly. In the former case the mandrel is grooved longitudinally, (see Figs. 6, 7, and 8,) while in the latter case the grooves will be provided on the matrix.

When the blank is heated in order to facili-

tate the operation, the comparatively thin outer portion obviously is heated more than the thicker inner portion, and this is an advantage, since more heat is required at the outer portion, where the greatest contraction has to take place.

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

The herein-described blank for a hollow body, consisting of a plate whose thickness within a marginal portion extending from the periphery inward up to a predetermined distance from the center increases in such proportion that the area of similar concentric cross-sections taken within said marginal portion at any distance from the center of the plate shall be constant, substantially as set forth.

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

CARL MEYER.

Witnesses:

H. F. HESS,  
OTTO KÖNIG.