

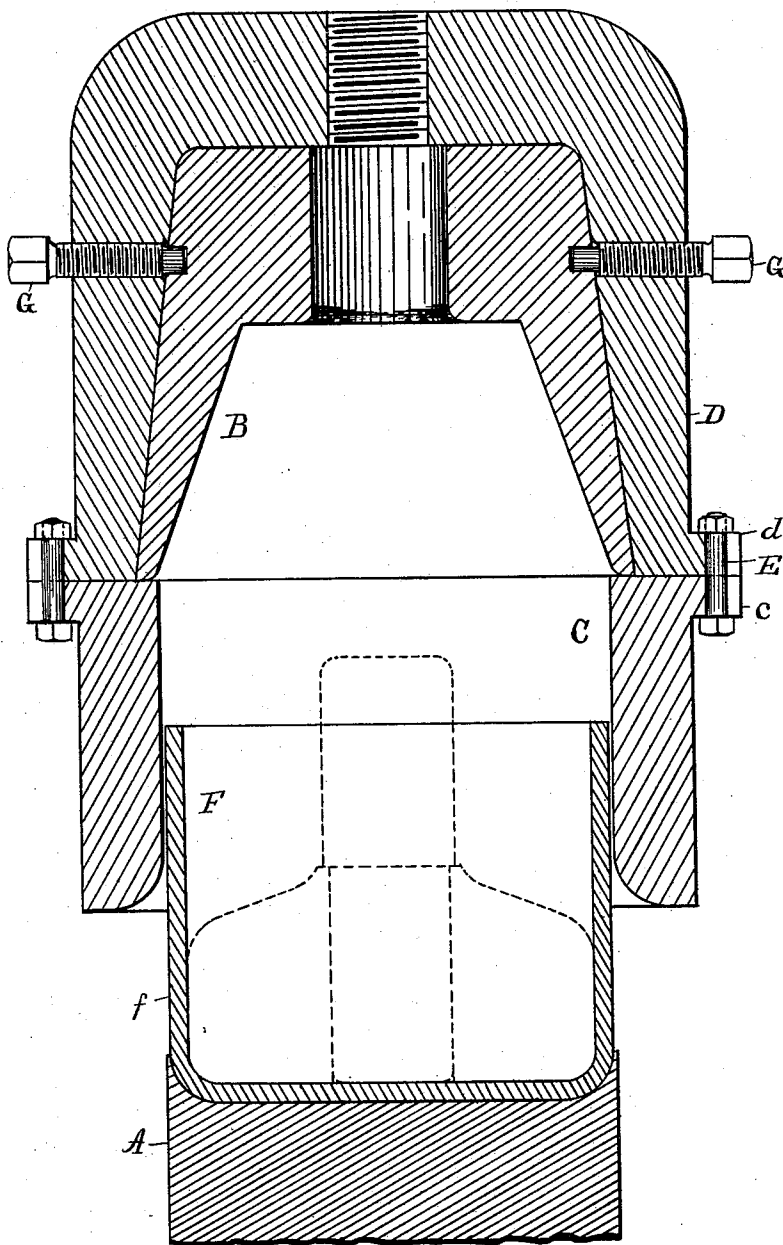
(No Model.)

F. W. JUDD.

DIE FOR MANUFACTURING SHEET METAL VESSELS.

No. 469,741.

Patented Mar. 1, 1892.



WITNESSES.

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UNITED STATES PATENT OFFICE.

FRED W. JUDD, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO THE
AVERY STAMPING COMPANY, OF SAME PLACE.

DIE FOR MANUFACTURING SHEET-METAL VESSELS.

SPECIFICATION forming part of Letters Patent No. 469,741, dated March 1, 1892.

Application filed March 23, 1891. Serial No. 386,142. (No model.)

To all whom it may concern:

Be it known that I, FRED W. JUDD, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Dies for Manufacturing Sheet-Metal Vessels having Contracted Necks, of which the following is a specification.

The object of my invention is to facilitate the practice of a process for drawing out of a single metallic plate a vessel having a contracted neck, which process forms the subject-matter of an application filed March 23, 1891, and serially numbered 386,143; or, more specifically, the object of my invention is to draw inward the upper ends of a blank which is in the form of a straight-sided bowl, and to prevent the bulging of the breast or sides of the bowl during this indrawing operation.

My invention consists in the combination of a fixed die, upon which the bottom of the bowl is adapted to rest, (which die is similar in shape and of no greater size than a transverse section through the largest part of the finished bowl,) a vertically-movable tapering die, and a sleeve connected with and lying below said die and concentric with it and adapted to slide over the fixed supporting-die first named.

It also consists in the details of construction and the combination of the parts herein-after described, as pointed out definitely in the claims.

The drawing represents a central vertical sectional view of my improved dies, which are shown supporting and in position to perform the first operation upon a straight-sided sheet-metal bowl in the process of forming the same into a vessel having a contracted neck.

Referring now to the parts by letter, A represents a fixed die having a depression in which the bottom of the bowl fits. When the bowl to be formed is to be circular in transverse section, this die A is circular in form and of substantially the same diameter as the greatest transverse diameter of the bowl.

B represents one of a series of tapering compressing-dies, which will ordinarily be employed before the bowl is finished. In the form shown this die is secured in a vertically-

movable case D, which casing has around its lower edge an outwardly-extending annular flange *d*.

C represents a sleeve cylindrical in form adapted to slide freely over the die A. This cylindrical sleeve is provided on its upper edge with an outwardly-extending annular flange *c*, and the flanges *c* and *d* are secured together by a series of bolts E, of which two are shown in the drawing.

In order to facilitate the separation of the sleeve from the casing, the flanges *c* and *d* are slotted radially, so that the bolts E, when their nuts are loosened, may be readily removed.

In the drawing a straight-sided bowl is shown resting upon the supporting-die A and containing, as shown in dotted lines, a core, which may be or may not be used with the dies herein described, although I prefer to use it, because the bowl formed when the core is used is more regular in form and the walls thereof are more uniform in thickness. When the die B begins its downward movement for the purpose of drawing inward the upper part of the blank F, the cylindrical sleeve C also moves downward, inclosing the blank, and finally slips over the supporting-die A. During its downward movement the die B draws the upper edge of the blank inward, substantially as represented by the dotted lines. In this indrawing of the upper edges the die B tends to spread the breast of the bowl outward, as at *f*, which outward movement is prevented by the sleeve C; but at each of the successive indrawing operations the bowl will generally be found tightly wedged into the sleeve. If it is so tightly fitted in the sleeve that it cannot readily be removed, the bowl may be lifted with the sleeve away from the supporting-die, and a block smaller than the diameter of the bowl placed between it and the supporting-die. The sleeve will then be unfastened from the case D by removing the bolts. Blocks are placed between the meeting edges of the case and the sleeve, and when the case and sleeve are then moved downward the sleeve is pushed off of the bowl, which may then be easily removed. The blocks between the casing and the sleeve are then taken away and the two flanges fastened

together by the bolts, ready for operating upon another bowl.

As before stated, when a series of bowls have been operated upon by the die B it may be easily removed and a die adapted to perform the next operation upon the bowl substituted in its place, and so on until the bowls are finished. It is not, however, essential to the broad invention that the die and the casing should be separate pieces, although it is believed to be the better and cheaper construction, for the reason above stated—viz., a single case may be used with the entire series of compressing-dies B which are employed. The die B may be held in the case by means of set-screws, as G, or in any other suitable manner.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a fixed die A of substantially the same shape and size in transverse section as the hollow bowl which is to be operated upon and having a depression upon its upper side in which the lower part of said bowl may be supported with a vertically-movable tapering die B, a sleeve C, ar-

ranged below the die B, concentric with it and adapted to slide over and thus inclose the hollow bowl and the die A, and means for rigidly connecting the die B and sleeve C, whereby they move in unison, substantially as and for the purpose specified.

2. The combination of the vertically-movable case D, the sleeve C, secured thereto, the tapering die B, secured in said casing, and the bottom supporting-die A, all proportioned and placed substantially as and for the purpose specified.

3. The combination of the vertically-movable case having a radially-slotted annular flange on its lower edge, a sleeve having a radially-slotted annular flange on its upper edge, bolts for connecting the same, a tapering die, and set-screws for securing the same in said case, with a fixed supporting-die having a depression in its upper side and adapted to enter said sleeve, substantially as and for the purpose specified.

FRED W. JUDD.

Witnesses:

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