(No Model.)

C. G. P. DE LAVAL.

METHOD OF MAKING SEPARATOR BOWLS.

No. 441,368. Patented Nov. 25, 1890.

Fig. 1.

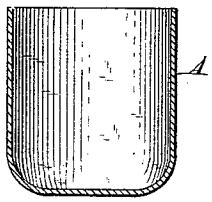


Fig. 4.

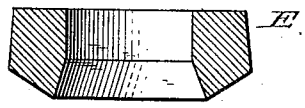


Fig. 2.

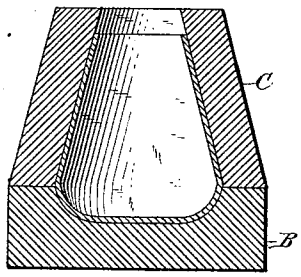


Fig. 5

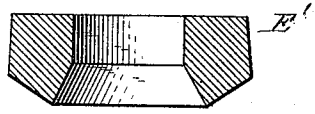


Fig. 6.

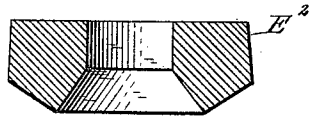


Fig. 3.

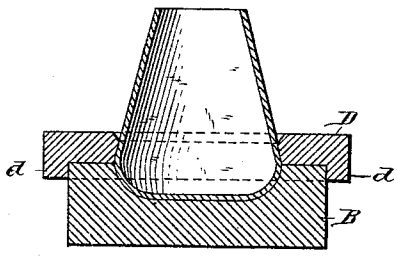
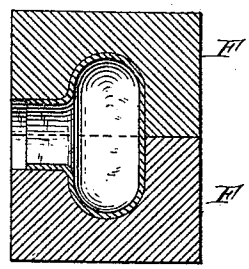


Fig. 7.



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UNITED STATES PATENT OFFICE.

CARL GUSTAF PATRIK DE LAVAL, OF STOCKHOLM, SWEDEN, ASSIGNOR TO THE AKTIEBOLAGET SEPARATOR, OF SAME PLACE.

METHOD OF MAKING SEPARATOR-BOWLS.

SPECIFICATION forming part of Letters Patent No. 441,368, dated November 25, 1890.

Application filed September 29, 1890. Serial No. 366,503. (No model.)

To all whom it may concern:

Be it known that I, CARL GUSTAF PATRIK DE LAVAL, a subject of the King of Sweden, residing at Stockholm, in the Kingdom of Sweden, have invented new and useful Improvements in the Method of Making Separator-Bowls, of which the following is a specification.

This invention relates to the manufacture of that class of separator-bowls which is provided with a contracted neck, and has the object to produce such bowls by bending them of a single plate.

In the accompanying drawings, Figure 1 is a sectional elevation of the plate after the first bending operation has been performed. Fig. 2 is a sectional elevation of the dies whereby the second bending operation is performed. Fig. 3 is a sectional elevation of the dies and bowl preparatory to the third bending operation. Figs. 4, 5, and 6 are sectional elevations of the upper dies used in the third, fourth, and fifth bending operations. Fig. 7 is a sectional elevation of the dies whereby the last bending operation is performed.

Like letters of reference refer to like parts in the several figures.

In practicing my invention the flat steel plate or blank, suitably heated, is first pressed between dies of any ordinary construction into the form of a straight-sided pot A, as represented in Fig. 1. This blank is then placed upon a bottom die B, which has a shallow recess in its upper side for the reception of the lower part of the blank. The upper part of the blank is then contracted or drawn in by an upwardly-tapering die C, having the form of a truncated hollow cone. The bottom die is now re-enforced by an annular die D, which is placed upon the bottom die, and which has a marginal flange *d* overlapping the bottom die. This re-enforcing die surrounds the breast or swell of the bowl. The upper part of the blank is now successively contracted or drawn in by dies E E′ E² more or less, the cavities of which taper upwardly from the bottom of the die and terminate in a cylindrical upper portion, which is of decreasing diameter in these successive neck-forming dies. The bowl is finally finished as to shape between two dies F F, which are divided in a plane laid through the axis of the bowl.

I claim as my invention—

1. The method of bending a steel plate into a bowl having a contracted neck, which consists in bending the plate into a blank having the form of a straight-sided pot, then drawing in the upper portion of the blank by successive compressing operations, and finally finishing the shape of the bowl between dies having the form of the finished bowl, substantially as set forth.

2. The method of bending a steel plate into a bowl having a contracted neck, which consists in bending the plate into a blank having the form of a straight-sided pot, then drawing in the upper portion of the bowl, then supporting the bottom and breast of the bowl by a bottom die and an annular re-enforcing die and further drawing in the upper portion by tapering dies of successively-smaller diameter, and finishing the shape of the bowl between dies divided lengthwise of its axis, substantially as set forth.

Witness my hand this 6th day of September, 1890.

CARL GUSTAF PATRIK DE LAVAL.

Witnesses:

E. HAASE,

STEN ERICSSON.