(No Model.)

T. F. STEVENSON.

HOLLOW VESSEL AND METHOD OF MAKING THE SAME.

No. 383,023. Patented May 15, 1888.

Fig. 2.

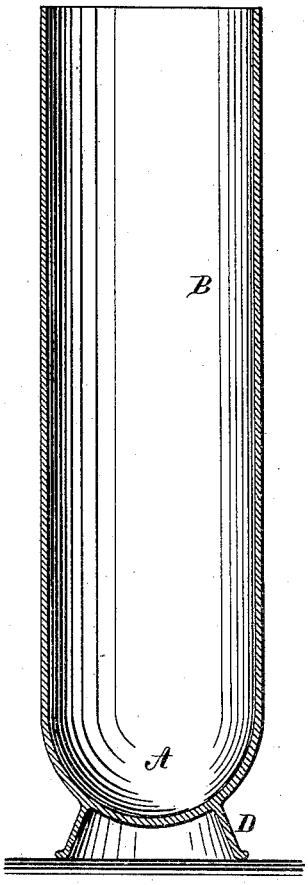


Fig. 3.

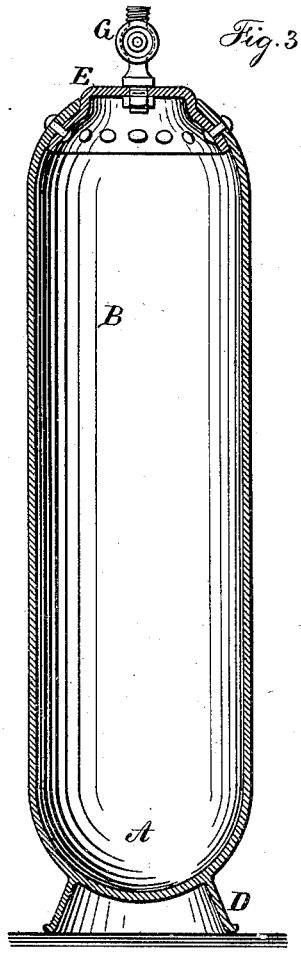
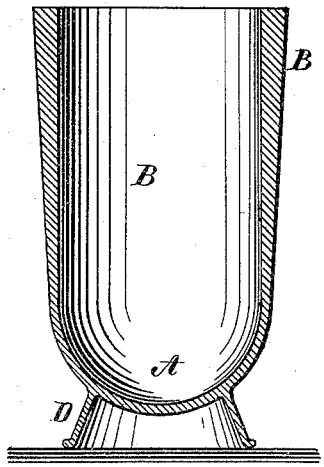


Fig. 1.



Witnesses:
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UNITED STATES PATENT OFFICE.

THOMAS F. STEVENSON, OF BROOKLYN, NEW YORK.

HOLLOW VESSEL AND METHOD OF MAKING THE SAME.

SPECIFICATION forming part of Letters Patent No. 383,023, dated May 15, 1888.

Application filed May 28, 1887. Serial No. 239,634. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. STEVENSON, of Brooklyn, in the county of Kings and State of New York, have invented an Improved Method of Making Hollow Vessels, of which the following is a specification.

Hollow metallic vessels have been made by stamping up sheet-metal blanks and drawing them through dies to extend the same in length and to reduce the thickness of the sides; but this involves frequent annealing operations that injure the metal, and the process is slow and expensive, besides which the base or feet on which the vessel rests have to be separately attached.

My invention is especially adapted to the manufacture of hollow vessels in steel; but it may be used in making vessels of brass, copper, or other metal, and I do not limit myself as to the use to which such hollow vessels may be adapted, as my improvements can be employed in making milk-cans, soda-water fountains, boilers, receivers, kegs, cans, or other articles.

In the drawings, Figure 1 is a section of the cast-metal blank. Fig. 2 is a section of the vessel after it has been reduced in thickness and extended by rolling, and Fig. 3 represents a receiver with a head inserted therein.

The vessels produced by my process are preferably cylindrical; but they may be prismatic, with numerous flat or corrugated sides.

The casting is to be of a character similar to that shown sectionally in Fig. 1—that is to say, the hemispherical end A is to be of a strength and thickness adapted to the article to be made, and the cylindrical sides B are considerably thicker, so as to contain the metal necessary for the sides of the vessel as reduced and finished.

If the cast blank is of steel it may be ground off inside or outside, or both, to ascertain whether there are any flaws or imperfections, and the steel should be of a sufficiently low grade to allow for the subsequent rolling operations. A mandrel is provided to fit the inside of the blank vessel, and the rollers made use of are made with semicircular grooves similar to those employed in rolling pipes or tubes, the rollers being of the proper size for acting upon the outside of the vessel.

The hollow blank, after it has been cast, is to be placed upon a mandrel that fits the interior and rolled with the proper number of successive rollings to reduce the sides B, commencing at the head or end A and extending outwardly to the open end. In this manner the metal is reduced in thickness and the vessel extended in length. These rolling operations may be performed upon the metal when in a cold condition with such metals as copper and brass; but for low-grade steel it is preferable to heat the metal to a welding-heat, or nearly so.

In manufacturing a hollow vessel, especially of cast steel, it is advantageous to have the head or end A cast thicker than the finished article, so that the rounding head may be consolidated by a series of blows, either by hand or by suitable tools, applied when the metal is heated to welding-heat, or nearly so, thereby reducing the thickness of the metal sufficiently to consolidate the same and render it homogeneous and free from flaws or imperfections.

When the vessel is to be provided with feet or a base, as at D, the same is preferably cast upon the blank, so as to avoid rivet-holes or soldering and to lessen the expense of manufacture.

When the otherwise open end of the vessel is to be closed, any suitable head or end may be applied. I have shown the end of the vessel as drawn in or closed over a convex end piece, E, rivets or screws being employed to connect the parts together, and a cock or valve, G, is represented as attached to this head.

In finishing the rolling operations it is usually preferable to pass the vessel through between the same rollers two or three different times, partially rotating the core or mandrel and the vessel between the rolling operations to insure uniformity of thickness and to loosen the vessel upon the mandrel, and with this object in view the vessel may be exposed to a peripheral rolling operation between three rollers that tend to stretch the metal slightly and loosen it upon the mandrel; or the vessel may be forced through a circular die to render the exterior uniform, or to reduce the thickness and elongate the cylinder, and this may be used after the rolling operation or in place of the same. When the vessel is complete, the cylindrical sides may be the same thickness as the end, or slightly thinner, to obtain uniformity of strength throughout the vessel.

If desired, the vessel may be tinned or gal-

vanized or plated either inside or outside, or both, either before or after the head E is attached.

I claim as my invention—

1. The method herein specified of making hollow metallic vessels, consisting in casting a hollow blank with cylindrical sides that are thicker than the end, and then reducing the thickness of the sides of the vessel and extending the same in length, substantially as set forth.

2. A hollow metallic vessel having a head or end of metal that is consolidated by hammering, and sides that are of wrought metal, substantially as set forth.

3. The method herein specified of making hollow metallic vessels, consisting in casting a hollow blank, subjecting the end portion to a hammering or forging operation to consolidate the metal, and heating and rolling the metal to reduce the thickness of the sides and to elongate the cylindrical portion, substantially as set forth.

4. The hollow metallic vessel having a cast-metal end, with a base or feet thereon, and with wrought-metal sides, the end, the sides, and the feet or support being integral without seam or joint, substantially as set forth.

Signed by me this 23d day of May, 1887.

THOS. F. STEVENSON.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.