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PATENTED DEC. 4, 1906.

A. L. J. QUENEAU.
MANUFACTURE OF METALLURGICAL VESSELS.
APPLICATION FILED JAN. 3, 1906.

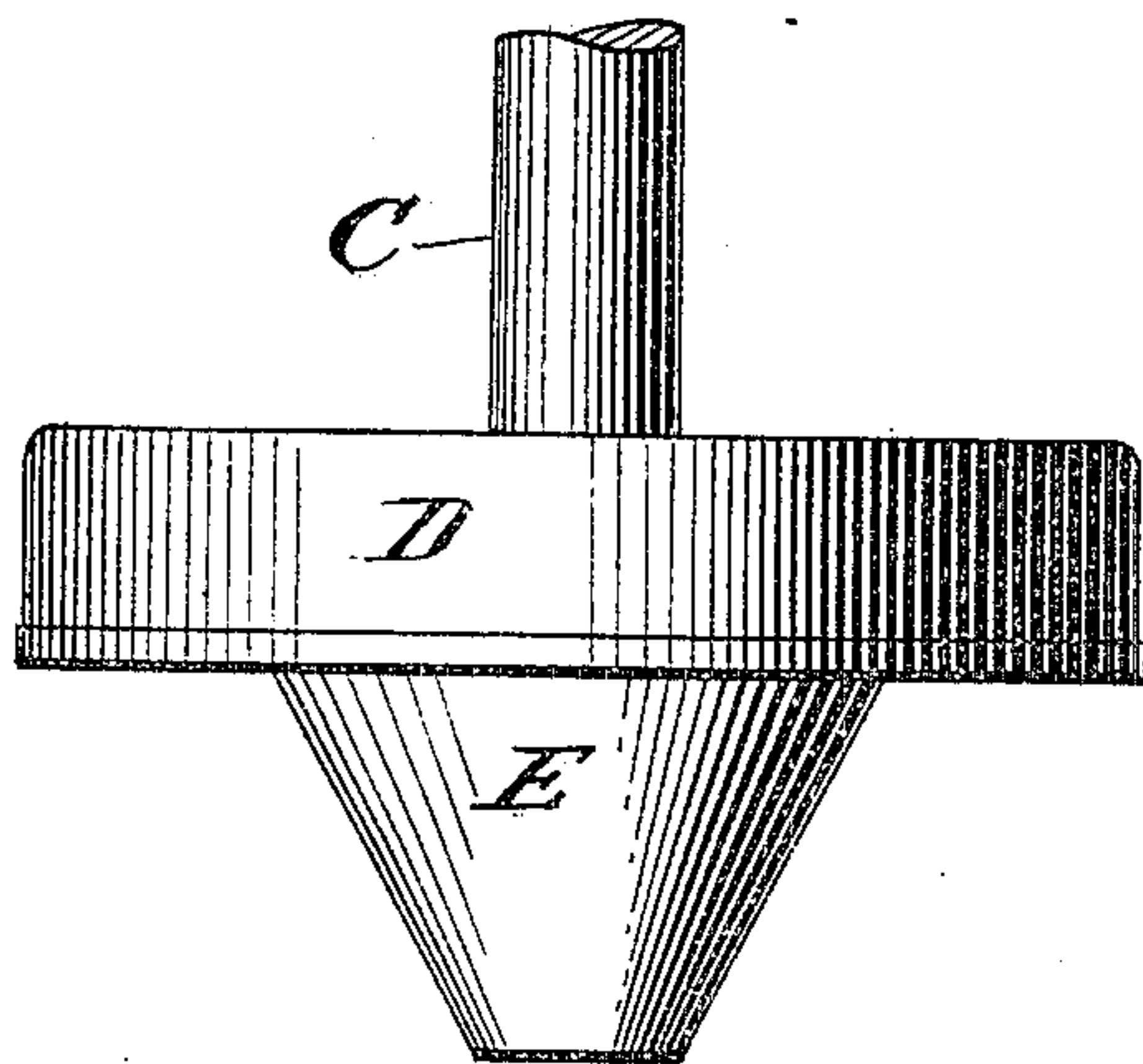


Fig. 1.

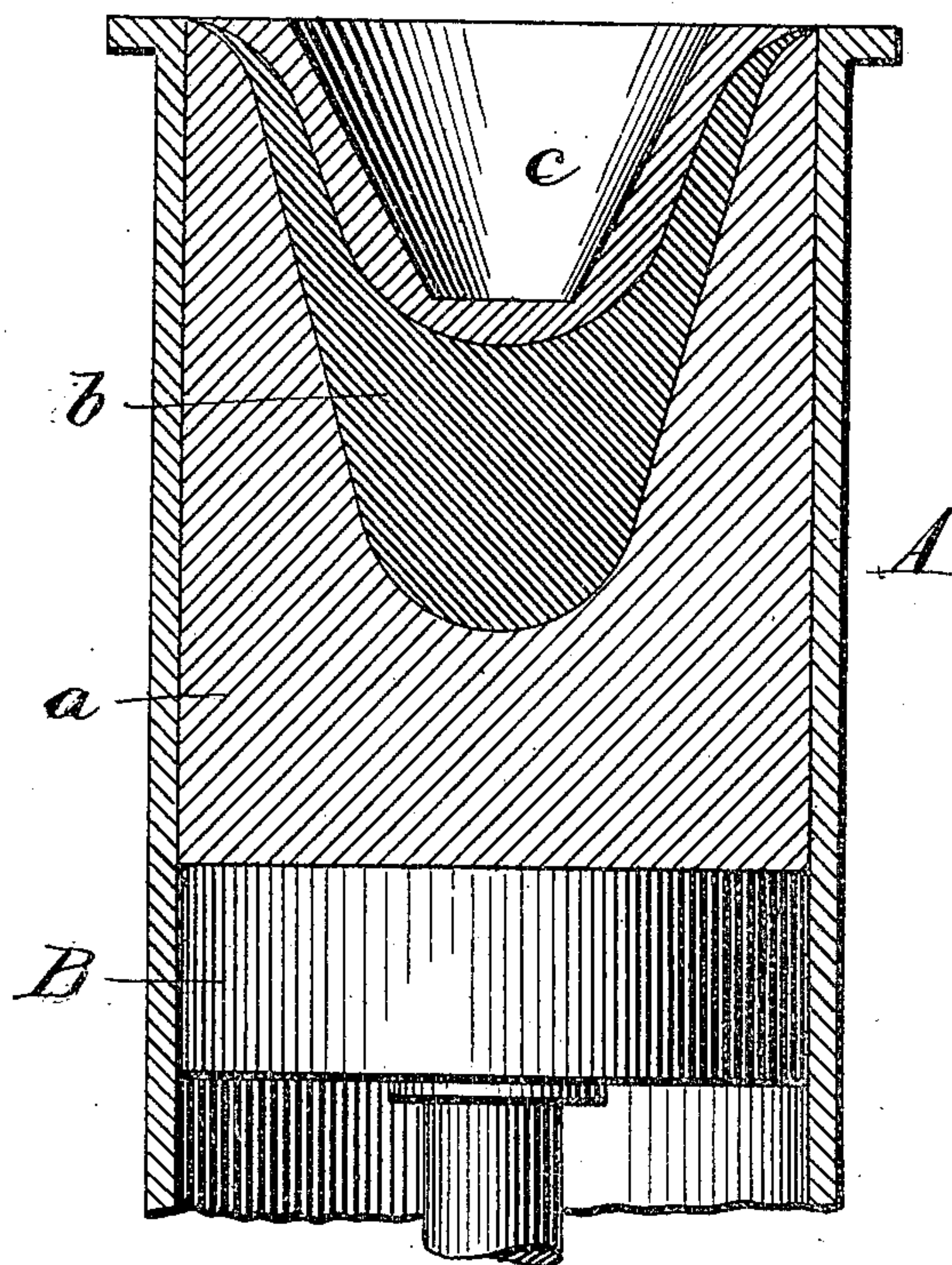
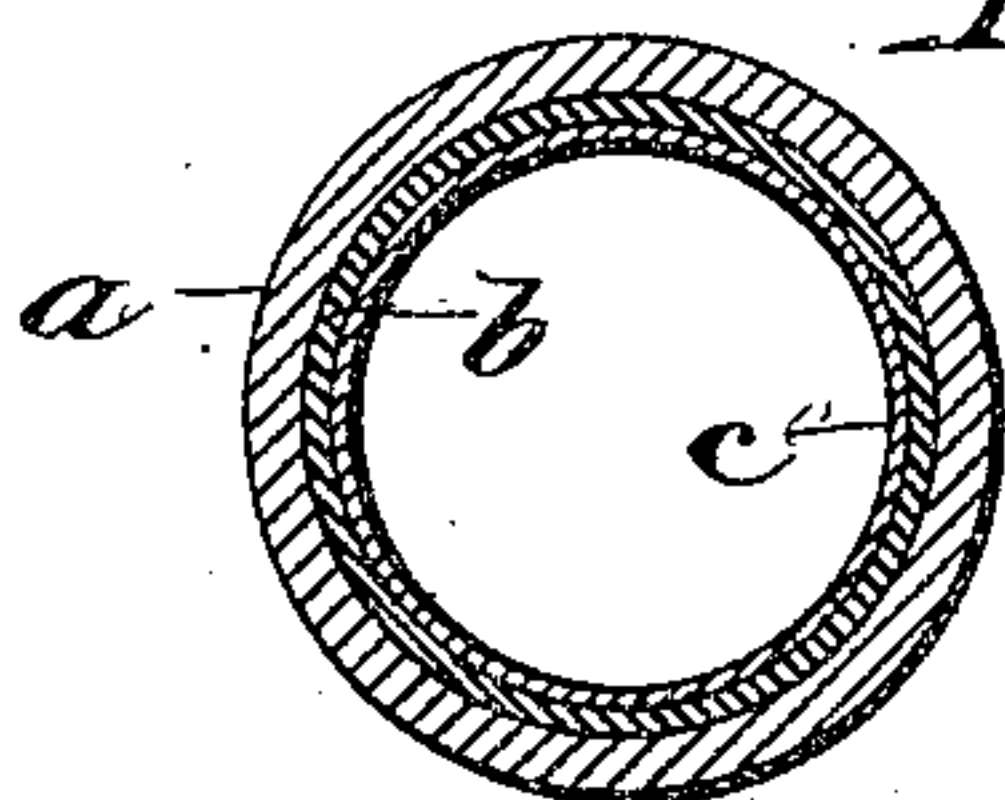


Fig. 2.



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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF METALLURGICAL VESSELS.

No. 837,724.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, AUGUSTIN L. J. QUENEAU, a citizen of the Republic of France, residing at South Bethlehem, county of Northampton, State of Pennsylvania, have invented certain new and useful Improvements in the Manufacture of Metallurgical Vessels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In Letters Patent of the United States granted to me under date of May 9, 1905, No. 789,451, I have described the manufacture of crucibles, retorts, and other metallurgical vessels wherein the walls are made up of composite layers—as, for instance, an outer layer or main body portion of fire-clay and sand, an intermediate layer of fire-clay, graphite, and sand, and an interior layer of fire-clay and sand. A main purpose of these outer layers is in this instance to protect the intermediate layer from the destructive pitting or corrosion incident to the use of so-called “graphite” crucibles or retorts when subjected to the direct impact of products of combustion—as, for instance, when exposed to the furnace-gases of a heating-furnace, or to the gases employed for drying the vessels, or for preheating them within and without before inserting them in the metallurgical furnace.

As explained in my patent referred to, metallurgical vessels having composite walls of different mixtures may be first roughly shaped in the so-called “hammering-machine,” sometimes known also in the trade as the “schlag” machine. This machine, generally stated, consists of a vertically-operating plunger provided at its lower end with a wooden shoe, said plunger being raised by a lifting-cam in manner similar to the lifting-cams of an ore-stamping machine and being permitted to drop by gravity from the point to which the lifting-cam raises it, thereby imparting a corresponding blow to the “wad.” The wad is supported upon a piston forming the movable bottom of a cylindrical casting, in which it is sustained, and said piston is adapted to be raised or lowered hydraulically or otherwise at the will of the op-

erator. In practice the wad is formed by placing upon the piston when the latter is at an upper position of adjustment a number of cylindrically-shaped bodies of the material to be hammered. These bodies are compounded or kneaded in the pug-mill and are discharged through the exit-nozzle of the pug-mill in cylindrical form corresponding to the contour of said discharge-nozzle. They are cut up into convenient sizes of, say, eight inches in diameter and four inches in length and are placed upon the hydraulic piston, whereupon they are hammered into a single compact section by means of blows from the impact-shoe. Thereupon the hydraulic system is lowered for the reception of additional cylinders from the pug-mill, which in their turn are similarly hammered, and in this manner successive additions are made to the hammered wad until it has attained its desired final dimensions prior to its insertion in the forming-press. Inasmuch as the receiving-cylinder is frequently, say, fourteen inches in diameter and twenty-two inches in length, it follows that quite a number of pug-mill balls or cylinders are required to make a single press-wad. In ordinary practice the shoe is a plain disk of wood and is attached to the under surface of a metal plunger-head of, say, sixteen inches in diameter, so as to extend beyond the sides of the receiving-cylinder, thereby limiting the downward movement of the shoe.

In the hands of a skilled workman it is entirely feasible to make press-wads for composite wall vessels by means of the disk shoe referred to. For unskilled labor, however, I find that a more uniform product can be obtained by the employment of a form of shoe which automatically stamps or forms the various layers in their proper relative positions in the wad.

In the accompanying drawings, Figure 1 represents, partly in section and partly in elevation, the essential elements of a hammering-machine embodying my invention and illustrates its application to the formation of a press-wad for composite wall vessels. Fig. 2 illustrates in section a composite wall vessel of a kind that is formed in the retort-press from such a press-wad.

Referring to the drawings, A indicates the

receiving-chamber of the hammering-machine, provided with the usual hydraulic piston B, adjustable to different positions therein. C indicates the cam-lifted gravity-actuated plunger having the head D and shoe E.

In the drawings I have illustrated the hammered press-wad in its completed condition. As shown, it consists of the outer portion *a*, which may be, for instance, composed of a mixture of fire-clay and sand; the intermediate layer *b*, which may be composed of graphite, fire-clay, and sand, and the interior layer *c*, which may be composed of a mixture of fire-clay and sand.

The composite press-wad shown is formed by placing upon the piston B a number of pug-mill cylinders of fire-clay and sand and hammering them by means of the plunger-shoe E until a body of the required length is gradually formed. Thereupon similar pug-mill balls or cylinders of a mixture of graphite, clay, and sand are placed in the receiving-cylinder and in turn are hammered by the plunger-shoe E, and finally a number of pug-mill cylinders or balls of a mixture of fire-clay and sand may be inserted and hammered by the plunger-shoe. The final product is a composite press-wad whose several layers are cup-shaped, the inner ones being nested within the outer. The press-wad thus formed is inserted in the usual Dorr press in an inverted position or into the press illustrated in my Patent No. 792,452, dated June 13, 1905, whereupon it will be converted

into the composite wall vessel shown in Fig. 2 when the press is put in operation.

It will be evident that the configuration of the plunger-shoe E may be modified without departing from the spirit of my invention, provided it retains a shape adapted to form cup-like layers nested within each other, as indicated.

In order to enable the operator to know accurately the location of the piston-head B, and to thus insure the proper length of the wad, I may attach a gage or rider to the under side of said piston-head of such size and length as to give the necessary indication.

Having thus described my invention, what I claim is—

1. The method of forming composite wall vessels of moist plastic material, which consists in forming a preliminary hammered wad of cup-shaped layers nested within each other and subjecting said wad to the finishing action of a forming-machine; substantially as described.

2. A hammered press-wad consisting of a plurality of cup-shaped layers of mixtures of different compositions nested one within the other said mixtures being of moist, plastic material; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUSTIN L. J. QUENEAU.

Witnesses:

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