L. J. WEINSTEIN.

APPARATUS FOR CASTING PORCELAIN.

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1,193,645.

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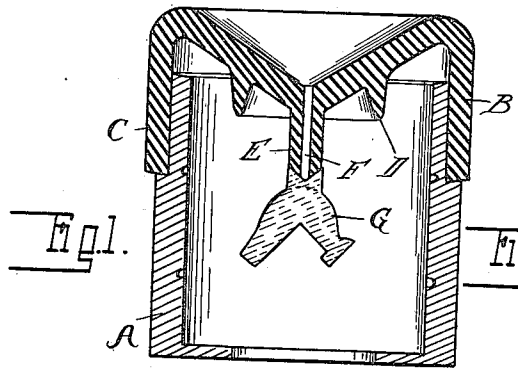


Fig. 1.

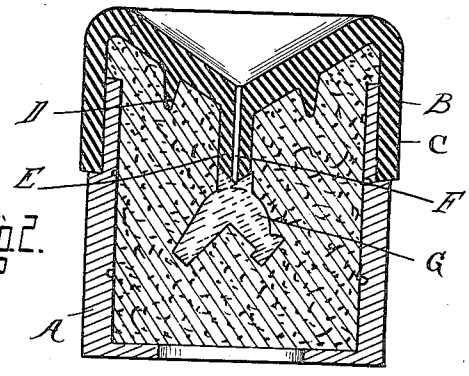


Fig. 2.

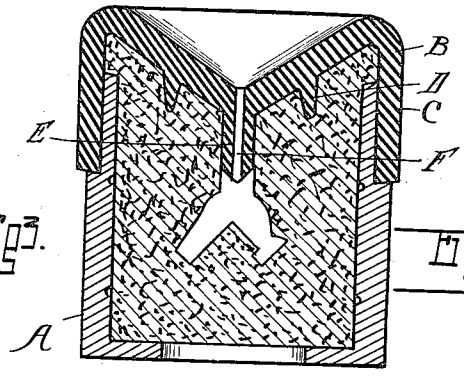


Fig. 3.

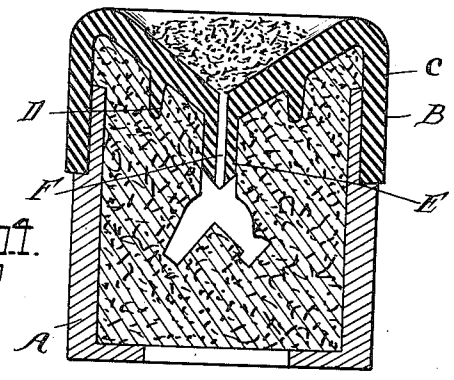


Fig. 4.

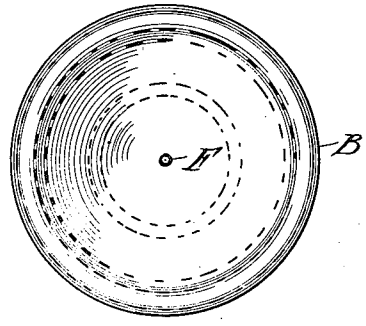


Fig. 5.

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APPARATUS FOR CASTING PORCELAIN.

1,193,645. Specification of Letters Patent. Patented Aug. 8, 1916.

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To all whom it may concern:

Be it known that I, LOUIS J. WEINSTEIN, a citizen of the United States of America, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Apparatus for Casting Porcelain, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to the art of forming porcelain inlays and other porcelain bodies for use in dentistry.

It is the object of the invention to obtain an apparatus by which porcelain may be successfully cast.

It is a further object to obtain casts of exact form and size and uncontaminated by contact with the mold.

In the present state of the art one method of forming porcelain inlays is to use a metallic matrix supported in an investment, filling the matrix with plastic material for forming the porcelain, and then heating until the material is fused. By this method shrinkage is unavoidable and the cast porcelain is therefore not the size of the original pattern. Metal inlays have been formed by a casting process in which the metal is first fused on the top of the mold and then forced into the mold by air pressure, but such processes as heretofore used cannot be applied to the casting of porcelain, for various reasons; one of which is that the molten porcelain will be contaminated by contact with the investment in the cavity in which it is fused.

The present invention comprises a novel apparatus by which porcelain may be successfully cast.

In the drawings: Figure 1 is a section through the crucible and flask, showing the wax pattern in position for embedding in the investment compound; Fig. 2 is a similar view showing the flask filled with the investment material; Fig. 3 is a similar view after the removal of the wax impression; Fig. 4 is a similar view with the porcelain in the crucible in position for fusing; and Fig. 5 is a top view.

With the present invention I preferably employ a porcelain body, which is comparatively low fusing, as for instance where the melting point is below 1400° F. Such a body when fused can be cast in a mold of refractory investment material without contamination, but the fusing of this material directly in contact with the investment endangers the overheating of the latter which would produce contamination. I therefore fuse the porcelain in a crucible of a more refractory nature and only when fully fused permit the porcelain to enter the mold.

In my improved apparatus I preferably employ a casing or mold flask A for holding the investment material, which is provided with a flat base for engagement with the air-exhausting apparatus. I further provide a crucible B formed of a highly refractory material such as a high fusing clay and which constitutes a cap for the casing A, being also preferably provided with a depending flange C for overlapping and protecting the upper end of said casing, and with a depending rib D for embedding in the investment to form an air seal. The central portion of this crucible is depressed to form the conical cavity, and the bottom is provided at the center with a depending lug E centrally apertured at F to form a sprue.

In carrying out my improved process a wax impression or other pattern G is first formed and is then attached to the depending lug E by a fragment of plastic wax. The crucible B is then engaged with the casing A, holding the pattern centrally within the latter, after which the investment material is filled in so as to surround the pattern and to conform to the shape of the inner faces of the casing A and crucible. When the investment is solidified the pattern may be removed by melting, which leaves the mold cavity connecting with the sprue F. The casing A may then be placed on the table of an air-exhausting apparatus, the material placed in the crucible B and melted by the flame of a blow-pipe or by other suitable means. As the investment material is of a porous nature the air in the mold cavity will be drawn outward therefrom, so that when the porcelain is fused it will be forced downward by atmospheric pressure through the sprue F and into the mold cavity.

The crucible B performs several important functions: In the first place being of a highly refractory material and being also of a chemical nature, such that it will not readily combine with the fused porcelain, contamination of the molten porcelain is

avoided; second, the crucible separates the porcelain from the investment compound during the melting process and only permits flow into the mold cavity when completely melted; third, the crucible forms a heat insulation to protect the investment compound from overheating; and fourth, it forms a sealing cap preventing leakage of air inward through the pores of the investment which would partially destroy the vacuum formed in the mold cavity.

By my improved process porcelain casts may be produced which are for all practical purposes exact reproductions of the pattern in form and dimensions, while the surface of the cast will be smooth and free from contamination.

What I claim as my invention is:—

1. In an apparatus for forming porcelain casts, a crucible formed of refractory material having a depending hollow portion for attachment to the pattern and forming a sprue connection with the mold cavity.

2. An apparatus for casting porcelain, comprising a mold flask, and a crucible formed of refractory material constituting a sealing cap for said flask, said crucible having an orifice for discharging fluid material into the flask and having a depending annular flange exteriorly overlapping and protecting the top of the flask, said flange restraining the crucible against lateral displacement relative to the flask.

3. An apparatus for casting porcelain, comprising a mold flask, a crucible formed of refractory material constituting a sealing cap to said flask, and a hollow projection from said crucible forming the means of attachment to the pattern and constituting the sprue connection with the mold cavity.

4. An apparatus for casting porcelain, comprising a mold flask, a crucible formed of refractory heat-insulating material constituting a cap for said flask, a central hollow lug depending from said crucible forming a means of attachment to the pattern and constituting a sprue connection to the mold cavity.

5. An apparatus for casting porcelain, comprising a mold flask, and a crucible forming a cap for said flask having an orifice for discharging fused material into the flask, and having an annular depending rib substantially concentric with said orifice.

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

LOUIS J. WEINSTEIN.

Witnesses:

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JAMES P. BARRY.