

(No Model.)

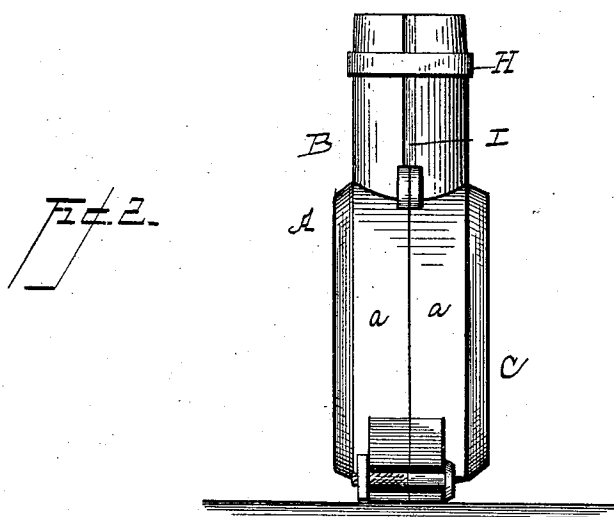
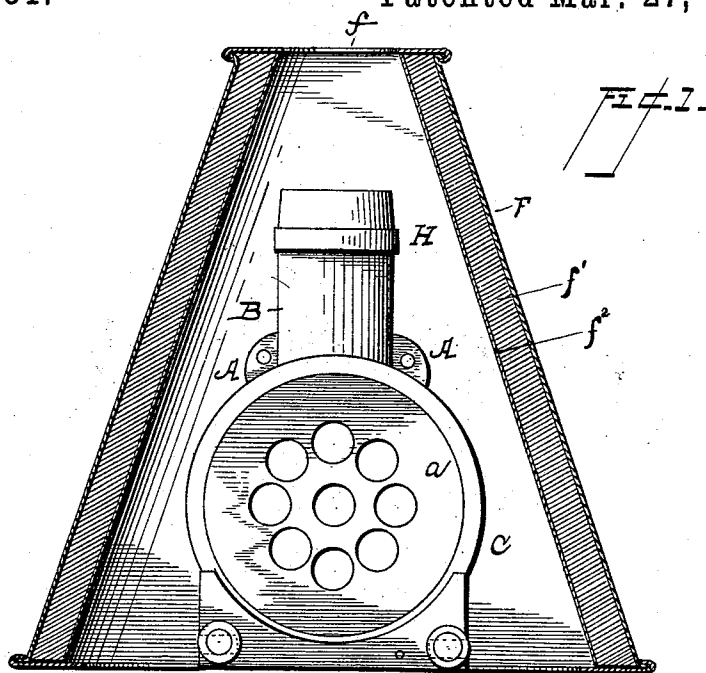
2 Sheets—Sheet 1.

G. A. TOMPKINS.

PROCESS OF MANUFACTURING DENTAL PLATES.

No. 517,151.

Patented Mar. 27, 1894.



Witnesses:
J. W. Johnson,
James E. Jester

Inventor
Geo. A. Tompkins
by J. R. Nottingham atty.

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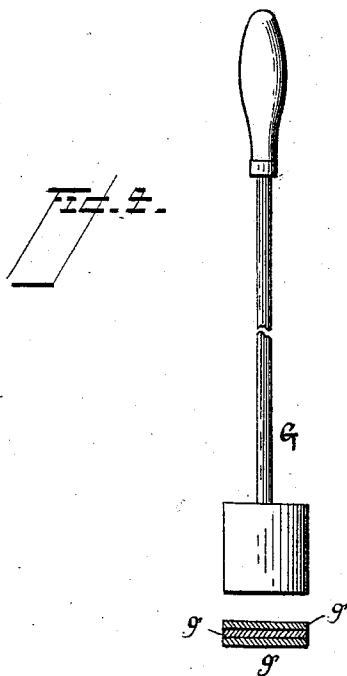
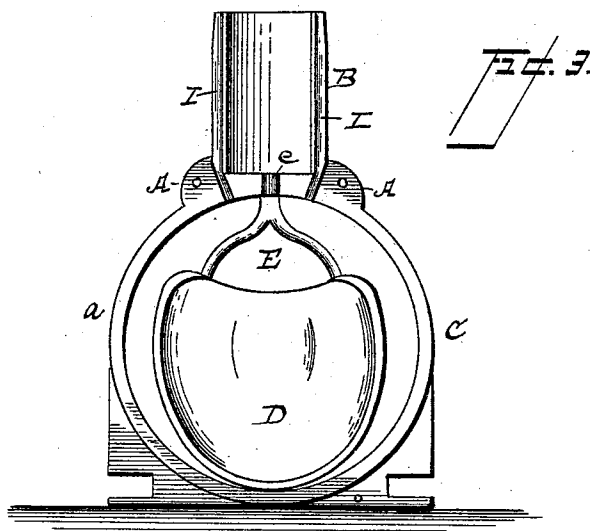
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UNITED STATES PATENT OFFICE.

GEORGE A. TOMPKINS, OF CORTLAND, NEW YORK.

PROCESS OF MANUFACTURING DENTAL PLATES.

SPECIFICATION forming part of Letters Patent No. 517,151, dated March 27, 1894.

Application filed February 23, 1892. Serial No. 422,505. (No specimens.)

To all whom it may concern:

Be it known that I, GEORGE A. TOMPKINS, a citizen of the United States, residing at Cortland, in the county of Cortland and State of New York, have invented certain new and useful Improvements in Processes of Manufacturing Dental Plates; 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.

My invention relates to certain improvements in the manufacture of dental plates from aluminum and its alloys; and it has for its object to provide an apparatus by means of which a very light and perfect fitting dental plate may be successfully produced.

The invention consists, in a combined airtight crucible and flask; and the details of construction to be hereinafter described and specifically set forth in the claims.

In the various apparatuses heretofore used in the manufacture of dental plates great difficulty has been experienced in maintaining the heat of the flask at a temperature nearly equal to that of the molten metal.

It is a well known fact to the profession, that unless an even and like temperature, between the flask and metal, be maintained, it is impossible to have perfect success in casting the plate, for without this even and like temperature the metal in the crucible will chill before it fills the mold. Again bad results have evented in the attempt to force the molten metal into the mold by atmospheric pressure from an air tube or syringe device. Where the metal is thus forced the plate is liable to become filled with air-pits or cells. Another objection exists in the fact that nearly all of the devices are complicated, more or less, generally requiring two or more operations to effect a casting. By combining the crucible with the flask I overcome these difficulties to a successful casting of a plate.

With my combined crucible and flask I am enabled to obtain an even and like temperature for the mold sections contained within the flask and the crucible containing the metal, thus greatly insuring the successful obtaining of a very thin and perfect plate.

By the use of packing-disks I confine the heated air in the crucible, between the liquid

metal and the top of the crucible, and use the air so confined for forcing the liquid metal into the mold by forcing down the packing-disks with a plunger. This method of confining and using the air for forcing the metal into the mold insures an even and steady pressure over the entire surface of the metal contained in the crucible, preventing it from being filled with air-holes and giving to the casting a density approaching that of rolled plate.

By employing a cone-shaped cover or hood, suitably lined, I am enabled to so regulate the heat around the combined crucible and flask as to avoid injuring the metal by burning, thus insuring a casting having a very bright and exceedingly fine surface. The use of the cover or hood renders it possible to cast a plate in an ordinary gas-jet, the cone-shape drawing the flame around the combined crucible and flask with greater or less closeness as may be desired.

In the accompanying drawings—Figure 1 illustrates a side elevation of my combined crucible and flask, with the mold sections contained therein, showing the cover or hood in vertical section; Fig. 2 an edge elevation of the combined crucible and flask; Fig. 3 an interior view of one part of the combined crucible and flask, and Fig. 4 a view of the packing-disks and plunger.

The improved apparatus is described as follows:—A indicates the combined crucible and flask, which is constructed of malleable metal and is divided into two parts *a a*; B indicating the crucible and C the flask part. In a mold, D D, is cut or formed a sprue, E, extending from the recess of each half of the mold to the entrance *e* in the bottom of the crucible.

F is a cone-shaped cover or hood, open at the bottom and having a circular perforation, *f*, at the top thereof. The interior of the cover or hood is lined with asbestos, *f'* the latter being coated with a fire-proof cement *f''* to prevent it powdering from the action of the heat.

g g g are asbestos packing-disks to be employed in confining the air in the crucible, and G is a plunger to be used in forcing down the packing-rings and cause the confined air to exert a pressure upon the liquid metal in the crucible and force it into the mold.

In carrying out the process, I place the mold

sections within the flask; bolt the two parts, *aa*, together; slip over the top of the crucible a metal band, *H*, and lute the grooves *I I* of the crucible to make the same air-tight. The combined crucible and flask is then set to dry in a solid gas flame and the cover or hood placed over it. After the mold sections are dried, or nearly so, the aluminum is placed in the crucible to be melted, but it will be understood the melting cannot take place so long as any steam is arising from the mold sections. When the aluminum is melted, the cover is removed and the gas turned off, the packing-disks are fitted in at the top of the crucible, confining the air therein, and said disks forced downward by means of the plunger *H*. The pressure of the confined air acting upon the liquid metal causes it to be forced down into the mold.

It will be observed that when the packing-disks have been fitted into the crucible, the whole device becomes hermetically sealed, and as the outside atmosphere is excluded there can be no danger of the liquid metal becoming chilled and thus injuring the casting. After the packing-disks have been forced down into the crucible, the metal is allowed to cool, and when sufficiently cooled, the flask and crucible is opened and the sprue sawed off.

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

1. An apparatus for casting dental plates, comprising a two-part flask and a two-part crucible the sections of which are integral with said flask; so that when the two sections

are joined together the combined flask and crucible may be subjected to the influence of heat at one and the same time, substantially as specified.

2. An apparatus for casting dental plates, comprising a two part flask and a two-part crucible, the sections of which are integral with said flask-sections, each crucible-section being provided with a groove at its center and a groove at each side edge, so that when the two sections are joined together the center grooves will form a perforation to register with the gate of a mold and the edge grooves will form luting grooves, substantially as and for the purpose set forth.

3. In an apparatus for casting dental plates, the combination with a two-part flask, of a two-part crucible the sections of which are integral with said flask and provided with a bottom perforation to register with the gate of a mold, and with suitable luting grooves, packing disks, for confining the air within the crucible, and means for forcing said disks down upon the confined air to force the liquid metal into the mold, substantially as specified.

4. In an apparatus for casting dental plates, the combination with the combined flask and crucible, of a cone-shaped hood or cover lined with asbestos and having an inner coating of fire-proof cement, substantially as specified.

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

GEORGE A. TOMPKINS.

Witnesses:

JOHN W. SUGGETT,
MILTON H. YALE.