S. Lawrence,

Casting Dental Plates.

No. 94,323.

Patented Aug. 31. 1869.

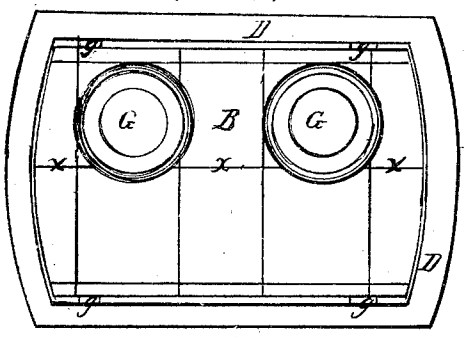


Fig: 1.

Fig: 2.

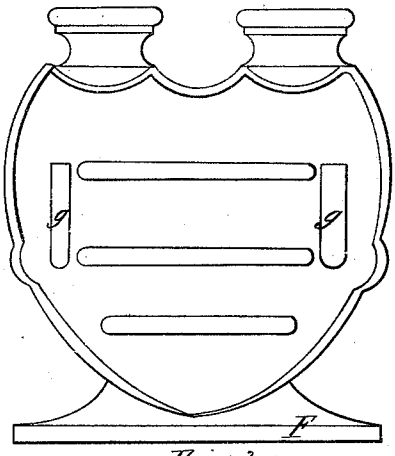


Fig: 4

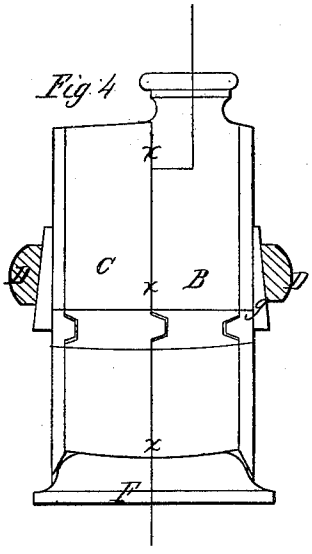


Fig: 5.

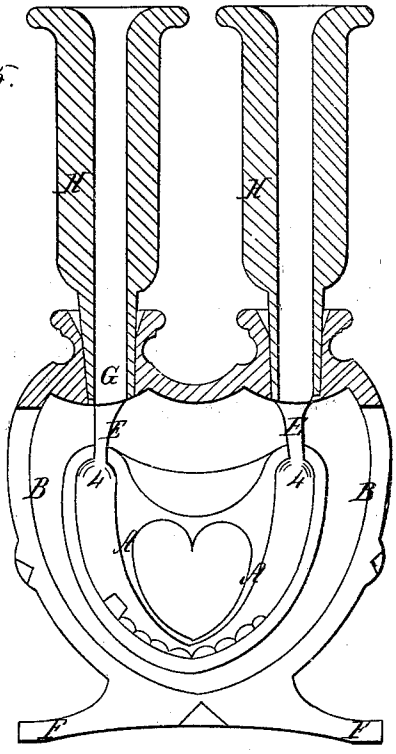


Fig: 3.

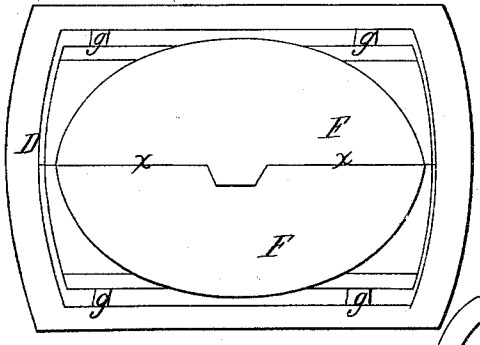


Fig: 7.

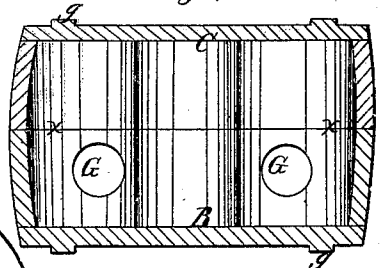
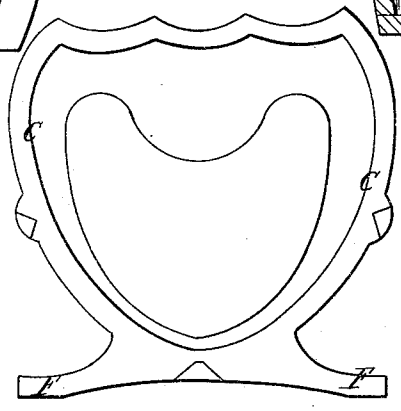


Fig: 6.



Witnesses;
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UNITED STATES PATENT OFFICE.

SAMUEL LAWRENCE, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND AMBROSE LAWRENCE, OF SAME PLACE.

IMPROVEMENT IN FLASKS FOR CASTING DENTAL PLATES.

Specification forming part of Letters Patent No. **94,323**, dated August 31, 1869.

To all whom it may concern:

Be it known that I, SAMUEL LAWRENCE, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Flasks for Casting Dental Plates, in the mode or process of casting such plates direct to the teeth, and in the plates and teeth combined, as a new and improved manufacture, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents a top view of my improved flask; Fig. 2, a side elevation after the clamping-ring has been removed. Fig. 3 is a bottom end view of Fig. 1. Fig. 4 is an edge view of said flask; and Fig. 5, an inner side view of the nowel or bed-piece, which in all cases contains or is provided with the two gates or pouring-holes, shown in section. Fig. 6 represents the inner side view of the cope or top piece, and Fig. 7 a transverse section of the flask.

My invention and improvements in flasks for casting dental-plates consist in the peculiar form of the flask, and which conforms with the shape of the model to be molded in such flask, and in the peculiar construction and arrangement of the parts, and the adaptation of the cover to either side or part of the flask.

By my mode or process of gating and pouring the metal, and by the use of the riser-tubes, I am enabled to cast a dental plate of "aluminium" directly to and upon the teeth, and quite easily, and with reasonable certainty of producing every time a good sound plate firmly connected with the teeth and the fastening-pins projecting therefrom. Other light metals can be formed into dental plates of uniform thickness, and connected with the teeth, if poured by this process, using the riser-tubes. Gold, silver, or other heavier metals can be formed into dental plates of uniform thickness, and connected with the teeth by gaiting and pouring on the condyles 4 without the use of the riser-tubes, as the specific gravity of the heavier metals is sufficient without raising the column of melted metal above the top of the pouring-sockets into which the riser-tubes are inserted. After taking the impression of the mouth of the patient, and from this impression forming the male model upon which the plate is to be cast, a gutta-percha or wax try-plate is fitted to this model, the articulation is taken and the teeth fitted up in the same manner as for vulcanite, except that the wax should not be allowed to lap over the edge of the gum, as there is a liability to break the teeth by shrinkage after the flask and its contents have been heated and while cooling. This male model A, with the teeth and the try-plate upon it, is placed in the nowel or bed-piece B in about the position shown in Fig. 5, and there bedded in the usual way, the bedding substance coated with collodion, or otherwise suitably prepared, the cope or top part, C, of the flash placed on the bed-piece or nowel and filled with suitable semi-liquid substance to form the matrix. I then put on the cover and apply the clamping-ring D, and allow the molding substance to set or harden, then remove the clamping-ring and open the flask at the center X, remove the wax and the try-plate, cut the gates E from each condyle to the lower end of each pouring hole or tube, close the flask and apply the clamping-ring, which should be well forced down onto the inclines *g*, then gradually dry and heat the flask or mold and its contents to a red heat, remove the heated flask from the fire and place it in a vertical position, standing on its base or bottom F, and pour the melted metal into one or both holes G until it rises to the top. The flask is then allowed to cool, when it may be opened and the cast-metal plate and teeth removed. Such a plate will be uniform in thickness and precisely the shape of the interior of the mold; and this plate will be firmly and closely connected with the teeth and around the pins projecting therefrom. In casting a plate directly upon the teeth, if the metal used is aluminium or other light metal, then the riser-tubes must be heated at the same time of heating the flask and contents, and the heated riser-tubes inserted in the holes at the top of the flask, when the latter is placed in a vertical position, the melted aluminium poured into one tube until it fills the mold and rises to the top of each tube.

By this process and by pouring on the condyle at one side the mold is more perfectly filled, the air and any loose substance is carried or forced out through the opposite riser-tube, and a plate produced of uniform thick-

ness and free from blow-holes or other imperfections, and the aluminium closely connected with the teeth without breaking or injuring them.

It will be observed that by forming the pouring-holes in one side of the flask, as shown and described, there will be no liability of wedging the flask apart when the riser-tubes H are inserted, or when the metal is poured without the riser-tubes, whereas if the tubes are inserted or the melted metal poured between the two parts of the flask and gated to the plate between the condyles and against the palate the flask will be strained and the thickness of the plate increased, particularly at the junction of the gate, which makes the plate uneven; and there would be great difficulty in finishing such an uneven plate so as to fit the model or the mouth of the patient. The riser-tubes should be from four to six inches high, which will be sufficient to insure the filling of the mold with melted aluminium, and its certain and direct connection with the teeth, which has heretofore been considered an impossibility. The nearest approximation to connecting the aluminium plate with the teeth was by J. B. Bean, in a patent of September 3, 1567, No. 68,548, wherein he claims supplying fluid metal to compensate for the contraction of the metal in the mold, as well as to secure a denser casting by means of the detachable reservoir D, heated previous to pouring the metal. I make use of no such means to compensate for contraction, but other and entirely different means, requiring but one simple process to form an aluminium plate and connect it with the teeth, instead of three or four different processes and two distinct pourings, as patented to Bean.

The means I employ to compensate for the supposed contraction of the metal, or, rather, to equalize the expansion and contraction of the metal, and also of the mold, are as follows: I form the male model of a composition of calcined plaster and pulverized silex in about equal parts by bulk, mixed and formed in the usual way of mixing and forming a plaster model, and to bed this model and the teeth, and for the matrix I use the same composition in the proportion of from one-half to three-fourths silex and the balance of plaster. This composition can be successfully employed in flasks of other form or construction, and therefore it is not necessarily and dependently connected with this flask, but is susceptible of a separate patent, the application for which bears even date with this.

The object of this invention is economy in the use of the molding substance; to insure more equal expansion and contraction of such substance between the model and teeth and the rim of the flask, (the quantity being nearly equal on all sides;) the easy and convenient access for the severing of the gates by removing the cover from the bed-piece, to prevent straining or wedging the flask apart by inserting the riser-tubes or by pouring the melted metal; to pour the melted metal directly to and on the condyles, thereby producing a plate of uniform thickness, and which may have the gate portions removed without changing the form of any important or essential part of the plate; to provide a simple, cheap, and very efficient clamping device for holding the parts together, and a base or bottom, F, as a stand to keep the flask in a vertical position.

The object of my peculiar mode or process, and of the improved manufacture consisting of a dental plate and teeth combined by the said process, is to reduce the cost of the plate by simplifying the process, to insure the more certain formation of a plate connected with the teeth by a single operation, and to produce a better and more durable set of artificial teeth than has before been produced.

The process patented by Bean, before referred to, is faulty, for the fluid metal supplied to compensate for contraction will not unite with the metal in the mold, and the two metals will become detached by use, and leave the plate in one part and the teeth and the supplied metal in another.

By the use of my improvements I am enabled to produce a good, sound, even plate of uniform thickness, and closely connected with the teeth at each operation of molding and pouring, which, I believe, has never before been done.

I claim—

The flask, constructed as described, with the parts combined and arranged in the manner and for the purpose specified.

SAMUEL LAWRENCE.

Witnesses:

J. S. WHITNEY,

JOHN E. CRANE.