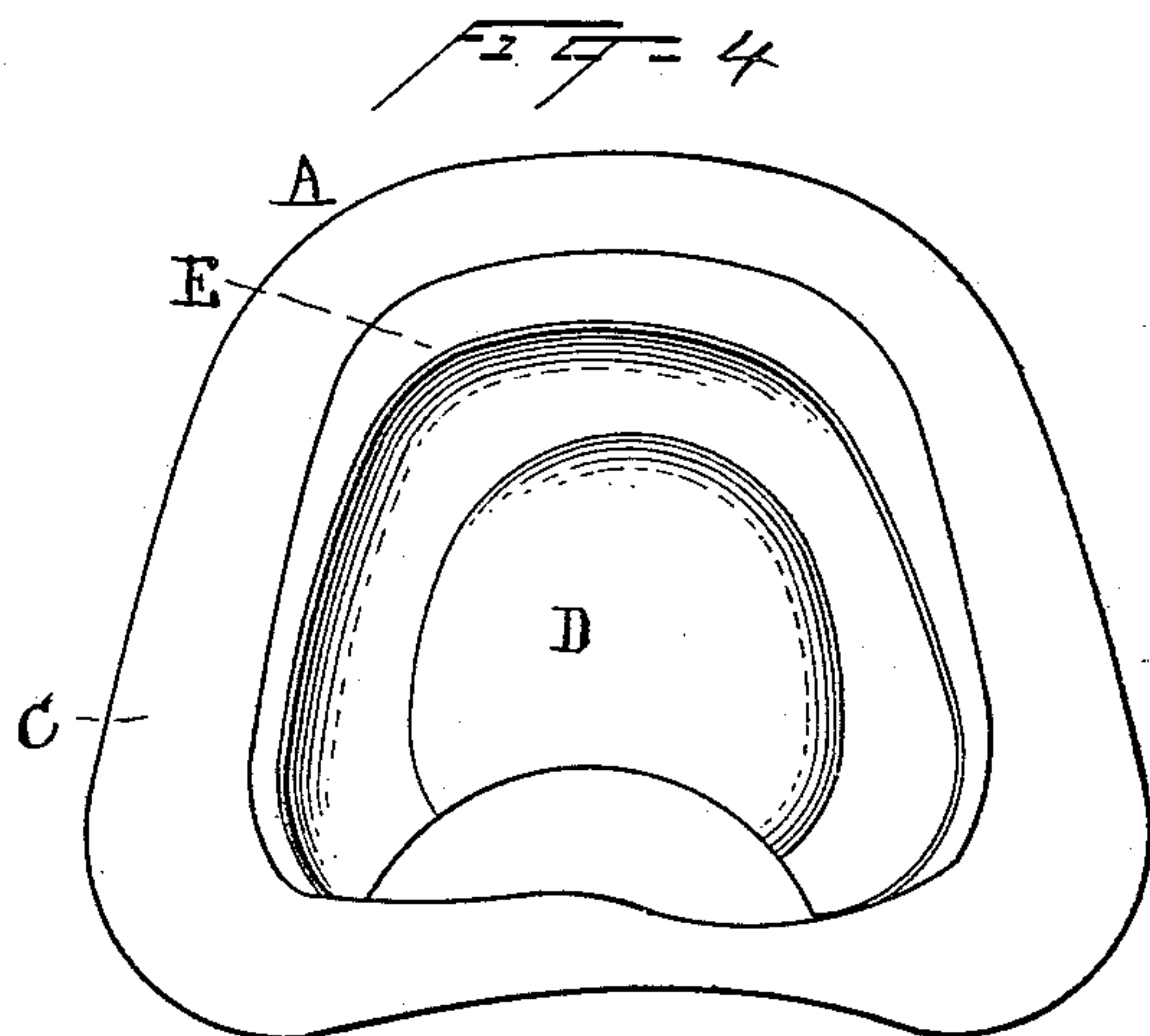
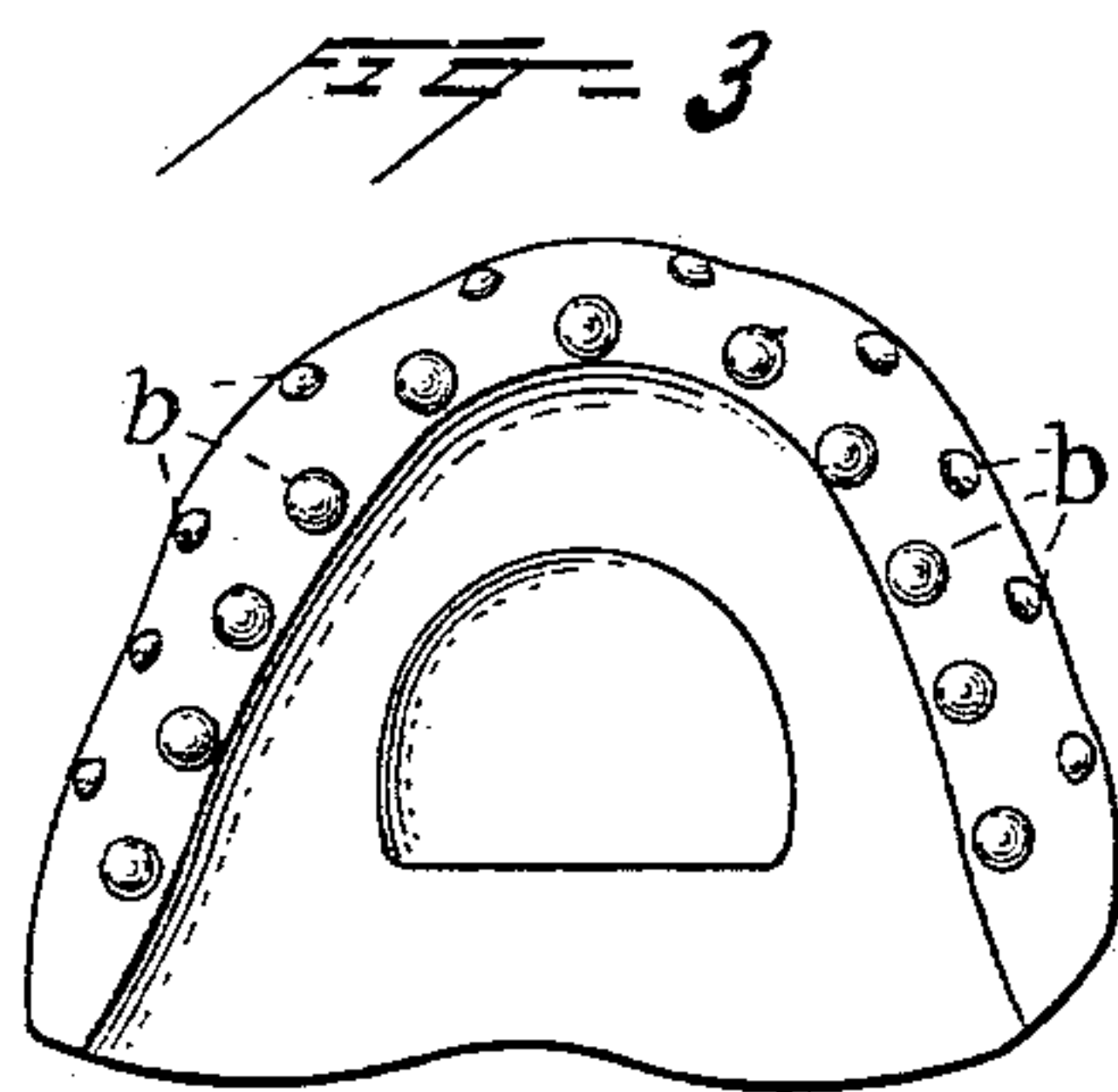
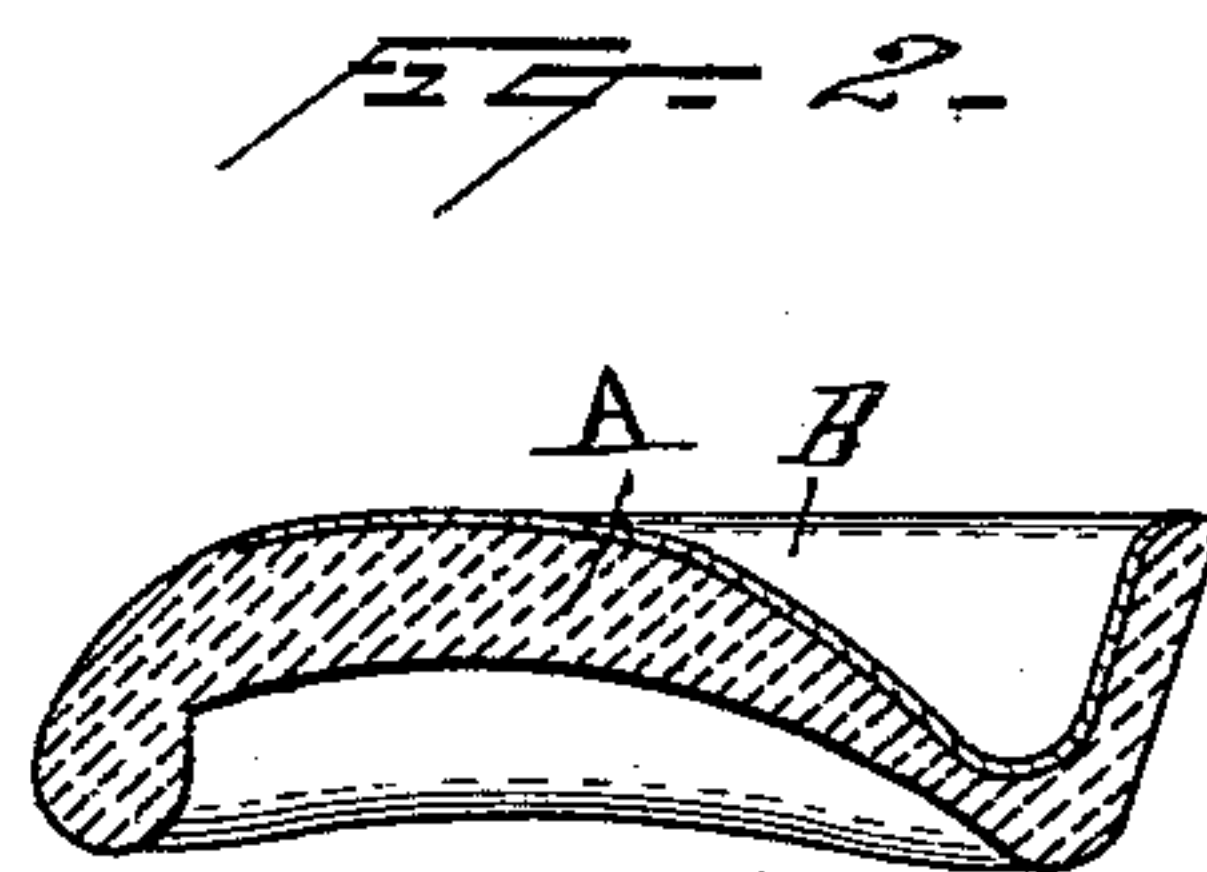
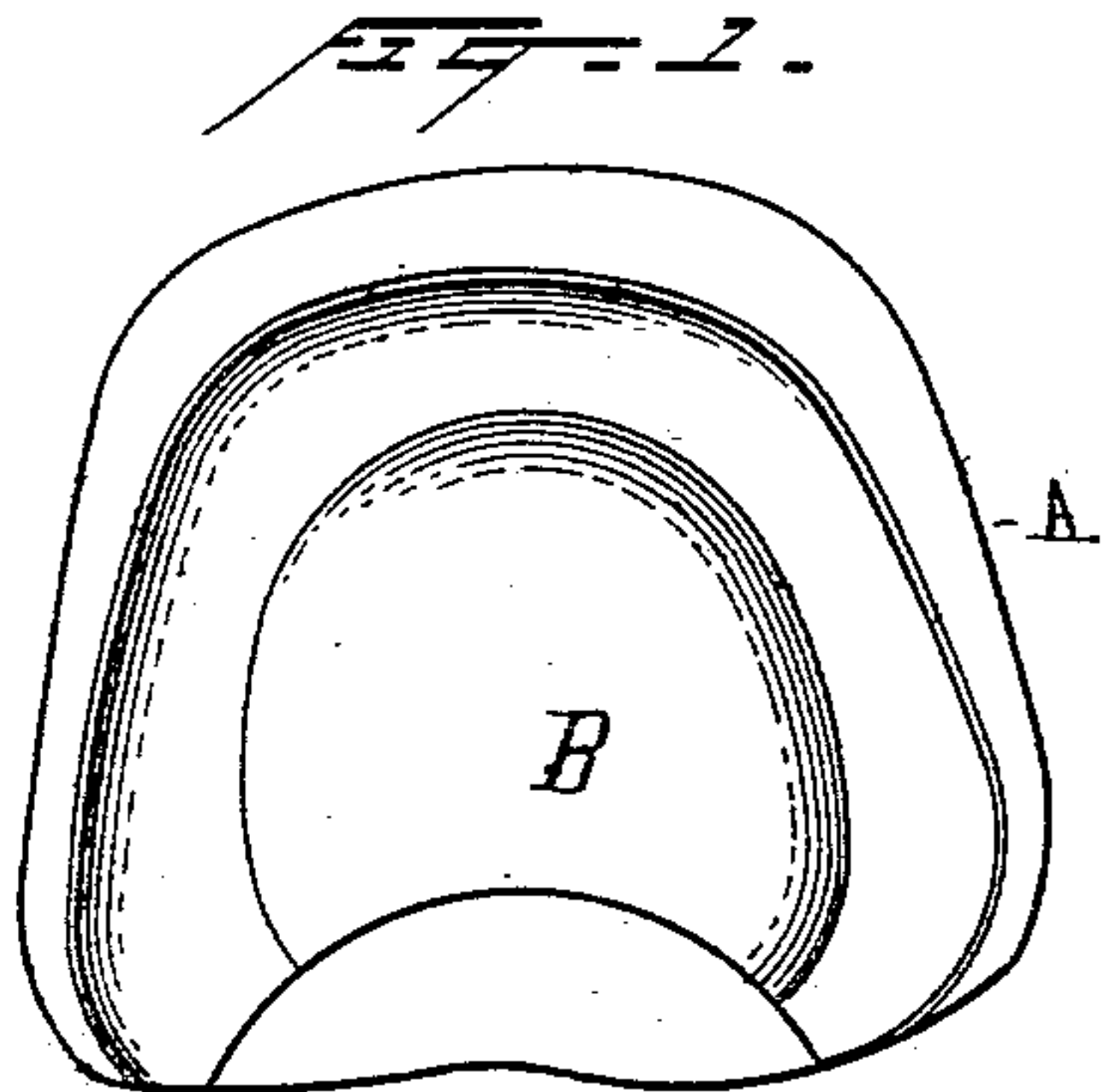


(No Model.)

J. F. X. HAMER.
DENTAL PLATE AND PROCESS OF MAKING.

No. 555,158.

Patented Feb. 25, 1896.



Witnesses
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JOANNES FRANCISCUS XAVERIUS HAMER, OF LEENWARDEN, NETHERLANDS.

DENTAL PLATE AND PROCESS OF MAKING.

SPECIFICATION forming part of Letters Patent No. 555,158, dated February 25, 1896.

Application filed August 11, 1893. Serial No. 482,919. (No model.)

To all whom it may concern:

Be it known that I, JOANNES FRANCISCUS XAVERIUS HAMER, a subject of the Queen of the Netherlands, residing at Leenwarden, in the Province of Friesland and Kingdom of the Netherlands, have invented certain new and useful Improvements in the Process of Making Dental Plates by Electrodeposition; 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.

The object of my invention is to provide a process by means of which accurately-fitting dental plates provided with depending cone-shaped or tapering projections for the effective attachment thereto of the usual coating of celluloid, rubber or similar material may be produced by electrodeposition.

Another object of my invention is the production of a very strong and elastic dental plate, consisting of two gold or silver plates with solder or other suitable material between them.

In carrying out my process an impression or cast is first taken from the mouth. This impression or cast is then carefully dried, and by means of a suitable tool a number of small tapering or cone-shaped depressions are formed therein. The surface of the impression or cast is then coated with a suitable electrically-conductive material, such as graphite. In order to limit the extent to which the deposition of the metal model shall take place, the graphite or other material is removed where it is not intended to deposit the model, or instead the surface of the impression or cast may be entirely covered with graphite, and those portions thereof which are not intended to receive the model may be coated with a suitable non-conducting paint or other material. The impression thus prepared is now immersed preferably in a copper-bath, and a copper model of suitable thickness is deposited thereon, said copper model being thereby provided with small projections produced by reason of the depressions in the cast or impression. This model is then removed from the impression or cast, and is strengthened by being filled in with some suitable material, such as plaster-of-paris, plaster

and marble dust, or some low melting metal, "Darcet metal," so-called, being well adapted for this purpose. The conducting-wire, by means of which the model is to be suspended in the subsequent bath, is now secured either to the model itself or to the metal backing, if such be used, and the model is then coated with graphite or other conducting material, in order that the plate deposited thereon may be readily removed, and also to compensate for the small difference in size between the model and the impression or cast due to the coating of the impression or cast with the conducting material before mentioned. The model thus coated is then placed in a suitable gold or silver bath, and a plate of the desired thickness is deposited on said model, said plate being provided with cone-shaped or tapering depressions therein, formed by the projections on the model, and which, as before stated, were produced by reason of the depressions made in the original cast or impression. The plate is then separated from the model and the cone-shaped or tapering depressions therein are then ground down on their tops, so that the plate will be formed with a series of tapering cavities upon the obverse side of the plate, and by reason of which the coating of celluloid, rubber or other material may be very securely attached to the plate. The plate is then polished, the coating of celluloid, rubber or other material is secured thereto, and the teeth are fixed in position, after which the plate will be finished.

Should a very strong and elastic plate be desired it may be produced by the formation of two thin gold or silver plates in the way to be presently explained, and in filling in between the plates with molten solder or some other suitable material.

In order that my process may be fully understood, attention is directed to the accompanying drawings, which are explanatory thereof, and in which—

Figures 1 and 2, respectively, are an inverted plan view and a sectional view of the model and impression or cast before they are separated. Fig. 3 is an inverted plan view of a plate with globular depressions therein before being ground or polished off; and Fig. 4 is a view similar to Fig. 1, showing a somewhat larger impression or cast and illustrat-

ing the application thereto of a non-conducting material by which the size of the model deposited thereon will be limited.

In carrying out my process I first take an impression from the mouth, using for this purpose any suitable material, such as plaster-of-paris. This impression is represented at A in the drawings. The impression thus taken is carefully dried, and by means of a suitable tool a number of small cone-shaped or tapering depressions are formed therein at suitable points. It is then coated to the desired extent with very fine graphite or some other good conducting material. Instead of this the impression may be entirely coated with graphite, and a suitable insulating paint E or similar material, as shown in Fig. 4, is applied thereto at its portions where it is not desired to deposit the model. The impression thus coated is immersed preferably in a copper-bath and the copper model B is deposited on the conducting-surface thereof. The deposition in this bath is continued until a model of the desired thickness is obtained. The impression having the model deposited thereon is now removed from the copper-bath and the model is removed from the impression. By forming the small cone-shaped or tapering depressions in the impression, as before explained, the model obtained will be provided with semispherical projections thereon, as will be understood. This model is then filled in with a suitable backing material, such as plaster-of-paris, plaster and marble dust, or a low melting metal, such as "Darcet metal," so called, so as to be strong enough for the subsequent manipulations. The ordinary conducting-wire is now secured to the model, or if a metal backing is used the conducting-wire may be secured to the latter.

It is obvious that the obverse, or in Fig. 2 the under side, of the model is an absolutely accurate negative of the mouth, with the exception that it is a trifle smaller, owing to the minute coating of the conducting material applied to the impression.

The model, which has been suitably backed, as explained, is now coated to the desired extent on its obverse or under side with a suitable conducting material by which the minute difference in size between the model and the original impression is compensated for, after which the model is placed in a suitable gold or silver bath, and the desired plate is electrodeposited thereon onto the conducting material.

It may be stated that the model and metallic backing, if used, may be coated with a suitable non-conducting material, so as not to receive the gold or silver plating at other points. This electrodeposition is continued

until a gold or silver plate of the desired thickness is obtained, when the model is removed from the bath and the plate is separated therefrom. This plate, as will be understood, will be of the exact size and shape of the mouth, except that it will be provided with small cone-shaped or tapering depressions *b* therein. These projections are now ground or polished on the reverse side of the plate until the metal is entirely worn through the plate, whereby a series of shallow cavities will be formed in the plate having sloping walls and open at the lower end in the case of a plate for the upper jaw. When the coating or celluloid, rubber, or other material is applied to the reverse side of the plate, said coating will enter these cavities and set therein, being flush with the obverse side of the plate, so as not to inconvenience the wearer.

Before attaching the coating of celluloid, rubber or other material the plate is preferably polished, and before or after attaching said coating the teeth are applied thereto.

When very strong and elastic plates are desired, they may be produced by depositing a thin gold or silver plate upon a model, as explained, then in removing the plate from the bath, then in covering the thin gold or silver plate with a suitable layer of conducting material, and then in electrodepositing another thin plate upon the latter. When the second plate has been thus formed, the two plates are separated from the model and from each other, and molten solder or other suitable material is run in between them.

Having now described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. The process of making dental plates, which consists in taking an impression from the mouth, forming tapering or cone-shaped depressions at suitable places therein, electrodepositing a model upon said impression, coating said model with a conducting material, and electrodepositing a dental plate thereon, then in grinding or polishing down the tops of said depressions, substantially as set forth.

2. The process of making dental plates, which consists in taking an impression from the mouth, coating the same with a conductive material, depositing a plate thereon, coating said plate with a conducting and readily-removable material, depositing a second plate thereon, removing the conducting material between said plates and substituting a permanent material, substantially as set forth.

JOANNES FRANCISCUS XAVERIUS HAMER.

Witnesses:

JOHN EILERT GREVERS,
AUGUST SIEGFRIED DOCENS.