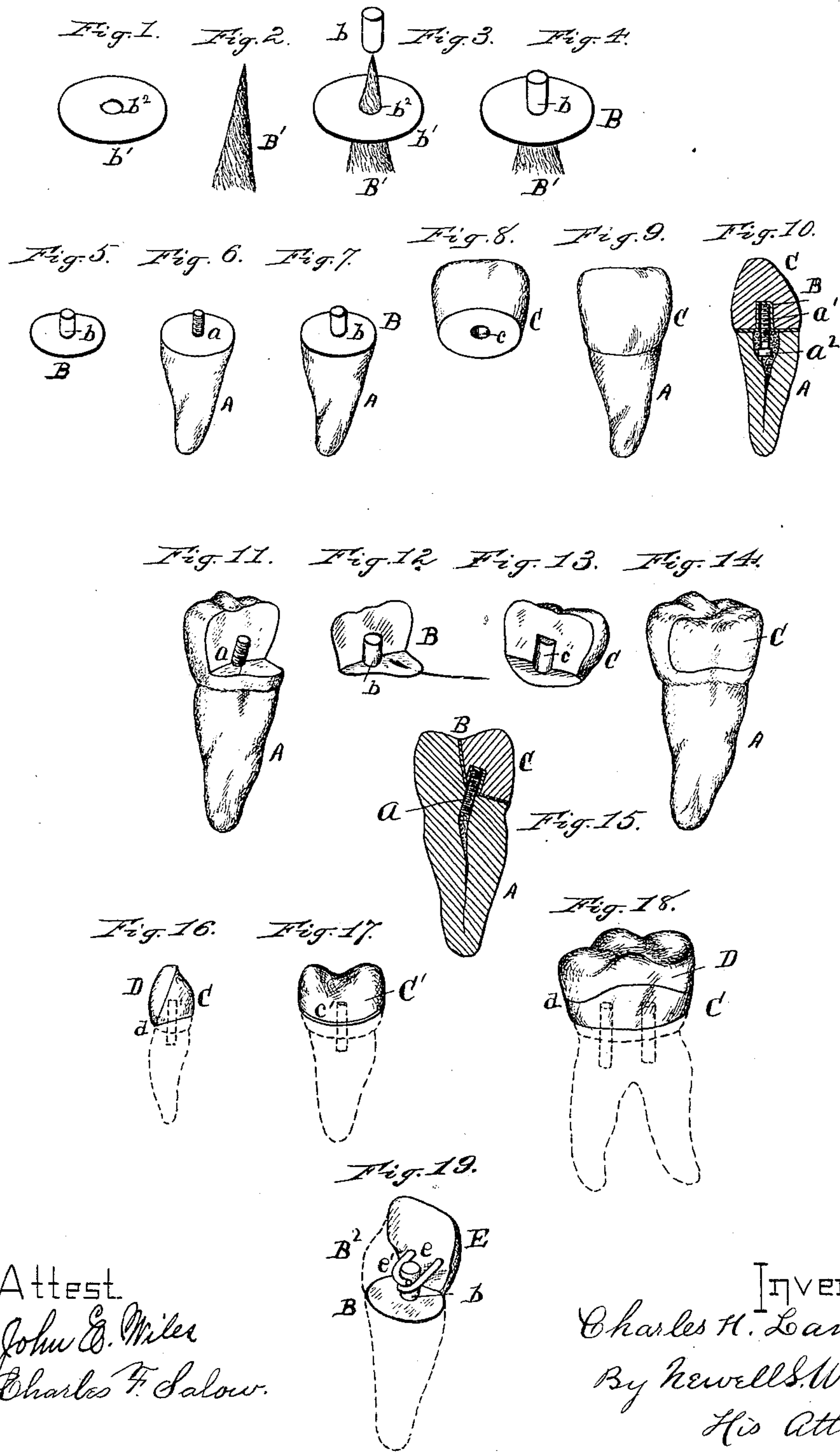


(No Model.)

C. H. LAND.
ARTIFICIAL TOOTH CROWN.

No. 403,597.

Patented May 21, 1889.



UNITED STATES PATENT OFFICE.

CHARLES H. LAND, OF DETROIT, MICHIGAN.

ARTIFICIAL TOOTH-CROWN.

SPECIFICATION forming part of Letters Patent No. 403,597, dated May 21, 1889.

Application filed October 3, 1888. Serial No. 287,086. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. LAND, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in a Process of Forming Artificial Crowns and Partial Crowns for Teeth; and I 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, reference being had to the accompanying drawings, which form a part of this specification.

My invention embraces certain new and useful improvements in dentistry; and it relates more particularly to a novel process of forming artificial crowns and partial crowns for teeth. It has among its objects, first, the manner of forming and adjusting a metallic matrix or supporting-base over an anchoring post or screw engaged in the tooth in any desired way; second, the manner of combining with the matrix or base a prepared crown or part of a crown; third, the manner of combining with the matrix a previously-prepared veneer constituting the surface of the crown or partial crown, and fused upon the matrix with an intervening vitreous substance—such as glass, porcelain body, and the like; fourth, my invention contemplates in some instances, also, the method of uniting an ordinary artificial tooth with its fastening-pins upon the post engaged upon the root of the tooth, and with a filling of porcelain body or the like substance; fifth, it contemplates, moreover, in some cases the method of fusing upon the matrix or base herein described the porcelain body alone constituting the crown or partial crown; sixth, I have also in view the process of fusing a partial crown upon the matrix and the union thereupon of a previously-prepared veneer by means of a vitreous substance fused therewith by means of a blow-pipe or otherwise; seventh, my invention embraces the formation of a crown or portion of a crown with a tubular socket to fit upon a matrix constructed with an analogous cap or tube to fit upon the post or screw in the tooth; eighth, the union of the matrix with its crown upon the tooth; or, ninth, the union of the crown so prepared upon the

tooth without the matrix; and, tenth, my invention embodies the general methods of construction of parts and their combinations, as more fully illustrated in the accompanying drawings, and more clearly hereinafter specified, and pointed out in the claims.

In the drawings, Figures 1, 2, 3, and 4 illustrate the various steps in my improved process of forming a matrix or supporting-base with a tubular socket to engage upon a post or screw in the tooth. Figs. 5, 6, 7, 8, 9, and 10 illustrate various operations and stages in the process of crowning an incisor. Figs. 11, 12, 13, 14, and 15 show my improved method as applied to the partial crowning of a bicuspid. Fig. 16 is a view illustrating the application of a single cusp-veneer upon a tooth. Fig. 17 shows my improved method of applying a bicuspid crown or veneer. Fig. 18 illustrates a method of applying a molar-veneer, and Fig. 19 shows my improved method of uniting an ordinary artificial tooth upon a post engaged in the root of the tooth.

I carry out my invention as follows:

A illustrates a tooth provided with an anchoring post or screw, *a*, engaged therewith in any desired manner, as, for instance, with the well-known "Howe post."

The manner of securing the post in position in the tooth forms no special feature of my present invention. To accomplish this object a screw, *a'*, may be engaged in a fastening device, *a''*, embedded in the tooth-cavity, as shown in Fig. 10 in section.

In Fig. 5 is illustrated a matrix, *B*, fitted upon the prepared tooth *A* and its post *a*, the matrix being provided with a metallic tube or chamber, *b*, to fit over said post.

I find the following a very convenient process of forming the matrix or base. A piece of platinum plate, *b'*, is burnished upon the prepared surface of the tooth, a hole, *b''*, being made therein to permit the piece to be passed over the post. The shape of this piece will of course vary according to the tooth surface to be crowned. Asbestos fiber is then made into a rope, *B'*, as shown in Fig. 2. A piece of tubing to constitute the cap *b* is then passed over the fiber, which is inserted through the orifice *b''*, as shown in Fig. 3. The asbestos is packed within the tube by a suit-

able instrument, when the cap is brought into position and there supported in place by the asbestos, as shown in Fig. 4. The tube is then soldered to the base. This will be found a very convenient and rapid method of holding the platinum tube firmly in position while soldering it in place. Upon this matrix or supporting-base thus fitted to position I may then build up a porcelain body to constitute a crown, C, the same being formed with a countersink or chamber, as at *c*, to receive the tubular cap of the matrix or base. The porcelain body mixed into a stiff putty or paste may in its plastic condition be readily molded and carved into any desired shape. Thus the porcelain body may be built upon the supporting-base and shaped, as shown in Figs. 8, 9, and 10. It is then placed in the muffle of the furnace and fused. When removed from the heated muffle, it may be placed in a cold muffle and the air excluded therefrom until sufficiently cool. When removed therefrom, a shrinkage will be found to have taken place. This is known as the "first biscuit." In some cases cracks will have formed and the body will have separated from the base. Resort is therefore had in such cases to a second biscuit. A quantity of porcelain paste mixed to suitable consistency is carefully applied to the original crown and molded thereon to preserve the original form, when it is passed again through the furnace, coming out in perfect shape. In some cases the base will act chiefly as a support. In others it will constitute also a matrix to give proper form to the base of the crown to fit it for a cavity or partial crown, as shown in Figs. 11, 12, 13, 14, and 15, the same representing a typical case of the application of my invention to a bicuspid. In many cases, in order to more effectually imitate the natural color and expression, the anterior surface of this prepared porcelain denture already described may be so molded or ground off as to make room for the application thereupon of a previously-prepared veneer, D. Such a method of construction is illustrated in Figs. 16 and 18. In this manner a front may be applied having the proper blending of color and shading to correspond with its natural neighbor, and in a more precise and ready manner than where dependence is had to a structure built up entirely of plastic porcelain paste, and to shading and carving the same before fusion, the method being adapted to partial or to complete crowns. When a veneer is applied, it may constitute a single cusp or a bicuspid veneer, or a molar-veneer, or be fitted to any anterior portion of the crown. The veneer is applied to the structure built up of porcelain paste by fusion therewith. Thus it may be applied thereupon before the fusion of said structure and fused therewith, whereby it will be firmly held in place, or after said structure is fused and shaped to receive the veneer the two may be united by the appli-

cation of an intermediate stratum of plastic porcelain paste, as at *d*, the whole then being fused together in a furnace; or the veneer may be applied to said structure by the use of any other vitrified substance—as glass, for instance—applied by the blow-pipe or fused therewith by the use of a furnace. When the crown or partial crown, either with or without a veneer, is thus completed, it is applied upon the tooth, the countersink thereof fitting over and about the post in the tooth, as shown in Figs. 10 and 15, the crown being cemented upon the tooth by the use of an ordinary or suitable cement, the post entering the countersink and affording great firmness.

In some instances I contemplate having the entire crown formed as a separate article of manufacture, so constructed that it may be readily adjusted upon a matrix or base such as I have described. Such a process is shown in Fig. 17, where the entire crown C' consists of a previously-prepared structure or veneer, the same being provided with a countersink to engage the tube of the matrix or base, as shown in dotted lines at *c'*. The artificial crown is fused upon the matrix or base by means of a vitrified intervening substance under the blow-pipe or in a furnace.

In Fig. 19 I have shown an ordinary artificial tooth, E, with its pins *e* bent about and soldered upon the tube *b*, as at *e'*. A backing or filling for the crown, made of plastic porcelain body, is then applied to give greater firmness to the structure, the same being fused with the artificial tooth and upon the matrix. Such a backing or filling of porcelain body is shown in Fig. 19 in dotted lines at B². In this instance the artificial tooth serves the purpose as a veneer, and is contemplated as coming within the term "veneer" in the following claims. It is united with the crown B² in the same manner as the veneer, as hereinbefore described, with the addition of the pins *e* engaging the tube *b*.

What I claim is—

1. The process herein described of forming an artificial crown or partial crown conformed to the lost portion of a tooth, consisting of securing an anchoring-post in the tooth, fitting thereupon and upon the adjacent tooth portions a thin plate of metal to form a matrix or supporting-base, then fusing upon said matrix or base an artificial crown or partial crown, substantially as described.

2. The process of forming an artificial crown or partial crown conformed to the lost portion of a tooth, herein set forth, consisting of securing an anchoring-post in the tooth, fitting thereupon and upon the adjacent portion of the tooth a thin plate of metal to form a matrix or supporting-base provided with a tube to engage the post, then molding upon said matrix or base a crown or partial crown of plastic porcelain body, and fusing said body, substantially as described.

3. The process of forming an artificial crown

or partial crown conformed to the lost portion of a tooth, herein set forth, consisting of securing an anchoring-post in the tooth, fitting thereupon and upon the adjacent portion of the tooth a thin plate of metal to form a matrix or supporting-base provided with a tube to engage said post, then molding upon said matrix or base a crown or partial crown of plastic porcelain paste, and fusing said body, provided with an anterior veneer thereupon, substantially as described.

4. The process of forming an artificial crown or partial crown conformed to the lost portion of a tooth, herein set forth, consisting of securing an anchoring-post in the tooth, fitting thereupon and upon the adjacent portions of the tooth a thin plate of metal to form a matrix or supporting-base provided with a tube to engage said post, engaging a veneer with

said tube by means of pins in the veneer, and molding thereupon an intermediate body of porcelain paste and fusing said body with the veneer and said matrix or base, substantially as described.

5. The herein-described process of forming a matrix or supporting-base for an artificial tooth - crown or partial crown, consisting of securing an anchoring-post in the tooth, fitting upon the tooth adjacent to said post a thin perforated metal plate, *b'*, then uniting upon said plate a tube, *b*, to engage said post, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

CHARLES H. LAND.

Witnesses:

N. S. WRIGHT,
CHAS. F. SALOW.