

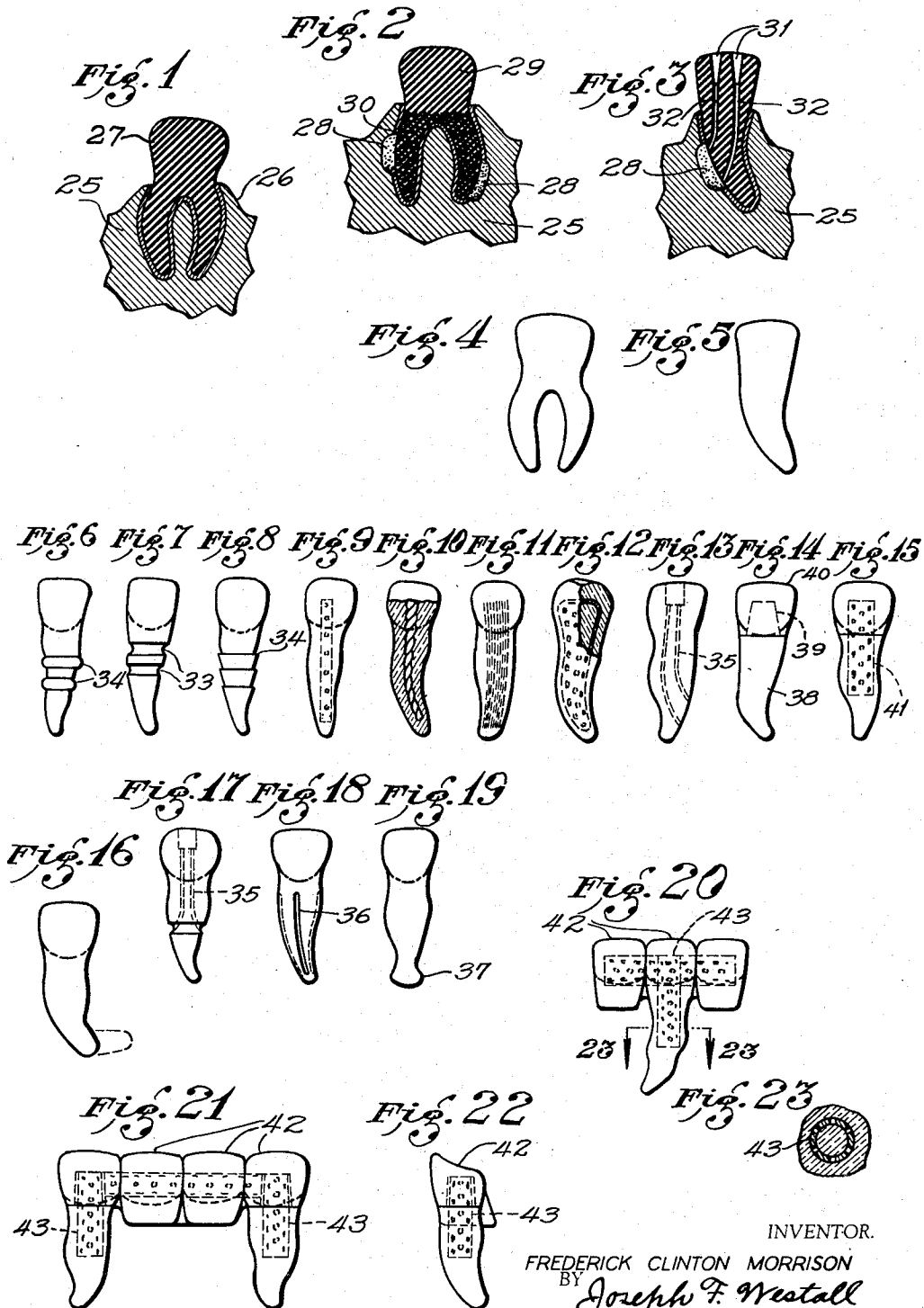
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ARTIFICIAL TOOTH AND METHOD OF INSTALLATION OF THE SAME

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ARTIFICIAL TOOTH AND METHOD OF
INSTALLATION OF THE SAME

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This invention relates to artificial teeth and method of their implantation in a tooth socket of the alveolar process of the jawbone to replace diseased, decayed, broken, deformed, or otherwise defective teeth.

In the art prior to my invention it has been general practice to replace the defective crown or upper portion of a natural tooth and employ the lower root portions thereof as a foundation for an artificial structure. In preparing the lower natural root formation for such use the pulp must necessarily be removed, together with the arteries, veins, and nerves, to insure thorough sanitation within the tooth. However, due to the proximity of the infectious virus of a decayed tooth, before its removal, the root portions, surrounding peridental membrane and bone structure are invariably contaminated, which cannot be remedied without extraction of the root portions themselves. It is thus ordinarily impossible to utilize any part of a partially decayed tooth for an unlimited time, without seriously affecting the health of the patient.

It is a general object of my invention to provide a means and method whereby defects in natural teeth, either because of decay, infection, or similar noxious conditions, or a physical injury or deformity, may be corrected by replacement of the natural tooth with an artificial structure rooted in the same manner as the original tooth.

A specific object of my invention is to provide an artificial tooth of any size and shape having root portions adapted to seat in the tooth socket of the jawbone so as to replace all or any part of the original tooth, and which will be united, when so placed, with the peridental membrane and alveolar process by natural secretions of cementum in the same manner as the original tooth.

Another object is the provision of an artificial tooth or portion thereof having a shape determinable by the shape of a specific tooth socket in which the tooth is to be implanted, and adapted to have metal reinforcing fiber, bars, or tubes incorporated therein to lend either flexibility or strength and rigidity as required, and which structural bonds may, in accordance with specific requirements, be extended through the sides thereof and associate with adjacent natural or artificial teeth, a removable crown, or as a support for bridge structure.

Another object is the provision of an artificial tooth embodying in combination with any of the above features, roots and neck portions having

a porous exterior, the cells of which are adapted to be filled with a gelatinous compound and animal fiber or similar substances so as to cooperate with the cementum secretions adjacent the peridental membrane to retain the artificial tooth within the socket.

Another object is to provide an artificial tooth comprising a rooted portion embodying any of the characteristics above designated having a substantially flat upper surface to furnish a foundation for a bridge formation, a set of adjoining teeth not necessarily themselves rooted, or a removable crown.

Another object is to provide a method by which natural teeth having one or more root portions may be replaced by artificial teeth in individual natural sockets of the alveolar process or ridge of the jawbone and encourage the natural growth of tissues around the same to thus retain the roots and neck of the tooth in the same manner as the original.

Another object is the provision of a method of preparing and treating a decayed or diseased tooth socket for the installation of an artificial tooth.

In the drawing—

Fig. 1 is a diagrammatic sectional view of the jawbone and alveolar process or ridge forming the tooth socket, with a rubber or other flexible temporary filling disposed therein;

Fig. 2 is a section similar to Fig. 1 showing a diseased portion of the tooth socket and a medicated temporary flexible filling comprising two integral portions, varying in their porosity disposed therein;

Fig. 3 illustrates in section a channelled flexible filling for treatment of diseased portions of the tooth socket;

Figs. 4 and 5 are elevations of solid porcelain teeth adapted to replace, respectively, the temporary fillings illustrated in Figs. 1 and 3;

Figs. 6, 7 and 8 are elevations of porcelain teeth having auxiliary means to resist removal from the tooth socket;

Figs. 9, 10, 11 and 12 illustrate artificial teeth, in elevation, embodying various reinforcing structures;

Fig. 13 shows a tooth in elevation, with channels for treating diseased portions;

Fig. 14 is an elevation of a composite tooth comprising a root portion and a crown connected by means of a dowel pin;

Fig. 15 is a composite tooth, in elevation, reinforced by a perforated tube, shown in dotted lines;

Fig. 16 is an elevation of a tooth with dotted lines indicating an abnormal projection of the original natural tooth it is adapted to replace;

Fig. 17 is an elevation of a channelled tooth;

Fig. 18 is an elevation of a tooth provided with grooves to facilitate attachment in the socket;

Fig. 19 is an elevation of the tooth having a knob at its lower end;

Figs. 20 and 21 illustrate in elevation the crown portions of teeth supported by adjacent rooted artificial teeth;

Fig. 22 is an end elevation of the rooted tooth illustrated in Fig. 21;

Fig. 23 is a section on line 23—23 of Fig. 20.

Referring to the drawing in detail, the numerals of which indicate similar parts throughout the several views, 25 designates the jawbone, and 26 the alveolar process or ridge in which the tooth socket is formed. The specific natural shape of the alveolar process depends upon the number of root portions it supports. Between the natural teeth and the osseous tissues of the jawbone, the peridental membrane is located, through which the nerves, arteries, and veins pass to the lower end of the roots and into the inner pulp chamber of each tooth. The teeth are held within the socket by a natural cement produced by glands within the peridental membrane. While a thorough understanding of the composition and function of individual natural elements of the tooth socket is imperative for complete appreciation and recognition of the present invention, it is believed that such information is well within the knowledge of those of skill in this art.

By careful extraction of the tooth and adhering cementum, by well known means, the glands which produce the cementum may be preserved. Upon removal of the natural tooth, the alveolar process, and peridental membrane will immediately begin to disintegrate unless a substitute is provided to stimulate growth and the glands to rebuild old tissue. Diseased portions of the socket must be cured and dead tissue removed. To combat these difficulties and particularly to allow time for common skill in the art combined with well known natural and artificial expedients to cure and cleanse the cavity, a temporary expansible filling 27 is inserted therein. This temporary filling, preferably composed of gutta percha, rubber or the like, maintains the cavity at the exact size and shape until a porcelain permanent tooth can be constructed and the cavity prepared for its installation. As is well known, natural teeth may have abnormal root formations which many times interfere with adjacent teeth. For this reason, the shape of the temporary filling does not necessarily conform to the shape of the cavity, but may be smaller or improved by omitting abnormalities. In such case the portion of the cavity not occupied by the filling will gradually close and disappear. Certain dimensions of the filling may be larger to expand the cavity at certain points to aid in retaining the permanent tooth when installed as will hereinafter appear.

A series of fillings may be successively inserted into the cavity, each slightly larger or changed in design from its predecessor to alter the form of the tooth socket. Successively-placed fillings may similarly vary in porosity and renitence to gradually mold the socket.

To facilitate treatment of a diseased cavity, generally indicated at 28, before the implantation of the permanent tooth, a filling 29 is provided,

having a very porous lower portion 30 (Fig. 2). The pores of filling 29 are impregnated with a medicated wax which is melted by the heat of the body or forced against the diseased portion of the tooth socket by compression of the filling. A flexible filling having a pair of canals is shown in Fig. 3. The canals comprise a pair of funnels 31 embedded in the top of the tooth communicated with a pair of tubes 32. The tubes extend to opposite sides or ends of the diseased portions of the socket and furnish conduits for medicaments to be passed over the diseased portions and removed with the infectious matter or dead tissue. When the curative irrigation is not in progress, the funnels may be sealed by well known means.

When it has been determined that the cavity is thoroughly cured, formed, cleaned, and sufficiently healed, a permanent tooth, reinforced if desired as hereinafter specified, is inserted therein and the temporary filling discarded. This final tooth is preferably made of inorganic mineral elements or salts, such, for instance, as porcelain, impervious to stains or deterioration. The crown of a permanent porcelain tooth may be of any desired color, shape, or brilliance.

Permanent teeth, adapted for installation in the cavities indicated in Figs. 1 and 3, are shown in Figs. 4 and 5 respectively. Immediately upon installation the tissues of the jawbone structure, alveolar process, peridental membrane, and cementum build up between and around the roots, and, when not disturbed, the tooth is soon firmly held in the socket at exactly the angle desired. Braces (not shown) of the type well known in the art may be employed to prevent displacement of a tooth until natural agencies have established the tooth.

In the manufacture of the canines, particularly the single root may be provided with grooves 33 or ridges 34 of any shape to facilitate its retention in the tooth socket by the growth of tissues thereover. Figs. 6, 7 and 8 illustrate examples of such construction. Various means of reinforcement may be embodied in the tooth by the manufacturer. Fig. 9 illustrates, in dotted lines, a non-corrosive perforated metal tube embedded in a porcelain body. In Fig. 10 twisted wire provides strength without the accompanying rigidity of a steel bar or tube. Mineral fibers (Fig. 11) may be incorporated in the ceramic mixture of the porcelain tooth prior to firing, such as flint, sillimanite, pyrophyllite, kyanite, synthetic mulite needles, or any fiber which will not be dissolved or undergo a physical change in the process of firing the tooth. In Fig. 12 a metal perforated tube conforming to the shape of the final tooth is illustrated in dotted lines, which provides great rigidity.

The natural tendency of the tooth socket glands is to build up and close the cavity, as above noted. Abnormal root formations of original teeth, as indicated in dotted lines in Fig. 16, may be omitted in both filling and artificial tooth, and will be eventually supplemented by natural osseous tissue.

If it should be necessary to continue treatment of the tooth socket after the installation of a permanent tooth it may be done by means of the teeth illustrated in Figs. 13 and 17, which are provided with channels 35 and through which a circulation of a fluid medicament may be established. The channels are sealed when not in use to prevent foreign matter from contacting

the cavity or impeding circulation through the tubes.

5 In addition to the horizontal grooves 33 or ridges 34 as is shown in Figs. 6, 7 and 8, longitudinal grooves 36 illustrated in Fig. 18 may be provided in the tooth root to counteract any tendency of a tooth to turn in its socket before final setting. A knob 37 (Fig. 19) may be formed any place on the root in specific embodiments to aid 10 in retaining the final tooth.

Rooted artificial teeth being entirely free from organic matter affected by mouth acids, capable of strength far greater than ordinarily required, and formed for their most rigid balanced support in their sockets, provide an excellent foundation for crown or bridge formations. A canine root structure 38 is illustrated in Fig. 14 provided with a dowel pin 39 on which is mounted a crown 40 of any shape or shade desired. A rod, or as is shown in Fig. 15, a perforated tube 41, may be substituted for the dowel pin to retain the crown in place. 15

My invention is particularly adaptable for bridge and set structures. Figs. 20 and 22 illustrate two applications of said construction, of which there are many well known in the art. It should be noted that the crown portions 42 are cast in a single unit with the supporting tube 43, 20

entirely invisible, being molded within the porcelain.

What I claim and desire to secure by Letters Patent is:

1. The method of replacing an entire natural 5 tooth with an artificial tooth which consists of extracting the natural tooth, cleaning the cavity, inserting a flexible filling into the cavity of sufficient rigidity to resist compression by growth of the natural tissues and stimulate gland activity, 10 moving the filling periodically to prevent adherence to the cavity walls, extracting the filling and inserting a rigid permanent tooth of substantially the same size as the filling.

2. The method of replacing an entire natural 15 tooth which consists of extracting the natural tooth, inserting an expansible filling into said cavity, and periodically substituting a filling more resistant to pressure of the walls of the cavity than its predecessor. 20

3. The method of replacing a natural tooth which consists of extracting the natural tooth and inserting therein an artificial tooth having a pair of tubes from the crown through the root and circulating a medicinal fluid into one of said 25 tubes and from the other of said tubes.

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