

F. S. WELDEN.
DEVICE FOR TOOTH RESTORATION.
APPLICATION FILED OCT. 19, 1910.

996,818.

Patented July 4, 1911.

Fig. 1,

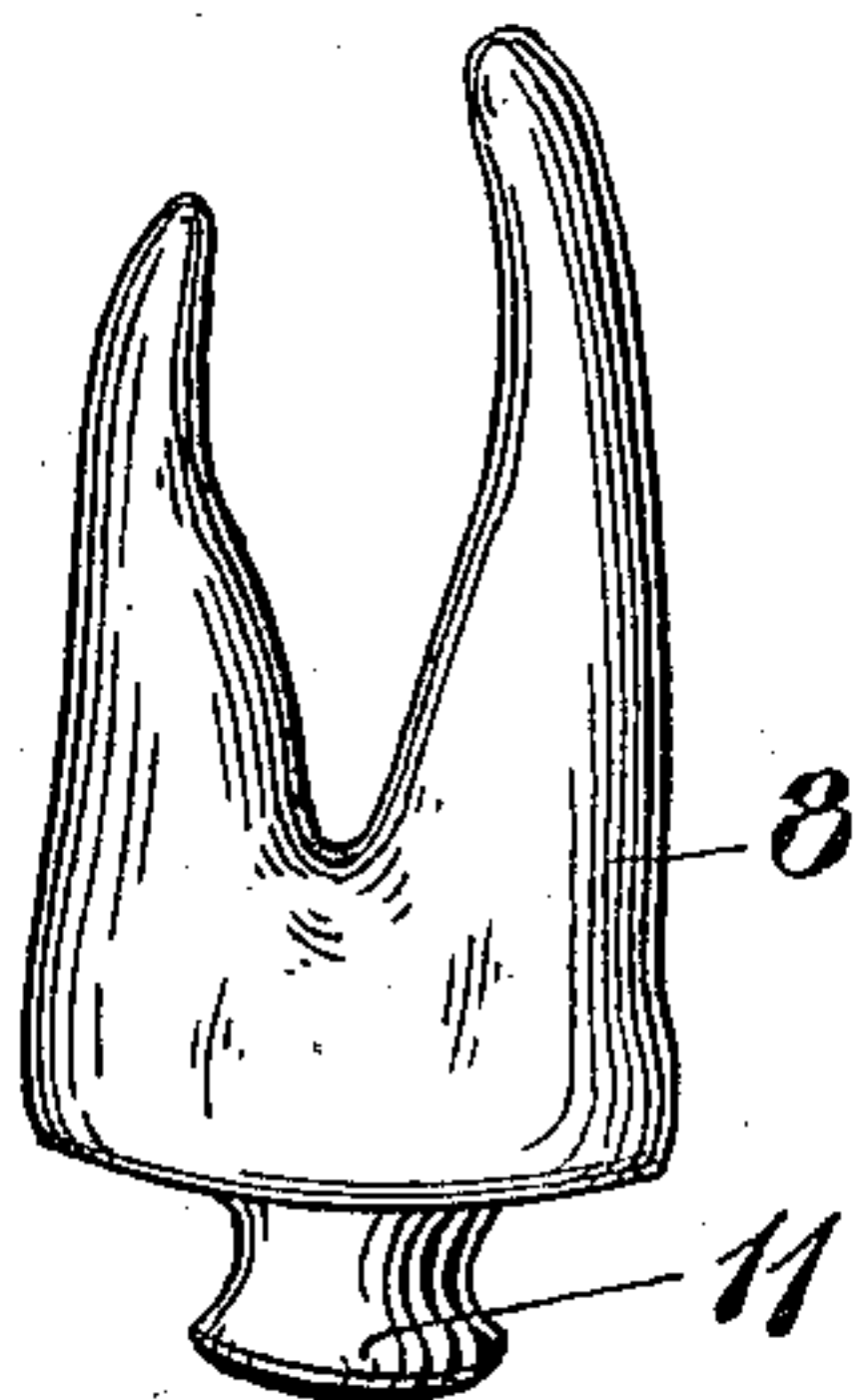


Fig. 2,

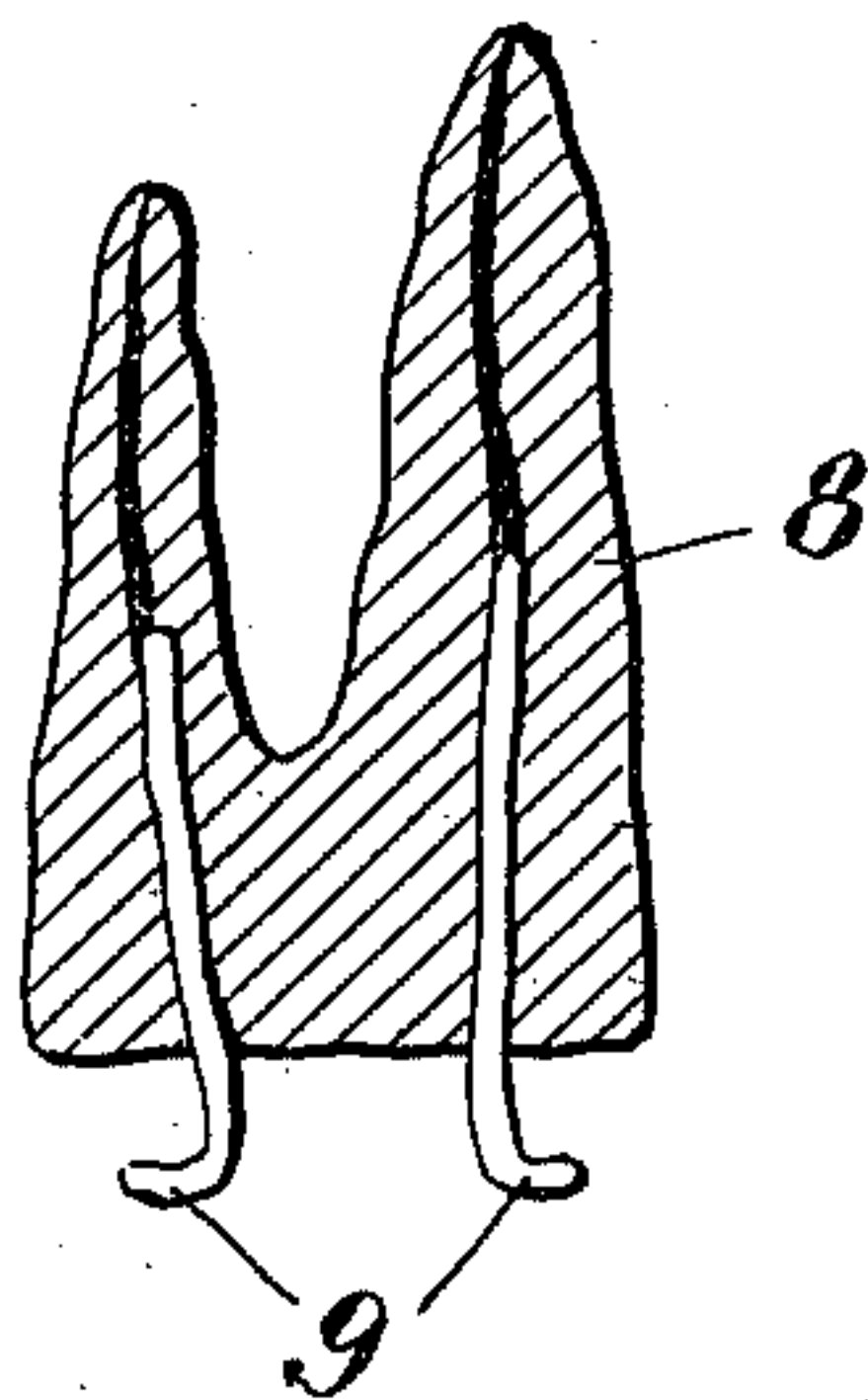


Fig. 3,

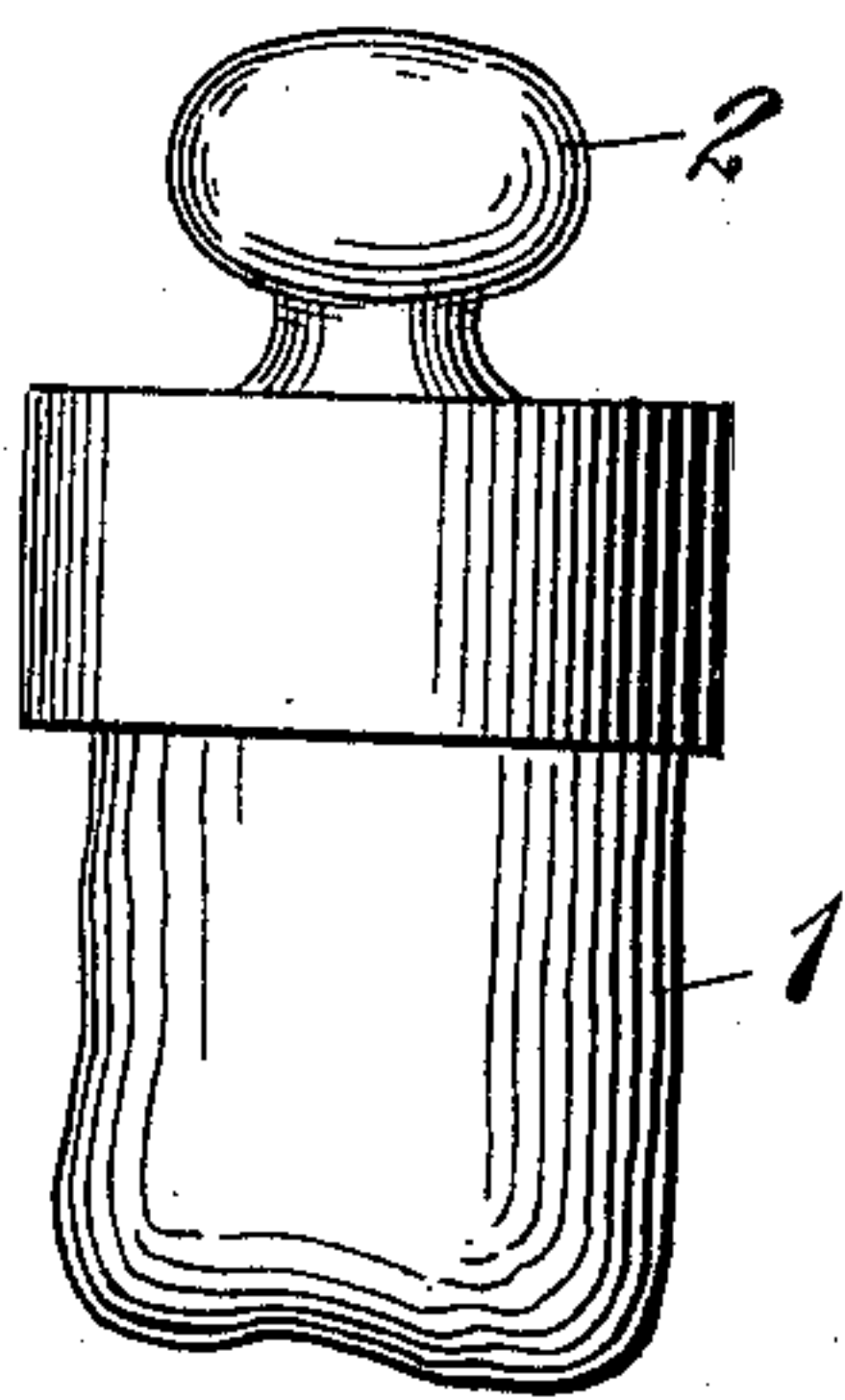


Fig. 4,

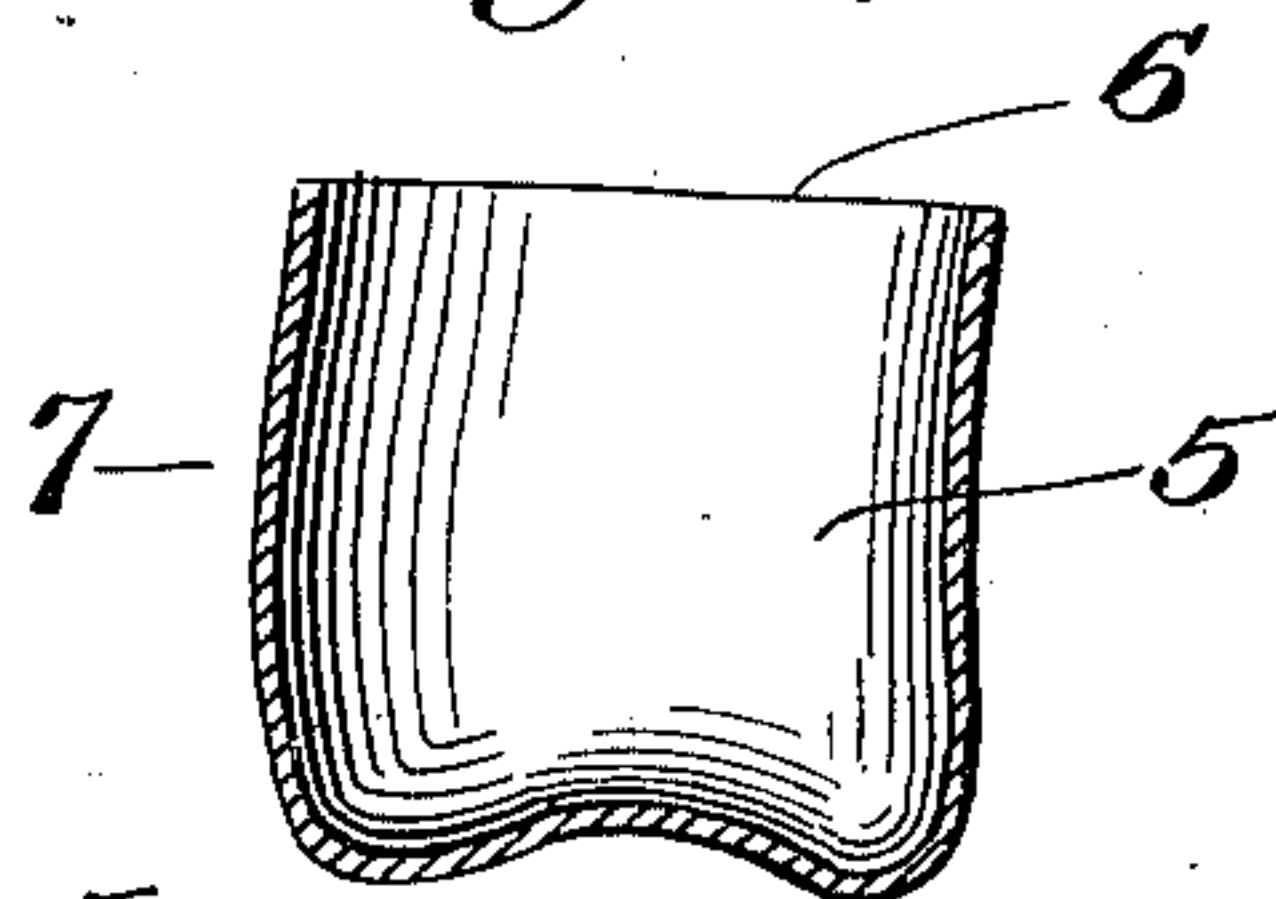
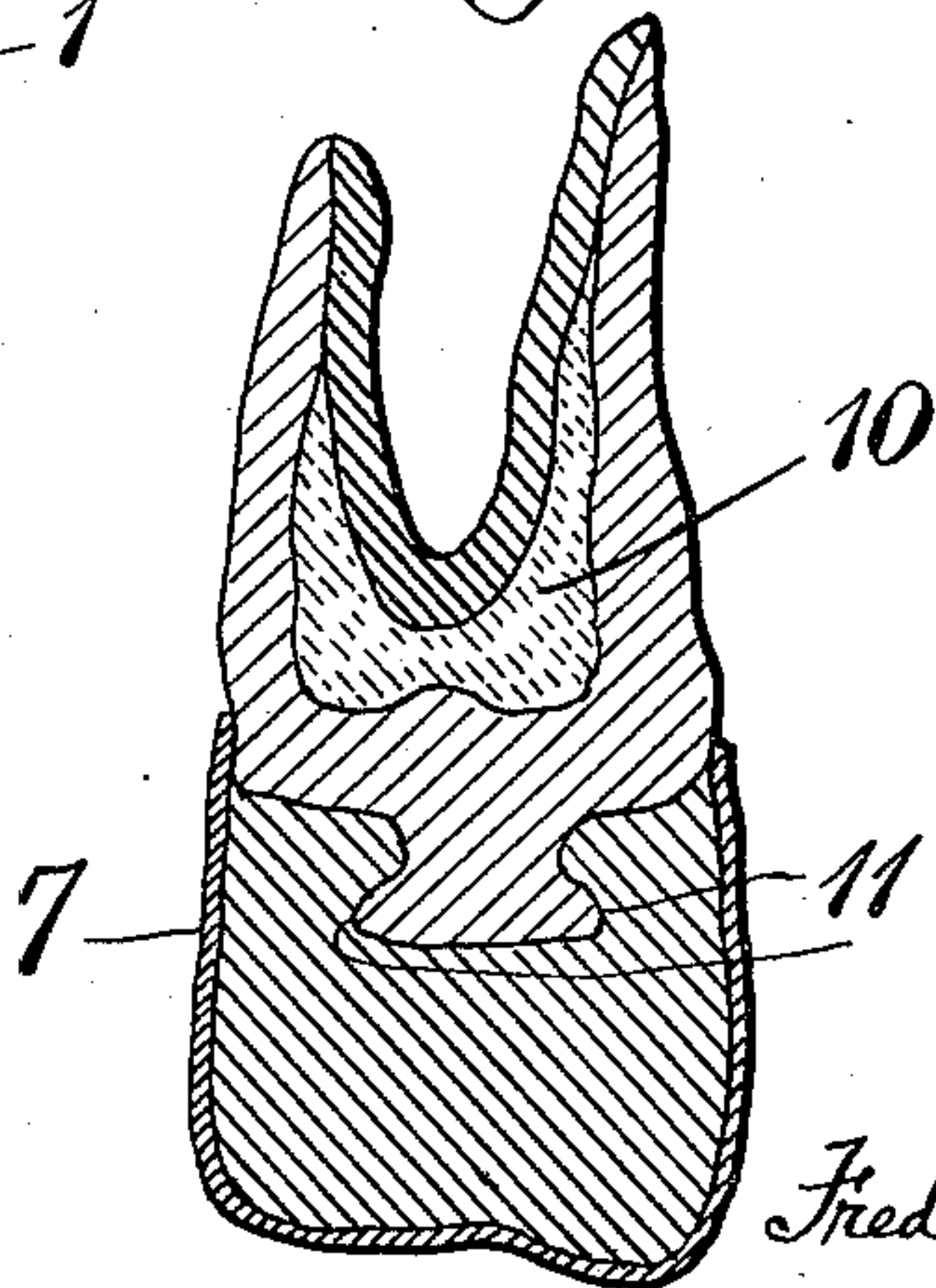


Fig. 5,



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DEVICE FOR TOOTH RESTORATION.

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To all whom it may concern:

Be it known that I, FREDERICK STANWOOD WELDEN, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Devices for Tooth Restoration, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to the restoration of diseased, broken or malformed teeth in substantial simulation of the natural teeth, and it is applicable to all cases requiring such treatment, whether the crown of the tooth is entirely or partially destroyed, so long as the roots or fangs of the tooth are in condition to support a crown.

My invention is also applicable to what is known as bridge work where one or more artificial teeth are required to be supported by contiguous roots.

In the accompanying drawings, in which I have illustrated my invention, Figure 1 is a view of a tooth remnant prepared for the application of a restoration without injuring the pulp or nerve. Fig. 2 is a view of a root from which the entire crown has been cut away, also prepared for the application of the restoration. Fig. 3 is a view of a former employed in carrying out my invention. Fig. 4 is a vertical cross section of my invention, and Fig. 5 is a sectional view of a restored tooth.

Similar reference characters are employed to designate corresponding parts in all the views.

In carrying out my invention I provide a former 1, for the restored tooth. This former is shaped to correspond in size and shape to the tooth to be restored, and is provided with a handle 2 for convenient manipulation. If desired, an assortment of these formers, of various shapes and sizes, may be made in advance, of metal or other durable material, and from the assortment may generally be selected one of the desired shape and size; but where only a small portion of the crown of the tooth requires restoration, or where it is desired that the restored tooth shall be an exact counterpart of the original tooth, an impression may be made in wax or plastic material from which a duplicate of the remnant may be made in plaster in a manner well understood by those skilled

in the art. The former is then completed by building up this duplicate to correspond with the tooth in its original or desired form.

Having thus provided what I have termed a former, which it is to be understood shall correspond as closely as possible with the tooth in its original or desired form, I produce therefrom a cup-like matrix, which is shown in section in Fig. 4, and is entirely novel, and so far as I know has never before been used in the art of tooth restoration. It consists in general terms of a cup-like device 5, open at one end 6, and closed at the other end 7. The interior surfaces of the walls at the closed end 7, which correspond to the enamel or external surfaces of the tooth, are fixed in form, having the permanent shape of the restoration, by which I intend to have it understood that they are sufficiently rigid to preserve their form without distortion or relative movement during the subsequent operations involved in my process. The open end 6, of the matrix, corresponds interiorly in general shape and size to the tooth to be restored, and the walls at the open end are preferably slightly flexible to facilitate subsequent operations. The matrix is formed of some non-metallic material which will have no oxidizing or chemical effect on the cement used in forming the restoration. I have secured the best results by using for the matrix pyroxylin compounds, such as celluloid, but it is to be understood that my invention is not restricted to the use of any particular materials except where so specifically stated. However, I prefer the use of celluloid or some like substance, because of the facility it affords for the manufacture of the matrix; because it imparts to the restoration a smooth glossy surface resembling the natural surface of a tooth, and because, being transparent, it is hardly distinguishable while in position during the hardening of the restoration, and also permits, owing to its transparency, an accurate adjustment of the restoration into position, and into the retaining devices provided for it.

In order that my invention and its functions and advantages may be clearly understood I will now describe generally a preferred method of forming the matrices and also the method of employing them in tooth restoration; but I make no claim to such methods in the present specification. The method preferably employed by me in con-

structing these matrices consists in immersing the tooth shaped end of the former used for the restoration in celluloid or other equivalent material in a solvent condition. The former is momentarily immersed to the depth required for the completed matrix, and then withdrawn, permitting the thin film of the solvent material to solidify. This operation is then repeated until the solidified material on the end of the former is of the requisite thickness. The matrix thus formed may then be readily removed from the end of the former, the slight flexibility of the open end of the matrix permitting it to be removed without cutting or mutilation. Any irregularity of the edges of the open end of the matrix may then be removed and the matrix is ready for the subsequent operations. In the mean time, or at such time as may suit the convenience of the patient, the tooth remnant 8 is prepared to receive and support the restoration. In case only the root or roots of the tooth remain, it is trimmed down sufficiently to furnish a proper bearing or supporting surface, and retaining hooks or wires 9 are anchored in the roots, in a manner well understood by those skilled in the art. If however the restoration is only partial so that the nerves and pulp 10 of the tooth may be preserved, the bony structure of the tooth is cut away, as shown in Fig. 1, so as to leave suitable retaining points 11 thereon. When the matrix 5 and the tooth remnant 8 have thus been prepared, I fill the matrix with a suitable compound in a plastic condition which will harden quickly, and when hardened will have the requisite durability to serve as the permanent restoration. For this purpose I preferably employ one of the improved dental cements now in use. These cements are furnished in different shades or colors, and a color is selected which matches the adjacent teeth of the patient. The matrix is then pushed firmly into place so that it occupies the position of the original tooth. By this operation the prepared end of the tooth remnant, or the retaining hooks or their equivalent, which are to be considered as constituting part of the remnant, are firmly embedded in the cement in the matrix. The slightly flexible edges of the matrix allow it to adjust itself to the varying contour of the tooth remnant as it is pressed into place, and at or near its open end to closely engage the periphery of the tooth when in its final position. Any surplus ma-

terial which squeezes out of the matrix as it is pushed into position is then removed. The matrix is then allowed to remain in position preferably for several days, until the cement is thoroughly hardened. During this period however the tooth may be used carefully with the matrix still in position, as the cement will set quite hard in a short time. The matrix being thin and preferably transparent, and conforming externally as well as internally to the general shape of the tooth, will not inconvenience the patient, and its presence, even upon an incisor tooth, will be hardly distinguishable. At the proper time however, the matrix is removed by cutting it slightly at one side, which permits its removal without difficulty. Any surplus material or any roughness between the meeting edges of the remnant and the restoration 12 may then be smoothed away, leaving the restored tooth so exactly corresponding in color, size and shape to the adjacent teeth that the restoration would not be suspected or detected save by an expert examination.

While it is not my intention to limit my invention to use with any particular cement, I have obtained the best and thoroughly satisfactory results with the latest improved silicate cement. This cement sets, and when set is extremely hard and durable. It takes a smooth polished surface from the matrix which, as stated, it is difficult to distinguish from that of a natural tooth.

I claim

1. A removable cup-like tooth restoring matrix, the closed end of which corresponds to the grinding or cutting surface of the natural tooth and is fixed in form and corresponds interiorly in shape and size to the tooth to be restored, and the open end of which is slightly flexible to permit it to assume the contour of the tooth to be restored.
2. A removable cup-like tooth restoring matrix formed of one of the pyroxylin plastics and conforming in shape and size interiorly to the tooth to be restored.
3. A removable cup-like transparent tooth restoring matrix.
4. A removable cup-like tooth restoring matrix, conforming in size and shape interiorly at its closed end to the restoration to be effected.

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Witnesses:

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