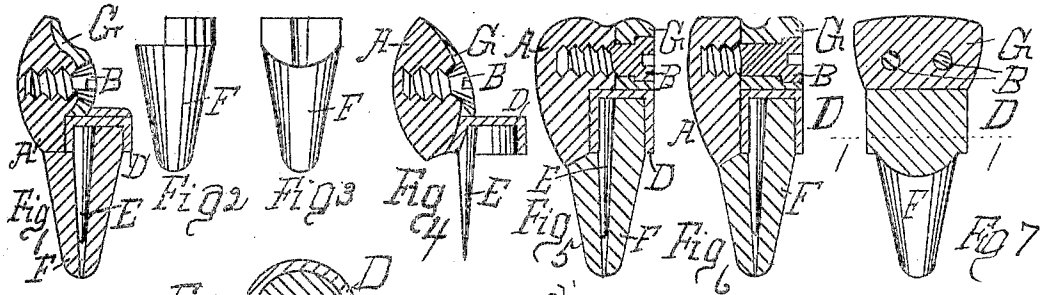
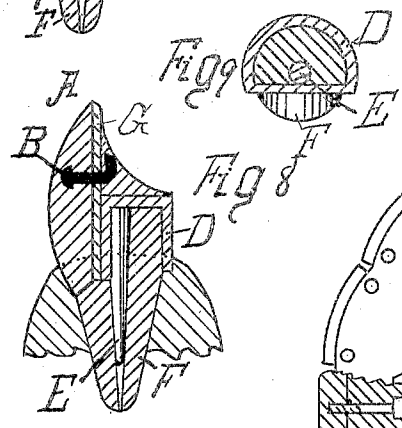
No. 797,312. PATENTED AUG. 15, 1905.

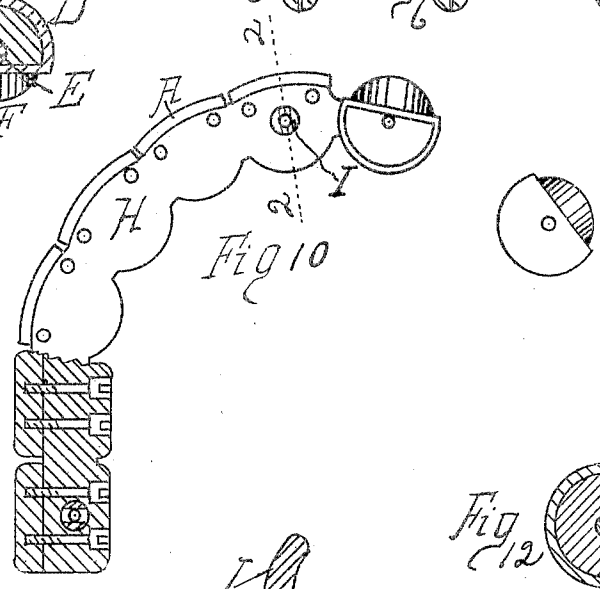
H. P. OSBORN.

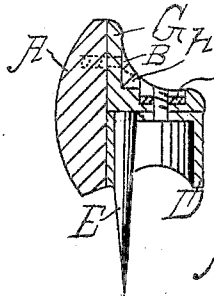
ARTIFICIAL TOOTH.

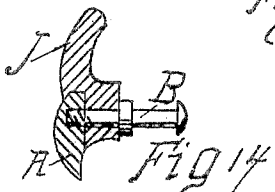
APPLICATION FILED MAY 9, 1904.

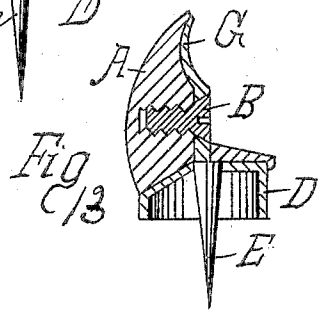


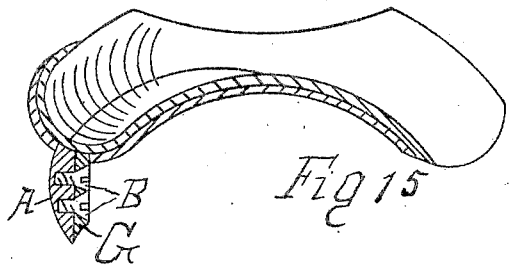












Witnesses
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ARTIFICIAL TOOTH.

No. 797,312. Specification of Letters Patent. Patented Aug. 15, 1905.

Application filed May 9, 1904. Serial No. 207,104.

To all whom it may concern:

Be it known that I, HENRY P. OSBORN, a citizen of the United States, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented a new and useful Artificial Tooth, of which the following is a specification.

My invention relates to improvements in artificial teeth, and comprises an improved method of inserting and attaching artificial teeth.

My invention further consists in a root-band flattened in front to seat in a step formed in the front side of a root, in the combination with such band of a tooth-facing covering the front of said band and likewise adapted to be seated in said step, and in the combination with such band of a canal-post secured thereto; and my invention further comprises a novel tooth-face.

Other features comprised in my invention will be described hereinafter and particularly pointed out in the claims.

The objects of my invention are to permit the renewal at will of broken or injured teeth or tooth-facings whether the same be in crown-teeth, in plates, or in bridges; to conceal from view the joints between crowns and the roots to which they are applied; to avoid projection of artificial teeth beyond the normal line; to provide an artificial tooth which shall closely simulate in appearance the natural tooth, which shall not expose its metal parts to view, and which shall have great strength and durability, and generally to improve and strengthen the construction of artificial teeth and to permit the ready repair thereof.

I will now proceed to describe my invention with reference to the accompanying drawings, in which certain constructions of artificial teeth or dentures embodying my invention are illustrated, and will then point out the novel features in claims.

Figure 1 shows a vertical section of a tooth-crown and of a root to which the same is attached, the root having formed thereon on its front side a step in which both the root-band and the upper portion of the facing are seated. Figs. 2 and 3 show, respectively, side and front views of a root stepped according to my invention to receive a crown. Fig. 4 shows a vertical section of a crown prepared for attachment to a root, the construction of the tooth-face and of the band being slightly different from the construction shown in Fig. 1. Fig. 5 shows a vertical section through a bicuspid crown and root. Fig. 6 shows another vertical section through a bicuspid crown and root, illustrating an alternative construction. Fig. 7 shows a vertical section taken on a plane parallel to the front of the tooth of a crown in place on a root. Fig. 8 shows a vertical section on a plane at right angles to Fig. 7 of the same crown and root and illustrates the attachment of the tooth-face to the band by pins instead of by screws. Fig. 9 shows a cross-section of a band and root on a plane substantially perpendicular to the axis of the root, the section being taken on the line 1 1 of Fig. 7. Fig. 10 shows a partial section and partial top view of a bridge comprising root-bands flattened to fit upon roots which have been stepped in accordance with my invention. Fig. 11 shows a vertical section through the bridge on the line 2 2 of Fig. 10. Fig. 12 shows a detail cross-section through a root which has been banded according to my invention, the view illustrating the use of a connecting-piece between the band and canal-post when said post is not immediately adjacent to the front flattened portion of the band. Fig. 13 is a vertical sectional view of a crown-tooth of the Richmond type and illustrates the use in such teeth of screw-threaded tooth-faces and the attachment of such faces to the bands and the backings thereof by means of screws. Fig. 14 shows a central vertical section of a gum-tooth block provided with a removable screw-threaded tooth-face held in place by a screw. Fig. 15 shows a vertical section of a dental plate provided with a removable tooth-face which is screw-threaded and is held to the backing of said plate by means of screws.

I will first describe my invention in its application to crown-teeth and will then describe its application to bridges and plates.

Referring first to Figs. 1 to 9, inclusive, illustrating the application of my invention to crown-teeth, in said figures reference-letter A designates a tooth-face formed of porcelain or other suitable material; B, a fastening-pin by which said face is attached to the band; D, the said band; E, a canal-post secured to said band; F, the natural root, and G a metal backing forming a part of the band and to which the face A is secured.

In applying a crown-tooth to a natural root according to my preferred method after the root has been cut off to the proper length, as is customary in crownwork, a step is formed

in its front side by grinding away the front of the root. Such step, as shown in Fig. 8, preferably extends above the edge of the gum, so that when the gum grows down to take the place of such portion of it as may be cut away during the forming of the step it will cover the joint between the root and crown. Said step also preferably extends inward to a point such that the canal-post when inserted in the tooth will be flush with the back of said step. Over the elevated portion of the root remaining after the forming of the step the root-band D is next placed. This root-band encircles the said elevated fraction of the root and is flattened in front to seat in the step formed in the root, as above described. Said band has attached to it the canal-post E, which serves to anchor the crown firmly to the root. The root-band by encircling the elevated fraction of the root preserves the latter from decay and prevents it from splitting. The band D is provided with a projecting portion G, forming a backing for the tooth-face A. Said tooth-face is customarily formed of porcelain, is curved on its front side to correspond to the curvature and proportions of the natural tooth, and at its upper or gum end is seated in the said step formed in the natural root, for which purpose the tooth-face is frequently notched or recessed at its upper or gum end, as indicated in Figs. 1, 5, 6, and 8. Said tooth-face may be attached to the backing, as indicated in Fig. 8, by pins B′, baked into the porcelain face and having their ends brazed or soldered into the backing; but preferably I employ screw-threaded pins B, as shown in Figs. 1, 4, 5, and 6, screwing into threads formed in the porcelain itself. This method of attaching the face has the great advantage that if the face is broken, cracked, or chipped in any way it may be removed and a new face applied in its place with little trouble and at little expense. This advantage, of much importance in crown and bridge teeth, is of equal importance in plate-teeth, to which reference will be made hereinafter.

To secure the face properly to the backing by means of a screw, it is important that the screw-threads formed in the porcelain shall be of fine pitch and perfectly formed. This is a matter of great difficulty, if not absolutely impossible, by former methods of forming such threads in porcelain; but I have found that the threads may be formed very perfectly and of as fine pitch as desired by employing a metal bushing threaded on the outside to correspond to the threads to be formed in the porcelain. This bushing, which preferably is of platinum, is placed within the tooth-mold used in forming the porcelain tooth, and the tooth substance is pressed in and around it. This bushing or matrix remains in the tooth during the subsequent baking of the latter and after the baking is removed from the porcelain by means of a suitable solvent which dissolves the matrix, leaving in the porcelain very perfectly-formed screw-threads. There is no loss of platinum, as the latter may be recovered from the solvent used, and hence the use of this expensive metal in the matrix is not precluded on the ground of expense. It is obvious that by employing matrices of different shapes other forms of recesses may be formed in the porcelain.

The method above described of forming screw-threads, grooves, overhangs, and the like in porcelain and similar vitreous materials or materials which are molded or pressed to shape forms the subject-matter of a divisional application for Letters Patent.

Obviously the tooth-facing having formed in it a screw-threaded recess adapted to receive a fastening-screw may be employed in other types of crowns besides those illustrated in Figs. 1 to 8 inclusive. Fig. 13 shows such a face employed in a crown of the Richmond type.

Porcelain tooth-faces provided with screw-threads adapted to receive a fastening-screw may also be employed with great advantage in dental plates. Such a tooth-face may be removed from the plate if broken or otherwise injured and replaced by a new tooth or face of similar form, thus avoiding an expensive and difficult repair, such as is required in case a tooth of a dental plate as heretofore constructed is broken or injured, and the removal of the broken tooth or tooth-face attached according to my invention can be done very quickly, as can the insertion of a new tooth or face, and no special skill is required. Fig. 14 shows a gum tooth-block provided with a removable tooth A separate from the gum portion J of the block and held in place by a screw B. Obviously in the case of a plate comprising a gum block or blocks constructed as shown in Fig. 16 in case one of the tooth-faces breaks it is the work of but a moment to unscrew the corresponding fastening-pin and remove the broken tooth-face and replace it by a similar perfect tooth.

Fig. 15 shows a metal dental plate K of the type which are struck up in dies. The teeth of this plate comprise faces A, removably secured to backings B, attached to said plate, the particular means employed for attaching the faces to the backings being screws. The upper edges of the faces project up under and are covered by the artificial or imitation gum of the plate, so that the plate thus formed very closely imitates in appearance the natural teeth.

The method of attaching crowns to teeth above described and the method of attaching vitreous tooth-faces to the bands of such crowns are obviously applicable to bridges as well as to single teeth. Figs. 10 and 11 show a bridge so constructed. H is the bridge proper, anchored at the ends, as is customary, to natural roots. The crown-bands D, by which the

bridge is secured to the natural roots, are similar to the crown-bands employed in single teeth and have faces similarly applied. The portion of the bridge intermediate the natural roots may likewise have removable tooth-faces.

As shown in Fig. 11, the bridge may be removed for cleaning by unscrewing nuts I.

When it is not convenient or desirable to attach the canal-post E directly to the front flattened portion of the band D, I connect said post to the band by means of a connecting-piece K, as shown in Fig. 12.

My improved screw-threaded tooth-face may also be employed in crown-teeth of other types besides those shown in Figs. 1 to 9, inclusive.

Fig. 13 shows a tooth of what is known as the "Richmond" type, having its face screw-threaded and held in place by a screw. The face so held may be removed readily if injured and replaced by another face, which cannot be done when the faces are secured in place according to the methods now commonly used.

It is obvious that my invention is susceptible of many and varied modifications without departing from the spirit and scope thereof, that in the construction of the various parts many different materials may be used, and that certain parts may be used in connection with other parts of different construction. Therefore I do not limit myself to the particular details of construction herein illustrated and described or to any particular material from which to form the teeth or tooth faces, the bands, the bridges, or the plates.

What I claim is—

1. In an artificial tooth, the combination of a root-band flattened in front to seat in a step formed on the front side of a root, a tooth-facing, and means for securing the same to said band.

2. In an artificial tooth, the combination of a root-band flattened in front to seat in a step formed on the front side of a root, a tooth-facing, and means detachably securing said facing to said band.

3. In an artificial tooth, the combination of a root-band flattened in front to seat in a step formed on the front side of a root, a tooth-facing covering the front of said band and likewise adapted to be seated in said step, and means for securing the facing to said band.

4. In an artificial tooth, the combination of a root-band flattened in front to seat in a step formed on the front side of a root, a tooth-facing covering the front of said band and recessed to be seated in said step, and means detachably securing said facing to said band.

5. In an artificial tooth, the combination of a root-band flattened in front to seat in a step formed on the front side of a root, a canal-post secured to said band, a tooth-facing, and means for securing the same to said band.

6. In an artificial tooth, the combination of a root-band flattened in front to seat in a step formed on the front side of a root, a canal-post secured to said band, a tooth-facing, and means detachably securing said facing to said band.

7. In an artificial tooth, the combination of a root-band flattened in front to seat in a step formed on the front side of a root, a canal-post secured to said band, a tooth-facing covering the front of said band and recessed to be seated in said step, and means for securing the facing to said band.

8. In an artificial tooth, the combination of a root-band flattened in front to seat in a step formed on the front side of a root, a canal-post secured to said band, a tooth-facing covering the front of said band and recessed to be seated in said step, and means detachably securing the facing to said band.

9. A root-band adapted to surround the portion of a root remaining after the formation of a step in the front of said root, said band flattened in front to seat in said step.

10. A root-band adapted to surround the portion of a root remaining after the formation of a step in the front of said root, said band flattened in front to seat in said step, in combination with a canal-post secured to said band.

11. A root-band adapted to surround the portion of a root remaining after the formation of a step in the front of said root, said band flattened in front to seat in said step, in combination with a canal-post secured to the front flattened portion of said band.

12. In an artificial tooth, the combination of a screw-threaded vitreous facing, a root-band provided with a projecting backing against which said facing lies, and a screw passing through said backing, engaging the threads of said facing, and serving to hold said facing to the backing.

13. In an artificial tooth, the combination of a screw-threaded vitreous facing, a root-protecting band having its front side flattened, and a screw engaging the threads of said facing and holding the latter to said band.

14. In an artificial tooth, the combination of a screw-threaded vitreous facing, a root-protecting band having its front side flattened, a canal-post secured to said band, and a screw engaging the threads of said facing and holding the latter to said band.

15. In an artificial-tooth structure, the combination with a root-band having a front flattened portion the face of which is back of the normal position for the front of the tooth, said band having a projecting tooth-backing, of a removable face covering the front of said backing and the front flattened portion of said band, and secured to said backing.

16. As an article of manufacture, a detachable tooth-face formed of porcelain or other suitable material, having its front side curved to correspond with the curvature of the face

of the natural tooth, and its rear side having a flat-surfaced notch at its root end to seat in a notch-like step in the face of a root, said face beveled off at its cutting end, so as to leave said face thickened at one point, and tooth-face having a screw-threaded hole formed in such thickened part.

17. As an article of manufacture, a tooth-face convexly curved on its front side to natural proportions, and having at its gum end, on its rear side, a flat-surfaced notch for permitting seating of the face in a stepped root, the cutting edge of said face being tapered; said face being provided, near its thickest part, with supporting means.

HENRY P. OSBORN.

Witnesses:
H. A. LOOMIS,
R. A. CARDEN.