F. W. MacDONALD.

ARTIFICIAL TOOTH.

APPLICATION FILED NOV. 10, 1906.

920,768. Patented May 4, 1909.

Fig. 1.

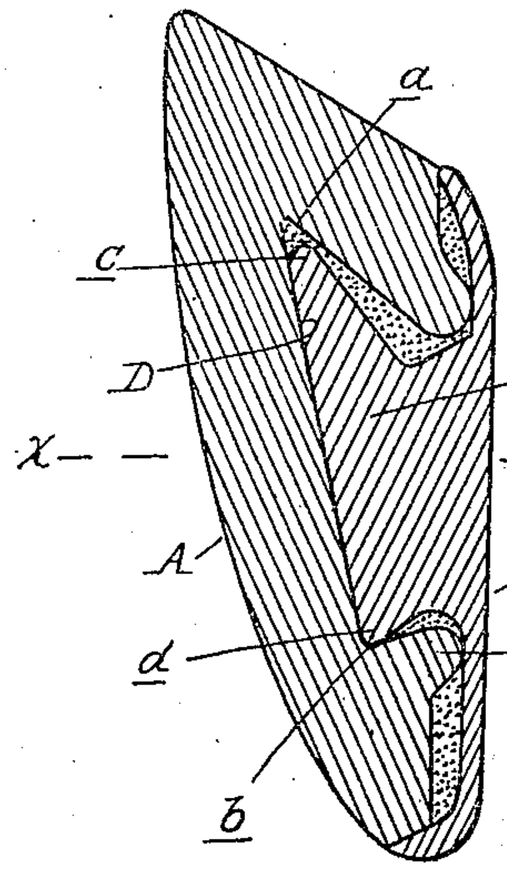


Fig. 3.

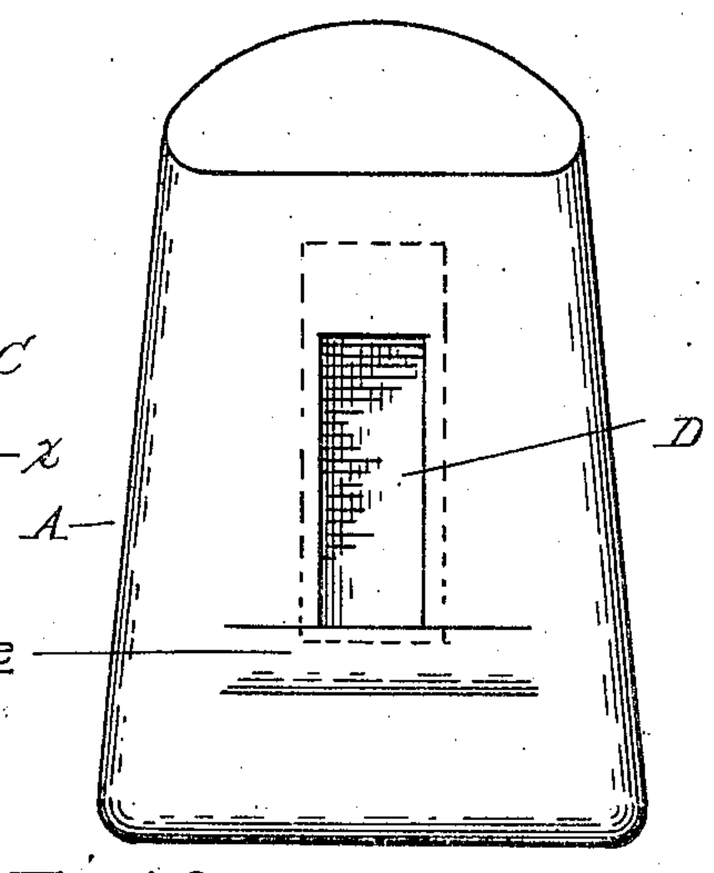


Fig. 2.

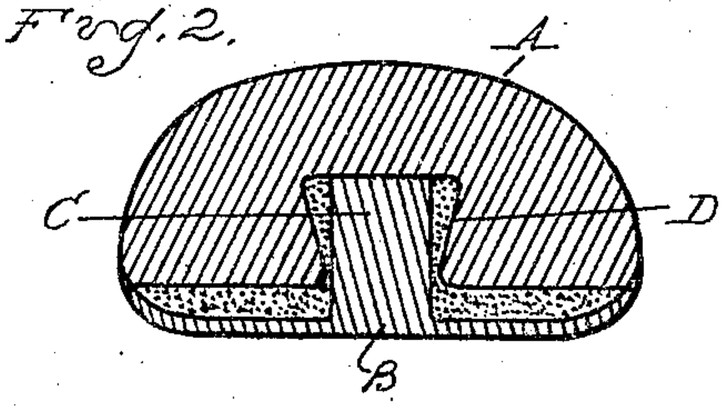
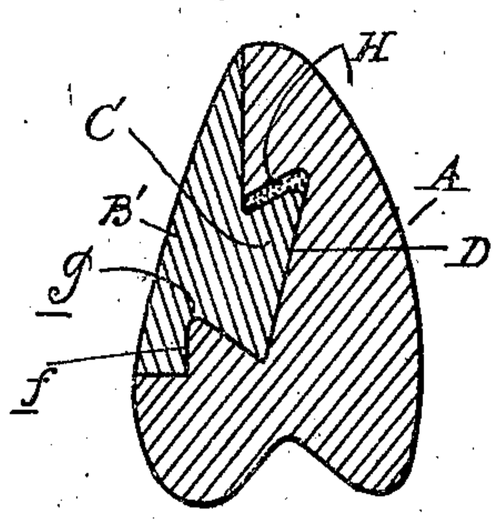


Fig. 4.



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ARTIFICIAL TOOTH.

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Application filed November 10, 1906. Serial No. 342,886.

To all whom it may concern:

Be it known that I, FREDERICK W. MacDONALD, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Artificial Teeth, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates generally to the construction of artificial teeth, and more particularly to the means of attachment of a tooth or tooth section to its support, being peculiarly adapted for use in "bridge" and "crown" work.

It is the object of the invention to provide a strong attachment between the porcelain and metallic portions and one in which the principal stresses are transmitted directly from one member to the other, instead of through the medium of a cement.

It is a further object to form an interlocking engagement between the porcelain and metallic members, and to avoid weakening the porcelain by the entering slots for the engaging member.

With these and other objects in view, the invention consists in the construction as hereinafter set forth.

In the drawings, Figure 1 is a vertical central section through a porcelain facing and the metallic backing of an artificial tooth; Fig. 2 is a horizontal section on line *x*—*x*, Fig. 1; Fig. 3 is a rear elevation of the porcelain facing. Fig. 4 illustrates a modified construction.

A is the porcelain facing of a tooth, as used in bridge work, and B is the metallic backing therefor.

C is a member secured to or preferably integral with, and projecting forward from the backing B, and D is a recess in the rear facing of the porcelain, with which the member C is engaged.

Heretofore the engagement between the member C and the porcelain has been effected in various ways, such, for instance, as by forming a dove tail engagement with an entering slot extending to the end of the porcelain. Or, again, by the formation of a central recess in the porcelain, in which the engaging metallic member enters laterally, and is secured by cement. The first of these constructions is objectionable in that the entering slot weakens the porcelain members, and, further because the parts must be engaged by sliding the porcelain parallel to the backing, which is prevented by a slight bending of the latter. The second construction is objectionable for the reason that the stresses are transmitted through the medium of the cement instead of directly from the porcelain to the metal. With my invention, these difficulties are avoided by the peculiar formation of the member C and recess D being such that the members may be engaged by a relative angular movement and when engaged are interlocked, and are in direct contact at points for the transmission of the principal stresses. As specifically illustrated, the recess D is under cut at its upper and lower ends, as indicated at *a* and *b*, and at the upper end, which is in the thicker portion of the tooth, the recess is deeper. The member C is provided with projecting portions *c* and *d* for respectively fitting the under cut portions *a* and *b* of the recess. Thus, the entering slot, or mouth of the recess D is contracted to be less in diameter than between the points *c* and *d* of the member C, thereby preventing disengagement by a transverse movement. It is however possible to engage or disengage the member C by an angular movement for the reason that clearance is provided between the projecting portions *c* and the adjacent wall of the recess. Thus, by angularly moving the member C, the point *d* may be first withdrawn from the recess, and when clear of the shoulder *b*, the member C may be drawn downward to disengage the projecting portion *c*.

It will be understood that with the construction as described, the member A may be readily engaged or disengaged from the member B but that the stresses to which the tooth is ordinarily subjected have no tendency to cause disengagement. Thus, in biting, the stress of the member A is transmitted to the member B through the contacting points *b* and *d*. Again a downward pressure sometimes exerted on the member A will be transmitted through the contacting points *a* and *c*. Lateral pressure against the outer face of the member A will be transmitted directly to the member B, and lateral movement in the opposite direction exerted against the inclined upper face of the member A will be transmitted to the member C through the contacting points *a* and *c*. In fact the only movement which can cause disengagement, viz., the swinging of the lower end of the

member A outward about the upper end of the point *c* as a pivot cannot be caused by pressure against any portion of the exposed surface of the member A. To complete the securing of the members A and B they are cemented to each other, the cement filling the clearance space between the point portion *c* and the adjacent wall of the recess and also the other clearances incident to the construction. It is not essential that the member C should closely fit the recess D, for even if a slight clearance is left all around, which is subsequently filled with cement, only compression stresses will be transmitted through the cement. I deem it preferable, however, to have the principal stresses transmitted directly from the member A to the member B.

It is obvious that the porcelain member constructed as described is very much stronger than where provided with an entering slot extending to either end. The deepest portion of the recess is in the thickest portion of the member and the contraction in size of the entering orifice produces strong cross connections at both top and bottom. These may be further strengthened by providing a rib or bead *e* adjacent to the edge of the orifice, as illustrated in Fig. 1 and 3.

In Fig. 4 a modified construction is illustrated, in which A′ is the porcelain member of the double tooth, and B′ the backing therefor. These parts are formed with interlocking shoulders *f* and *g* from which the upward stress on the tooth, in biting, is transmitted directly to the metal backing. At the same time, the members can be interlocked by the engagement of the projecting member C on the backing with the recess D, and by an angular movement while, after the members are thus engaged, the cement is filled in the clearance space H of the recess D, disengagement is prevented.

What I claim as my invention is:

1. In an artificial tooth, a recessed member and a member having an undercut projection for interlocking with said recessed member, and of greater extent than the orifice of said recess, said members being engageable only by a relative angular movement in a plane transverse to their meeting faces.

2. In an artificial tooth, a member having an undercut recess therein with a contracted entering orifice, and a member having an integral projecting portion of greater extent than said orifice and substantially fitting the undercut portion of said recess, said members being engageable only by an angular movement in a plane transverse to their meeting faces.

3. In an artificial tooth, a member having an under cut recess, a contacting member, a projection on said contacting member for engaging said under cut recess and a strengthening rib adjacent to the under cut portion of the first mentioned member.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK W. MacDONALD.

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