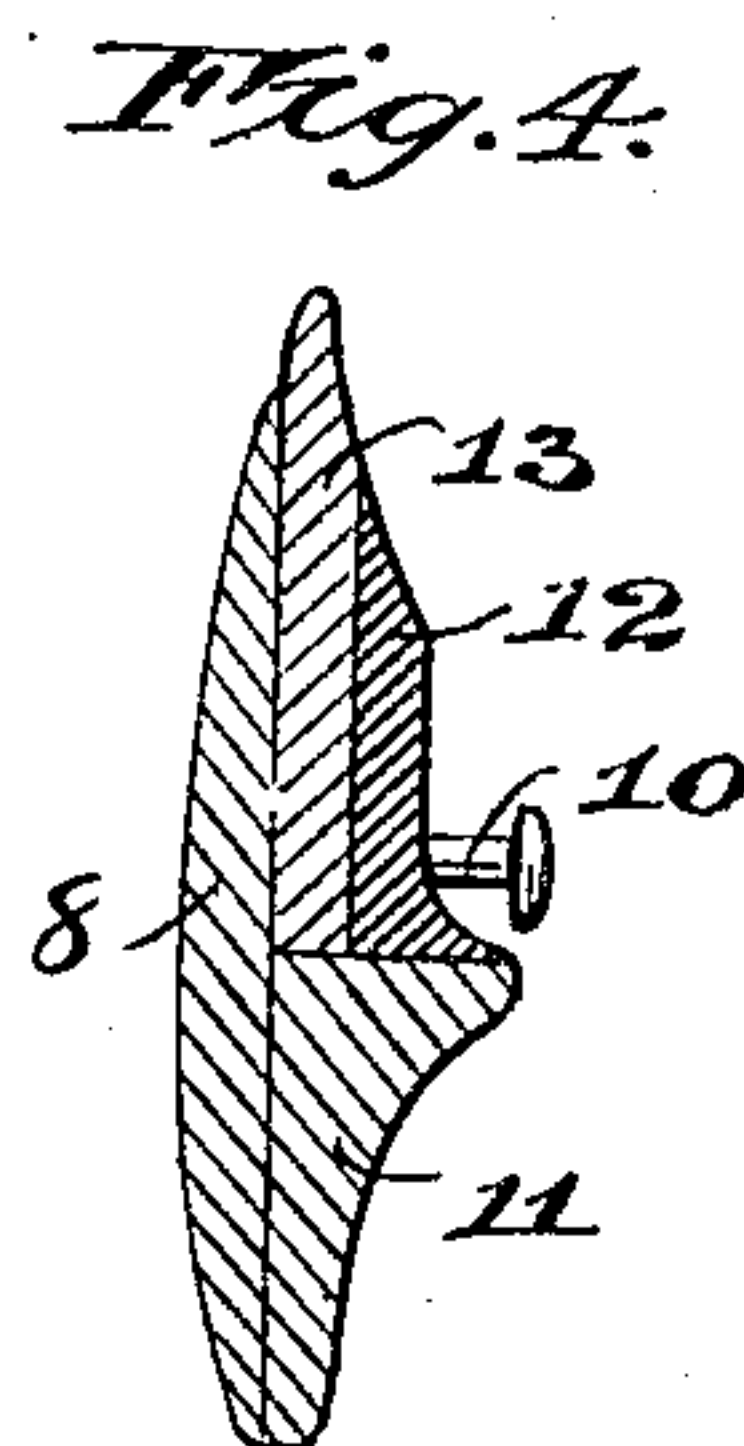
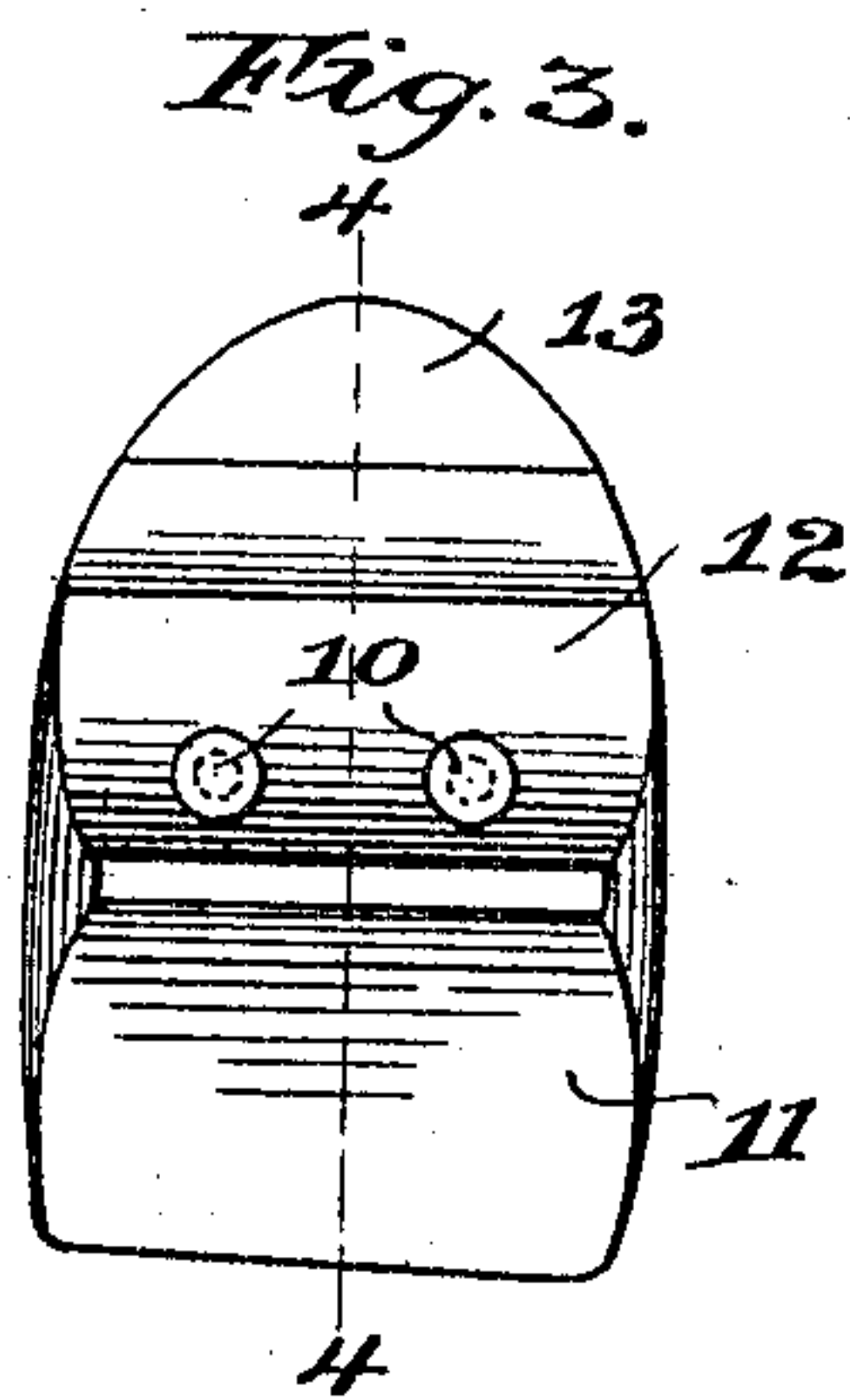
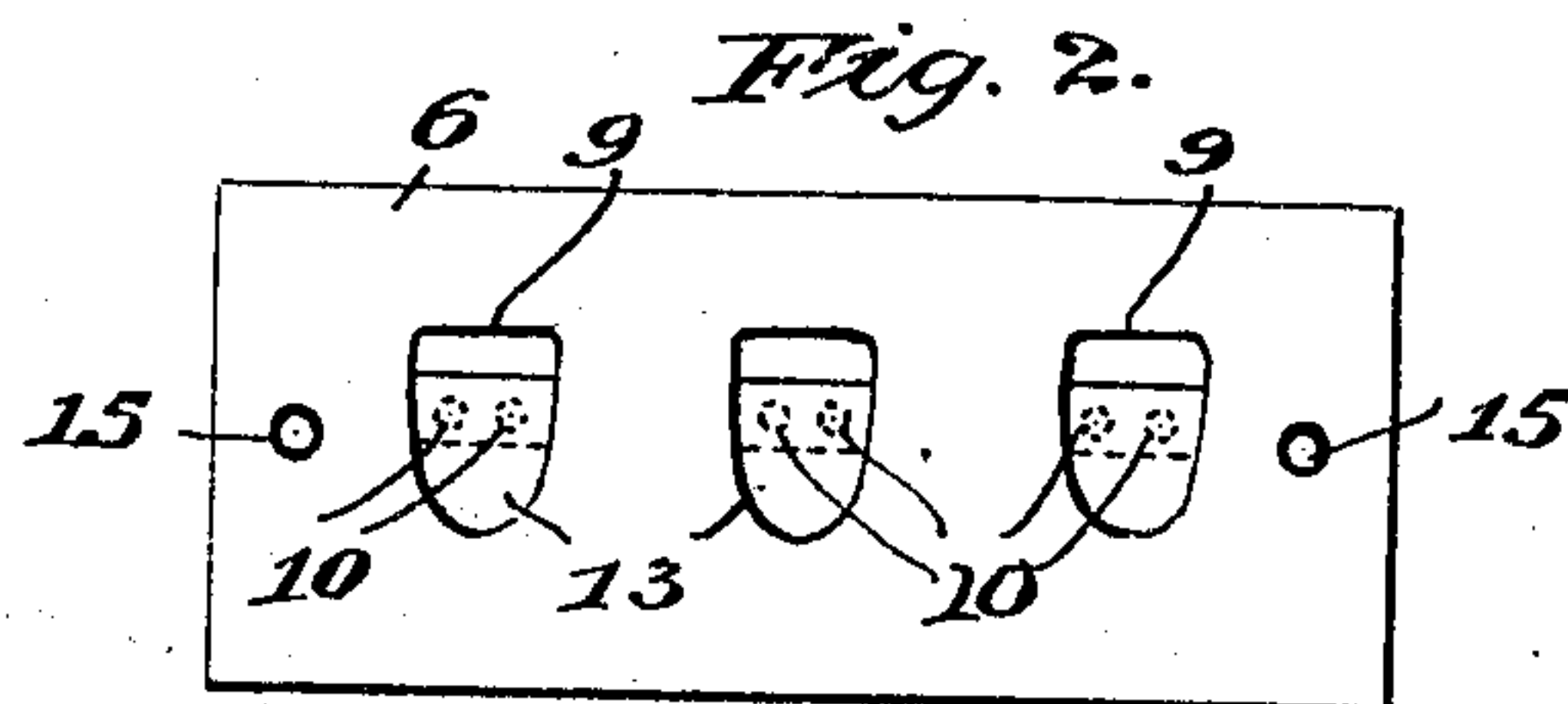
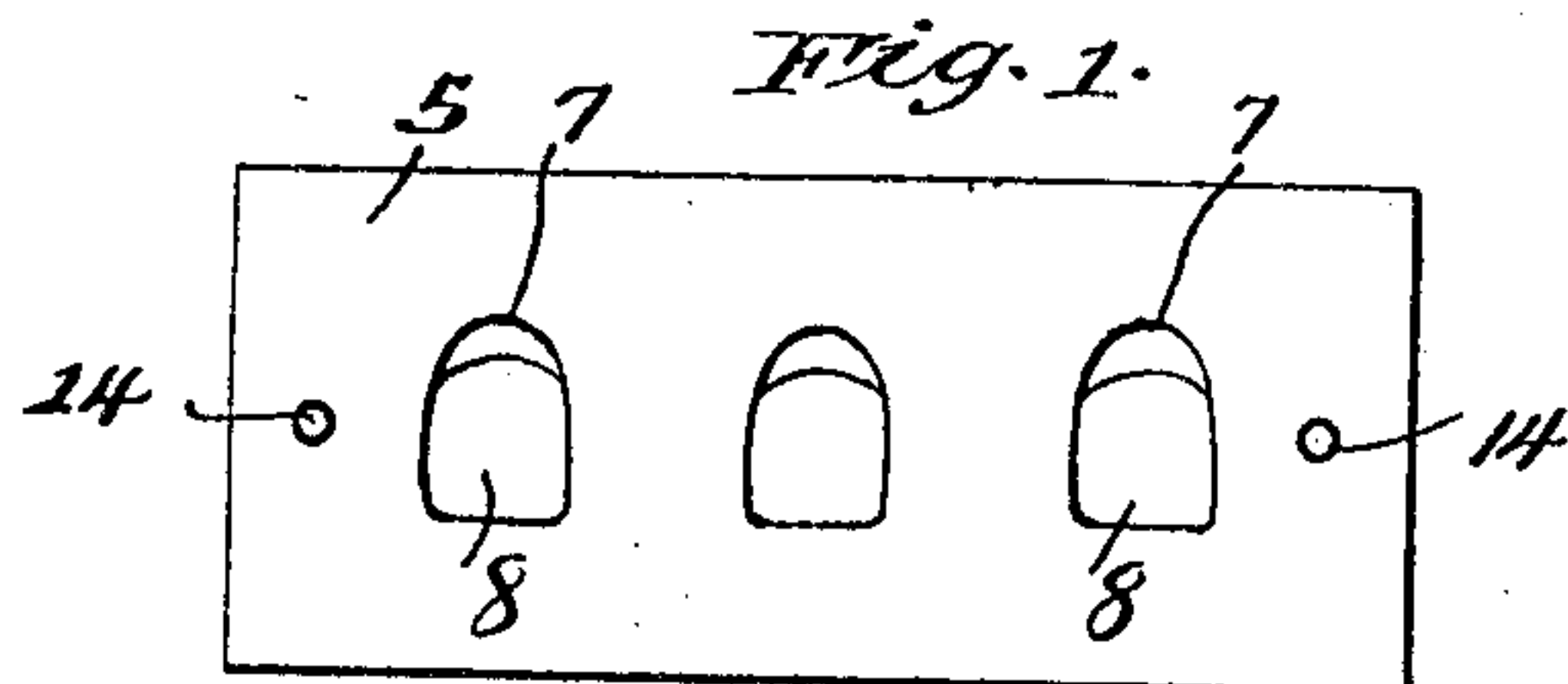


No. 871,430.

PATENTED NOV. 19, 1907.

J. MORRIS.  
ARTIFICIAL TOOTH.  
APPLICATION FILED SEPT. 15, 1905.



Witnesses,  
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# UNITED STATES PATENT OFFICE.

JOSEPH MORRIS, OF NORTH WALES, PENNSYLVANIA, ASSIGNOR TO THE DENTAL PROTECTIVE SUPPLY COMPANY OF THE UNITED STATES, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## ARTIFICIAL TOOTH.

No. 871,430.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed September 15, 1905. Serial No. 278,611.

*To all whom it may concern:*

Be it known that I, JOSEPH MORRIS, a citizen of the United States, residing at North Wales, in the county of Montgomery and State of Pennsylvania, have invented certain new and useful Improvements in Artificial Teeth, of which the following is a specification.

This invention relates to artificial teeth of that class or type which are commonly manufactured of porcelain and are provided with inset pins on the back or reverse side for purposes of mechanical connection with a plate or bridge, the invention being applicable to both what are known as vulcanite teeth and what are known as plate or flat-back teeth. Porcelain teeth are commonly manufactured at present by a molding and subsequent burning process, the plastic material forming the front and back halves of the artificial teeth being deposited in a pair of mold-plates, which latter are then rigidly united with the mold cavities in registration, the material being then baked, which unites the front and rear parts, then removed from the mold and the edges thereof trimmed and shaped, and finally subjected to a fusing heat which thoroughly integrates and hardens the entire mass. In these operations, the material forming the rear half of the tooth is, in its plastic state, cast around one or more pins, that serve later to mechanically connect the tooth to the plate, bridge, or other carrying member. The weak point in such teeth resides in the character of the anchorage of these pins therein. Platinum pins afford fairly good results, but are very expensive; and hence cheaper composition metal pins are being largely substituted. It has been found in practice that when these latter are employed, while they will withstand the fusing heat to which the tooth is finally subjected, yet the heat, through chemical action, or from some other cause, produces fine bubbles in the material surrounding the pins, producing tiny cavities, and weakening the anchorage of the pins in the porcelain. Again, in the ordinary vulcanite teeth, these pins, when made of "black metal", a carbonized nickel at present employed, show through the face of the tooth in the form of darkened spots.

The present invention has for its leading object to increase the strength and dura-

bility of an artificial tooth of the porcelain variety, whether a vulcanite or flat-back tooth, by increasing the strength or anchorage of the fastening pins therein; a minor object, in connection with the former variety, being to avoid the discoloration resultant from the use of other than pure platinum pins.

To these ends, and in accordance with my invention, I provide on the back side of a tooth a reinforcing material, which not only anchors the pins securely and with far greater strength than pure porcelain, but also fuses readily and thoroughly with the porcelain body of the tooth, and prevents the ends of the pins from showing through the enamel facing or front. This reinforcing material comprises preferably porcelain mixed with about an equal part of an oxid or salt of one or more metals. The best results which I have thus far attained have been produced by a composition of substantially equal parts of porcelain and aluminium oxid; but good results are obtainable with the oxides of tin, nickel, corundum, zinc, barium, and other metals, which may be used as a substitute for aluminium oxid, or with the latter, or with each other.

In order that my invention may be more readily understood, I have illustrated the same in the accompanying drawing, in connection with a vulcanite tooth, wherein,—

Figure 1 is a plan view of the top section of a mold for making a tooth; Fig. 2 is a similar view of the bottom section of a mold in which the rear half of the tooth is cast; Fig. 3 is a rear elevational view of a finished tooth; and Fig. 4 is a longitudinal vertical section on the line 4—4 of Fig. 3.

My invention will perhaps be more readily understood by describing the same in connection with the means and method or process of manufacturing it.

5 and 6 may designate, respectively, the top and bottom plates of a mold in which the tooth is formed. The mold 5 contains a series of depressions or cavities 7, each of which corresponds to the form of the outer or face section of a tooth. In each of these cavities is deposited in a plastic condition a body of porcelain 8, adhered by water and gum tragicum, which subsequently becomes the enamel front of the tooth. This material fills the cavity, except at the upper portion



thereof, which latter is designed to subsequently have pressed thereinto part of the body porcelain, to form what is known as the neck of the tooth.

5 The lower mold section 6 has a similar series of cavities 9, each having a pair of holes in its bottom for the reception of headed pins 10 that are to be embedded in the material cast therein. These cavities are loaded by  
10 pressing into the end corresponding to the lower or cutting end of the tooth a mass of porcelain designated by 11, which extends something less than one half the total length of the cavity. Around the pins 10 is then  
15 packed a body of my novel composition mixture consisting preferably of porcelain and metal oxid or salt, this composition being indicated at 12 (Fig. 4), and entirely surrounding and embedding the exposed portions of  
20 the pins, extending upwardly toward the neck portion or upper end of the tooth. Finally, a charge of what is known as body porcelain is impressed into the remaining unfilled space of the cavity, completely covering the composition material 12, this body porcelain being indicated at 13. The two halves of the mold,  
25 thus loaded, are laid together, face to face, and registered by pins 14 on one plate passing through holes 15 in the other, and are then  
30 clamped together in a suitable press. The whole is then subjected to a baking heat sufficient to thoroughly dry out the material and cause the several parts to adhere to each other. The mold is then opened, and the teeth, hav-  
35 ing about the hardness and consistency of chalk, are removed, and their edges trimmed down to remove burs and fins. The teeth then undergo the final process, which consists in subjecting them to a high fusing heat,  
40 which causes the several porcelain portions and the reinforcing composition portion to become thoroughly integrated. I find that the pins 10, when thus set in a composition material, such as specified, are very firmly  
45 anchored therein, while the composition material itself not only possesses a degree of resistance to breaking strains greater than the porcelain itself, but adheres to the latter with even greater strength than that of the  
50 porcelain itself. I have found by thorough

tests that a tooth thus made possesses fully double the strength and resistance to strains tending to break it away from the fastening pins or the usual solid porcelain tooth.

So far as I am aware my invention is  
broadly new to the extent of the employ-  
ment of a composition material containing a  
metal oxid for anchoring the fastening pins  
that is fusible and capable of being inte-  
grated with the porcelain body of the tooth,  
and hence the invention is not limited to  
any particular metal oxid for this composi-  
tion, except to the extent indicated in spe-  
cific claims.

I do not herein claim the above described  
process employed in the manufacture of my  
improved artificial teeth, as said process  
forms the subject-matter of a companion ap-  
plication filed concurrently herewith, Serial  
No. 278,610.

I claim:—

1. An artificial tooth comprising a body of  
porcelain, a backing of composition material  
containing a metal oxid, and one or more fas-  
tening devices embedded in said composition  
material, substantially as described.

2. An artificial tooth comprising a body  
of porcelain, a backing composed of mingled  
porcelain and metal oxid, and one or more  
fastening pins embedded in said backing,  
substantially as described.

3. An artificial tooth comprising a body  
of porcelain, a backing composed of mingled  
porcelain and aluminium oxid, and one or  
more fastening pins embedded in said back-  
ing, substantially as described.

4. An artificial tooth comprising a porce-  
lain face, a cutting member backing the cut-  
ting edge of said face, a body member back-  
ing the major portion of said face, a body  
of porcelain and metal oxid inset in said body  
member, all of said parts being fused to-  
gether, and one or more pins anchored in said  
composition member, substantially as de-  
scribed.

JOSEPH MORRIS.

Witnesses:

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FREDERICK C. GOODWIN.