

A. E. GIBSON.
ARTIFICIAL TOOTH.
APPLICATION FILED AUG. 23, 1911.

1,139,028.

Patented May 11, 1915.

FIG. 1.

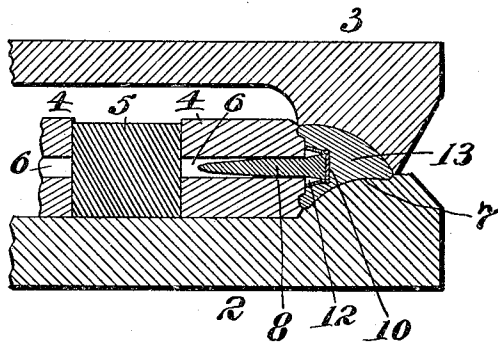


FIG. 3.

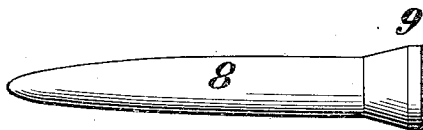


FIG. 4.



FIG. 5.

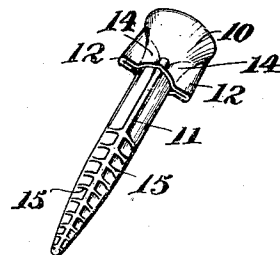


FIG. 2.

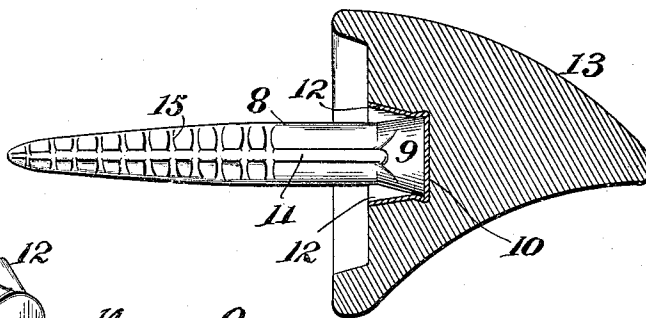


FIG. 6.

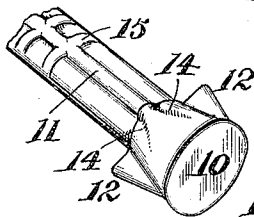
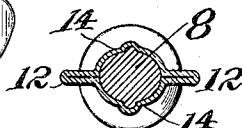


FIG. 7.



Witnesses
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UNITED STATES PATENT OFFICE.

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ARTIFICIAL TOOTH.

1,139,028.

Specification of Letters Patent.

Patented May 11, 1915.

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To all whom it may concern:

Be it known that I, ALBERT E. GIBSON, a citizen of the United States, and a resident of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented an Improvement in Artificial Teeth, of which the following is a specification.

My invention has reference to artificial teeth and more particularly to the pins for attachment of crown teeth in position, and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings which form a part thereof.

Heretofore, it has been customary to provide crown teeth with supporting pins secured to them in various ways, and in those cases where the tooth is required to be fused while in contact with the pin, it is necessary to provide against the oxidizing action of the alloy of the pin when the same is formed of inexpensive materials such as alloys of nickel as a substitute for the more expensive alloy of platinum and iridium.

The object of my invention is to provide a construction of attached pin and fused crown tooth which shall embody the employment of a cap to the pin to shield the pin itself from being oxidized by contact with the heated material of the tooth, and which, moreover, may provide a duct or passage for the escapement of any gases which may be generated adjacent to the pin head and within the confines of the tooth structure and thereby prevent the formation of weakening gas holes or cavities within the tooth adjacent to the head of the pin during the vitrifying of the tooth.

Moreover, my object is also to provide a construction of cap for the pin which will insure proper positioning of the pin in the mold when molding the tooth material about the head of the pin before the vitrifying of the said tooth.

In accomplishing these objects, I clamp over the head of the pin a thin cap of platinum, and so form the platinum cap that when clamped under the action of dies, it provides one or more wings or lateral projections formed by the folding of the side wall of the platinum cap upon itself.

The platinum cover or cap shields the head of the alloy pin from direct contact with the materials of which the tooth proper

is formed, and the wing or wings formed, as above specified, will act in the threefold capacity of positioning the pin in the mold, permitting any gases, which may be formed by the oxidation of the pin head, escaping from the tooth composition, and preventing any possibility of the pin becoming loose in the tooth under rotation and inversely, of the tooth becoming loose upon the pin in a rotary direction even though positively held against longitudinal movement.

Where the cap remains intact, there is very little tendency to produce objectionable oxidation from the head of the pin during the vitrifying operation of the tooth, but the article is so small and the platinum cap so thin, that the heavy pressure employed in the dies for shaping the pin and clamping the cap thereto, is such that sometimes the cap becomes ruptured without being perceived, and in these cases, the tendency of oxidation will produce defects in the finished article which are highly objectionable, although not easily perceptible to the eye. These objections are, as before indicated, a generation of gases which produce blow holes or cavities within the body of the vitrified tooth structure, tending to make it weak and unreliable. By eliminating all possible danger from this cause, perfect teeth are insured and incidentally the cost of manufacture is reduced.

My invention will be better understood by reference to the drawings, in which:—

Figure 1 is a cross section of a mold having my improved crown tooth and pin in process of manufacture; Fig. 2 is a sectional elevation of the finished tooth and pin; Fig. 3 is an elevation of the pin before being capped and stamped; Fig. 4 is a sectional elevation of the cap before being applied to the pin; Fig. 5 is a perspective view of the pin and cap after being subjected to the action of dies; Fig. 6 is a perspective view of the head portion of the pin and the cap applied thereto, ready for being placed in the mold; and Fig. 7 is a section of the pin adjacent to the wings.

The mold employed for forming the tooth upon the pin is fully illustrated in Fig. 1, and ordinarily comprises the portions 2, 3, 4 and 5 providing a tooth cavity 7 corresponding to the shape of the tooth to be molded. In Fig. 1, I have only shown ap-

proximately one-half of the mold, as this is all that will be necessary for imparting a clear explanation of the utility of my invention to the manner in which the pin is applied to the tooth, the mold thus forming no part of my invention.

The pin 8 to be attached to the tooth, is provided with a head portion 9 and may be slightly tapering, as clearly illustrated in Fig. 3, and said pin may be formed of any suitable material or alloy having a high temperature of fusibility, and ordinarily may be formed of alloys of nickel. The cap of platinum is indicated at 10, Fig. 4, and is exceedingly thin, so that when it is clamped over the head of the pin, it, in effect, provides a cover or shield to protect the pin head against the action of the material of which the tooth is formed. The cap is preferably formed of platinum, because of its resistance to the action of chemicals, even when heated, and because of its great ductility which enables it to be pressed snugly to the form of the pin head. In view of the high cost of platinum, it is important that its thickness shall be reduced to a minimum to keep the weight within the practical limits. The making of this cap exceedingly thin, incidentally reduces its resistance to rupture when subjected to the action of the dies, when bringing it to the condition indicated in Figs. 5 and 6. After the cap has been applied to the pin, the said parts are subjected to heavy pressure of dies which simultaneously clamp the cap upon the head and form folds in the side walls of the cap to constitute the wings 12 which are wide at the bottom and taper in to the head portion. Simultaneously with this formation of the head and cap, the opposite faces of the pin itself are forged into rib form, as indicated at 11, to enable it to more firmly hold in the cement in which it is embedded in the root of the tooth to which it may be applied. The wings 12 are formed by pinching together the side portions of the cap, and in the finished form will have closed outer edges and with a seam on the end or edge directed to the pointed pin, as is clearly indicated in Figs. 5 and 7.

The pin when capped, as indicated in Fig. 5, is placed within a hole 6 of the mold part 4 (Fig. 1), and the wings 12 are abutted against the face of the mold, as indicated, thereby positioning the pin in the mold space 7, so that the head of the pin will be embedded in the composition of which the tooth is formed to the proper degree. Without the wings, there is nothing to limit the depth to which the pins would be embedded in the tooth composition, but by the use of said wings, no special care is necessary in applying the pins to the mold or holding them in position, because any pressure which is placed upon the pin head during the com-

pression of the mold material, will not be able to force the pin upward through the hole 6, because of the presence of the wings 12. When such wings are not employed, the pressure of the mold material would have a tendency to force the pin upward and reduce the depth to which the pin is embedded within the molded tooth and thereby produce weakness. By my improvement, the full maximum depth to which the head is to be embedded in the tooth, is uniformly insured.

After the tooth is molded upon the head of the pin, the upper part of the mold 3 is removed, the wedge 5 withdrawn, and the mold portion 4 lifted out from the part 2, together with the pins and molded teeth. The teeth 13 may then be withdrawn from the mold portion 4 with the pins attached. As the molded tooth is more or less frail until vitrified, it is evident that the pins must not fit tightly into the holes 6, otherwise the material of which the tooth is formed, would be crushed in the withdrawing of the pin. By my improvement, the pins may fit very loosely in the holes 6 and yet under no circumstances could the pins be pushed into said holes to reduce their depth of attachment in the tooth, so that by my improvement, I am enabled to provide a loose fit between the pin and the whole, so as to easily withdraw the tooth and pin therefrom.

If from any cause, such as rupture of the cap when the cap pin is subjected to the action of dies, there should be produced gases by oxidation of the head of the pin thus exposed adjacent to the tooth composition, these gases under the pressure due to their production, will force their way out between the folds in the wings and adjacent to the sides of the pin, and escape from the structure of the tooth, so that when the same is fully vitrified, there will be no objectionable gases and pockets formed thereby within the tooth structure, the same having passed from the place of generation by way of least resistance, namely, through the microscopic passages formed between the pin to the cap adjacent to and in the wings. It is evident that, while I have shown the employment of two wings in the cap, one or more such wings may be employed as preferred. Incidentally, it may be said that by the action of the dies, it is more easy and satisfactory to provide two wings than one, and for that reason, I prefer to form the cap with two wings and especially so as it more securely positions the pin in the mold. It will be more difficult to provide more than two wings, and I thereby prefer not to employ more than two such wings, although I do not restrict myself in this respect.

When the pin with the applied cap is subjected to the pressure of the dies, the por-

tions 14 are depressed so as to form a tight fit of the cap to the body of the pin, as well as causing the cap to fit snugly around the head to form a neck somewhat smaller than the end diameter, whereby the pin may be more or less dove-tailed into the vitrified tooth portion 13. The dies also subject the pin to pressure from opposite sides and preferably produce a slightly flattened condition of the pin with the longitudinal rib 11 with the cross ribs 15 and by which the pin is positively anchored in the root of the tooth by the cement.

I do not restrict myself to any particular metals to be employed in the construction of my invention, but commercial practice requires that the pin shall be sufficiently hard to resist bending under normal use of the teeth and also to withstand the high temperature necessary for the vitrification of the porcelain portion of the tooth, and likewise the cap which is intended to shield the pin from the composition of the tooth during the vitrification thereof, shall be practically non-oxidizable and also heat resistant, so as not to fuse under the necessary temperature required in the production of a tooth of this character.

I have shown my invention in the form which I have employed in commercial practice and while I prefer the same, the details thereof may be modified without departing from the spirit of the invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. As an article of manufacture, a pin for an artificial tooth, which consists of a pin of oxidizable metallic material of high fusibility, having one end covered by a shielding cap of non-oxidizable metal, said cap compressed tightly upon the pin and in which the metal of said pin and cap is densified in part providing raised portions of the pin and depressed portions of the cap, and in which further, the cap has its side portion extended radially to form a wing having an exposed edge at a distance from and directed away from the head portion of the pin.

2. As a new article of manufacture, a pin for artificial teeth which consists of a pin of base metal of high fusibility, combined with a cap of non-oxidizable metal of high fusibility clamped over the head of the pin and having its side portion compressed into a laterally projecting flat wing having a two ply exposed edge at the end of the cap most distant from the head of the pin, said plies in close contact upon each other.

3. As a new article of manufacture, a pin for artificial teeth which consists of a pin of base metal of high fusibility, combined with a cap of non-oxidizable metal of high fusibility clamped over the head of the pin and having its side portion compressed at a plu-

ality of places about the pin into laterally projecting flat wings arranged at the end of the cap most distant from the head of the pin.

4. As an article of manufacture, a pin for artificial teeth, consisting of a pin structure of base metal of high fusibility and having a head portion, combined with a cap of non-oxidizable metal fitting over the head and about the body of the pin to a distance from the head and said cap being compressed upon the pin and at diametrically opposite places and flattened radially to provide oppositely directed flat wings of folded metal with radial edges in substantial alinement and extending from substantially diametrically opposite sides of the pin.

5. As an article of manufacture, a pin for artificial teeth, consisting of a pin structure of base metal of high fusibility and having a head portion, and said pin being formed with longitudinal and transverse ribs, combined with a cap of non-oxidizable metal fitting over the head and about the body of the pin to a distance from the head and said cap being compressed upon the pin and at two oppositely directed places and flattened to provide oppositely directed flat wings of folded metal extending from substantially diametrically opposite sides of the pin.

6. As an article of manufacture, a pin for an artificial tooth, comprising a pin of base metal, combined with a cap of non-oxidizable metal fitting over the end of the pin and compressed thereon to form a head, and said cap also having a projection extending laterally away from the pin and provided with a gas passage from the head portion of the pin.

7. As an article of manufacture, a pin for an artificial tooth consisting of a pin of base metal having a head portion, combined with a cap of non-oxidizable metal of high fusibility compressed upon the pin about its head portion and provided with a lateral projection from its side and extending to its end farthest from the head of the pin.

8. As an article of manufacture, a pin for an artificial tooth, consisting of a pin of base metal having a head portion, combined with a cap of non-oxidizable metal of high fusibility compressed upon the pin about its head portion and provided with lateral projections on diametrically opposite sides and extending to its end most distant from the head of the pin.

9. In a crown tooth, the combination of the vitreous tooth portion, with a pin projecting therefrom and having a head portion extending to a distance within the tooth, and a non-oxidizable shielding cap tightly fitting over that portion of the pin which

extends within the tooth and having a projecting part extending laterally from the pin into the body of the tooth and terminating adjacent to the surface of the tooth
5 from which the pin projects.

10. In a crown tooth, the combination of the vitreous tooth portion, with a pin projecting therefrom and having a head portion extending to a distance within the
10 tooth, and a non-oxidizable shielding cap fitting over that portion of the pin which extends within the tooth and having a laterally projecting part extending from the shank of the pin into the body of the tooth
15 and adjacent to the surface of the tooth from which the pin projects, and said lateral projection being formed by side portions of the cap closely resting upon each other to provide a microscopic passage in the direction of the length of the pin and to the
20 surface of the tooth for escape of gas from

within the cap to a point outside of the tooth.

11. As an article of manufacture, a pin for an artificial tooth, consisting of a pin 25 part of oxidizable metallic material of high fusibility, said pin having an enlarged head and with depressed portions on its body adjacent to the head providing an irregular shaped neck in cross section, combined with
30 a cap of non-oxidizable metal said cap fitting snugly in contact with the enlarged head and neck portion of the pin and providing raised portions upon its outer surface adjacent to the neck portion of the
35 pin.

In testimony of which invention, I hereunto set my hand.

ALBERT E. GIBSON.

Witnesses:

R. M. HUNTER,
R. M. KELLY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."