

No. 702,871.

Patented June 17, 1902.

W. E. GRISWOLD.

SECURING DEVICE FOR DENTAL BRIDGEWORK.

(Application filed Oct. 19, 1900. Renewed May 19, 1902.)

(No Model.)

Fig. 1.

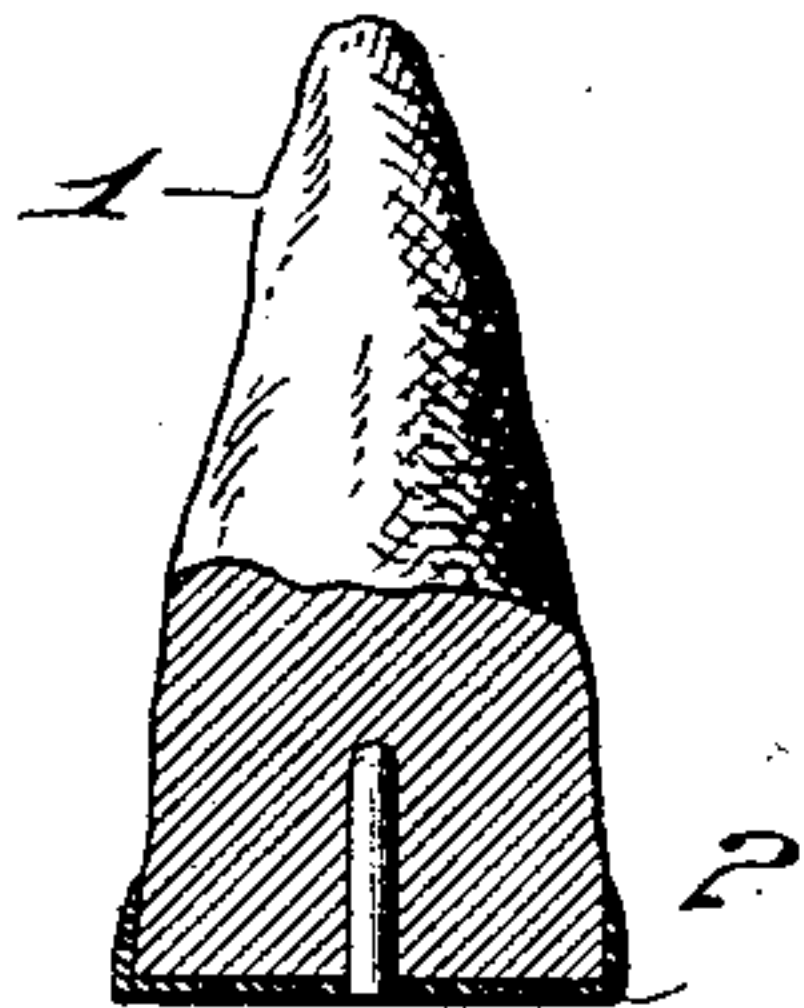


Fig. 2.

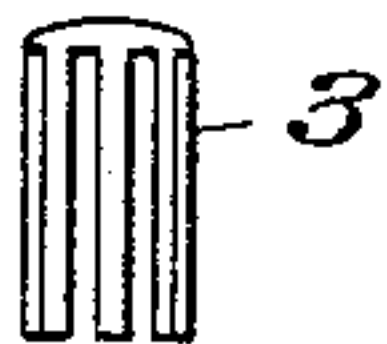


Fig. 3.

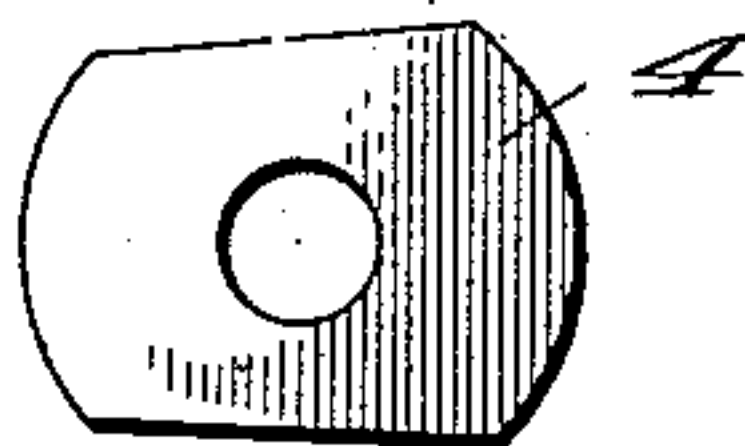


Fig. 4.

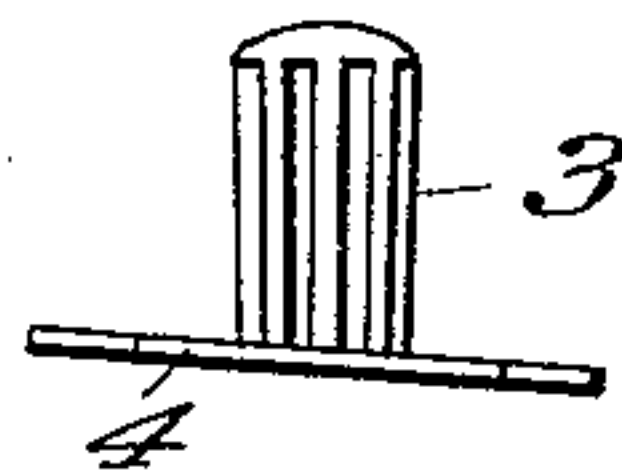


Fig. 5.

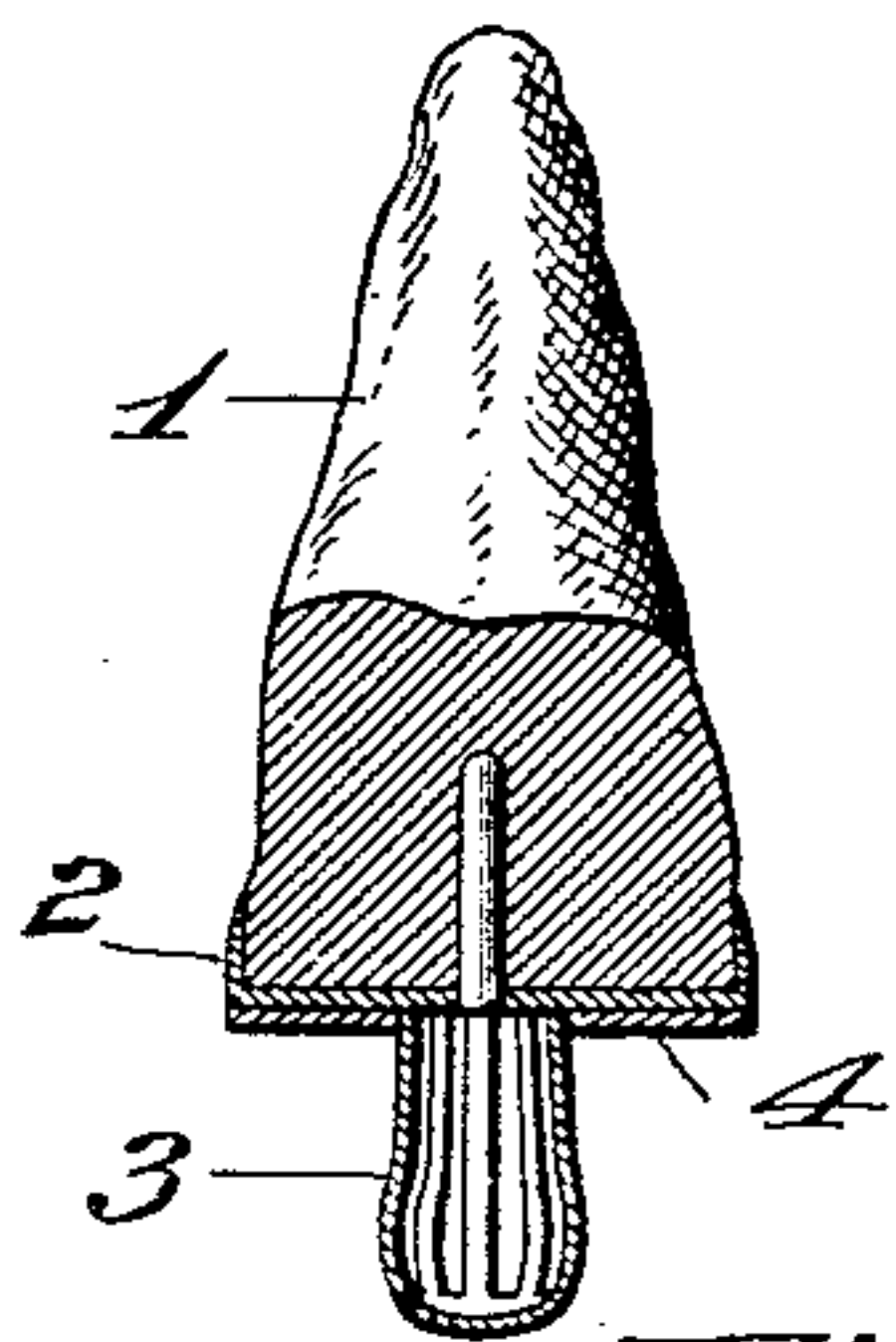


Fig. 6.

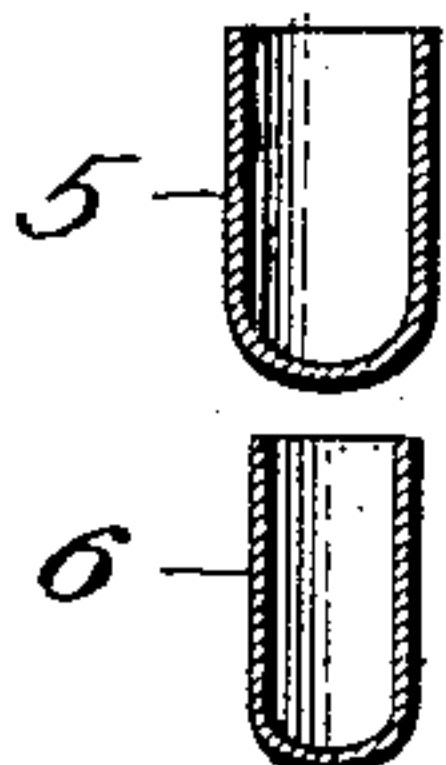


Fig. 7.

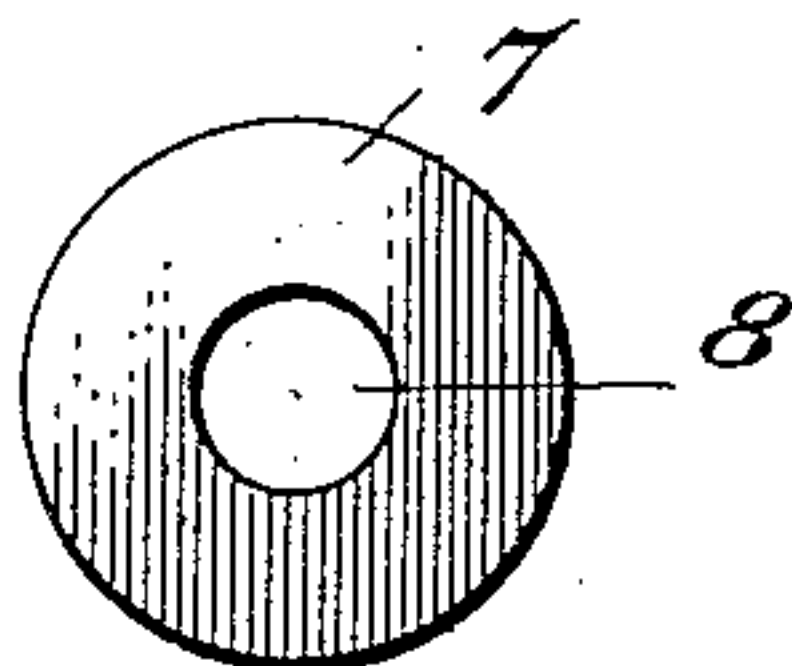


Fig. 8.

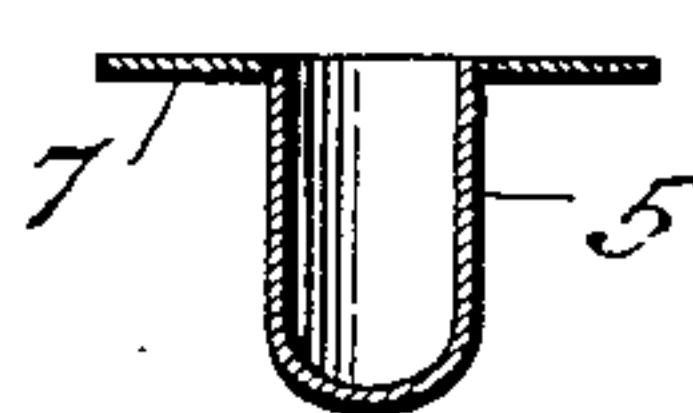


Fig. 12.

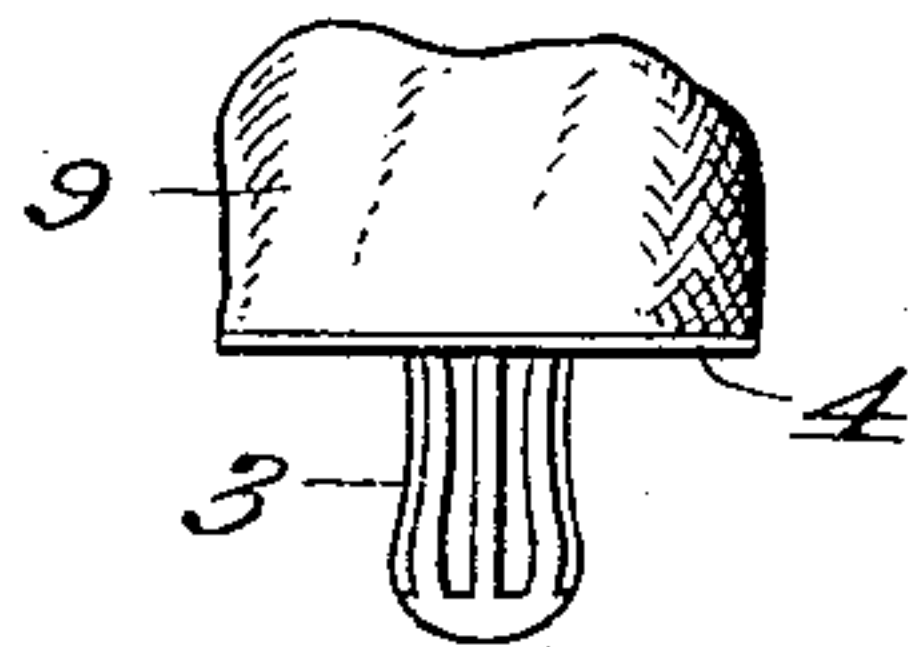


Fig. 10.

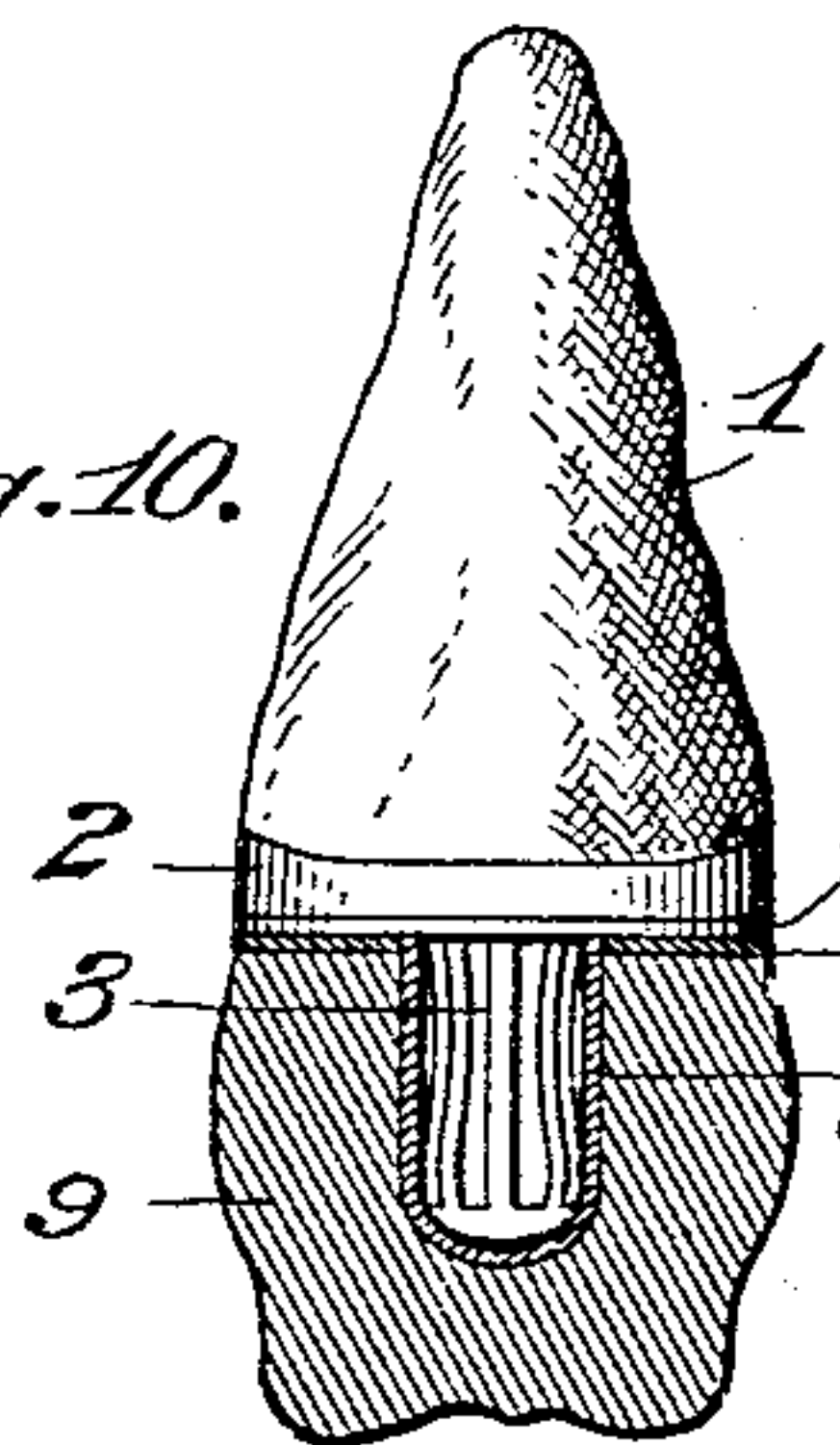


Fig. 11.

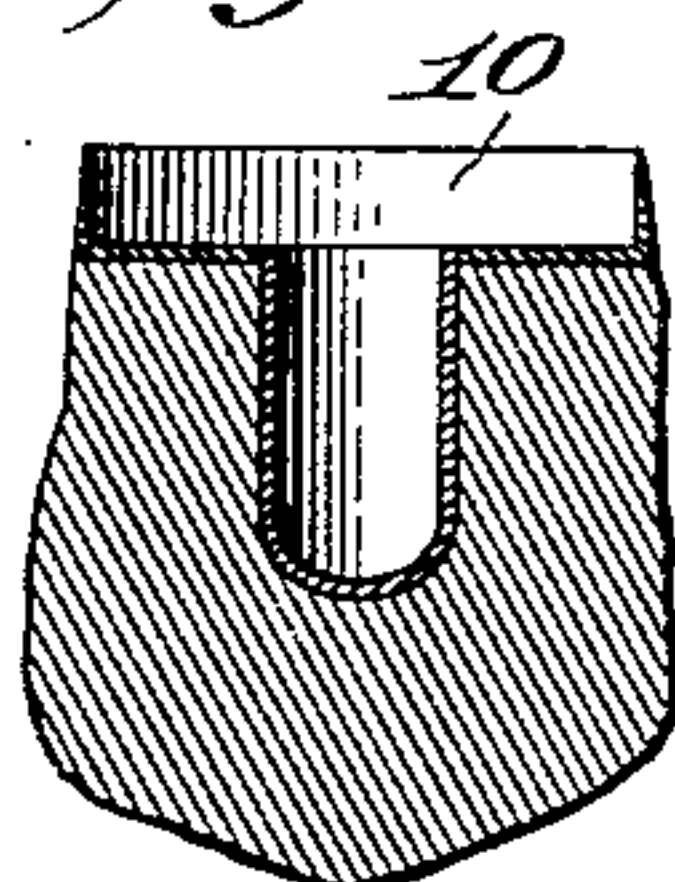


Fig. 13.

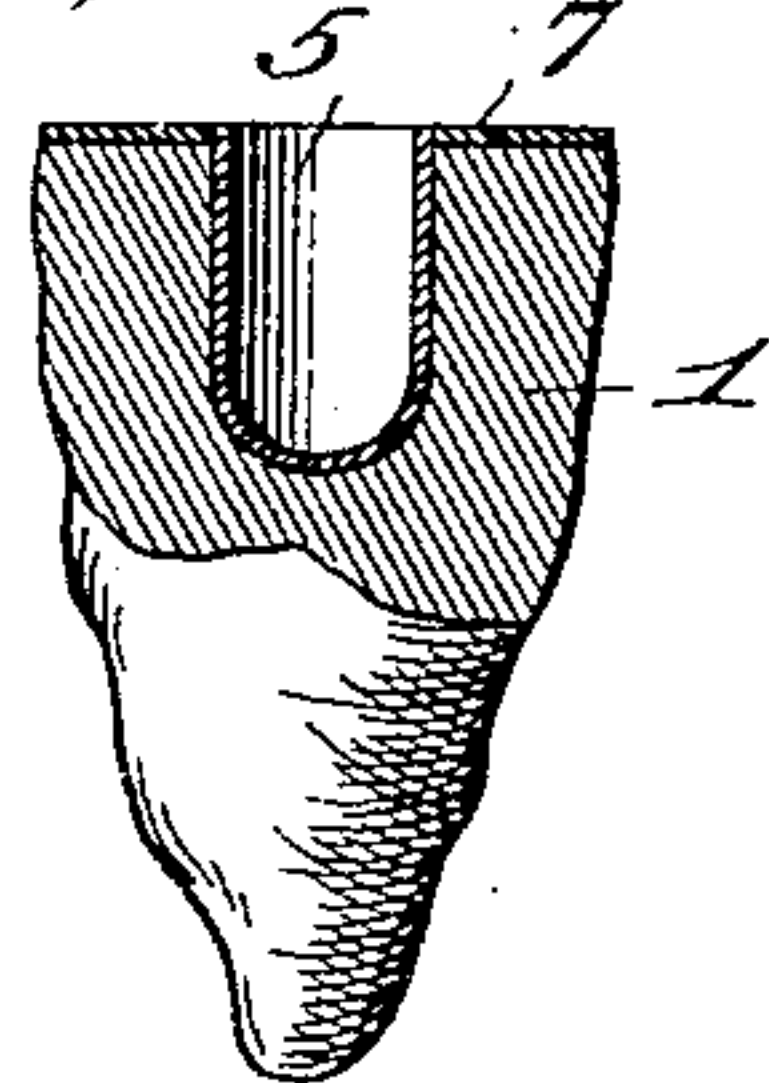


Fig. 9.

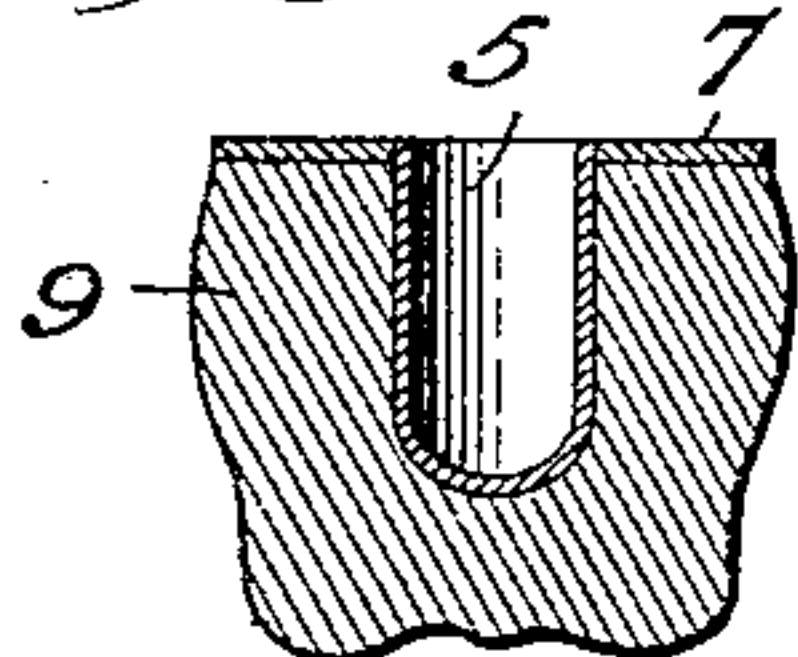


Fig. 14.

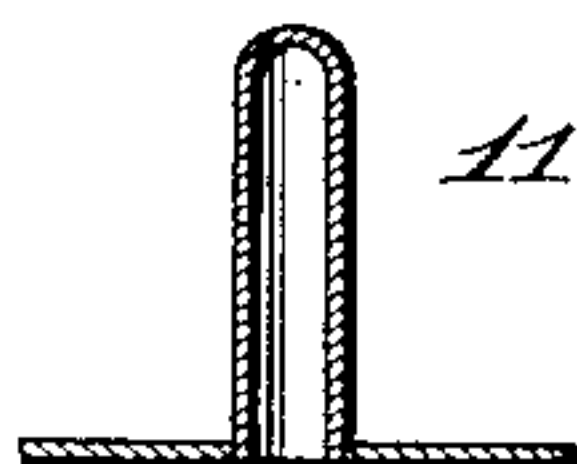


Fig. 15.

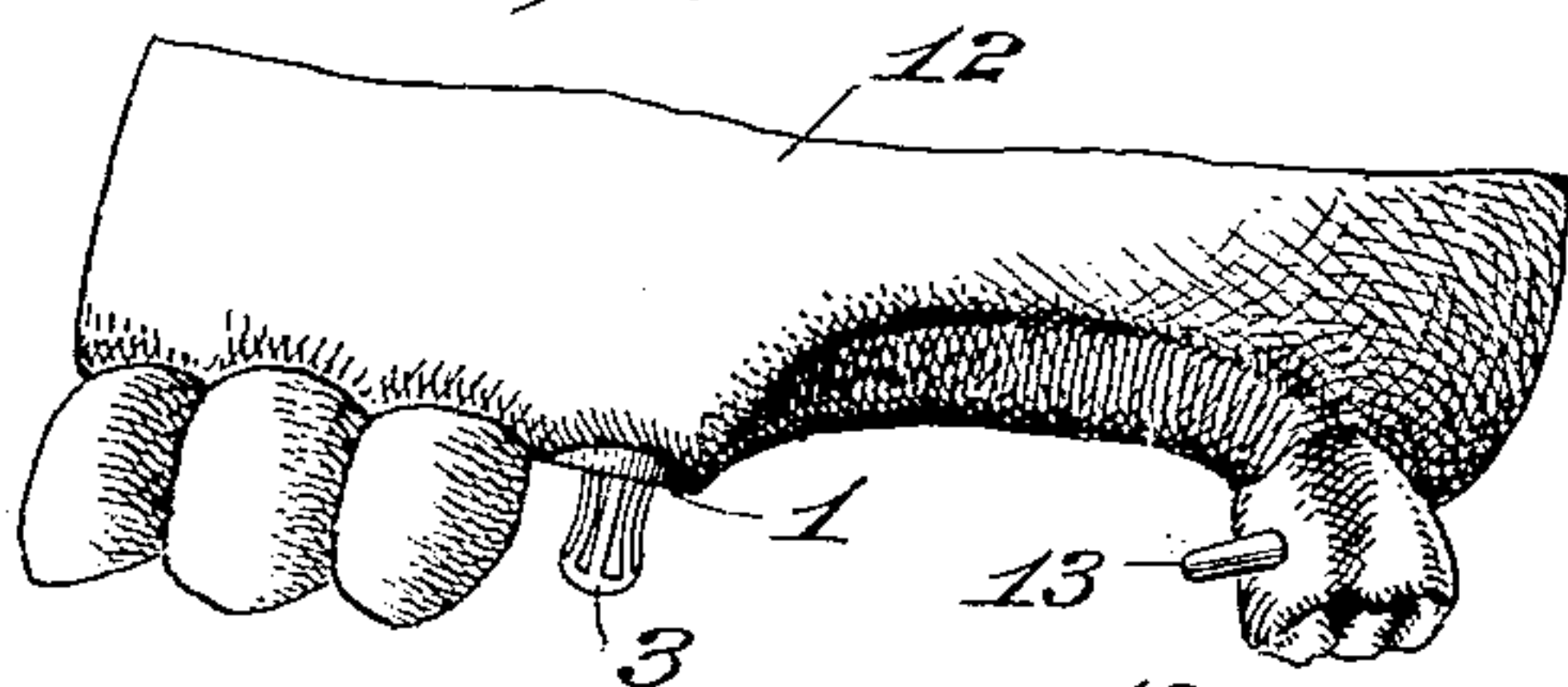
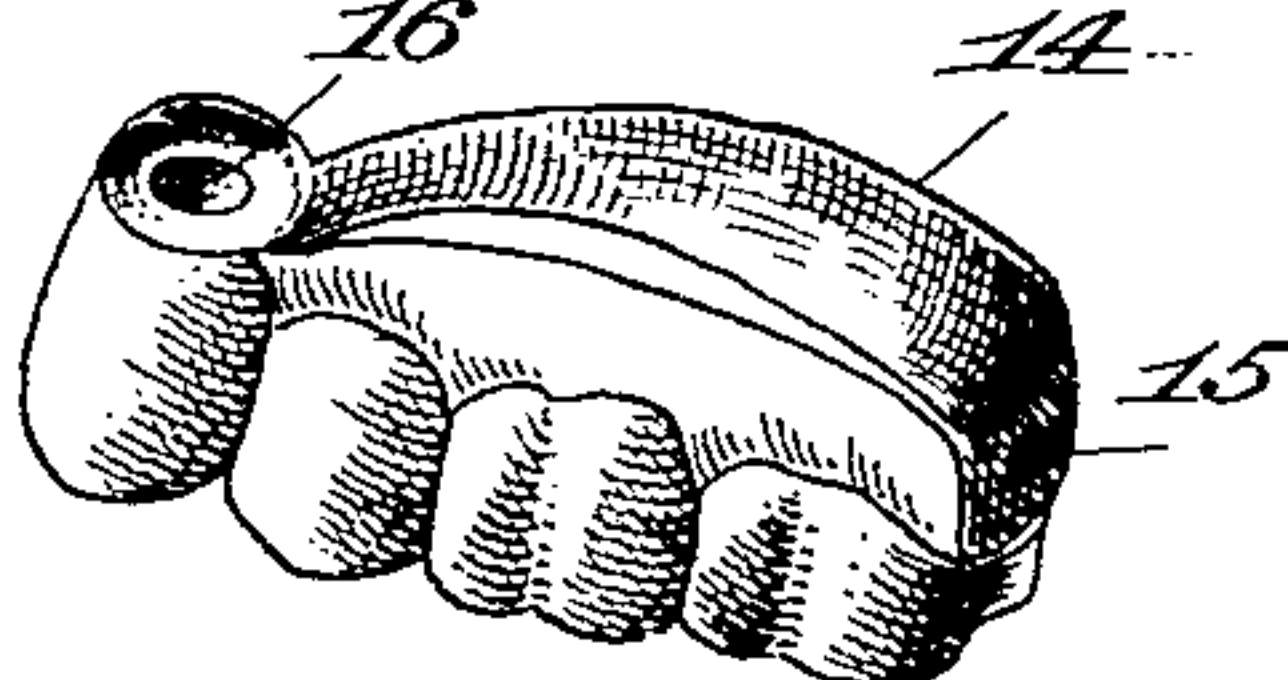


Fig. 16.



Witnesses
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by
Walter J. Rogers,
his Attorney

UNITED STATES PATENT OFFICE.

WILLIAM E. GRISWOLD, OF DENVER, COLORADO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO GRISWOLD DENTAL BRIDGE COMPANY, OF DENVER, COLORADO, A CORPORATION OF COLORADO.

SECURING DEVICE FOR DENTAL BRIDGEWORK.

SPECIFICATION forming part of Letters Patent No. 702,871, dated June 17, 1902.

Application filed October 19, 1900. Renewed May 19, 1902. Serial No. 108,051. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. GRISWOLD, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Securing Devices for Dental Bridgework; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to securing devices for removable bridgework and similar use in dentistry. Its object is to provide a strong appliance which will firmly hold saddle-plates or other parts when in place and yet permit an easy removal and the tightening of the fastening should it become loose.

My invention especially comprises placing a spring-stud in a root or crown, to which a saddle carrying the teeth may be attached, and which is also applicable in securing a single tooth.

In the accompanying drawings, the figures of which are enlarged views, Figure 1 is an elevation, partly in section, of the usual capped root. Fig. 2 is a detail in elevation of a spring-stud. Fig. 3 is a plan of a reducing-ring. Fig. 4 is an elevation of the reducing-ring applied to the spring-stud. Fig. 5 is an elevation, partly in section, of the spring-stud and reducing-ring fixed to the cap of the root. Fig. 6 is a vertical section of a cap for the spring, two sizes being illustrated. Fig. 7 is a plan of a tooth base-ring. Fig. 8 is a vertical section of the cap of Fig. 6 and the base-ring joined. Fig. 9 is a vertical section of the cap and plate of Fig. 8 in place in a crown. Fig. 10 is an elevation, partly in section, of a root and crown connected by the attaching devices of my invention. Fig. 11 is a vertical section of a modification, showing a flange around the top of the crown. Figs. 12 and 13 illustrate modifications or reversals of the securing devices of Figs. 5 and 9. Fig. 14 is a view in elevation of a firing-stool on which the crown is built and the cap applied. Fig. 15 is a perspective showing the securing devices in place, and Fig. 16 is a perspective of a saddle adapted to be secured.

In the drawings, 1 represents (enlarged) a root, and 2 the usual band-cap.

3 is a hollow stud with separate arms—in brief, a spring-stud.

4 is a reducing-ring, with a central perforation of smaller diameter than the normal diameter of the circle made by the free ends of the spring-stud.

5 is a platinum cap, and 6 is a cap of smaller size adapted to telescope with cap 5.

7 is a circular base-ring, with an axial perforation 8 large enough to fit over the cap 5.

9 is a porcelain crown, in which is secured the base-ring cap.

10 is a supplementary flange or band encircling the root-cap for greater strength.

11 is a hollow firing-stool, of platinum or iridium, on which the cap 5 is placed when the porcelain crown is being built up on it and fired.

12 is a portion of a jaw and teeth.

13 is a pin fixed in the side of an artificial tooth.

14 is a saddle with perforations 15 and 16, which respectively fit over the pin 13 and the spring-stud 3.

In practice the reducing-ring 4 is to be forced over the free ends of the spring-stud, which may be easily done by pressing in those ends and twisting them into the opening of the reducing-ring. It is obvious, however, that in actual application the angle of inclination of the base will vary in different roots. It is therefore necessary to file both the spring 3 and the cap 5 or 6, so that they may when placed on the root maintain their proper position without regard to the angle of the base of the root, so that all the studs used may be parallel. Though this can be done by hand and by tools now in use, I have invented a tool especially adapted for fitting the spring-stud to various roots, and in practice one of the most essential features of my invention is the precise adjustment of the spring-stud, the reducing-ring, the cap, and the base-plate, so that all the parts may be perfectly parallel throughout the attaching devices.

In Fig. 4 I have indicated as an example an angle at which the reducing-ring may be required to lie with regard to the spring-stud

and at the same time indicating the varying degree of filing required in the several spring-arms of the stud.

In proceeding to assemble the parts the usual impression is taken in plaster of the capped roots and the parts to be supplied with teeth, the caps being arranged to easily slip off the roots. The inside and pins of the root-caps are covered, preferably, with a solution of paraffin dissolved in ether, the impression is varnished, and a model is made in the usual manner. After the model is made it is slightly warmed, so that the root-caps can easily be removed and accurately replaced. This model is waxed on the instrument before referred to as my invention. This instrument is adjustable in all its parts and is used to set the spring-studs perfectly parallel one with the other. In an adjustable chuck or holder of the said instrument is placed, for example, the cap 5, and the spring-stud is slipped inside the cap. If the small size is to be used, the second-size cap 6 is fitted into the first, and the spring-stud is then placed within the second cap, so that one holder may serve for the two sizes. I have not deemed it necessary to illustrate this instrument in this application, inasmuch as it is to be the subject of a companion application. It is sufficient to say that by this instrument the proper angle is obtained, and then the cap and the spring-stud are ground or filed to the proper angle while in the adjustable chuck or holder. I then insert the spring-stud into the reducing-ring, so that its free arms are flush with the surface of the ring, and solder it on the back of the ring, producing the device illustrated in Fig. 4. The spring-stud is now obviously just as much shorter than the cap 5 as the thickness of the reducing-ring 4. The combined spring-stud and reducing-ring are now replaced in the chuck or holder previously used, and the chuck or holder through the action of the instrument brings them back to position over the model, where they are waxed fast with hot wax. The root-cap and the securing device are then removed from the model, and the parts so combined may be invested in the usual manner as a working step. As the reducing-ring ordinarily projects beyond the cap, it is considered preferable to solder from the cap side. The parts are then filed up, so that the roots, the cap, and the securing devices may be now a finished article, as shown in Fig. 5. It is important that the preceding step be accurately and well done, as these parts are to remain permanently on the roots in the mouth. The same proceeding is used for each abutment. The next step is to take the platinum cap 6, which has been filed or ground at the same time and at the same angle as the spring-stud, and place it over the stud, as in Fig. 5. Then the base-ring 7 is forced over the cap. As all these are punched or made of uniform gage, they fit each other accurately. The base-ring and the cap are now fastened together

with wax and then removed from the spring-stud and soldered with pure gold or gold and platinum in the usual manner. A porcelain crown has a receptacle formed in it for the reception of the joined cap and base-ring, and these parts are built up and fired in the usual manner on a stool of iridium, (shown at 14.) The complementary devices are now completed, and the crown and the root may be secured by them, as illustrated in Fig. 10.

In Figs. 15 and 16 I have illustrated the application of my securing devices and bridge-work. The spring-stud 3 has been secured by the method described in an anterior crown or root. The posterior attachment comprises a platinum or iridium solid stud soldered on the side of a gold crown or artificial tooth. The saddle has a metal sheath soldered to it, and two perforations are formed at opposite ends of the sheath. Perforation 15 is placed over the pin 13, the saddle swings downward on this as a pivot, and the perforation 16 is forced over the spring-stud 3, securely holding the saddle in place.

To properly produce and apply my securing device requires distinct inventions in separate tools. I have previously referred to one tool which I use. In insuring the proper action of the saddle in making close connection, as required in using my securing device, I use also a device which forces the saddle up into the soft tissues of the mouth previous to the taking of an impression, so that I am sure of accomplishing the nicest relation of the parts, thus enabling me to properly and efficiently use and apply my securing devices.

I have illustrated and previously referred to modifications and a reversal of the securing devices. The telescoping features of the caps enable the operator to alter the size of the device to suit the occasion. In case a tooth to be attached is so small that it would necessitate placing a part of the appliance in the root and a part in the crown it is advisable to cut off the end of one of the caps, fasten the spring to the proper size reducing-ring, and solder to the cut-off end of the cap. Then a platinum-iridium wire is fitted through the hole, extending down into the spring nearly to its end as long as the root-channel will allow, and there soldered. Thus the proper size of crown-cap is applied and soldered on the root end and attached to the end of the root. Then the small-size cap is carried over the spring inside the larger cap, the crown-plate is properly applied and waxed, and then removed and soldered. An adjustment is thus secured which is half in the root and half in the crown. This will illustrate one of the possibilities of the application of my securing devices to various uses in prosthetic dentistry.

Having fully described my invention, I claim—

1. A spring-stud fastener for dental use, having a series of spring-arms and a reducing-ring applied to the arms to converge their ends

and furnish a means of attachment to a root or crown.

2. A spring-stud fastener for dental use, having a series of spring-arms, a ring encircling the arms and set upon the arms at the same angle as the base of the root or crown to which it is to be applied.

3. The combination in a dental securing device, of a spring-stud fastener carrying a reducing-ring and a complementary cap and base-ring.

4. In removable bridgework, the combination of posterior and anterior attaching de-

vices, one a solid stud fixed in an artificial tooth, the other a spring-stud secured in a root or crown, and a saddle having a metal sheath perforated to take over the solid stud as a pivot and to receive the spring-stud to secure the saddle.

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

WILLIAM E. GRISWOLD.

Witnesses:

F. G. CANT,
W. C. EARLE.