Jan. 14, 1930. H. BOATNER 1,743,910

DENTAL ANCHORING METHOD AND DEVICE

Filed July 23, 1928

Fig. 1.

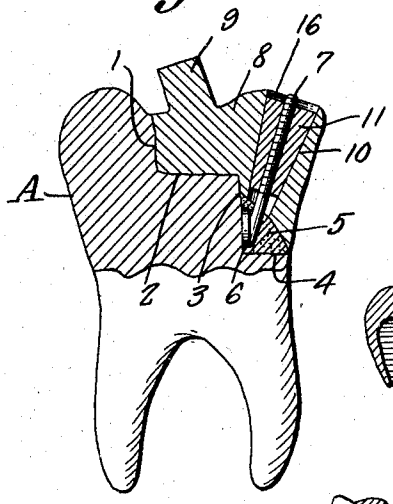


Fig. 2.

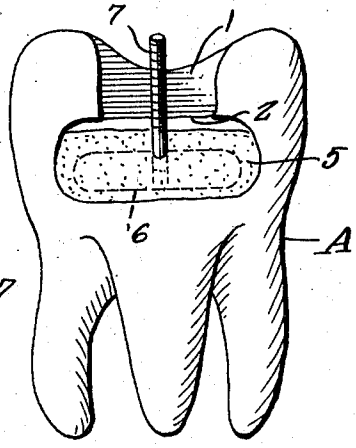


Fig. 9.

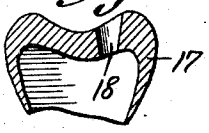


Fig. 3.

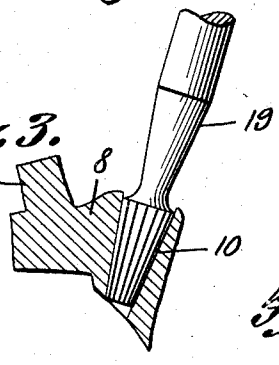


Fig. 4.

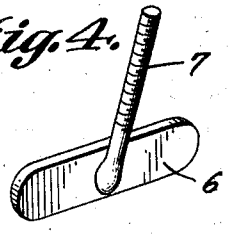
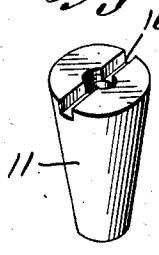


Fig. 6.

Fig. 5.



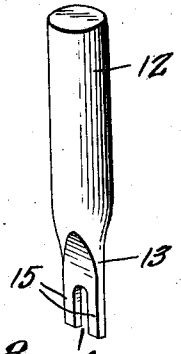


Fig. 7.

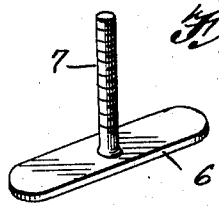
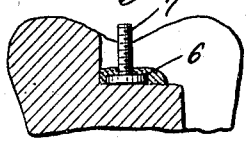


Fig. 8.



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WITNESS:

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UNITED STATES PATENT OFFICE

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DENTAL ANCHORING METHOD AND DEVICE

Application filed July 23, 1928. Serial No. 294,765.

This invention relates to dentistry, and its general object is to provide an improved method of anchoring cast metallic inlays and crowns to teeth in a manner whereby the inlays and crowns may be used for anchoring bridges.

A further object of the invention is to provide a novel method of forming cavities in teeth in preparing them for inlays and the like, the cavities being formed in a manner to not only keep the pulp alive and to retain the investing tissue in a healthy condition but also to effectively, firmly and securely receive an anchoring means which cooperates with the walls of the cavity to retain inlays with crowns and bridges secured thereto or the crowns secured directly to the teeth in a manner whereby they will resist stress in all directions.

Another object of the invention is to provide a metallic anchoring means for securely receiving inlays, crowns and the like, and cooperates with the novel arrangement of the walls of the cavity so that the strain is put upon the strongest part of the tooth when the inlays and crowns and the like are used for supporting bridges.

A further object of the invention is to provide an anchoring means that is simple in construction, inexpensive to manufacture, and efficient in operation and service.

This invention also consists in certain other methods and features of construction and in the combination and arrangement of the several parts to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing my invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a fragmentary sectional view taken through a tooth and illustrates an inlay anchored therein by my novel method and anchoring means with the sprue of the inlay left for the impression of the bridge.

Figure 2 is a view illustrating the tooth prepared with a cavity in accordance with my method and illustrates the metallic anchoring means secured therein.

Figure 3 is a sectional view taken through the inlay in the form as shown in Figure 1 and illustrates the reaming drill in use for smoothing out the bore which is formed for the anchoring nut.

Figure 4 is a perspective view of one form of the anchoring means with the nut removed.

Figure 5 is a similar view of the anchoring nut.

Figure 6 is a similar view of the screw driver that is used upon the nut.

Figure 7 is a modified form of anchoring means with the nut removed.

Figure 8 illustrates the form of anchoring means as shown in Figure 7 in secured position in a tooth.

Figure 9 is a sectional view of a crown prepared in accordance with my method.

While I have shown a molar prepared with a cavity formed in accordance with my invention, with an inlay secured in said cavity, as well as the arrangement of my anchoring device, I want it understood that any type of tooth can be prepared accordingly for receiving the anchoring device and inlays without departing from the spirit of the invention. While the cavity may be formed in a healthy tooth for the purpose of accommodating the inlay and anchoring device, the natural under-cuts produced by decay may be finished and prepared in the same manner.

Referring to the drawings in detail, the letter A indicates a molar having a cavity formed therein in substantially step formation and in accordance with my method. The cavity includes a vertical wall 1 and a horizontal wall 2 which make up the occlusal step, an axial wall 3 and a base wall 4. The axial wall and base wall may be laterally cut as at 5 for the purpose of accommodating the flat body 6 of the anchoring device which also includes a stem 7 formed with screw threads as clearly shown in Figures 4 and 7 of the drawings. The anchoring device as shown in Figure 4 is illustrated in applied position in Figure 1, and the stem 7 may be secured to the body so as to extend therefrom in any desired direction, it depending of

course upon the tooth and the condition thereof as well as the manner in which it is desired to secure the inlay or crown to the tooth as will be apparent.

The inlay which is indicated by the reference numeral 8 is cast to fit the cavity and of course has a portion or portions shaped for fitting engagement with the respective walls of the cavity as well as the built up portions and the material used in securing the anchoring device in operative position, as shown in Figure 1 of the drawings.

When the inlay is cast, a sprue 9 is formed therewith so as to provide appropriate means for making the impression for a bridge, and in the process of casting the inlay a conical shaped bore 10 is formed therein for the purpose of accommodating a conical shape nut 11 which is threadedly received by the screw threads of the stem 7, and this nut together with the remaining portion of the anchoring means and shape of the cavity secure the inlay in the cavity in a manner whereby it will resist stress in all directions, with the result a bridge can be secured to the inlay without fear of separation of the inlay from the tooth or breakage or other damage thereto.

For the purpose of applying and removing the nut to and from the stem 7, I provide a screw driver such as shown in Figure 6, and this screw driver includes a handle 12 which tapers at one end to provide a shank 13. The shank 13 is flattened and formed with a slot 14 to provide spaced parallel arms 15 for the purpose of being received in a transversely disposed slot 16 arranged in the large upper end of the nut which is shown in Figure 5. Sometimes I make use of a sleeve (not shown) with the screw driver to assist in holding the nut, and the sleeve is provided with cooperating spring fingers curved toward each other.

In Figure 8 I have illustrated a slightly different arrangement of the body and screw stem portions of my anchoring device, and in this figure it will be noted that the body is fixed to the horizontal wall 2 of the occlusal step and the stem is arranged with respect to the step in the manner as shown in Figure 7. This arrangement may be used for securing crowns such as shown in Figure 9, but in order to secure the crown referred to and which is indicated by the reference numeral 17 to a tooth, the stem must be arranged so as to pass centrally through the bore 18 of the crown whereby it will be in a position to receive the nut 11 in the same manner as illustrated in Figure 1.

When the inlays or crowns are cast, the bores thereof may be rough and I employ a reaming drill such as indicated by the reference numeral 19 for smoothing the bore so that the nut will be disposed in fitting engagement therewith as will be apparent when the latter is threadedly secured to the stem.

The method for making the inlays whereby they conform to the shape of the prepared tooth with the anchoring means secured thereto, and the manner of fixing the anchoring means in the tooth will now be described.

The cavity is formed in accordance with the method above set forth and as suggested in Figures 1 and 2 of the drawings, the body 6 of the anchoring means is fitted in position, and the stem is soldered thereto at the proper angle. The stem is then cut off at the proper length for the occlusion, and the body is cemented in position. Any under-cuts is filled with amalgam or other material, so that the wax pattern can be readily removed from the cavity without distortion thereof. The conical shape nut is disposed upon the stem, thence the inlay wax is forced under and around the nut and into the rest of the cavity for making a wax pattern. This pattern is formed in the same manner as an ordinary two surface inlay pattern. After the wax is chilled the nut is unscrewed by means of the screw driver above referred to, the wax is then removed and cast. After casting the inlay or crown will have a cone shape hole disposed therein to accommodate the nut. The inlay is placed in the cavity and held in position by means of the nut, or wax is melted about the stem and into the hole, for the purpose of temporarily holding the inlay in place while an impression is made for a bridge.

The bridge is made in the ordinary way now commonly employed, and after the bridge is made, it is cemented in place. While the cement is still soft the nut is disposed on its stem, with the result the inlay is not only held securely to the tooth, through the medium of the novel form of cavity as well as the anchoring device, but the bridge will be held accordingly.

The crown is formed, made, fitted and secured in the same manner, and a bridge may be secured thereto accordingly, but of course a cavity is not formed in the tooth for accommodating the crown unless it is necessary for removing decayed parts, jagged or irregular edges and the like.

It is thought from the foregoing description that the advantages and novel features of my invention will be readily understood.

I desire it to be understood that I may make changes in the method and construction, and in the combination and arrangement of the several parts and steps of the method, provided that such changes fall within the scope of the appended claims.

What I claim is:

1. A method of securing inlays to teeth by forming a cavity in a tooth in a manner to provide stepped walls arranged therein so as to keep the pulp alive and to retain the investing tissues in a healthy condition,

under-cutting two of said walls, securing anchoring means including a threaded stem to any of the walls, filling the under-cuts with amalgam, threading a conical nut upon the stem, forcing wax under and around the nut and in the cavity to form a pattern for an inlay, unscrewing the nut after the wax is chilled, removing the chilled wax and using the same for making a cast, forming an inlay from the cast and leaving a sprue thereon, said inlay being provided with a conical bore formed by the cast being made from the wax pattern, fitting the inlay in position in the cavity, temporarily securing the inlay in place, making an impression for a bridge from the sprue, tooth and inlay, forming the bridge from the impression, fixing the inlay to the bridge, cementing the bridge with the inlay to the tooth, and screwing the nut in place while the cement is soft.

2. A method of securing inlays to teeth for fixing a bridge thereto, by preparing a stepped cavity in a tooth, said cavity including a vertical wall, a horizontal wall extending from the vertical wall, a base wall below the horizontal wall, an axial wall connecting the base wall with the horizontal wall, undercutting the axial and base walls if necessary, securing the body portion of an anchoring means to any of the walls and under-cut portions, securing a threaded stem to the body of the anchoring means at any desired angle with respect thereto, cutting off the stem at the proper length, filling the under-cuts with amalgam, threading a conical nut upon the stem, forcing wax under and around the nut and in the cavity to form a pattern, unscrewing the nut after the wax is chilled, removing the chilled wax and using the same for making a cast, forming an inlay from the cast and leaving a sprue projection upon the inlay, placing the inlay in position in the cavity, temporarily securing the inlay in place, making an impression for a bridge from the sprue, tooth and inlay, forming the bridge from the impression, cementing the bridge to the tooth and inlay, and securing the nut permanently to the stem while the cement is soft.

In testimony whereof I affix my signature.

HOWELL BOATNER.