Aug. 16, 1927. 1,638,820

D. BARATT

METHOD OF AND APPARATUS FOR BRIDGE ATTACHMENT

Filed Jan. 23, 1924

Fig. 1.

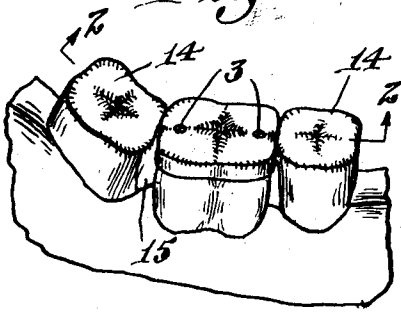


Fig. 2.

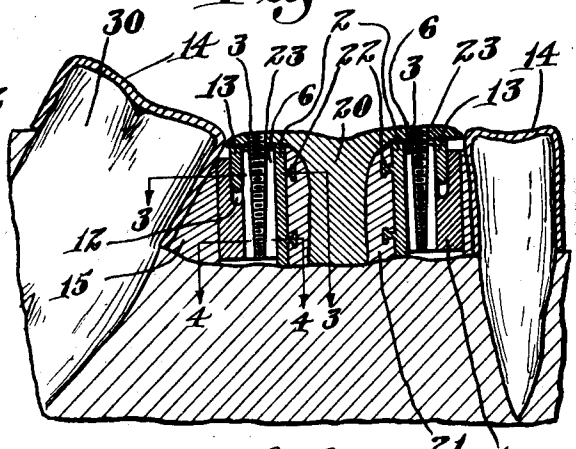
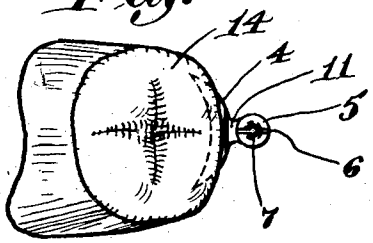


Fig. 5



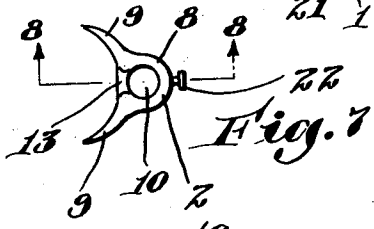


Fig. 7

Fig. 6.

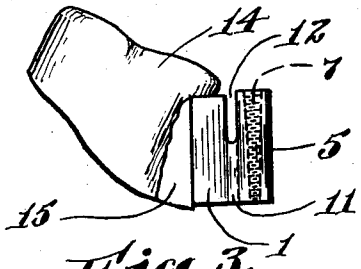


Fig. 8.

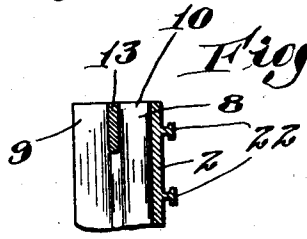


Fig. 3.

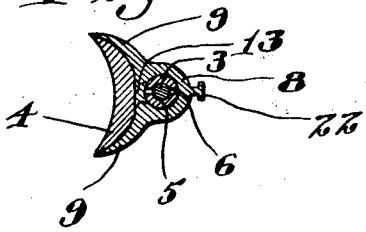


Fig. 9.

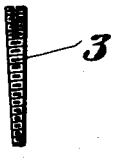
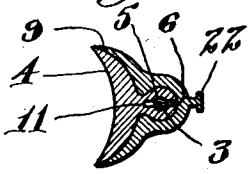


Fig. 4.



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by
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UNITED STATES PATENT OFFICE.

DAVID BARATT, OF ROXBURY, MASSACHUSETTS.

METHOD OF AND APPARATUS FOR BRIDGE ATTACHMENT.

Application filed January 23, 1924. Serial No. 687,900.

My present invention relates to a novel attachment for dental bridge work, and more particularly to an attachment which may be removably attached, or fixed in a stationary position in the mouth of the patient, and also to a novel method or process of attaching dental bridges by the use of my invention.

I am aware that there have been many methods and devices for attaching bridgework, but heretofore these methods have been objectionable for many reasons; principally because of the pain to the patient and the injury to the natural teeth in the mouth, and because of the fact that it has been heretofore impossible to so position a bridge that it would remain in a fixed stationary position.

My present invention has overcome all these prior difficulties, and eliminates all pain to the patient during the operation of attaching, and obviates the injuries to the natural teeth which have been considered necessary in attaching prior dental bridges.

I have devised a novel form of crown and bridge attachment which may be removably positioned in the mouth of the patient, so that the patient may easily remove the same for cleaning the bridge and the gum, and then readily replace it in position for use. My present attachment is also so constructed that the dentist may secure it firmly and permanently in position, against any possibility of removal or pulling out. The bridge attachments heretofore employed have also been objectionable because in eating substances like sticky candy, meats, or the like, the bridge would adhere to the same and work loose with the movement of the jaws. My present invention obviates this difficulty, and renders it possible for a patient who is wearing dental bridge work attached by my novel devices, to eat anything without danger of the bridgework pulling loose.

It has also been heretofore impossible to satisfactorily insert a bridge with crown abutments where the space between the teeth where the bridge is to be inserted is of a V-shape, i. e., te space near the occlusion is narrower than at the gingival margin of the natural tooth, or vice versa, except by grinding off the mesial or distal sides of the natural teeth. This naturally resulted in great pain to the patient, consequent injuries to the natural teeth, and frequently the patient would refuse to have the work done because of these difficulties. By the use of my present invention all these difficulties and disadvantages have been overcome and eliminated, and my novel attachment renders it possible to apply a crown and bridge in any shape of cavity with no pain to the patient, and no injury to the natural teeth used as abutments.

My invention is also important because of the improved hygienic condition which exists as the result of the use thereof. In many forms of stationary and fixed bridgework the same had to be cemented in one solid piece to the abutting teeth, thus rendering it difficult, if not impossible, to thoroughly cleanse the teeth. Food would lodge around and under this artificial work, and, it being impossible to properly remove the same, the food would decay with the consequent ill effects and damage to the health and mouth of the patient. By the use of my attachment, the patient can either remove the bridgework himself for cleansing the bridgework and the gums, if the bridge is removably attached, or if it is fixed in a stationary position, the dentist can easily remove, clean, and replace the same. It will thus be seen that a great advantage of my invention is the hygienic condition of the mouth produced as a result of the use of my novel device.

Repairing of prior bridgework has been very difficult because of the fact that it was necessary to forcibly remove the whole bridgework, merely to replace a broken facing, or some such comparatively trivial repair. In order to so remove such bridgework, the abutting crowns must be cut, and the whole forcibly removed by mechanical means, which was necessarily very painful to the patient, and injurious to the surrounding teeth because of such mechanical force applied. The same difficulties exist when one of the abutting crowns is bitten through, or when a tooth under one of the abutting crowns decays, or aches. By the use of my invention, all this mechanical forcing, resultant pain and possible injury is entirely eliminated.

My present invention consists in a pair of members, male and female, and the novel construction of such members. In order to apply my novel attachment, it is necessary to provide a crown on each of the natural teeth abutting the space to be filled, and to

each of these crowns is soldered or otherwise attached the male member. These male members must be so fitted that the same are in an absolutely parallel upright plane. The male member consists of a flared portion permitting of soldering to the adjacent crown, an upright, hollow, threaded, split pin attached to said flared portion. To the bridge to be inserted are secured the female members of my attachment. These may be soldered or secured by any other desirable means. The female members are so constructed and arranged in the form of a sleeve as to permit a snug, sliding fit downwardly over the male member, and with an aperture at the top of the female member, the purpose of which will be hereinafter more fully described. This aperture extends through the top of the bridge to be attached, permitting the entrance of a headless tapered screw through the aperture in the bridge, the aperture in the female member, and into the tapered threaded portion of the male member. If it is desired to position the bridgework removably in the mouth of the patient, the screws are inserted to normal position and the bridge can then be removed and replaced by the patient as desired. If, however, it is desired to have the bridge stationary or fixed in the mouth of the patient, the dentist turns the screws more tightly, and the consequent threading into the male member will expand the same where split, thus exerting an outward gripping, binding action on the inner walls of the female member, and giving a firm positioning of the attachment, so that the bridge can only be removed by loosening of the screws.

It will be appreciated that my novel attachment can be applied to bridge work and crowns on abutting natural teeth, or may be applied to pivoted teeth, or any artificial work, such as rubber, where the male member would be soldered to the abutment and female member vulcanized into place with hard rubber, instead of by soldering, as shown in the present drawing.

It will be appreciated that it is desirable to manufacture the male and female members of my novel attachment separately, of standard sizes, as they can be applied to any form or size of teeth, it being feasible and desirable to manufacture the parts of my attachment in quantity and of uniform size, so that interchange of parts and repair may be readily and conveniently effected.

I believe that my novel attachment is a radical departure from anything existing in the art and I wish to claim the same broadly herein.

I also believe that the process or method of attaching artificial bridges by means of my novel attachment is new, and I wish to claim such process herein broadly.

The process of technique of constructing a bridge with my attachments is as follows: The crown abutments are adjusted on teeth in patient's mouth, an impression taken, a model poured and male attachments adjusted to crown on parallel lines by means of a parallel meter, male member and crown waxed together, crown removed and same are then invested and soldered together. The crown and soldered male attachment are then placed back in position, and female attachment fitted on male attachment. A wax bridge is then constructed with the female attachment held thereto by sticky wax, bridge and female attachment are removed, invested and soldered. When bridge is properly fitted in the model, the same is placed back, screws inserted and tightened as for a stationary bridge, crowns and bridge are removed together and polished as one piece. Crown is then separated from bridge, crowns adjusted in patient's mouth on the abutted teeth, bridge inserted, and when fit and articulation are satisfactory, the crowns are cemented to the abutting teeth with slow-setting cement, bridge is inserted immediately and when fit and articulation are satisfactory, the same are left in that position until the cement hardens, when the bridge and crown are cleaned of surplus cement. The retaining screw can then be tightened as desired.

Referring to the drawings illustrating a preferred embodiment of my invention,

Fig. 1 is a perspective view of a completed bridge;

Fig. 2 is a cross sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a cross sectional view on the line 3—3 of Fig. 2;

Fig. 4 is a cross sectional view on the line 4—4 of Fig. 2;

Fig. 5 is a top plan view of the male member of my attachment positioned on a tooth;

Fig. 6 is a cross sectional view of the male attachment;

Fig. 7 is a top plan view of the female member of my attachment;

Fig. 8 is a cross sectional view on the line 8—8 of Fig. 7, and

Fig. 9 is a view on an enlarged scale of the tapered screw member.

As shown in the drawings, my novel attachment comprises the male portion 1, female member 2, and tapered screw 3. The male portion 1 is constructed and arranged with a body portion 4 of appropriate contour to fit against, or be soldered to, an abutting crown 14, as clearly shown in Fig. 5. Attached to the body portion 4 and integral therewith is a hollow threaded split pin 5. As clearly shown in Fig. 5, this pin 5 is split at a point 6 opposite the body portion 4. The purpose of this construction will be hereinafter more fully described.

Within the pin 5 is a threaded, tapered aperture 7 adapted to receive the headless tapered screw 3. The female portion 2 comprises a hollow body portion 8 having wing members 9, 9, adapted to fit, when in position, snugly against the body portion 4 of the male member. The female member 2 has formed therein a tubular portion 10 which is adapted to fit over the pin 5 of the male member of my attachment. As shown in Fig. 5, the male member 1 has a narrowed neck portion 11 in the upper end of which portion 11 is a recess 12 adapted to receive the downwardly extending inner wall 13 of the female member to prevent the bridge being forced into the gum during mastication, operation of the screw 3, or the like.

Fig. 3 illustrates, in cross sectional view, the complete attachment with the female member positioned on the male member in a substantially tight, snug fit. It will be appreciated, from an inspection of Fig. 3, that operation of the tapered screw 3 in a downward direction in the threaded slot 7 will cause the pin 5 to expand against the wall of the tubular portion 10 of the female member. Such expansion will effect a firm gripping tension against the walls of the tubular portion 10, thus holding the female member securely in position on the male member.

Referring now to Fig. 2 illustrating my novel attachment incorporated in a dental bridge, the male member 1 is shown secured to the crown 14 by means of solder, or the like, 15. As heretofore explained, it is absolutely essential that the pin 5 of the male members 1 be positioned in parallel relation to each other. It will be appreciated that it is essential to have two attachments in each bridge to be applied and therefore it will not be necessary to describe in detail each attachment as shown in Fig. 2. I have illustrated a bridge 20 of gold, silver, or the like, provided with the female portion 2 secured thereto by means of solder, or the like, 21. The female member is provided with projecting headed pins 22 to further assist in rigidly securing the female member to the bridge.

When it is desired to attach a dental bridge in the mouth of a patient, it is first necessary to make an impression in wax of the space to be filled. I have herein illustrated a bridge inserted in the space between a molar and a bicuspid, which space, due to the curvature of the mouth, is uneven, being narrower at the top than at the bottom. By the use of solid bridge work at present employed, great pain and possible injury is occasioned to the patient during the installation of such bridge work.

By the use of my novel attachment, the dentist first ascertains, by any desirable means, the position which the male members must assume when finally secured in place, such position being on parallel lines. The female member 2 is then slid over the male member 1 and a wax impression or mould is made. The pins 22 will assist in holding the female members in position in this wax mould. Having ascertained the desired parallel, upright relation of the male members, the same are soldered or otherwise secured to crowns, such as 14, which crowns are then positioned on the teeth abutting the space to be filled by the bridge. These crowns 14 are held in position on these abutting teeth in the customary manner, such as by cement or the like. The dentist having completed the bridge 20 with the female members 2 securely attached thereto, it is merely necessary to slide the bridge 20 into position in the space or cavity to be filled. The bridge 20 is provided with apertures 23 at each side thereof, which apertures are adapted to be relatively positioned over the tubular portion or sleeve 10 in the female member 2 to permit insertion of the headless tapered screw 3 through the aperture 23 and into the threaded recess 7 in the rod 5. When the bridge 20 is in position with the female member 2 engaging the male member 1, the screws 3 are then inserted through the aperture 23 into the slot 7 and screwed into normal position, without, however, being screwed downwardly sufficient to expand the split pin 5. With the bridge thus in position, it will be seen that, due to the closely fitting construction of the male and female members, the bridge 20 will be held in a substantially firm position. It will be possible, however, for the patient, should he so desire, to remove the bridge 20 by merely raising it from its normal position, it merely being held in such position by the close fitting relation of the male and female members of my attachment.

Should it be desired, however, to secure the bridge 20 firmly in position against any possibility of any accidental removal thereof, such as might occur through chewing stick candy, meats, or the like, it is only necessary that the dentist, in applying the bridge with my novel attachments, tighten the screw 3 so that the same will be threaded downwardly in the recess 7, thereby causing an expansion of the pin 5 against the walls of the tubular portion or sleeve 10 of the female member. This expansion may be made sufficiently great to cause such a gripping action as to prevent the removal of the bridge by any ordinary application of force. Should it be desired, however, for any purpose, to remove the bridge 20, it is only necessary for the dentist to loosen or remove the screws 3 from position in the aperture 7, whereupon the bridge 20 can be slid outwardly and out of position by the fingers alone without the use of any mechanical force. For example, if the patient

should suffer from pain in the teeth 30, for any reason, it is only necessary to remove the screws 3, slide the bridge 20 out of its position, cut and remove the crown 14 from the tooth 30, leaving the tooth 30 exposed for any work the dentist may find it necessary to do. Such work completed, the crown 14, or a similar crown with the male member attached thereto, is replaced and the bridge 20 inserted, screws 3 threaded into the aperture 7, and the bridge is again firmly in position with no unnecessary pain or injury to the patient. The same methods would be utilized for any reason for which it became necessary to remove the bridge, such as if the abutting crowns 14 should be worn or bitten through, cracked facing on the bridge 20, or for any similar causes which will be readily apparent to those skilled in the art.

While I have herein shown my novel attachment secured to a bridge comprising a single tooth, it will be appreciated that the same can be applied to a bridge composed of any number of teeth, in any position in the mouth of the patient where it is necessary or desirable to install such bridge work. It will also be appreciated that, while I have illustrated my novel attachment in conjunction with abutting crowns applied to natural teeth, it is equally feasible to utilize the same on pivoted teeth or any artificial teeth to which the male members 1 can be attached. My invention is also capable of utilization in an artificial bridge composed of vulcanized rubber or the like, with equal facility.

By the use of my novel attachment in bridge work, it is possible to attain a more hygienic condition in the mouth of the patient due to the easy removal of the bridge for cleaning, and equally easy replacement of the same either by the patient or by the dentist.

By so constructing and arranging my attachments in the bridge work to be applied so that the same are concealed within the bridge, the patient is relieved from the annoyance and disagreeable features which are present in bridge work necessitating the application of outside attaching elements.

It will be appreciated that in some instances where it is permanently desired to install a crown or bridge in the patient's mouth I may eliminate the tapered screw construction, and utilize a plain headed straight screw, which may be removed when desired, and which will at the same time carry out the purpose of my invention in rigidly and positively holding the crown and bridge attachment in position.

My invention is further described and defined in the form of claims as follows:

1. The improved process of applying bridgework between abutting teeth, which consists in fitting a pair of male members adjacent the abutting teeth in parallel upright relationship, then applying a bridge thereto, said bridge being fitted with interlocking female members, and thereupon applying removable expanding threaded means to rigidly secure the bridge in position.

2. Attachments for bridge work, comprising a male member adapted to abut against a rigid tooth, an interlocking female member cooperating therewith to hold the bridge, and a removable tapered threaded wedge member to hold the male and female members in rigid position.

3. In a device for attaching a bridge, the combination of two parts, one being secured to the abutting tooth and the other to the bridge, one part carrying a sleeve and the other part a threaded expansible pin which is adapted to enter and engage the sleeve as and for the purposes set forth.

4. Attaching means for removable dentures, comprising a pin, a sleeve engageable over said pin, said pin being threaded and split along one edge thereof for engagement with the interior of said sleeve.

5. In a dental device the combination of two parts, one carried by the abutting tooth and the other by the removable bridge, an open ended sleeve carried by one of the parts and an expansible pin carried by the other part and adapted to fit within the sleeve, means for expanding said pin whereby the two parts will be held in a stationary position.

6. The improved process of bridge work, which consists in first positioning crowns on teeth abutting a cavity to be provided with bridge work, then taking a wax impression, and adjusting male attachments to the abutting crowns on parallel lines by means of a parallel meter, then waxing the male members and crowns together, then removing the crowns, investing and soldering male members and crowns, then replacing the crowns and soldered male attachment on the abutting tooth, and fitting the female attachment on the male attachment, then constructing a wax bridge with the female attachment adhered thereto, then removing the bridge and female attachment, investing and soldering the same together, then replacing the completed bridge in the mouth, and applying interlocking threaded wedging means to hold the bridge and cooperating parts in position.

7. In a dental device the combination of two parts, one carried by the abutting tooth, and the other by the removable bridge, an open ended sleeve carried by one of the parts, said sleeve being partially open on one side and provided with a shoulder, said shoulder being adapted to co-operate with a corresponding recess on the part carried

by the abutting tooth to prevent downward movement of the bridge when in position, and an expansible pin carried by the other part and adapted to fit within the sleeve, means for expanding said pin whereby the two parts will be held in a stationary position.

8. Attaching means for removable dentures, comprising a pin, a sleeve engageable over said pin, said pin being threaded and split along one edge thereof for engagement with the interior of said sleeve, said sleeve being provided with means to prevent further downward movement over said pin beyond the desired position.

In testimony whereof, I have signed my name to this specification.

DAVID BARATT.