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July 13, 1937.

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Filed June 1, 1935

2,087,047

2 Sheets—Sheet 1
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This invention relates to dental bridge construction of the fixed removable type, and has as its object the provision in such dental bridge construction, of locking means whereby the patient is inhibited from removing the pontic part of the bridge, this prohibition being desirable from the fact that constant removal of the pontic part of the bridge the same becomes loose and in time will have a tendency, of its own accord, to work out.

Also, in behalf of the patient it is desirable to provide for the locking of the bridge work in place against removal by the patient since upon removal, the patient carelessly, as a rule, handles the bridge with the result that the danger of breaking of the pontic part of the bridge, especially, is ever present.

Further, by means of the present invention bridge constructions embodying what is known as "post-sleeve" attachments are now made applicable for the anterior region of the oral cavity whereas previous use of such post-sleeve attachments were confined to removable bridge construction and as such used in the posterior region of the mouth only.

More particularly, an object of the invention is to improve upon what is known in the art as the post-sleeve attachment, above referred to, and now generally used for bridge work. Such attachments, however, owing to the type of service for which they are now used, makes no provision for the locking of the bridge in the mouth of the patient, and the present invention consists in the provision of an attachment similar to the one just mentioned, but characterized by an efficient locking feature that will serve to prevent this undesirable removal of the bridge by the patient.

Further the invention consists in the provision of a lock which will permit anterior fixed bridge construction in removable units, a construction heretofore impossible and not done previous to my invention.

Further the invention consists in the provision of a lock whereby the jacket crown abutments may be constructed first and the arrangement of the pontics in regard to esthetics may be judged and changed during a trial appointment by the dentist, herefore impossible. Further, an object of the invention is the provision of a lock which will not require abutment teeth which are converged or diverged in mal-position to be ground dangerously close to the vital pulp in order to secure parallelism and permit the bridge to be properly set in place. Again, in accordance with the present invention, the lock attachment will permit the use of porcelain facings from tooth stock with a wide selection of molds and natural shades seldom ever reproduced by hand carving. This will result in the saving of a great deal of time and will simplify the procedure considerably, making it possible for the dentist to supply the patient with high quality bridge work at minimum cost.

The invention together with its objects and advantages will be best understood from a study of the following description taken in connection with the accompanying drawings wherein:

Figure 1 is a view of an upper anterior portion of the mouth prepared for receiving a four tooth bridge.

Figure 2 is a view of the bridge embodying my improved lock, and looking at the bridge from the labial side.

Figure 3 is a view of the bridge from the side thereof opposite to that shown in Figure 2.

Figure 4 is a view of the completed bridge visible from the labial or front side thereof.

Figure 5 is a detail sectional view showing the abutment tooth as it appears when the bridge construction is completed, that is to say, with the thimble and porcelain facing in place on the abutment tooth.

Figure 6 is a detail sectional view through one of the pontics showing the manner of attaching the same to the bridge bar.

Figure 7 is a top plan view of the bridge, the thimbles being shown without the porcelain facings applied thereto.

Figure 8 is a perspective view of the bridge bar.

Figure 9 is a perspective view of one of the female locking members.

Figure 10 is a similar view of the other female locking member.

Figure 11 is a perspective view of a spring lock.

Figure 12 is a detail view of a slightly modified form of the invention.

Figure 13 is a fragmentary sectional view taken substantially at right angles to Figure 12.

Figure 14 is an elevational view of a slightly modified form of spring locking member.

Figure 15 is an elevational view of the lock designed for use in connection with posterior bridge work.

Referring to the drawings by reference numerals it will be seen that generally the bridge consists in the provision of a bridge bar 10, that is provided with holes to fit the pins 11 usually provided in the facings or pontics 12 and adapted
to be soldered to the bar 10 for securing the facings or pontics to the bar. At each end thereof the bar 10 is provided with a female locking member 18. This locking member 18 is welded or otherwise affixed laterally to a thimble 13 as best shown in Figure 7. In the form of the invention shown in Figures 12 and 13 a slight departure is resorted to, it being noted that in this form of the invention, a female member indicated by the reference numeral 16a is provided on each end of the bar 10a while the male member indicated by the reference numeral 15a is formed integral with an attaching plate 17. In each form of the invention the lock further includes a substantially U-shaped locking element either of the type shown in Figure 11 and indicated by the reference numeral 18 or of the type shown in Figure 14 and indicated by the reference numeral 19.

Also, in each form of the invention, as illustrated the female members 16 are provided on opposite sides thereof with grooves 20 terminating in their upper ends in openings 21 that register with through openings or bores 22 in the male members.

The grooves 20 are adapted to accommodate the U-shaped locking elements which are provided with lateral projections 23 and 24 respectively to engage in the openings 21 and 22 for locking the male and female members of the joints together. It will also be noted that in each form of the invention the female element is in the form of a split sleeve, and the male and female elements are of proper curvature so as to conform substantially to the curvature of the thimbles 13 and the teeth so that when the bridge construction is completed these elements will not be noticeable to any extent.

For anterior bridge work, and as shown in these forms of the invention illustrated in Figures 9 to 13 the male and female locking members have edges 25 cut at a forty five degree angle in lieu of flatly accommodating the bite, while the biting edges of the joint or lock for posterior bridge work, and as shown in Figure 15 are square as at 25a.

Referring again to the grooves 20 in the female locking elements it will be understood that these grooves connect at their edges 25 with a groove in the biting edge of the male locking members. In this connection it will be further noted that the bite or closed end of the U-shaped locking elements 18, as the case may be, will fit in the groove in the biting edge of the male locking member 15 or 15a while the sides of the spring locking devices will fit in the grooves 20.

Being more specific it will be seen that where the locking element 18 is used in connection with the male and female locking members Figures 9 and 10 inclusive, the locking element 18 is slipped upwardly from the biting edge and the projections 23 are snapped into engagement with the openings 21 and 22 for locking the engaged members 15 and 15a together. The spring locking element is associated with the locking members 15a and 16a shown in Figures 12 and 13 in substantially the same manner. The spring locking element 19 is also applied in substantially the same manner the projections 24 thereof snapping into engagement with the aligned openings 21 and 22 in substantially the same manner as the projections 19 on the locking element 18 engages with the aligned openings.

The manner of assembling and locking the elements shown in Figure 15 is also substantially the same the form of the invention shown in this last figure being only to illustrate how the invention would appear when used in connection with posterior bridge work.

In making use of the locking feature of the present invention the abutment teeth 14 are ground in the usual manner; the thimbles 13 are provided to fit over the abutment teeth 14 and in the form of the invention shown in Figures 1 to 7 the female locking members 16 are welded or otherwise secured to the thimbles 13 while as before stated and as illustrated the male locking members 18 are formed integral with the bridge bar 10 to which the pontics or dummy teeth 12 are secured through the medium of the pins 11 and in a manner well known in the art. Obviously, with the bridge elements assembled as shown in Figure 7 the bridge may readily be set in place by first cementing the thimble which has the porcelain crowns or pontics to the thimble and slipping the removable dummy unit into the female receptacles. The completed bridge structure will appear as illustrated in Figure 4.

It will therefore be apparent that in providing the male and female locking members with means to accommodate a lock such as the spring locks 18 or 19 the bridge after once being set in place is securely held therein against removal by the patient, a tool being necessary to slip the locking elements 18 or 19, as the case may be, prior to any removal of the bridge in whole or in part.

Thus it will be apparent that the present invention will have many advantages over that type of bridge construction using male and female members such as for example the members 15 and 16 and wherein these members are not equipped as in the case of the present invention for accommodating any locking elements such as the element 18 or 19 for positively securing these male and female members jointed together.

It will also be apparent, and as illustrated in Figures 9 to 13 inclusive the locking elements will be entirely concealed from view thus giving the section of the mouth so equipped with the bridge the desirable esthetic appearance.

It is thought that a clear understanding of the utility, advantages and purpose of an invention of this character will be had by those skilled in the art without a further description thereof.

Having thus described the invention, what is claimed as new is:

1. In dental bridge construction, a bridge bar and a thimble, male and female locking members respectively provided on the bar and thimble respectively and cooperating to secure the bar and thimble together, said locking members having openings aligning when the members are in final engagement, the projections on the locking element straddling the engaged locking members and having lateral projections engaging the aligning openings for positively securing said members against separation.

2. In dental bridge construction, means for connecting the bar with a bridge thimble against casual and improvident separation, consisting of a locking member on the bridge bar, a locking member on the thimble and sleeved on the first named locking member, and a U-shaped
spring wire locking element straddling the engaged locking members and having sides the ends of which are in positive engagement with the locking members.

3. In dental bridge construction wherein comprising male and female locking members are provided for locking a bridge bar and a bridge thimble together, and wherein further each of said locking members is provided at opposite sides thereof with openings, with the openings of one locking member adapted to align with the openings in the other locking member when said members are engaged one with the other, a locking element in the form of a substantially U-shaped spring wire adapted to straddle the locking members and having ends adapted to spring into the aligned openings formed in the locking members.

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