Aug. 6, 1935. H. SPIRO 2,010,611

DENTAL CROWN, INLAY AND BRIDGE WORK

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Fig. 1.

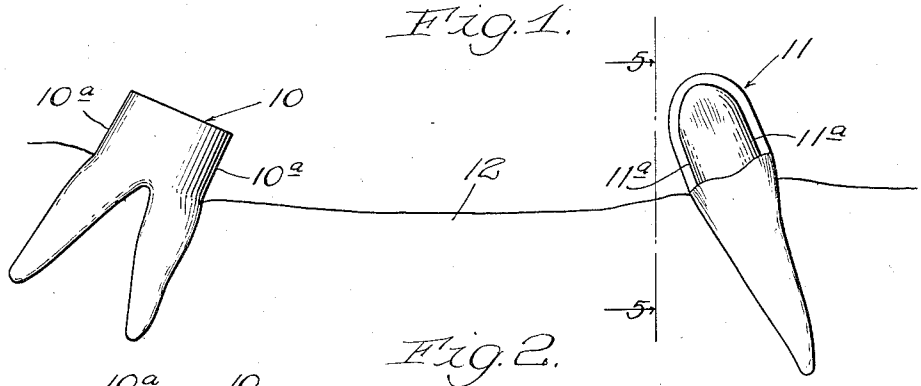
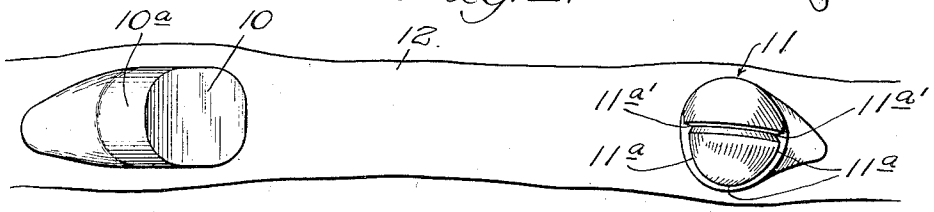


Fig. 2.



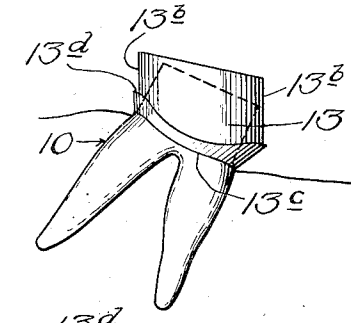


Fig. 3.

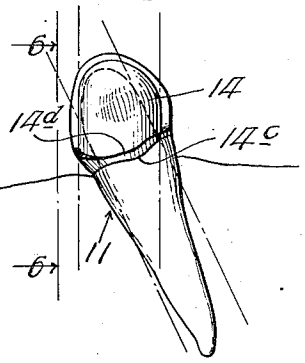


Fig. 4.

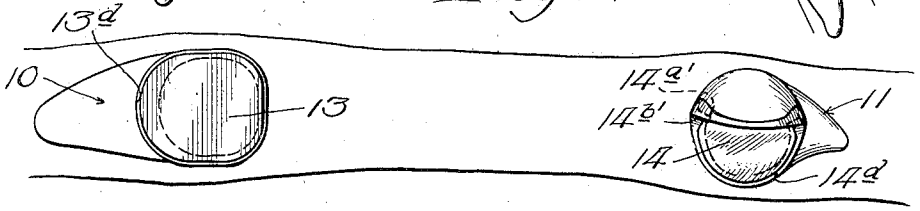


Fig. 5.

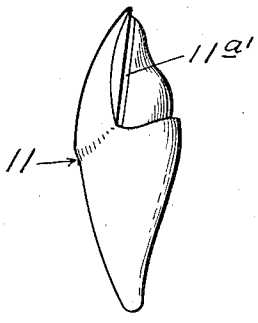


Fig. 6.

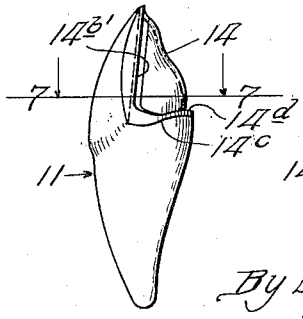
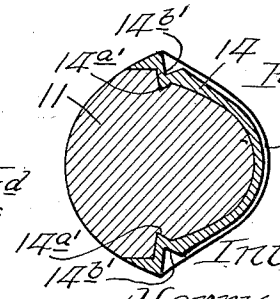


Fig. 7.



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Fig. 8.

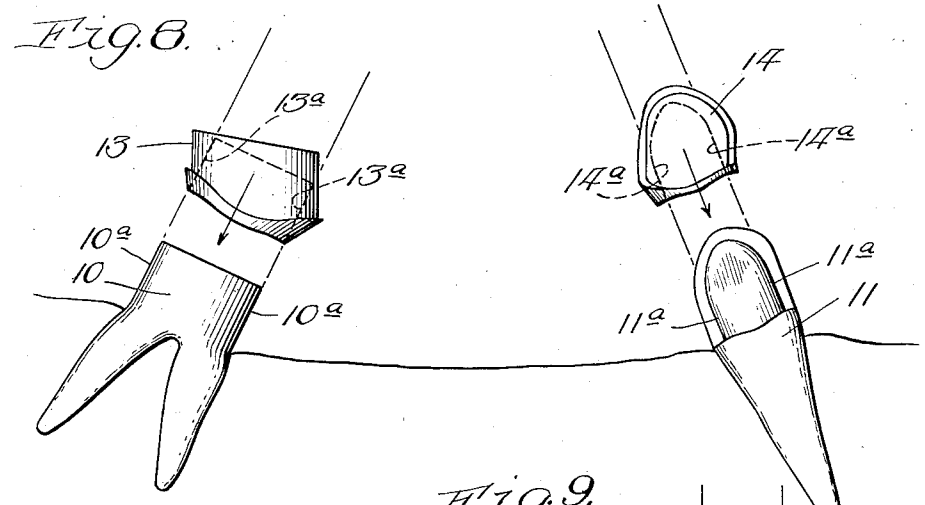


Fig. 9.

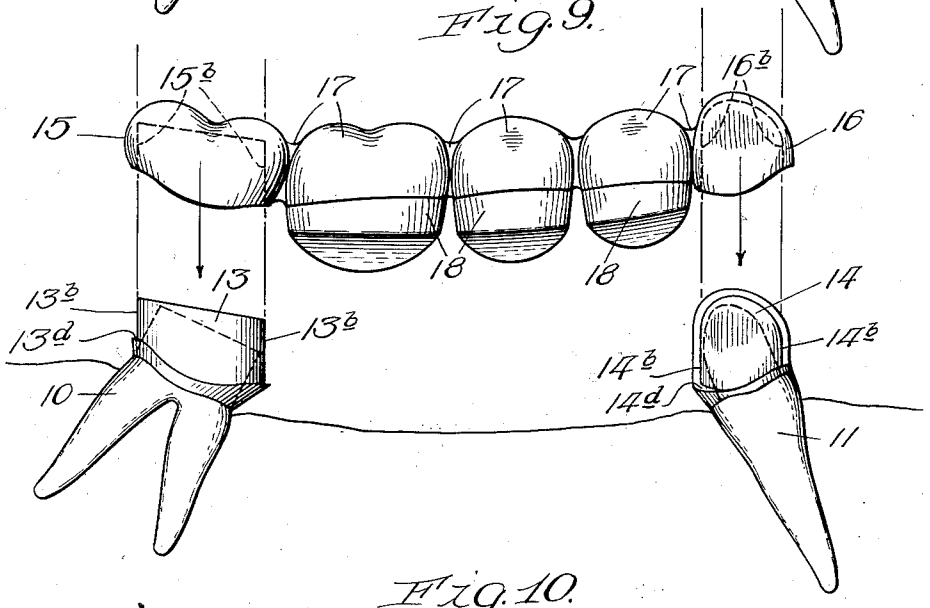
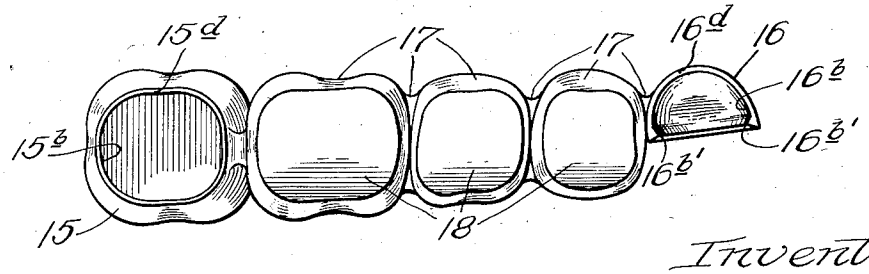


Fig. 10.



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Fig. 14.

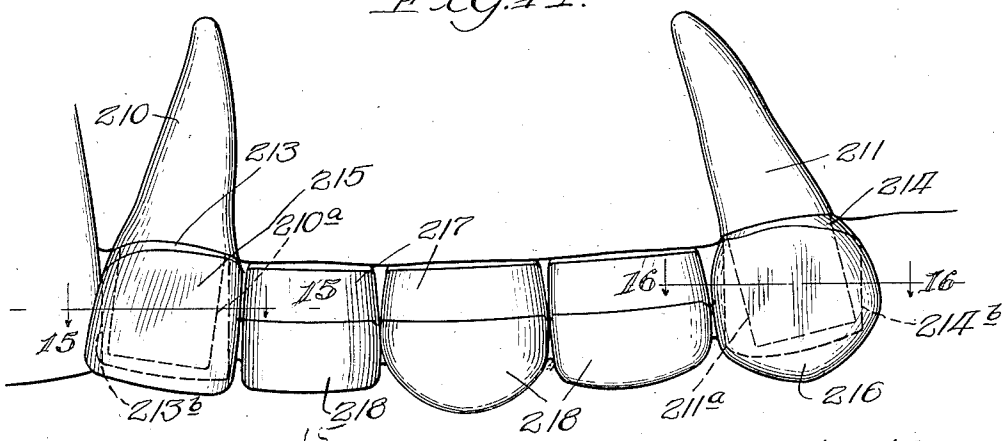


Fig. 15

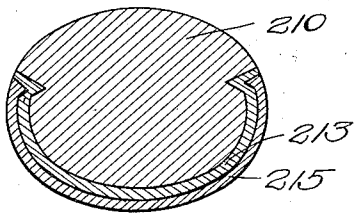
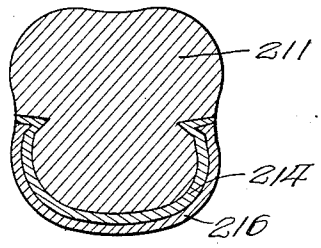


Fig. 16



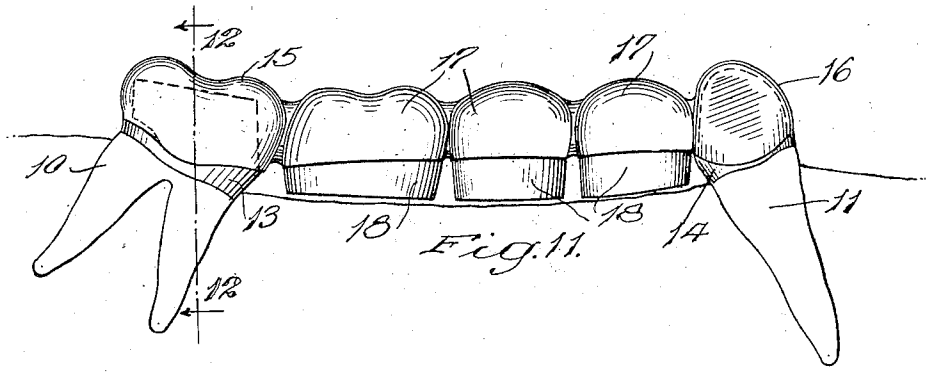


Fig. 11.

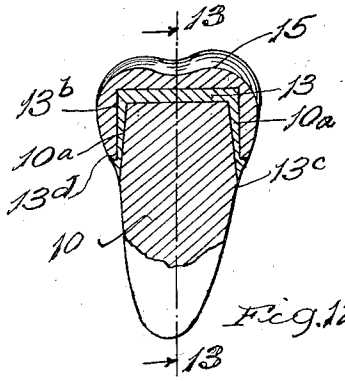


Fig. 12.

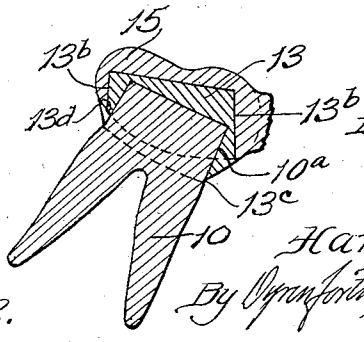


Fig. 13.

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UNITED STATES PATENT OFFICE

2,010,611

DENTAL CROWN, INLAY, AND BRIDGE WORK

Harry Spiro, Chicago, Ill., assignor to Dental Research Corporation, Cook County, Ill., a corporation of Illinois

Application September 8, 1932, Serial No. 632,203
Renewed February 1, 1935

5 Claims. (Cl. 32—6)

This invention relates to improvements in the art of dentistry and, more especially, to crown, inlay and bridge work.

Among the features of my invention is an improved bridge construction employing adapters on the abutment teeth, each of said adapters being fitted onto its supporting tooth by sliding movement substantially in line with the axis of the tooth. The adapters have outer wall surfaces which are parallel to each other and carry the abutment pieces of the bridge which are fitted on to them simultaneously by sliding movement in one direction. In other words, the adapters serve to parallel all the abutments which support the bridge. Such paralleling is accomplished by building up the tooth structure with the adapters rather than by cutting it away. There is thus provided maximum retention with minimum destruction of tooth structure or pulp. The adapters also afford protection to the abutment teeth.

In the above description I have referred to adapters for use in making crowns and inlays. It is to be understood that in both such cases the crown or inlay may be employed alone or used as an abutment piece or attachment for one end, or other portion, of a bridge structure.

Other features and advantages of my invention will appear more fully as I proceed with my specification.

In the accompanying drawings, Figures 1 to 13, inclusive, illustrate my improved bridge construction as applied to a lower molar and cuspid, carried by a crown on the molar and a three-quarter crown on the cuspid. In these drawings—Figure 1 is a view in rear elevation of a molar and cuspid showing the same prepared to receive my improved bridge construction; Fig. 2 is a similar view in top plan; Fig. 3 is a view similar to Fig. 1 showing the abutment teeth with the adapters installed; Fig. 4 is a view similar to Fig. 3 in top plan; Fig. 5 is a view taken as indicated by the line 5 of Fig. 1; Fig. 6 is a view taken as indicated by the line 6 of Fig. 3; Fig. 7 is a view taken as indicated by the line 7 of Fig. 6; Fig. 8 is a diagrammatic view similar to Fig. 1 showing the direction of movement in fitting the adapters on the abutment teeth; Fig. 9 is a diagrammatic view similar to Fig. 3 showing the direction of movement in fitting the bridge on the adapters; Fig. 10 is a bottom plan view of the bridge removed and without the adapters; Fig. 11 is a view similar to Fig. 3 showing the bridge in place; Fig. 12 is a view taken as indicated by the line 12 of Fig. 11; and Fig. 13 is a view taken as indicated by the line 13 of Fig. 12.

In the accompanying drawings, Figures 14 to 16, inclusive, show the bridge construction as applied to an upper incisor and bicuspid, the bridge being supported by a three-quarter crown on each end. In these drawings—Figure 14 is a view in rear elevation; Fig. 15 is a view taken as indicated by the line 15 of Fig. 14; and Fig. 16 is a view taken as indicated by the line 16 of Fig. 14.

The construction of Figures 1 to 13, inclusive

I shall first describe my invention as disclosed in Figs. 1 to 13, inclusive. As here shown, 10 may indicate a lower molar and 11, a cuspid. The molar is shown as somewhat tilted. It may indicate, for example, a third molar tilted so that its crown lies substantially in the position of a second molar. The abutment pieces or bridge attachments may be a crown on the molar and a three-quarter crown on the cuspid. The bridge may be designed to carry three pontics or artificial teeth. Fig. 1 shows the lingual faces of the teeth after the same have been prepared to receive the crowns. 12 may indicate the gum.

The crown of the molar 10 has been prepared with outer parallel wall surfaces 10^a, 10^a which are substantially parallel with the axis of the tooth. In other words, the tooth 10 has been prepared in the usual manner to receive a single crown without regard to bridge construction. The lingual and proximal surfaces of the cuspid have likewise been provided with parallel wall surfaces 11^a, 11^a substantially parallel with the axis of the tooth together with the undercut grooves $11^{a'}$, as such a tooth is ordinarily prepared to receive a three-quarter crown.

13 indicates an adapter for the molar which has a cavity with parallel inner wall surfaces 13^a, 13^a adapted to fit against the surfaces 10^a of the abutment tooth 10. A similar adapted 14 is provided for the tooth 11. This adapter is likewise provided with a cavity having parallel inner wall surfaces 14^a, 14^a adapted to fit against the surfaces 11^a on the tooth. The adapter is likewise provided with inwardly extending flanges $14^{a'}$ fitting into the grooves $11^{a'}$ in the tooth.

Fig. 8 will show how the adapters 13 and 14 are fitted onto the tooth. The arrows indicate the direction of movement and it will be seen that each adapter is placed on its tooth by movement substantially in line with the axis of the tooth.

The outer walls of the adapters 13 and 14 are also provided with parallel surfaces, such surfaces on one adapter being parallel with those on the other. These surfaces on the adapter 13 are indicated by 13^b and on the adapter 14 by 14^b. The

parallelism of all these surfaces is well shown in Fig. 9.

15 indicates the abutment piece or bridge attachment at one end of the bridge adapted to be supported by the molar and 16 indicates the abutment piece at the other end of the bridge. The abutment piece 15 is made in the shape of a cap in the manner of a crown and provided with a cavity to receive the adapter 13. This cavity is provided with parallel wall surfaces 15b to fit over the surfaces 13b of the adapter. The abutment piece 16 is made in the manner of a three-quarter crown and likewise provided with the usual cavity having parallel inner wall surfaces 16b adapted to fit against the wall surfaces 14b of the adapter 14. The adapter 14 is provided with undercut grooves 14b' (see Fig. 7) which receive the inwardly projecting flanges 16b' on the outer member or cap.

The abutment pieces 15 and 16 are connected by any suitable bridge construction 17 carrying the pontics or artificial teeth 18, 18. Since the surfaces 13b and 14b of the adapters are parallel, it will be seen that the bridge may be completed and fastened to the abutment pieces before being placed in position. It may then be placed by movement in one direction, as indicated by the arrows in Fig. 9, so that both abutment pieces will simultaneously be fitted onto the adapters.

In the bridge construction as referred to, it is contemplated that the adapters 13 and 14 be first placed on the teeth, as shown in Fig. 3. These adapters are preferably made out of relatively soft metal, for example, burnishable gold. Being of soft gold, they are less injurious to the tooth structure with which they are in contact than if made of harder or alloyed gold. Being made of soft metal, they can also be perfectly fitted to the teeth by burnishing. With the bridge structure removed, complete access is afforded to these adapters and substantially perfect adaptation and angulation can be obtained. The gingival edge 13c of the adapter can be burnished entirely around the tooth. Likewise, the gingival edge 14c of the adapter 14 can be burnished close to the tooth through its entire extent. It is to be understood, of course, that as the adapters 13 and 14 are finally put in position on the teeth, suitable cement (not shown) may be employed to hold them in position; and the abutment pieces 15 and 16 may be finally cemented on the adapters.

The adapter 13 is preferably provided with a shoulder 13d and the lower edge of the member 15 is somewhat flattened, as indicated by 15d to fit against this shoulder. Likewise, the adapter 14 is provided with a shoulder 14d to receive the lower flattened edge 16d of the three-quarter crown.

The construction of Figures 14 to 16, inclusive

This construction does not require a detailed explanation, since the principles are substantially the same is employed in the bridge shown in Figs. 1 to 13, inclusive. As here shown, however, there is illustrated a bridge between an upper incisor and bicuspid, a three-quarter crown being employed at each end of the bridge. The teeth are somewhat tilted or angularly related, or out of parallel with each other. Here, again, the outer wall surfaces of each tooth are paralleled with respect to the axis of the tooth itself to receive an adapter; and the outer walls of the adapters are provided with surfaces parallel to each other to receive simultaneous mounting of the abutment pieces or bridge attachments which carry the ends of the bridge.

As here shown, the incisor is indicated by 210 and the bicuspid by 211. 213 indicates the adapter on the incisor and 214, the adapter on the bicuspid. The three-quarter crown on the incisor is indicated by 215 and the three-quarter crown on the bicuspid is indicated by 216, such crowns forming abutment pieces which carry the bridge 217 with the three pontics 218. The incisor 210 is provided with parallel wall surfaces 210a to receive the adapter 213 which has co-operating surfaces. The adapter is mounted on the tooth by movement in a line substantially parallel to the axis of the tooth. In the same manner, the bicuspid is provided with surfaces 211a parallel to its root to receive the adapter 214. The adapters 213 and 214 are provided with outer surfaces 213b and 214b parallel to each other so that the abutment pieces 215 and 216 may be simultaneously fitted thereon as the bridge is put in position. It is to be understood that the adapters and abutment pieces are finally cemented in place.

In speaking of the axis of the tooth in the specification, I mean to consider the crown as substantially cylindrical and treat the axis (extended) of such cylinder as the axis of the tooth. Likewise, in the claims, in speaking of the general axis of the inner surfaces of the wall of the adapter, I consider these surfaces as forming more or less a cylinder and adapted to fit on the cylindrical crown and consequently the general axis of these surfaces is the general axis of such cylinder. In the same way I consider the outer surfaces of the wall of the adapter as forming more or less of a cylinder so that the general axis of such surfaces is the general axis of such cylinder.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is my intention to claim all novelty inherent in my invention as broadly as permissible, in view of the prior art.

What I regard as new, and desire to secure by Letters Patent, is:

1. An adapter adapted to be fitted over the crown portion of a tooth, said adapter having a peripheral wall with inner surfaces adapted to extend at least partially around cooperating surfaces on the crown portion of the tooth and coact therewith to assist in holding said adapter in place, said wall having outer surfaces whose general axis is angularly related to the general axis of said inner surfaces.

2. In dental bridge construction, a plurality of adapters, each having a peripheral wall with inner surfaces adapted to extend at least partially around the crown portion of an abutment tooth and held in position principally by engagement of said inner surfaces with cooperating surfaces on said crown portion, said walls on said adapters having outer surfaces parallel to each other the general axis of said outer surfaces being angularly related to the general axes of the inner surfaces of at least one of said adapters.

3. In dental bridge construction, a plurality of adapters, each having a peripheral wall with inner surfaces adapted to extend at least par-

tially around the crown portion of an abutment tooth and held in position principally by engagement of said inner surfaces with cooperating surfaces on said crown portion, said walls on said adapters having outer surfaces parallel to each other the general axes of said outer surfaces exing angularly related to the general axis of the inner surfaces of at least one of said adapters; and a bridge with a plurality of abutment pieces adapted to be fitted onto all of the adapters simultaneously by movement in one direction after said adapters are in place on the abutment teeth, said abutment pieces having surfaces adapted to coact with said outer surfaces on the walls of the adapters to assist in holding the bridge in place.

4. Dental bridge construction as claimed in claim 3, in which the adapters are made of softer metal than the abutment pieces.

5. Dental bridge construction as claimed in claim 3, in which the adapters are made of softer metal than the abutment pieces, and in which the edges of said adapters are adapted to project beyond the edges of the abutment pieces when the latter are in place.

HARRY SPIRO.