Jan. 18, 1927. 1,615,034

W. J. PRYOR ET AL

DENTAL ANCHORAGE

Filed July 6, 1926

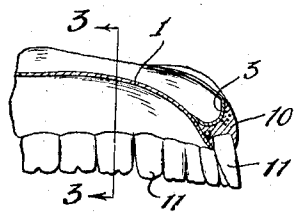

FIG.-2

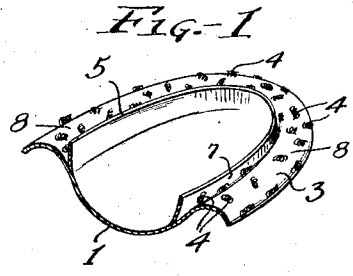

FIG.-1

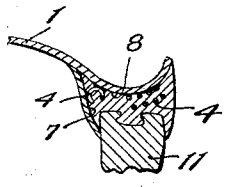

FIG.-3

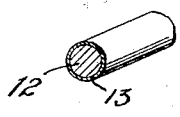

FIG.-4

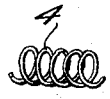

FIG.-5

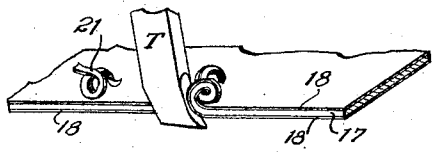

FIG.-6

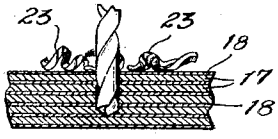

FIG.-7

FIG.-8

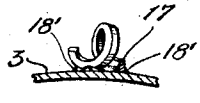

FIG.-9

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UNITED STATES PATENT OFFICE.

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DENTAL ANCHORAGE.

Application filed July 6, 1926. Serial No. 120,683.

This invention relates to an anchoring device for attaching dissimilar materials together, such for example as attaching vulcanized rubber compounds or the like, to metal.

It is well known that vulcanized rubber compounds are not readily attached to materials that do not contain rubber. In making dental restorations the problem of securely attaching such substances as that known as "Vulcanite" to a metal base is especially serious, since any fissure between the Vulcanite and base allows the plate to become foul in a short time when in use. It is the usual procedure to form a sheet metal base in approximately the required shape to fit the patient's mouth. This metal is usually left without any covering adjacent the gums or, at most, with a very light covering, hence it is not feasible to strike up anchoring lugs from the sheet itself. The recognized practice has been to provide small irregular strips which must be soldered to the base in such a manner that over-hanging surfaces are provided under which the Vulcanite is forced while plastic.

The general object of our invention is to provide a metallic anchor for attaching non-metallic material to metal, which anchor will be comparatively cheap to manufacture and very easy to apply.

A further object is to provide a metallic anchor which may be ultimately attached to a metallic base by metal of a low fusion point but which will not require the usual tedious soldering methods. The specific object is to provide an improved metallic anchor for effectively securing vulcanizable material, such as used in dental plates, to a metallic base.

Further objects and features of our invention will become apparent from the following description which relates to the accompanying drawing, wherein we have shown our preferred forms. The essential characteristics will be summarized in the claims.

In the drawing Fig. 1 is a sectional perspective view of a sheet metal base and doubler strip for a dental plate showing the anchors in place thereon; Fig. 2 is a fragmentary longitudinal cross section through a completely formed plate; Fig. 3 is an enlarged transverse cross section taken along the line 3—3 on Fig. 2; Fig. 4 is an enlarged cross sectional perspective view of the preferred form of anchor; Fig. 5 is a less enlarged complete anchor made in accordance with Fig. 4; Fig. 6 is a perspective view showing a different method of forming the anchor; Fig. 7 is a cross sectional view showing a still different method; Fig. 8 is a fragmentary cross sectional view showing the anchor made in accordance with Fig. 5 and temporarily attached to the base, and Fig. 9 shows the same form of anchor after heat has been applied to melt the low fusion metal.

In carrying out our invention we employ a bi-metallic strip of any desired shape which will provide overhanging surfaces, the metals forming the strip having different melting points, so that when the strip is applied to a metallic base, and the base and strip subjected to heat sufficient to melt only the more easily fusible metal, the strip will become permanently attached to the base by such melted metal.

Referring in detail to the drawing and indicating the various parts by suitable characters, 1 represents a sheet metal base of an "upper" plate, having a central body portion 2 and concaved rounded marginal portions 3. The marginal portions are shown as flanked by a strip of metal 5, known in the art as a doubler. The Vulcanite base 10 into which the teeth 11 are set is mounted upon the surfaces 7 and 8 of the doubler and base respectively, as shown in Figs. 2 and 3. The anchors, which form the subject of this invention, are shown at 4. In Fig. 4 which shows an enlarged section of our preferred form of anchor, 12 indicates a core which may consist of palladium silver alloy and 13 indicates a coating of metal having a lower fusion point than the core metal, for example, low fusing platinum solder. These metals are mentioned merely for illustration. Such a bi-metallic wire may be coiled as shown in Fig. 5 in which case it will be seen that substantially each individual turn will either contact with or be very close to the surfaces 8 when placed thereon as shown in Fig. 1. A few of such coils may be inserted in the crevice formed between the base and doubler, as shown in Fig. 1, respective portions of each of such coils contacting with both the surfaces 7 and 8. Any means may

be employed for holding the coil sections in place temporarily, for example, we have found that they can be held in place by liquid flux.

To fuse the metal 13 heat may be conveniently applied by a blow torch, or the base may be placed in a furnace. In any event the temperature to which the base, doubler and coils are subjected is only sufficient to melt off the coating 13 and cause it to flow along the exterior of the core and attach itself to the base or doubler, (or both in the case of coils lying in the crevice). Afterward the Vulcanite is molded while plastic, under sufficient pressure to cause it to surround the free portions of the coils so that, when vulcanized, it is securely retained by the coils.

Any method of coating the wire 12 with low fusion metal 13 may be used, such as dipping the wire into molten soldering metal. A better method perhaps would be to draw the previously coated wire 12 down to the required size following any recognized wire drawing method. It may be here mentioned that the low fusion metal may be also applied by electro-plating.

Another form which we have found very satisfactory is that shown in Fig. 6 wherein the core metal is shown at 17 and the solder metal at 18. The illustration shows the solder metal applied to both sides of the core metal to form a composite plate. A tool T is shown as taking a light cut off one edge of the composite plate, the severed chip curling up and breaking off to form irregular coils 21.

In Fig. 7, we show still another method of making the anchors consisting in providing a number of alternate laminations of dissimilar metals 17 and 18, the whole pile being fused together into substantially a single block without disturbing the relative positions of the two metals. Curled chips 23 are shown in this figure as being drilled out of the block. If this method is employed, the chips will have the more easily fusible metal running obliquely across the strand in some instances, so that the subsequent fusion of the metal 18 will result in still further breaking up the chips. This will result in the formation of over-hanging surfaces between the separated ends of a given curled chip, and there will, of course, be some loops attached at both ends as well.

Figs. 8 and 9 show an anchor made from a curled chip such as 21 (Fig. 6) with the low fusion metal at either side in contact with the base 3. Fig. 9 clearly shows the manner in which the whole curled chip is attached by reason of the fusion of the metal 18 forming an attaching fillet as at 18′ at either side of the bared core 17. This figure may be taken as illustrating generally what takes place when our anchorage is subjected to heat irrespective of the shape of the anchoring members or of the manner of combining the metals.

We claim:

1. An anchorage, adapted for use in attaching non-metallic material to a metal base, comprising a bi-metallic member, one of the metals thereof having a lower fusion point than the other, whereby the entire member and base may be subjected to the same degree of heat to cause the lower fusion metal to flow and attach itself to such base.

2. An anchorage, comprising a member formed of two united laminations of metal, one of the metals being of a lower fusion point than the other, said member being formed to provide surfaces adapted to contact with a base and overhanging surfaces separated therefrom, whereby the member may be attached to such base by fusion of the last mentioned metal, and whereby a non-metallic compound may be forced under such overhanging surfaces and be retained thereby on the base.

3. An anchorage for the purposes described comprising a bi-metallic member, the metals thereof being united and one embracing the other on opposite sides, the embracing metal being more readily fusible and the member being so formed that when it is subjected to heat, to cause the embracing metal to flow and form an attachment between the embraced metal and a metallic base, portions of the embraced metal are maintained separated from the base and overhanging the same.

4. A device of the character described, comprising a coiled metal core, a coating therefor of more readily fusible metal, said coil being adapted to rest at separated points along a metal base, whereby when the base, core and fusible metal are subjected to substantially the same degree of heat, overhanging loops are formed, attached to the metal base at said separated points by the readily fusible metal.

5. In combination, with a metal base for a dental plate, a bi-metallic member, distributed over a surface of the base, one of the metals of the members being readily fusible, whereby all the members will become attached to the base, when the base and members are subjected to sufficient heat to melt the fusible metal, and vulcanizable material adjacent said surface and underlying portions of said members.

6. In combination, in a dental plate, a base, a doubler attached thereto to form a crevice, and bi-metallic members arranged to contact with surfaces on the base and doubler, the metals composing the members having different fusion points, whereby, when the base, doubler and member are subjected to heat, the more readily fusing metal is caused to flow and form attachments be-

tween the other metal and both the doubler and base.

7. The method of forming an anchorage consisting of applying a lamination of readily fusible metal to another less readily fusible metal to form a substantially integral member, distorting the member so formed to cause it to contact at seperated points with an approximately regular surface, applying the member to a metal base and heating the member to cause the readily fusible metal to flow away from portions of the less readily fusible metal and to attach such latter metal to the base at separated points.

In testimony whereof, we hereunto affix our signatures.

WALTER J. PRYOR.
CARL G. SCHULLER.