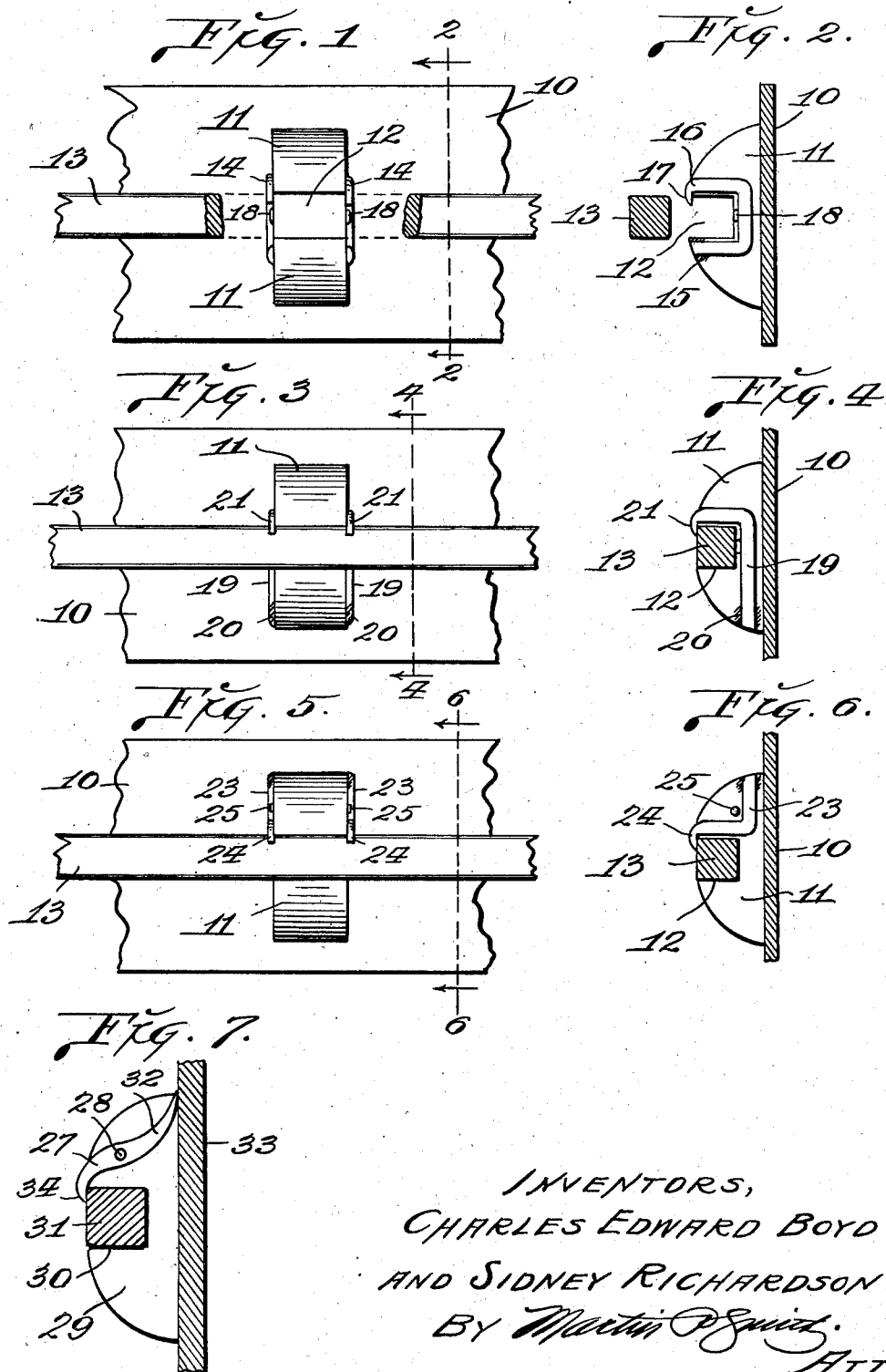


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C. E. BOYD ET AL  
ORTHODONTIA BAND BRACKET

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INVENTORS,  
CHARLES EDWARD BOYD  
AND SIDNEY RICHARDSON.  
BY *Martin D. Smith* ATT'Y.

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## ORTHODONTIA BAND BRACKET

Charles Edward Boyd and Sidney Richardson,  
Los Angeles, Calif.

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Our invention relates generally to orthodontia appliances and more particularly to a device for automatically securing arch bars to orthodontia brackets.

5 The principal objects of our invention are, to generally improve upon and simplify the construction of arch bar securing devices, to provide arch bar attaching means that is entirely automatic in its action of engaging and holding the arch bar in proper operative relation upon the bracket that is carried by the toothed band and further, to provide an automatic arch bar attaching device that entirely eliminates all separate or extraneous attaching or securing means such as tie wires, ligatures, screws and the like.

Further objects of our invention are, to provide arch bar securing means that will effect a material saving of time and labor on the part of the orthodontist in attaching arch bars to the tooth band brackets and further, to provide a relatively simple and convenient attaching means that will be effective in materially decreasing the time required for the treatment of the teeth to which the orthodontic appliance is applied.

A further object of our invention is, to provide an attaching device of the character referred to, that will offer no discomfort to the patient and which will not tend to irritate or cut the tissue of the flesh that makes contact with the bracket, arch bar and the securing means therefor.

A further object of our invention is, to provide an automatic arch bar attaching device that will enable the arch bar to be easily and quickly placed in position within or removed from the arch bar receiving notch in the tooth band bracket and which will effectually retain the arch bar in proper position upon the bracket and readily permit the desired longitudinal movement of the arch bar relative to the bracket, as is required during adjustment of the arch bar in the treatment rendered to the teeth.

With the foregoing and other objects in view our invention consists in certain novel features of construction and arrangements of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawing in which:

Fig. 1 is a front elevational view of a portion of a tooth band with a bracket applied thereto and with our improved arch bar attaching means in position on the sides of said bracket.

Fig. 2 is a vertical section taken on the line 2-2 and showing the bracket and arch bar attaching means in elevation.

Fig. 3 is an elevational view similar to Fig. 1 and showing a modified form of the arch bar attaching means.

Fig. 4 is a vertical section taken on the line 4-4 of Fig. 3.

Fig. 5 is an elevational view similar to Figs. 1 and 3 and showing a further modified form of the automatic arch bar attaching device.

Fig. 6 is a vertical section taken on the line 6-6 of Fig. 5.

Fig. 7 is an elevational view of a further modified form of the arch bar attaching device.

Referring by numerals to the accompanying drawing and particularly to the construction illustrated in Figs. 1 and 2, 10 designates a tooth band to which is secured in the usual manner, an arch bar receiving bracket 11, that is provided in its front portion with a horizontally disposed notch 12 for the reception of the arch bar 13.

It is the usual practice to secure the arch bar to the bracket by means of ligatures or the like and in order to secure the latter to the bracket 11, the ends of the latter are provided with hooks or notches for the reception of said ligatures, but in our improved construction, both ends of the bracket are rounded or beveled so as to offer no discomfort to the skin and tissues that come in contact with the bracket.

The arch bar securing means contemplated by our invention, comprises a pair of substantially U-shaped members with one member arranged on each side face of the bracket 11, with the parallel arms of said members disposed above and below the notch 12. These members designated by the numeral 14, are formed of resilient wire and the forward end of the lower horizontal arm of each member is permanently secured to the side face of the bracket immediately below the arch bar notch or recess 12, preferably by means of solder as designated by 15.

From this point of attachment, the member 14 extends rearwardly beneath the notch 12, thence upwardly to the rear of said notch and thence horizontally along the side of the bracket above the notch and the free end of said member projects a slight distance beyond the front face of the bracket just above the notch and said free end terminates in a depending hook 16 having a rounded or beveled front face 17.

The lower portion of this hook normally projects below the upper face of the notch 12, as illustrated in Fig. 2, so that when the arch bar 13 is positioned in the notch, said hook 5 overlies the upper front face of said arch bar.

In Fig. 2 the arch bar 13 is shown in position just before being moved into the notch 12 and during such movement the rounded or beveled face 17 of hook 16 will be engaged so as to flex the member 14 upwardly and rearwardly a sufficient distance for the bar to pass the lower end of the hook and occupy its seat in notch 12.

To restrain the members 14 against undue forward movement upon the bracket, stop lugs 18 project outwardly from the side faces of the bracket immediately to the rear of the notch 12.

In the modified construction illustrated in Figs. 3 and 4, the arch bar retaining members 19 are substantially of inverted L-shape and the lower ends of the vertical legs of said members are permanently secured, preferably by means of solder 20, to the side faces of bracket 11 adjacent to their lower ends.

The horizontal arms of these members occupy positions at the sides of the bracket just above the arch bar receiving notch 12 and the forward ends of these free arms terminate in depending hooks 21 that extend downwardly a short distance below the upper face of the notch or slot 12.

Stop lugs 22 are formed on the side faces of bracket 11 to the rear of the notch 12 for limiting the forward movement of the arch bar retaining members 19.

In this form of device, the arch bar, when moved toward and into notch 12, engages the rounded or beveled front faces of hooks 21, thereby flexing the resilient members 19 upwardly and rearwardly until the arch bar passes the hooks and the engagement of the latter with the upper front face of the arch bar effectually secures the same to the bracket.

In the modified construction illustrated in Figs. 5 and 6, the retaining members 23 of resilient wire are substantially L-shape with the upper ends of their vertical legs secured by solder or otherwise to the upper portions of the side faces of the bracket 11.

The horizontal arms of the brackets lie adjacent to the side faces of the brackets just above the arch bar receiving notch 12 and the free ends of said horizontal arms terminate in depending hooks 24 that project a short distance below the upper face of notch 12.

Suitably located stop lugs 25 project from the side faces of bracket 11 above the horizontal arms of the members 23 for limiting their upward flexing movements.

In the constructions illustrated in Figs. 1, 2, 3 and 4, the rearward flexing movement of the retaining members 14, 19 and 23, while the arch bar is being positioned in the arch bar receiving notch, is limited by the tooth band to which the bracket is secured.

In the modified construction illustrated in Fig. 7, downwardly and outwardly presented hooks 27 are pivotally mounted at 28 to the sides of the brackets 29 above the arch bar receiving notch 30 and the lower ends of said hooks extend a short distance below the upper edge of the arch bar receiving notch so as to overlie the arch bar 31 when the same is properly positioned within the notch.

Projecting upwardly and rearwardly from the hooks 27, beyond their pivot points, are resilient fingers 32, the upper ends of which bear against the outer face of the tooth band 33.

When the arch bar 31 is moved into the notch 30, the curved front faces 34 on the lower ends of the hooks are engaged by the arch bar so as to swing said hooks upwardly, thereby flexing the resilient fingers 32 and when the arch bar is properly positioned in the notch, the resiliency of the flexed fingers 32 returns the hooks 27 to their normal positions with their lower ends overlying the upper front face of the arch bar.

When the arch bar is properly seated in the bracket, it is firmly retained in such position by the hooks on the free ends of the resilient retaining members and while in such position, the arch bar may be shifted longitudinally relative to the bracket as is required for adjustments during treatment of the teeth to which the orthodontia device is applied and the attachment of the arch bar to the bracket is effected without the use of ligatures or other extraneous connecting means.

To effect a release of the arch bar from the brackets provided with the attaching means, it is only necessary to apply a suitable tool to the hooks on the free ends of the retaining members and lift said hooks a sufficient distance to permit the arch bar to be withdrawn.

Thus it will be seen that we have provided an arch bar securing device that is entirely automatic in action when the arch bar is inserted in the notch in the tooth band bracket and which device effects a material saving of time and labor in the application of the arch bar to the bracket and likewise in the removal of said arch bar from the bracket and said device entirely eliminates the use of ligatures and other fastening means that not only involves considerable time and labor in manipulation, but provides a source of discomfort to the patient by reason of possibility of irritation and cutting of the skin and tissue that comes in contact with the attaching means.

It will be understood that minor changes in the size, form and construction of the various parts of our improved orthodontia appliance may be made and substituted for those herein shown and described without departing from the spirit of the invention, the scope of which is set forth in the appended claims.

We claim as our invention:

1. The combination with an orthodontia band bracket, provided with an arch bar receiving notch, of resilient members permanently secured to the side faces of the bracket and hooks on the free ends of said resilient members, which hooks normally project beyond the edge of the arch bar receiving notch so as to overlie the front face of the arch bar that is seated in said notch.

2. The combination with an orthodontia band bracket having an arch bar receiving notch, of means permanently secured to the side faces of said bracket and projecting beyond the edge of the arch bar receiving opening in said bracket for overlying the front face of the arch bar that is seated in said notch.

3. The combination with an orthodontia band bracket provided with an arch bar receiving notch, of resilient members permanently secured at one end to the side faces of said bracket, the free ends of which members terminate in

hooks that project beyond the edge of the arch bar receiving notch and the front faces of which hooks are rounded or inclined.

5 4. The combination with an orthodontia band bracket, provided with an arch bar receiving notch, of resilient members secured at one end to said bracket, the free ends of which members terminate in hooks that project beyond the edge of the arch bar receiving notch, the front faces of which hooks are rounded or inclined and means for limiting the movement of said resilient members in one direction.

10 5. An orthodontia band bracket having an arch bar receiving notch and a resilient member permanently secured to said bracket and extending beyond the upper edge of the notch therein for retaining an arch bar when properly seated in the notch in said bracket.

6. An orthodontia band bracket having an arch bar receiving notch and a pair of spaced resilient members secured to said bracket, the free ends of which members permanently extend beyond the upper edge of the notch in said bracket for retaining an arch bar when properly seated within said notch. 5

7. An orthodontia band bracket, having an arch bar receiving notch and a resilient member permanently secured at one end to said bracket, and the free end of which member normally projects beyond one of the edges of the notch in said bracket for retaining an arch bar when properly seated in said notch. 10

CHARLES EDWARD BOYD. 15  
SIDNEY RICHARDSON.