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ORTHODONTIA BAND BRACKET

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Our invention relates generally to orthodontia appliances and more particularly to an arch bar receiving and retaining bracket of the type disclosed in our co-pending application for U. S. Letters Patent on Orthodontia band bracket, filed January 17, 1933, Serial No. 652,138.

The principal objects of our present invention are, to generally improve upon and simplify the construction of the arch bar securing device disclosed in our aforesaid co-pending patent application as well as other forms of similar devices, further, to provide arch bar attaching means that is relatively simple in construction, inexpensive of manufacture, entirely automatic in its action of engaging and holding the arch bar in proper position within the bracket that is carried by the tooth band and further, to provide an automatic arch bar attaching device that entirely eliminates all separate or extraneous attaching or securing means such as tangs, tie wires, ligatures 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 which bracket is equipped with our improved arch bar attaching means.

Fig. 2 is a vertical section taken on the line 2-2 of Fig. 1, with the arch bar receiving bracket in elevation.

Fig. 3 is a vertical section taken on the line 3-3 of Fig. 1.

Fig. 4 is a horizontal section taken on the line 4-4 of Fig. 1.

Fig. 5 is a perspective view of the hook that is mounted for sliding movement upon the bracket and which retains the arch bar when the same is properly positioned within the notch in the bracket.

Referring by numerals to the accompanying drawing which illustrates a preferred embodiment of our invention, 10 designates a tooth band, to the face of which is secured in any suitable manner, a bracket 11, provided in its front portion with a horizontally disposed notch 12 for the reception of the standard forms of arch bars such as 13.

Arranged in the corners between the sides of bracket 11 and the face of the tooth band and immediately to the rear of the ends of the arch bar receiving notch 12, are vertically disposed tubes 14 and these tubes are rigidly secured to the bracket and tooth band in any suitable manner, preferably by solder.

Arranged to slide freely through the tubes 14 are the vertically disposed parallel legs 15 of the arch bar securing hook and arranged on the lower portion of each of these legs, is an expansive coil spring 16, the upper end of which bears against the lower end of the corresponding tube 14.

The lower coil 16^a of each spring is rigidly secured to the lower end of the corresponding leg 15 in any suitable manner, preferably by solder and this lower coil, together with the enclosed lower end of the leg, provides a small head which may be readily engaged to apply upward pressure when the hook is elevated to permit the release of the arch bar from the bracket.

Tension coils of the springs above the lowermost coils are free so that the springs function in the usual manner.

Projecting forwardly from the upper end of each leg 15, is a short horizontally disposed arm 17 that lies immediately adjacent to the side faces of the bracket directly above the arch bar receiving notch 12 and formed integral with and connecting the forward ends of these arms 17, is a horizontally disposed plate 18, having a

downwardly and rearwardly curved or beveled face.

The rear face of this plate 18 which is straight and vertically disposed, occupies a position directly in front of the bracket immediately above the top of the arch bar receiving notch 12 and under normal conditions the lower portion of said plate overlies and forms a closure for the upper half of the arch bar receiving notch.

As a result of this arrangement, after the arch bar has been properly positioned in the notch 12, the expansive action of springs 16 exerts downward pressure upon the legs of the hook or keeper and thus the plate 18 lies immediately in front of the upper face of that portion of the arch bar that occupies notch 12, so that the arch bar is effectually held within the notch in the bracket and at the same time the arch bar may be moved longitudinally through the notch as is required in making certain adjustments in orthodontia practice.

To permit the arch bar to be positioned within or removed from the notch 12, it is only necessary to apply upward pressure to the lower end of one or both of the legs 15 so as to overcome the resistance offered by the springs 16 and as a result of such action the retaining hook or keeper is elevated until the lower edge of the retaining plate 18 occupies a position in the same horizontal plane with the top of the notch and with the parts so positioned, the arch bar may be readily positioned within or removed from the notch.

The plate 18 that forms a part of the hook or keeper for the arch bar, normally overlies the upper half of that portion of the arch bar that is positioned in the notch in the bracket so that the arch bar is firmly retained in the bracket and the hook or keeper may be easily and quickly shifted into position without the use of a special tool in order to permit the ready insertion or removal of the arch bar.

The front face of the plate 18 is curved or inclined downwardly and rearwardly to facilitate the placing of the arch bar in the notch in the bracket and if the orthodontist should desire to slightly lower the position of plate 18 so as to overlie a greater portion of the front face of the arch bar, such result may be brought about by cutting or filing away the front upper portions of the tubes 14 for the accommodation of the horizontally disposed arms 17 of the hook or retaining device.

Thus it will be seen that we have provided an arch bar securing device that is relatively simple in construction and manipulation, said device effecting a material saving of time and labor in the application of the arch bar to the bracket and likewise the removal of the bar from the bracket and our improved device entirely eliminates the use of ligatures and other fastening means that not only involves considerable time and labor in application, but provides a source of discomfort to the patient by reason of possibility of irritation and abrasion of the skin and tissues that come in contact with the attaching means.

The resiliency of the metal of which the arch bar is formed, is utilized for applying various strains, stresses and pressure to the tooth upon which the bracket carrying band is mounted, for the purpose of raising, lowering or rotating the tooth in its socket to correct the irregular position thereof and to produce the desired normal dental arch.

It will be understood that minor changes in the size, form, and construction of the various parts of our improved orthodontia band bracket 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 in its front portion with an arch bar receiving notch and on its side with bearings, of an arch bar retaining hook mounted for sliding movement in the bearings on said bracket and having a portion that normally overlies the upper portion of the arch bar receiving notch.

2. The combination with an orthodontia band bracket provided with an arch bar receiving notch and with bearings, of an arch bar retaining hook mounted for sliding movement in the bearings on said bracket and having a portion that normally overlies the upper portion of the arch bar receiving notch and means associated with said hook for yieldingly resisting its movement in one direction.

3. The combination with an orthodontia band bracket having an arch bar receiving notch, of a spring held inverted L-shaped member mounted for sliding movement on the sides of said bracket and having a part that normally overlies the front upper portion of the arch bar receiving notch.

4. The combination with an orthodontia band bracket having an arch bar receiving notch and bearings, of an arch bar retaining device having a pair of legs that are arranged for sliding movement in said bearings and having a portion that extends lengthwise across the upper front portion of the notch in said bracket.

5. The combination with an orthodontia band bracket having an arch bar receiving notch, of a bearing arranged on the side of said bracket, a member arranged for sliding movement through said bearing and a part of which member is adapted to overlie the upper portion of the notch in said bracket.

6. The combination with an orthodontia band bracket having an arch bar receiving notch, of a bearing arranged on the side of said bracket, a spring held member arranged for sliding movement through said bearing and a part of which member is adapted to overlie the upper portion of the notch in said bracket.

7. The combination with an orthodontia band bracket having an arch bar receiving notch and with bearings that are disposed substantially at right angles to said notch, of arch bar retaining means mounted on said bracket and comprising a pair of side members that are arranged for sliding movement in said bearings and a horizontally disposed member that normally occupies a position in front of the upper portion of the notch in said bracket.

8. The combination with an orthodontia band bracket having an arch bar receiving notch and with bearings that are disposed substantially at right angles to said notch, of arch bar retaining means mounted on said bracket and comprising a pair of side members that are arranged for sliding movement in said bearings, a horizontally disposed member that normally occupies a position in front of the upper portion of the notch in said bracket and means for yieldingly resisting the movement of said retaining member in one direction.

9. The combination with an orthodontia band bracket having an arch bar receiving notch, of bearings formed on the sides of said bracket, legs mounted for sliding movement in said bearings, 5 means for yieldingly resisting the movement of said legs in one direction and a member carried by the upper ends of said legs and extending lengthwise across the upper portion of the arch bar receiving notch in said bracket.

10 10. The combination with an orthodontia band bracket having an arch bar receiving notch and

bearings, of an arch bar retaining hook associated with said bracket and comprising a pair of legs that are mounted for sliding movement in said bearings, arms projecting forwardly from the upper portions of said legs and a cross bar 80 connecting the forward ends of said arms, which cross bar is adapted to overlie the upper front portion of the arch bar receiving notch in said bracket.

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