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M. WALLSHEIN

3,218,713

ORTHODONTIC BRACKETS FOR ARCH WIRES

Filed Oct. 13, 1961

FIG. 1

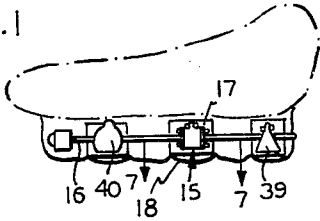


FIG. 3

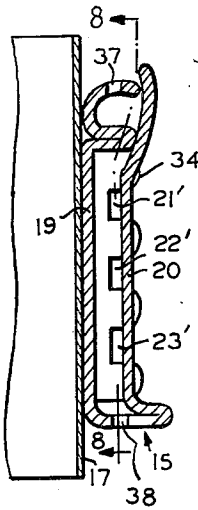


FIG. 5

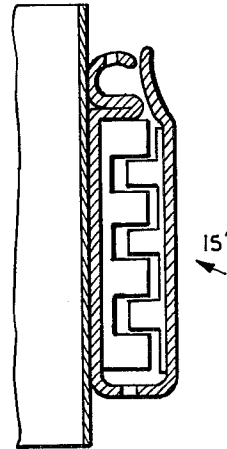


FIG. 2

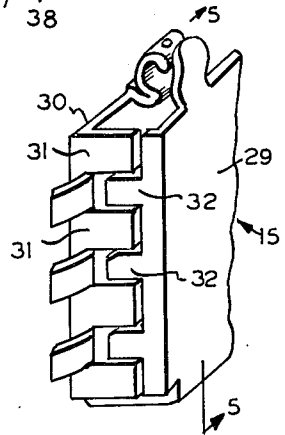
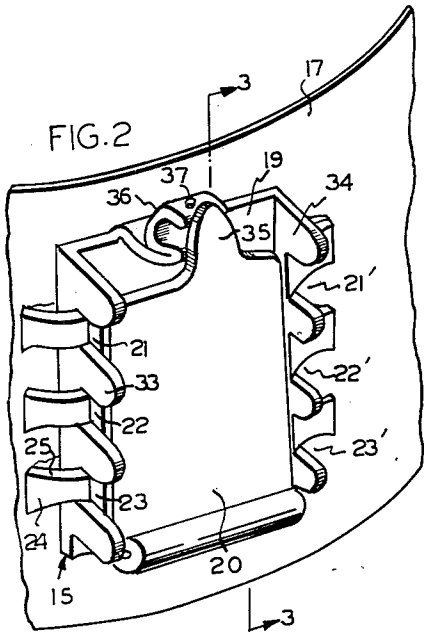


FIG. 4

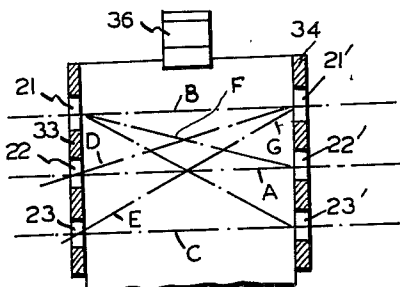
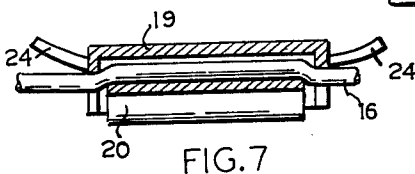
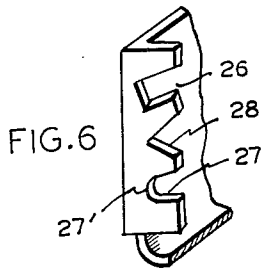
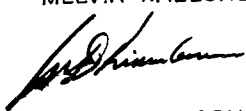


FIG. 8

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ORTHODONTIC BRACKETS FOR ARCH WIRES

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5 Claims. (Cl. 32-14)

The present invention relates to improvements in brackets which are mounted on teeth in a mouth, to carry an arch wire in the practice of orthodontia.

An object of this invention is to provide a novel and improved orthodontic bracket of the class mentioned, to support an arch wire in stressed condition so that a force is brought to play to effect alignment of the tooth carrying such bracket.

Another object thereof is to provide different locations for the arch wire on the bracket to effect forces in different directions and of different intensities. Locations are also provided so that the bracket can be used for mere support of the arch wire without the imposition of an additional force on the tooth.

A further object thereof is to provide a novel and improved orthodontic bracket of the character described, in which the arch wire is stressed upon being located on the bracket; the direction and intensity of the resulting force acting on the tooth involved, being selective.

Another object thereof is to provide that the bracket may hold the arch wire against longitudinal movement.

Still a further object of this invention is to provide a novel and improved orthodontic bracket of the nature described, having the mentioned attributes, and which is simple in construction, reasonable in cost, easy to use and efficient in carrying out the purposes for which it is designed.

Other objects and advantages will become apparent as this disclosure proceeds.

For one practice of this invention, it may comprise a thin metal band to be tightly fitted on a tooth in the mouth. A strip of springy sheet metal is folded on itself to form an openable clamp. One leaf is secured onto the band's exterior wall so the second leaf is outermost and hence free to be swung to admit an arch wire between said clamping leaves. The first leaf is of channel form whose opposite walls have spaced teeth; the teeth of one wall being directly opposite the teeth in the other respectively. The arch wire crosses the channel and is set between two selected adjacent teeth in one wall and between two selected adjacent teeth in the other wall and is engaged in the clamp. Said channel is preferably along the height of the band. Other incidents of structure will be set forth in the detailed description which follows of preferred embodiments of this invention.

In the accompanying drawing forming part of this specification, similar characters of reference indicate corresponding parts in all the views.

FIG. 1 is a side view of a patient's upper teeth in his mouth, equipped with an arch wire which is mounted on brackets embodying the teachings of this invention.

FIG. 2 is an enlarged fragmentary perspective view of such bracket carried on a band which is adapted to be tightly mounted on a tooth.

FIG. 3 is a section taken at lines 3-3 in FIG. 2.

FIG. 4 is an enlarged perspective view showing a bracket of slightly modified construction.

FIG. 5 is a section taken at lines 5-5 in FIG. 4.

FIG. 6 is an enlarged fragmentary perspective view of a bracket structure, further modified.

FIG. 7 is a section taken at lines 7-7 in FIG. 1.

FIG. 8 is a section taken at lines 8-8 in FIG. 3, drawn to a slightly reduced scale and indicating by dash and dot lines some of the possible positions of an arch wire through the bracket.

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In the drawing the numeral 15 designates generally a bracket to carry an orthodontic arch wire 16. This bracket is on the outer surface of a thin metal band 17 which is adapted to be tightly fitted on a tooth 18 which is intermediate the anchored ends of the wire. Said bracket may be made of springy strip metal, bent on itself to form a two-leaf clamp; one leaf, here denoted by the numeral 19 being of channel form, whose opposite walls have spaced teeth, between which walls comes the other leaf 20. Since the teeth formed in one channel wall are respectively opposite the teeth formed in the other wall, it is evident that the intervening spaces 21 and 21' will be directly opposite each other, so will the spaces 22, 22' and so will the spaces 23, 23'. The clamp leaf 19 is secured onto the outer wall of the band 17 and positioned so that the channel form shall be along the height of said band. In making the channeled leaf 19, it may be suitably slitted and the tabs as indicated at 24 may be bent outward to serve for attachment to the band by the spot weld as indicated at 25. The spaces between the teeth may be made of any desired forms, being shown rectangular, or angulated rectangular as at 26, triangular at 28, or a notch as 27 having a semi-circular bottom 27' as examples. Also, if desired, each of the clamp leaves may be of channel form as at 29 and 30, with interlocking teeth 31, 32 as shown in FIG. 4.

If the line A is the normal position of the arch wire 16, then placing such wire into the spaces or notches 22, 22', the bracket will serve merely to support it. If the arch wire is flexed and set along the line B into the notches 21, 21', it is evident that the tendency of said wire to straighten, will subject the tooth carrying the bracket to a downward force. For an upward force, the arch wire is flexed and set along line C into the notches 23, 23'. For a clockwise torsional force to be applied to the tooth, the arch wire is flexed and set along the line D into the notches 22, 21' and for a greater clockwise torsional force, the wire is set along line E into the notches 23, 21'. For counter-clockwise torsional force, the wire is flexed and set along the line F into the notches 21, 22' and to augment such force, it is set along the line G into the notches 23, 21'. These are given as examples of use. It is to be noted that the arch wire can be bent and flexed, using teeth of the bracket as fulcrums, as for instance, to set the wire along the line D, it is placed in the notch 22, as using the tooth 33 as a fulcrum, the wire is bent to lie along line D and then set into the notch 21' where the tooth 34 may be used as a fulcrum to bend the wire.

The leaf 20 may merely act as a spring door to keep the arch wire associated with the bracket in its set position therein, either along the normal line of the arch wire or bent to be out of such line as the case may be. When the leaf 20 is made narrow enough to be sufficiently spaced from the opposite walls of the channel and the bottom of the notches in said channel walls be spaced from the floor wall of said channel, the leaf 20 will act to bend the arch wire into the channel leaf 19, to secure said wire against longitudinal movement therein as indicated in the structure shown in FIG. 7. The leaf 20 is preferably provided with a finger piece 35 to facilitate the opening of the clamp and such finger piece may come across an auxiliary channel 36 formed on the leaf 19 for an auxiliary wire therethrough. The holes indicated at 37, 38 may be provided for attachments well known in orthodontia, as for instance to make inter or intra-maxillary connections.

The bracket may be of any shape, as for instance rectangular as the brackets 15, 15' or triangular as at 39 or substantially circular as shown at 40.

When the arch wire is for instance of rectangular cross-section and opposite notches are rectangular and

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inclined as the one indicated at 26, the arch wire can be torqued when set therein if it substantially snugly fits said notches.

This invention is capable of numerous forms and various applications without departing from the essential features herein set forth. It is therefore intended and desired that the embodiments herein be deemed illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the specific description herein to indicate the scope of this invention.

I claim:

1. In an orthodontic system consisting of a tooth band, a bracket member mounted on said tooth band, and an arch wire engaged by said bracket member, the improvement being in that said bracket member is of thin springy material bent on itself to form two leaves opposite each other, one of said leaves being a channel, each of the opposite walls of said channel having a plurality of notches therein whereby a tooth is formed between notches in each of said walls; the notches in one of said walls being opposite the notches in the other of said walls, each pair of opposite notches being aligned so as to be substantially parallel to the upper and lower ends of the band, each of the notches being of a size to have the arch wire set therethrough, said channel wall teeth extending from the leaf they are on towards the other leaf, the arch wire being positioned between said leaves and through a notch in each of said opposite walls, said arch wire being clamped by said leaves, said walls having tabs integral therewith and extending therefrom outwardly of the channel and against said band, at least one of said tabs being fixed on said band.

2. An orthodontic fitting as defined in claim 1, wherein the bottom of each notch is spaced from the bottom of the channel and the second leaf normally lies inside the channel.

3. An orthodontic fitting as defined in claim 1, wherein the second leaf has teeth extending therefrom, one into each of the notches in the first leaf.

4. In an orthodontic system consisting of a tooth band, a bracket member mounted on said tooth band, and an arch wire engaged by said bracket member, the improvement being in that said bracket member is made of thin springy material bent on itself to form two leaves opposite each other, one of said leaves being a channel, each of the opposite walls of said channel having a plurality of notches therein whereby a tooth is formed between notches in each of said walls; the notches in one of said

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walls being opposite the notches in the other of said walls, each pair of opposite notches being aligned so as to be substantially parallel to the upper and lower ends of the band, each of said notches being of a size to have the arch wire set therethrough, said channel wall teeth extending from the leaf they are on towards the other leaf, one of said leaves being fixed on the band, the arch wire being positioned between said leaves and through a notch in each of said walls, the arch wire being clamped by said leaves, one pair of opposite notches being inclined with respect to the height of the band.

5. In an orthodontic system consisting of a tooth band, a bracket member mounted on said tooth band, and an arch wire engaged by said bracket member, the improvement being in that said bracket member is made of thin springy material bent on itself to form two leaves opposite each other, one of said leaves being a channel, each of the opposite walls of said channel having a plurality of notches therein whereby a tooth is formed between notches in each of said walls; the notches in one of said walls being opposite the notches in the other of said walls, each pair of opposite notches being aligned so as to be substantially parallel to the upper and lower ends of the band, each of said notches being of a size to have the arch wire set therethrough, said channel wall teeth extending from the leaf they are on towards the other leaf, one of said leaves being fixed on the band, the arch wire being positioned between said leaves and through a notch in each of said opposite walls, the arch wire being clamped by said leaves, each pair of opposite notches being identical in shape and size respectively; the notches of one pair being different in shape than the notches constituting another pair.

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