Aug. 2, 1938. A. RICHARDSON 2,125,587

ORTHODONTIA BRACKET

Filed Oct. 21, 1935

Fig. 1.

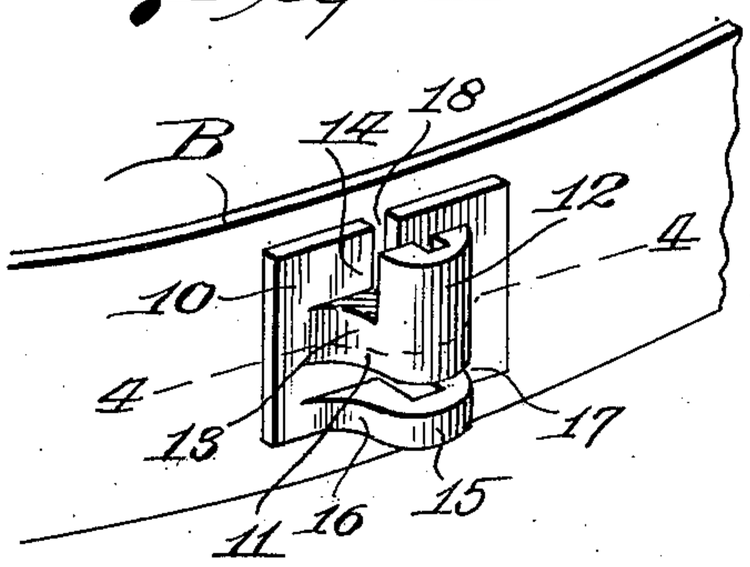


Fig. 2.

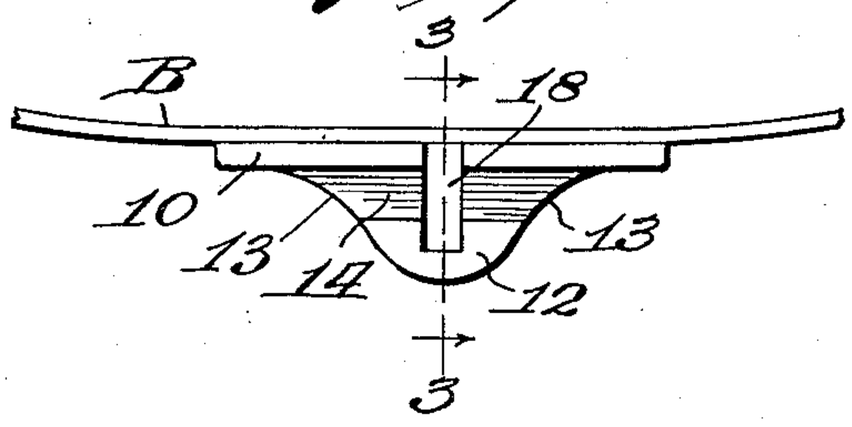


Fig. 3.

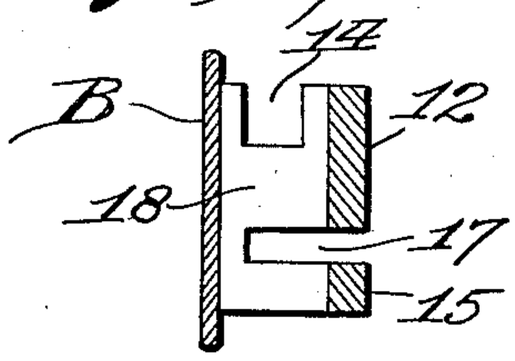


Fig. 4.

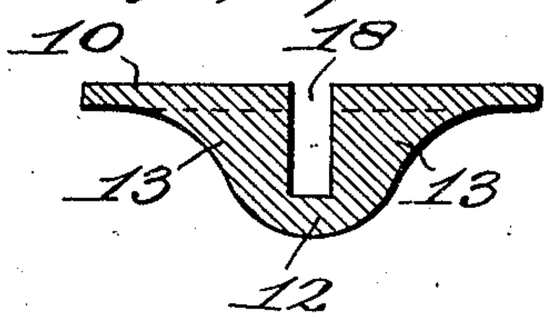


Fig. 5.

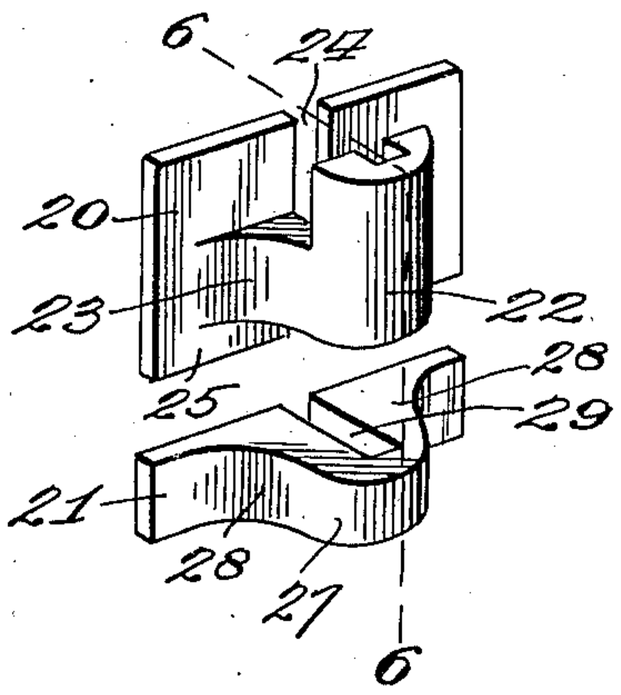


Fig. 6.

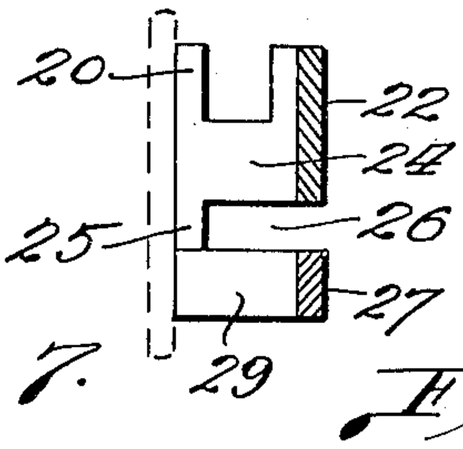


Fig. 7.

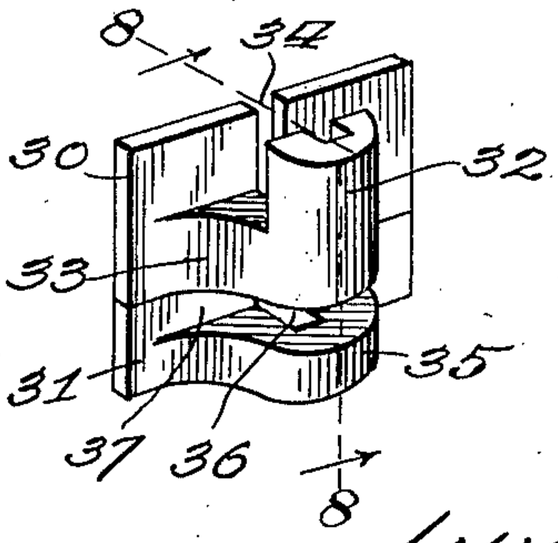
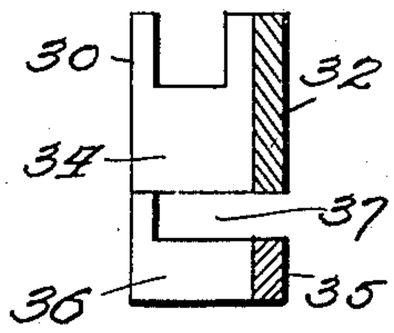


Fig. 8.



INVENTOR,
ANNIE RICHARDSON.
By Martin P. Smith,
ATTY.

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UNITED STATES PATENT OFFICE

2,125,587

ORTHODONTIA BRACKET

Annie Richardson, Hollywood, Calif.

Application October 21, 1935, Serial No. 45,939

3 Claims. (Cl. 32—14)

My invention relates to an orthodontia band bracket and has for its principal object, to provide a relatively simple, practical, strong and durable bracket that is adapted to be secured to the tooth encircling bands of orthodontia appliances, to serve as a support and point of attachment for the arch bow and wires or ligatures that are connected to the tooth band.

Further objects of my invention are, to generally improve upon and simplify the construction of the existing forms of orthodontia band brackets and to provide a bracket that is shaped and constructed so as to utilize to the greatest advantage the inherent strength of the metal to resist the strains and stresses that are transmitted to the bracket by the arch bow and ligatures while the orthodontia appliance which includes the bracket is in service.

Further objects of my invention are, to provide a bracket of the character referred to that may be easily and inexpensively produced, further, to provide the bracket with a base plate of ample size for attachment to the tooth encircling band and further, to construct the bracket so as to minimize indentations or recessed corners and which latter if present in orthodontia band brackets form pockets for the accumulation of particles of food and with attendant deleterious results.

With the foregoing and other objects in view my 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 perspective view of a bracket of my improved construction applied to a tooth encircling band.

Fig. 2 is a top plan view of the bracket applied to a tooth band.

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2.

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

Fig. 5 is a perspective view of a modified construction, wherein the bracket is formed in two parts.

Fig. 6 is a vertical section taken approximately on the line 6—6 of Fig. 5 and showing the parts of the bracket properly assembled.

Fig. 7 is a perspective view of a modified form of the two-part bracket.

Fig. 8 is a vertical section taken on the line 8—8 of Fig. 7.

Referring by numerals to the accompanying drawing and particularly to the construction illustrated in Figs. 1 to 4 inclusive, 10 designates a plate preferably rectangular in form and which is suitably secured either by soldering or welding to a tooth encircling band B.

Formed integral with the central portion of plate 10 and projecting forwardly therefrom, is a substantially L-shaped bracket, the rear end of the horizontal leg 11 of which is formed integral with the plate 10 and the vertical leg 12 being formed integral with the forward portion of leg 11.

The vertical leg 12 of the bracket and the forward portion of the horizontal leg 11, are substantially half-round in horizontal section with a continuous smooth rounded outward face and this rounded front face of the front end of leg 11 forms a continuation of the smooth outer faces of fillets 13 that form the sides of the rear portion of horizontal leg 11 and which extend rearwardly and outwardly to meet the front face of plate 10.

Obviously these fillets eliminate recesses or re-entrant corners between the sides of the horizontal leg of the bracket and the face of plate 10. Further, these fillets materially increase the strength and stability of the bracket and resist the strains and stresses imparted thereto by the arch bow.

By eliminating the recesses or re-entrant corners between the sides of the horizontal leg of the bracket and the face of the plate 10, it is impossible for food to collect on the sides of the bracket, due to the fact that the saliva readily washes all food products downwardly over the smooth curved surfaces of the fillets and the curved faces of the fillets lend themselves to the cleansing action of a toothbrush.

The substantially rectangular space 14 between the upper portion of the vertical leg 12 and the front face of plate 10, provides a transverse slot or opening that is occupied by the arch bow of the orthodontia appliance.

The front face of the plate 10 immediately to the rear of this slot functions as a relatively wide bearing surface for the arch-bar that is positioned in the slot, and thus distributes over a comparatively wide area, the strains and stresses that are transmitted to the plate 10 by the arch-bar and which strains and stresses are in turn transmitted to the tooth band to which the bracket is fixed. Further, it will be noted that the top surfaces of the fillets coincide with and are continuations of the top surface of the horizontal portion of the L-shaped bracket and thus a face of substantial area is provided upon which rests the bottom of

the insert arch-bar, such increased bearing surface cooperating with the wide surface against which the rear face of the arch-bar engages to counteract to a maximum degree, tendency of strains and torque forces to rotate the arch-bar, its slot and also distributing over comparatively large areas, the strains and stresses that are imparted to the bracket by the arch-bar. In other words, the construction of the bracket provides a very strong and substantial support for the arch-bar and the increased strength of the bracket, due to the wide bearing surfaces for the bottom and rear face of the arch-bar, is highly effective in maintaining the arch bar in proper position upon the bracket.

Formed integral with and projecting forwardly from the lower portion of plate **10**, is a horizontally disposed lug **15**, having the same shape in horizontal section as the lower leg **11** of the upper bracket and said lower lug or bracket including fillets **16** that eliminate corners or recesses between the sides of the lug or bracket and plate **10**.

The space **17** between the lug or bracket **15** and the underface of the bracket, comprising the legs **11** and **12**, constitutes a transverse notch or opening for the reception of ligatures or tie wires that form a part of the orthodontia appliance.

Formed through the central portion of plate **10** and extending forwardly in the bracket comprising the legs **11** and **12** and the lug or bracket **15**, is a vertically disposed slot **18** which intersects the transverse notches **14** and **17**.

This slot **18** extends a short distance beyond the front edge of the notch **14**, thus providing at the forward end of said slot **18** a vertically disposed opening for the reception of the key or pin that is utilized in connecting the arch bow and ligatures or tie wires to the bracket.

The bracket as just described, is preferably formed from a single piece of hard metal and it may be produced by cutting a solid block of metal to shape or it may be formed by rolling, pressing or forging methods.

The fillets **13** add materially to the strength of the brackets with which they are associated and the smooth outer faces of the brackets offer no discomfort to the tissues of the lips and tongue of the person to whom the orthodontia apparatus is applied.

In the modified construction illustrated in Figs. 5 and 6, the base plate is divided on a horizontal line to form an upper part **20** and a lower part **21**.

Formed integral with and projecting forwardly from the lower portion of the upper plate **20**, is an L-shaped bracket **22** that is identical in construction with the bracket comprising the parts **11** and **12** previously described and with fillets **23** between the sides of the horizontal leg of said bracket **22** and the face of plate **20**.

A vertically disposed slot **24** is formed through the center of plate **20** and extends forwardly through the horizontal leg of the bracket **22** and into the vertical leg thereof for the reception of the key or pin that is used in connecting the arch bow and tie wires or ligatures to the bracket.

The lower portion of plate **20** extends a short distance below the underface of bracket **22** as designated by **25** and the lower edge of this portion of the base plate rests directly on top of the lower plate **21** when the two plates are properly assembled and applied to the tooth encircling band.

This arrangement provides for the horizontally disposed notch **26** which corresponds to the notch **17** in the one piece structure previously described and which accommodates the ligatures or tie wires used with the device.

Formed integral with and projecting forwardly from the central portion of plate **21**, is a lug or bracket **27** that has the same horizontal sectional shape as the lower portion of bracket **22** and the sides of said lug or bracket **27** being connected to the plate **21** by fillets **28**.

Formed through the plate **21** and extending forwardly in bracket **27**, is a vertically disposed slot **29** that registers with the slot **24** in plate **20** and which provides a seat for the key or pin that is utilized in attaching the ligatures or tie wires.

The height of the plate **21** and the lug or bracket carried thereby is substantially less than the height of plate **20**.

When this form of bracket is used, the two parts are assembled as illustrated in Fig. 6 and permanently secured to the tooth band by soldering or brazing methods.

In the treatment of certain cases of orthodontia, the upper bracket or that part comprising the plate **20** and bracket **22** may be used without the lower part **21**.

In the modified construction illustrated in Figs. 7 and 8, the base plate that is rigidly secured to the tooth band is formed in two parts, an upper part **30** and a lower part **31**.

Formed integral with and projecting outwardly from the lower portion of the upper part **30**, is a substantially L-shaped bracket **32** that is practically identical in construction with bracket **22** and the bracket comprising the parts **11** and **12** and the sides of this bracket **32** are connected to the plate **30** by fillets **33**.

A vertically disposed slot **34** is formed through the center of plate **30** and extends forwardly into the bracket **32** for the reception of the arch bow and ligature retaining pin or key.

Projecting forwardly from the lower portion of the lower plate **31**, is a lug or bracket **35** having the same horizontal sectional shape as the lower portion of bracket **32** and a vertically disposed slot **36** is formed through plate **31** and extends forwardly in the lug or bracket **35** for the accommodation of the arch bow and ligature retaining pin or key.

Slot **36** is in direct alignment with the slot **34**.

When the two plates are assembled and secured to the tooth band, the upper edge of plate **31** bears directly against the lower edge of plate **30** and thus a transverse slot **37** is formed between the lug **35** and the bracket **32**, which slot receives the ligatures or tie wires.

The rounding of the front faces of the lugs or brackets and the fillets, present smooth unbroken surfaces that are in no wise uncomfortable to the patient and such construction or disposition of the metal in the lugs or brackets, provide ample strength to prevent bending distortion or fracture resulting from the strains and stresses imparted to the lugs or brackets by the arch bow and ligatures.

Thus it will be seen that I have provided an orthodontia bracket that is relatively simple in construction, inexpensive of manufacture and very effective in performing the functions for which it is intended.

Those portions of the bracket that project forwardly from the base plate have smooth curved front faces, thereby eliminating sharp corners that would otherwise tend to afford discomfort to the patient as a result of the contact of the sharp corners with the tissues of the lips and tongue and the fillets that connect the sides of the pro-

jecting portions of the bracket with the base plate imparting the required strength to the bracket to resist the strains and stresses transmitted thereto by the arch bow and ligatures and in addition said fillets eliminate the reentrant corners or recesses which tend to collect food while the bracket is in service.

It will be understood that minor changes in the size, form, and construction of the various parts of my improved orthodontia 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.

I claim as my invention:

1. An orthodontia bracket comprising a base plate, a bracket formed integral with and projecting forwardly from the front face of said base plate, fillets between the sides of said bracket and said base plate, said bracket being provided with a pair of horizontally disposed notches for the reception of an arch bow, ligatures and said base plate being divided by a centrally arranged vertically disposed slot, and said bracket being provided with a vertically disposed notch that extends from the slot in the plate forwardly into said bracket and constituting a slot for the reception of the pin or key that secures the arch bow and ligatures to the bracket.

2. An orthodontia bracket comprising a base plate, a bracket formed integral with and projecting forwardly from the front face of said base plate, said bracket provided in its upper rear portion with a transversely disposed notch for the reception of an arch bow, said bracket being provided in its lower portion with a horizontally disposed notch for the reception of ligatures, said bracket being provided with a vertically disposed slot for the reception of a pin or key that secures the arch bow and ligatures to said bracket, said base plate being provided with a centrally arranged vertically disposed slot that coincides with and constitutes an extension at the rear of the slot in said bracket and the front portion of the vertically disposed slot in the bracket projecting forwardly beyond the front face of the transversely disposed notch in the upper portion of said bracket.

3. As a new article of manufacture, an orthodontia bracket comprising a base plate, a substantially L-shaped bracket formed integral with and projecting forwardly from said base plate, the opening between the upper portion of the vertical leg of said bracket and the front face of said base plate constituting a transverse slot for the accommodation of an arch-bar, there being a vertically disposed slot formed in the center of said base plate and extending forwardly into said bracket to a point forwardly from the rear face of the upper portion of the vertical leg of said L-shaped bracket to provide a vertically disposed slot for the reception of a pin or key that secures the arch-bar to the bracket, fillets between the sides of the horizontal leg of said bracket and the face of said base plate and the top surfaces of which fillets coincide with and constitute extensions of the top surface of the horizontal leg of the L-shaped bracket to form an extended arch-bar supporting surface.

ANNIE RICHARDSON.