March 29, 1927. 1,622,856

E. H. ANGLE

ORTHODONTIC APPLIANCE

Filed Aug. 28, 1926 2 Sheets-Sheet 1

FIG. 1.

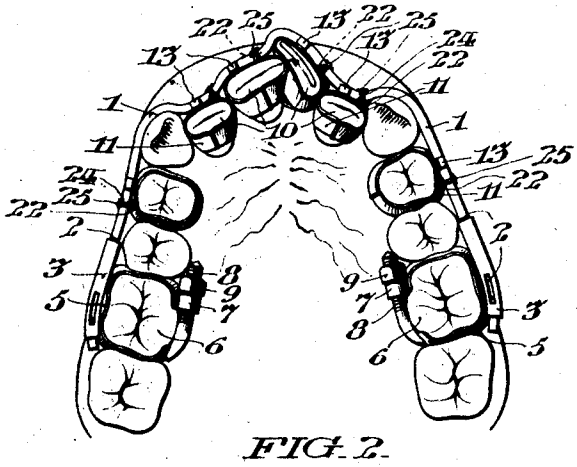


FIG. 2.

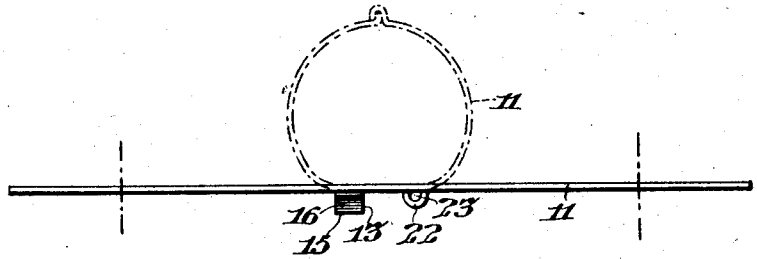


FIG. 3.

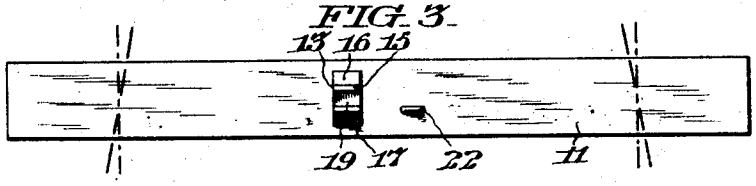


FIG. 4.

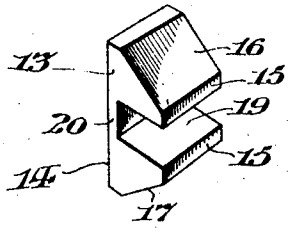


FIG. 5.



Inventor

Edward H. Angle,

By Clifton C. Callowell

Attorney

March 29, 1927. 1,622,856

E. H. ANGLE

ORTHODONTIC APPLIANCE

Filed Aug. 28, 1926 2 Sheets-Sheet 2

FIG. 6.

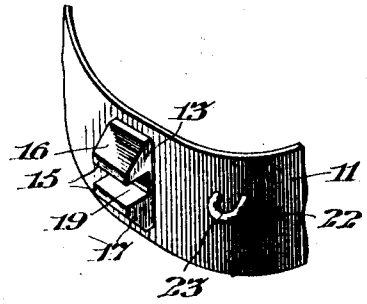


FIG. 7.

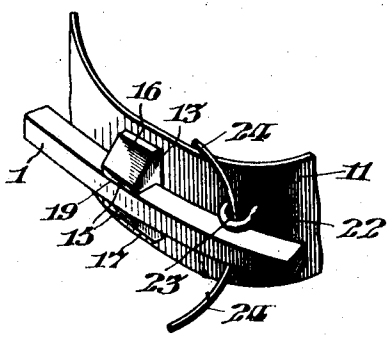


FIG. 8.

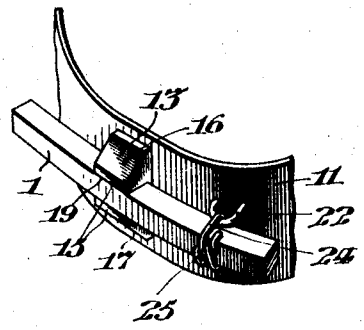


FIG. 9.

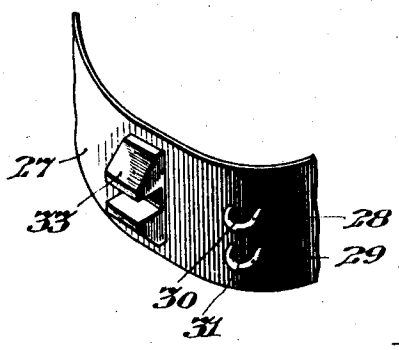


FIG. 10.

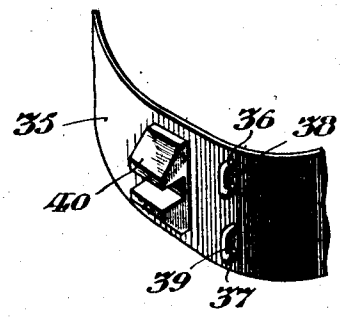
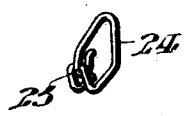


FIG. 11.



Inventor

Edward H. Angle,

By Clifton C. Hallowell

Attorney

Patented Mar. 29, 1927. 1,622,856

UNITED STATES PATENT OFFICE.

EDWARD H. ANGLE, OF PASADENA, CALIFORNIA.

ORTHODONTIC APPLIANCE.

Application filed August 28, 1926. Serial No. 132,071.

My invention is applicable to the art of correcting the position of malposed teeth of the dental arch, and particularly relates to that class of devices in which an arch-bar is adjustably supported at its opposite terminals by anchorages clamped to suitably disposed posterior teeth or molars, and is especially directed to the means by which said arch-bar is connected, intermediate of its ends, with selected teeth of the dental arch.

The principal objects of my invention are to provide a tooth engaging band with an arch-bar attaching bracket of such proportions and of such reduced bulk, or size, as to afford a minimum interference with the lips and cheeks, whereby a consequent lessening of discomfort and inconvenience to the wearer is effected, and to facilitate the engagement of the arch-bar with said arch-bar attaching bracket.

Other objects of my invention are to provide a tooth-band with a bracket that is so constructed and arranged as to afford such a reinforcement for said band as to require no supplemental stiffening or thickening of the tooth-band as has been commonly employed.

My invention comprehends an arch-bar attaching bracket, the construction of which is ideally adapted to be conveniently soldered to the tooth-band, and to afford such a tenacious attachment therewith, that any possible movement of the tooth, to which the band may be fitted, may be effected without danger of distortion or fracture of the appliance.

Further objects of my invention are to provide a tooth-band with a bracket having means cooperative therewith to so firmly hold an arch-bar therein as to insure the firm, accurate and positive movements of either the crown or root of a tooth in any desired direction, and thereby so facilitate the cooperative action of the arch-bar that it may as readily effect the movement of teeth lingually, labially and buccally, or they may be rotated or tipped transversely with respect to their individual axes, and may be as readily forced laterally in the direction of the length of the arch-bar with equal efficiency and accuracy of movement.

The form of my invention as hereinafter described, comprises a tooth-band, provided with a bracket having a slot opening outwardly from said tooth-band, and arranged to receive an arch-bar snugly fitted therein, and also provided with a separate anchor which may be in the form of a staple spaced from said bracket and providing an eye with which a looped ligature, embracing the arch-bar and forming a retaining lock therefor, may be engaged and so twisted as to draw the loop taut about the arch-bar and thereby firmly hold it in its slot in said bracket.

My invention also includes all of the various novel features of construction and arrangement as hereinafter more definitely specified.

In the accompanying drawings, Figure 1 is an inverted plan view of the upper human dental arch, showing a convenient embodiment of my invention attached to selected teeth of said dental arch; Fig. 2 is an enlarged plan view of one of the tooth attachments comprising a tooth-band extended in a plane and an arch-bar attaching bracket with its associated attachment eye, constructed and assembled according to my invention; Fig. 3 is a front elevational view of the assembled tooth attachment shown in Fig. 2; Fig. 4 is a greatly enlarged perspective view of the bracket per se, which is shown in Figs. 2 and 3 attached to the tooth-band; Fig. 5 is a greatly enlarged perspective view of the attachment staple per se; Fig. 6 is an enlarged fragmentary perspective view of the formed tooth-band with its arch-bar attaching bracket and associated attachment staple forming an eye secured thereto; Fig. 7 is a perspective view similar to Fig. 6, but showing a fragment of the arch-bar operatively engaged in the attaching bracket, with a piece of ligature wire extended through the attachment eye and in position to be engaged with said arch-bar; Fig. 8 is a perspective view similar to Fig. 7, but showing the wire ligature forming the lock inter-looped over the arch-bar, and its respective ends turned back over the top and bottom surfaces of said arch-bar; Fig. 9 is a perspective view similar to Fig. 6, but showing a pair of attachment eyes associated with the arch-bar attaching bracket; Fig. 10 is a perspective view similar to Fig. 9, but showing the attachment eyes turned transversely with respect to the tooth-band; and Fig. 11 is a perspective of the wire ligature lock per se, in its ultimate form as shown in Fig. 8, to retain the arch-bar in locked engagement with the bracket.

The tooth regulating appliance to which this invention is especially applicable is indicated in a general way in Fig. 1, and

includes, together with associated parts, an arch-bar 1 bent to substantially conform to the dental arch and having its extremities provided with tangs 2 and extended through anchor sheaths 3, with which said tangs may be engaged to retain the arch-bar 1 in adjusted position, and which are carried by the anchor-bands 5, of well known construction.

As shown in Fig. 1, the anchor bands 5 are attached to the first molar teeth 6, which serve as anchor abutments upon opposite sides of the dental arch, said bands being provided with an eye 7 at one end, and at the other end, a threaded stem 8 extended through said eye and arranged to be adjusted therein by the nut 9 to clamp the band 5 upon said abutment teeth 6, as is obvious.

The gist of my invention resides in the means of securing the arch-bar 1 to the malposed teeth 10 in the dental arch, and comprises the tooth-band 11 and its arch-bar attaching bracket 13, shown in Figs. 2 and 3 in its initial form extended in a plane, and arranged to be cut to the length desired as indicated by the transverse dot-and-dash lines or the oblique dash lines thereon shown, and formed into the tooth embracing ring as shown by the substantially circular dot-and-dash lines as indicated in Fig. 2.

As best shown in Fig. 4, the bracket 13 may be formed of a substantially rectangular piece of metal having its forward upper and lower corners chamfered and its rear wall 14 affording an uninterrupted plane surface coextensive with the extreme dimensions of said bracket, which not only affords a tenacious solder joint with the tooth-band 11, but also provides such a reinforcement for said tooth-band as to eliminate the necessity of any auxiliary reinforcement as has been heretofore employed.

The front or outer wall 15 of the bracket 13 comprises the outwardly converging chamfered surfaces 16 and 17, between the outer termination of which, said wall is provided with the deeply cut or depressed slot 19 extending transversely through the body of said bracket and in parallel relation to the length of said tooth-band, and so nearly bisecting the bracket body as to afford but a relatively thin web 20, sufficient only to insure the required rigidity, yet permitting the arch-bar to so closely approach the tooth-band as to conserve space and thereby minimize the extent of projection of the regulating appliances in the mouth of the patient.

As shown in the several figures, the slot 19 in the bracket 13 opens outwardly from the tooth-band and consequently affords convenient access thereto for the easy manipulation of the arch-bar with respect thereto irrespective of the shape and position of said arch-bar which is shown engaged in the slot in Fig. 7.

Associated with the bracket 13 but spaced therefrom on the tooth-band 11 is the staple 22 which serves as a means of attachment for the arch-bar 1, and which affords an eye 23, through which the wire ligature 24 may be passed, as shown in Fig. 7, so that its ends may be brought together and twisted to form the ligature lock 25, as shown in Fig. 8, to secure the arch-bar thereto and to thereby retain said arch-bar in operative engagement with said bracket 13.

As shown in Fig. 9, the tooth-band 27 is provided with the staples 28 and 29 affording eyes 30 and 31 respectively disposed upon opposite sides of the plane of the arch-bar which may lie engaged with the bracket 33, by passing the wire ligature through both of the eyes 30 and 31 to provide a firm lock for the arch-bar, as will be obvious.

As shown in Fig. 10, the tooth-band 35 is provided with the staples 36 and 37 which are disposed in a common plane transverse to the length of said tooth-band and afford eyes 38 and 39 having their axes relatively parallel and respectively disposed upon opposite sides of the plane of the arch-bar which may be engaged with the bracket 40. In this form of my invention the crests of the staples are preferably flattened to afford a positive engagement of the ligature therewith when embracing said arch-bar.

My invention is advantageous in that the bracket serves as a reinforcement affording a maximum solder attaching surface, and provides a uniform three-surface engagement with the arch-bar, which snugly fits therein, and which may be readily shaped and adjusted to engage therewith from the outer side thereof.

Furthermore, the bracket attachment affords such a positive attaching means comprising the ligature wire lock, that said arch-bar may be so rigidly engaged with the bracket as to insure an ideal torque power in any desired direction, whereby the movement of the tooth roots either labially or lingually, and the tipping mesially or distally of the crowns and roots, as well as the rotation of the tooth, may be effected with equal facility. In fact, every possible desired movement of the teeth may be readily accomplished thereby.

Although I have shown and described the ligature attaching means as being in the form of a staple, it is to be understood that it may be in the form of a ring or hook, or of any other desired configuration, and therefore I do not desire to limit my invention to the precise details of construction and arrangement as herein set forth, as it is obvious that the attaching staples may be variously

placed with respect to the bracket or may be disposed upon opposite sides thereof, and that other various modifications may be made therein without departing from the essential features of my invention as defined in the appended claims.

Having thus described my invention, I claim:

1. An orthodontic appliance comprising a tooth-band having an arch-bar receiving bracket, and having means spaced from said bracket affording an attachment with which a ligature may be engaged to hold the arch-bar engaged with said bracket.

2. An orthodontic appliance comprising a tooth-band having an arch-bar receiving bracket provided with a slot, and having an eye spaced from said bracket through which a ligature may be passed to retain the arch-bar in the slot in said bracket.

3. An orthodontic appliance comprising in combination a tooth-band, an arch-bar bracket having a slot arranged to receive an arch-bar, means on said tooth-band affording a retainer spaced from said bracket, and a ligature arranged to secure the arch-bar with said retainer and thereby secure said arch-bar in said slot.

4. An orthodontic appliance comprising in combination a tooth-band, an arch-bar bracket having a broad base and having its end walls converging outwardly and terminating upon opposite sides of an outwardly opened slot arranged to receive an arch-bar, a staple comprising an eye on said tooth-band spaced from said bracket, an arch-bar engaged in the slot in said bracket, and a ligature embracing the arch-bar and attached to said eye, arranged to retain said arch-bar in the slot in said bracket.

In witness whereof, I have hereunto set my hand this 17th day of August, A. D., 1926.

EDWARD H. ANGLE.