

Dec. 13, 1932.

E. H. ANGLE

1,890,487

ORTHODONTIC APPLIANCE

Filed June 5, 1930

2 Sheets-Sheet 1

FIG. 1.

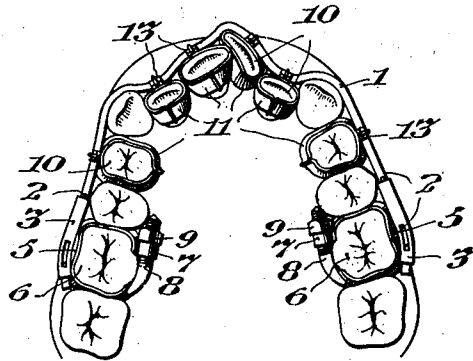


FIG. 2.

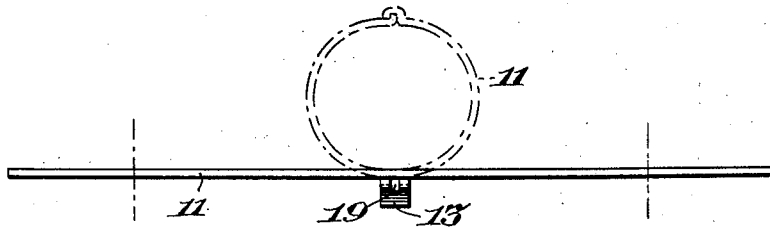


FIG. 3.

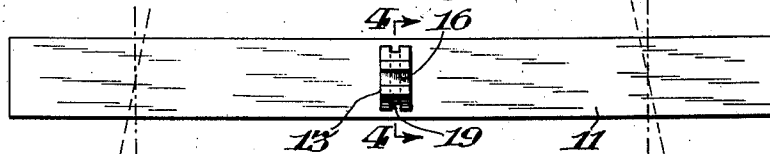


FIG. 8.

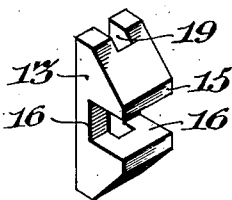


FIG. 4.

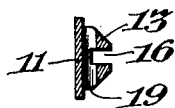


FIG. 5.



FIG. 9.

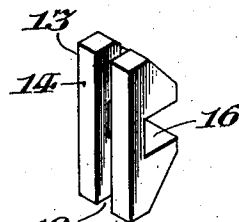


FIG. 6.

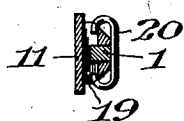
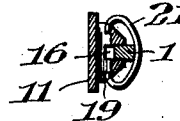


FIG. 7.



Inventor

Edward H. Angle,

By Clifton C. Hollowell
Attorney

Dec. 13, 1932.

E. H. ANGLE

1,890,487

ORTHODONTIC APPLIANCE

Filed June 5, 1930

2 Sheets-Sheet 2

FIG. 10.

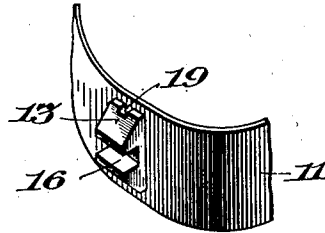


FIG. 11.

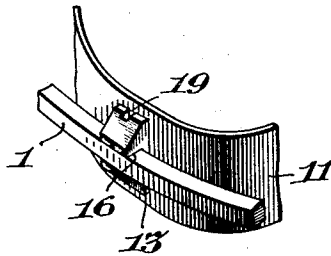


FIG. 12.

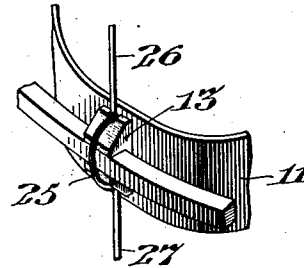


FIG. 13.

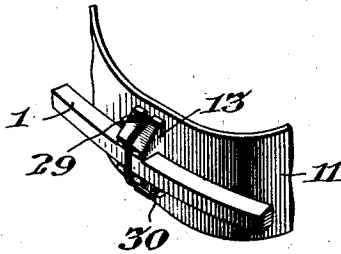


FIG. 14.

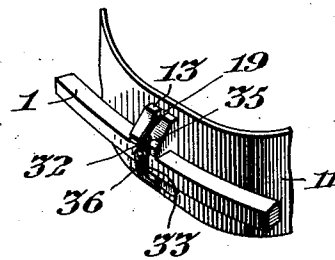


FIG. 15.



FIG. 16.

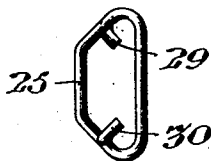
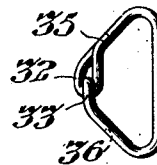


FIG. 17.



Inventor
Edward H. Angle,

By

Clifton C. Shallowell

Attorney

UNITED STATES PATENT OFFICE

EDWARD H. ANGLE, OF PASADENA, CALIFORNIA

ORTHODONTIC APPLIANCE

Application filed June 5, 1930. Serial No. 459,322.

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
10 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
15 afford a minimum interference with the lips and cheeks, whereby a consequent lessening of discomfort and inconvenience to the wearer is effected.

Other objects of my invention are to provide a tooth-band with a bracket that is so constructed and arranged as to afford means to facilitate the attachment of the arch-bar to the bracket whereby better force control in tooth movement is effected, and more rapid
20 progress in the treatment of cases may be obtained.

Further objects of my invention are to provide a tooth-band with a bracket having means with which an arch-bar retaining hasp may be readily sprung into and out of engagement to retain or release the arch-bar with
25 respect to said bracket, as may be desired.

Specifically stated, the form of my invention as hereinafter described comprises a
30 tooth-band provided with a bracket having a slot, opening outwardly and disposed in a horizontal position to receive an arch-bar snugly fitted therein, and having a slot disposed normal thereto in a vertical direction
35 in its inner surface which is attached to the tooth-band, and arranged to not only afford a guide or eye through which a ligature may be extended and drawn taut to position the arch-bar in its slot but may afford a recess
40 into which the free ends of a spring hasp may be engaged to lock said arch-bar in said slot.

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 dental arch, showing a convenient embodiment of my invention attached to selected teeth of
55 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, constructed according to my invention, attached thereto; Fig. 3 is a front elevational view of the tooth
60 attachment shown in Fig. 2; Fig. 4 is a transverse sectional view of said tooth attachment, taken on the line 4—4 in Fig. 3; Fig. 5 is a side elevational view of one of the spring hasps; Fig. 6 is a vertical transverse sectional
65 view similar to Fig. 4, but showing the arch-bar in position and being retained therein by the spring hasp, such as shown in Fig. 5; Fig. 7 is a vertical transverse sectional
70 view similar to Fig. 6, but showing the arch-bar in an intermediate position and a spring hasp tending to force said arch-bar into its innermost or ultimate position, as indicated in Fig. 6; Fig. 8 is a greatly enlarged perspective
75 view, as seen from a forward position, of the bracket per se, which is shown in Figs. 2 and 3 attached to the tooth-band; Fig. 9 is a greatly enlarged perspective view, as seen from a rearward position, of the bracket
80 shown in Fig. 8; Fig. 10 is an enlarged fragmentary perspective view of the formed tooth-band and its arch-bar attaching bracket secured thereto; Fig. 11 is a perspective
85 view similar to Fig. 10, but showing a fragment of the arch-bar operatively engaged in the attaching bracket; Fig. 12 is a perspective view similar to Fig. 11, but showing the wire
90 ligature forming the arch-bar retainer looped over the arch-bar and its ends extended through the slot forming the guiding aperture in the back of the attaching bracket and extended therefrom vertically in opposite
95 directions so that when pulled to separate said ends the loop is drawn taut; Fig. 13 is a perspective view similar to Fig. 12, but showing the free ends of the loop wire ligature drawn laterally from said guiding aperture and bent inwardly against the respective sides of the
100 bracket; Fig. 14 is a perspective view similar to Fig. 13, but showing the wire ligature

passed through the guiding aperture and having its opposite ends linked together and bent oppositely to retain the arch-bar in the slot in the bracket; Fig. 15 is an enlarged side elevational view of the looped wire ligature per se shown in Fig. 12; Fig. 16 is an enlarged side elevational view of the wire ligature per se, as shown in Fig. 13; and Fig. 17 is a side elevational view of the wire ligature per se, as shown in Fig. 14.

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 circular dot-and-dash lines as indicated in Fig. 2.

As best shown in Figs. 4 and 8, the bracket 13 may be formed of a substantially rectangular piece of metal chamfered forwardly and having its rear wall 14 affording a plane surface substantially coextensive with the dimensions of the bracket, which not only affords a tenacious solder joint with the tooth-band 11 but also provides reinforcement for said tooth-band.

The front or outer wall 15 of the bracket 13 is provided with a deeply cut or depressed slot 16 extending transversely through the body of said bracket and in parallel relation to the length of the tooth-band when extended in a plane. Said bracket 13 is also provided with a slot 19, which, as shown, is substantially square in cross section but which may be of any desired configuration, extended through the rear surface of said bracket from top to bottom and in relatively transverse relation to the slot 16, so as to form an aperture adjacent to the rear wall of said bracket when engaged with the tooth-band 11. Said

aperture is arranged to receive the ends of the arch-bar retaining staple or hasp 20 affording a lock for retaining the arch-bar in the slot 16, and best shown by itself in Fig. 5. The spring hasp 20 may be conveniently applied by snapping its free ends into said aperture with its medial portion extended transversely across the arch-bar 1 in a vertical position, as shown in Fig. 6.

As shown in Fig. 7, a spring hasp 21, of greater length than the spring hasp 20, may be bowed to engage an arch-bar whose relative position with the bracket is slightly abnormal, or, in other words, has not reached its ultimate position in the slot due to a slight abnormal position of the tooth to which said bracket may be attached and which may be corrected by the spring action of the hasp 21 tending to force the arch-bar 1 into its ultimate position against the bottom of the slot 16 in the bracket 13.

As shown in the several figures, the arch-bar slot 16 in the bracket 13 opens outwardly from the tooth-band 11 and consequently affords convenient access for the easy manipulation of the arch-bar 1 with respect thereto irrespective of the shape and position of said arch-bar, which is shown engaged in the slot in Fig. 11.

As shown in Fig. 12, the arch-bar 1 thus adjusted, is engaged by the loop 25 formed of the ligature wire, the opposite end portions 26 and 27 of which are passed through the slot 19 and may be pulled in opposite directions to draw the loop 25 taut across the front face 15 of the bracket 13 and the arch-bar 1, which is held in the slot therein.

As shown in Fig. 13, the ends of the ligature wire forming the loop 25, which has thus been drawn taut, may be cut to the proper length and bent laterally in opposite directions and their extremities bent inwardly as at 29 and 30 against the opposite side walls of the bracket 13 so as to be out of contact with the lips, tongue or cheek of the patient.

As illustrated in Fig. 14, the ligature wire is passed through the aperture formed by the slot 19 and the free end portions of said ligature are relatively engaged by the formation of the loops 32 and 33 and the surplus ligature ends clipped off and the terminals 35 and 36 bent inwardly to closely overlie the forward wall of the bracket 13, as shown.

The ligature formation shown in Figs. 12, 13 and 14 may be better understood by reference to the enlarged views showing them separately illustrated respectively in Figures 15, 16 and 17, it being understood, however, that as illustrated in Fig. 17, the loops are shown in relatively normal planes respectively parallel and perpendicular to the front face of the bracket 13 for convenience of illustration, whereas in practice said loops might better assume an angle of forty-five degrees to said face.

It will be obvious that the vertical aperture formed by the slot 19 in the bracket 13 may be used to great advantage to assist in the different movements of a tooth by means of a ligature inserted through it and made to embrace the arch-bar 1 in various ways before exerting tension thereon.

It may be here noted that the retaining spring hasp may best be employed as a means for locking the tooth in its relation to the arch-bar after the tooth has been moved by means of the ligatures from its malposition to its correct position in the dental arch, in the manner above described, that is, after teeth have been moved into correct position in the line of occlusion by means of the ligatures described in Figs. 12 to 14 inclusive, said ligatures may be replaced by the spring hasp, as shown in Figs. 5, 6 and 7, as fast as each individual tooth is brought into the correct or nearly normal positions, thus relieving the patient of the active ligatures which are always not only more or less annoying but are subject to accidental displacement.

My invention is advantageous in that by the employment of a bracket thus constructed, better force control in tooth movement and far more rapid progress in the treatment of cases is obtained and by the employment of the spring hasp the patient is not subjected to the long drawn out use of the ligatures and the consequent discomfort incident to the use of such ligatures.

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 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 bracket having an arch-bar receiving slot extending horizontally in its outer face and having a vertically extended aperture adjacent to its inner face, and a spring hasp extending across said slot and having its free ends bent inwardly to engage in said aperture and thereby retain an arch-bar in said slot.

2. An orthodontic appliance comprising a tooth-band bracket having an arch-bar receiving slot extending horizontally in its outer face and having retaining means, and a spring hasp extended across said slot and having its free ends bent inwardly to engage in said means and thereby retain said arch-bar in said slot.

3. An orthodontic appliance comprising a tooth-band bracket having retaining means and having its outer face provided with relatively inclined surfaces diverging toward said retaining means and serving as guides disposed upon opposite sides of an arch-bar

receiving slot in said face, and an arch-bar retainer having its free ends bent inwardly toward each other to engage said retaining means and cooperative with said inclined surfaces when forced to slide thereon to spread them apart and guide them into snapped engagement with said retaining means, and in position to embrace an arch-bar and to retain it in said slot.

In witness whereof, I have hereunto set my hand this 31st day of May, A. D. 1930.

EDWARD H. ANGLE.

80

85

90

95

100

105

110

115

120

125

130