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1,481,861

R. W. EATON
ORTHODONTIC APPLIANCE
Filed April 5, 1922

Fig. 1

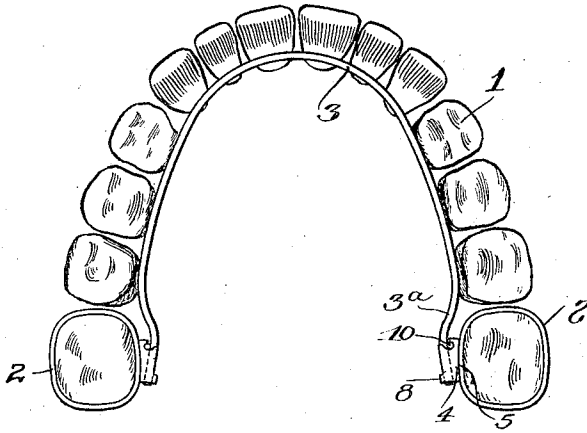


Fig. 2

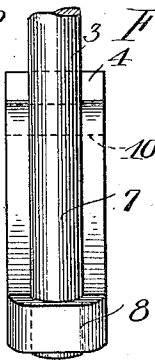


Fig. 3

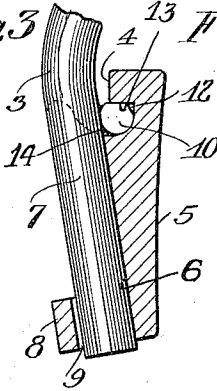


Fig. 4

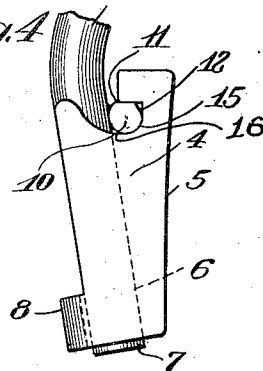


Fig. 5

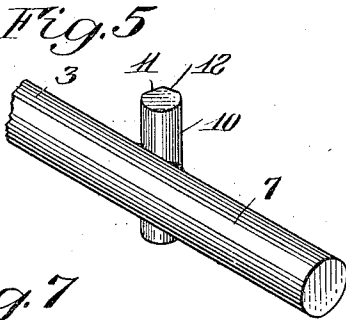


Fig. 6

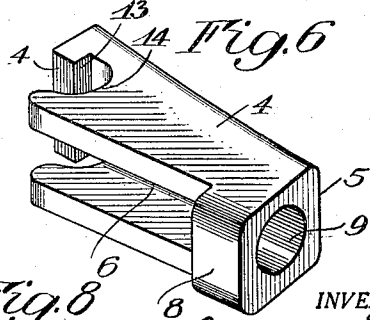


Fig. 7

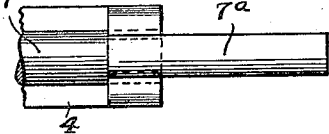
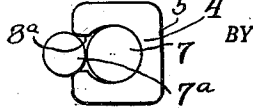


Fig. 8



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UNITED STATES PATENT OFFICE.

RALPH W. EATON, OF ROCHESTER, NEW YORK.

ORTHODONTIC APPLIANCE.

Application filed April 5, 1922. Serial No. 549,759.

To all whom it may concern:

Be it known that I, RALPH W. EATON, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Orthodontic Appliances, of which the following is a specification.

The present invention relates to orthodontic appliances and more particularly to the type in which a regulating wire is employed for cooperating with the teeth to correct defects in the arrangement thereof, such regulating wire being detachably secured at opposite ends to anchoring devices arranged on the teeth, an object of this invention being to provide interlocking connections between the regulating wire and the anchoring devices which will permit the ready disconnection of the regulating wire from the anchoring devices and will effectively secure the regulating wire in position against accidental displacement. Another object of the invention is to provide an interlocking connection which will be of a compact construction and free from parts which would injure the user.

To these and other ends, the invention consists of certain parts and combinations of parts, all of which will be hereinafter described: the novel features being pointed out in the appended claims.

In the drawings:

Fig. 1 shows a set of teeth with the orthodontic appliance in position thereon;

Fig. 2 is a detail view of the interlocking connection looking from the inner side;

Fig. 3 is a sectional view through the interlocking connection;

Fig. 4 is another side view of the interlocking connection;

Fig. 5 is a perspective view of the regulating wire showing the transverse abutment pieces thereon; and

Fig. 6 is a perspective view of the interlocking part carried by the anchoring member.

Fig. 7 is a fragmentary view of another embodiment of the invention; and

Fig. 8 is an end view of the parts shown in Fig. 7.

Referring more particularly to the drawings, 1 indicates the set of upper teeth to the molars of which anchoring rings or bands 2 are secured. A regulating wire 3

has interlocking connection with these bands at opposite ends through interlocking devices forming the subject matter of this invention.

Each interlocking connection comprises a lock member 4 having a curved face 5 which is soldered or otherwise secured to the anchoring band 2. This lock member also has, extending longitudinally thereof at a slight inclination to the curved face 5, a transversely curved seat or groove 6 for receiving the end 7 of the regulating wire 3. The outer end of this seat has its side walls connected by a strap 8 which with the seat forms a circular opening 9 in which an end 7 of the regulating wire fits when lying in the seat 6. The regulating wire 3 has spaced from each end thereof, an abutment piece 10 which, in this instance, is in the form of a piece of wire soldered transversely of the regulating wire 3 to project from opposite sides thereof, this cross piece having a flat face 11 forming the abutment surface and also being cut away at 12 to facilitate its connection with the lock as will be hereinafter pointed out. This abutment piece 10 cooperates with a shoulder 13 formed by providing the locking member 4 with a curved notch 14 intersecting that end of the lock member opposite the one provided with the opening 9, the shoulder 13 extending transversely of the seat and being formed by one side of the notch 14. The notch has a width substantially equal to the diameter of the cross piece 10 and the flattened portion 12 of the latter is provided in order to facilitate the entrance of the cross piece in the notch. The inner end of the notch is curved at 15 and 16 to conform to and fit closely that face of the cross piece opposite to the shoulder so as to prevent longitudinal as well as rotary movement of the regulating wire in either direction. The regulating wire may be bent at 3° adjacent each interlocking connection and being made of spring material has a tendency to hold the cross piece 10 in the locking notch as well as on the seat 6.

In order to connect the regulating wire to the anchoring members, the ends are introduced through the openings 9 and the abutment pieces 10 are fitted in the locking notches so as to engage with the shoulders 13, the resiliency of the regulating wire tending to hold the parts in this condition.

To remove the regulating wire the portions adjacent the locking devices are deflected toward each other to bring the cross pieces 10 out of the locking notches after which the ends of the portion of the cross pieces may be removed from the openings 9.

In the embodiment shown in Figs. 7 and 8, the parts are the same except that the circular opening 9 has a lateral passage-way 8^a and the regulating wire has attached to and extending beyond each end 7 an extension 7^a of reduced cross section. This extension serves, when the anchoring band is secured to a tooth in advance of the rear-most tooth, for engaging a tooth or teeth distal from such anchoring tooth to move such distal tooth or teeth to the correct position and also prevents a rotation of the end 7 of regulating wire in the curved seat 6.

From the foregoing it will be seen that there has been provided an improved interlocking connection between a regulating wire of an orthodontic appliance and anchoring devices secured to the teeth. This connection is of compact form and is so constructed as not to be uncomfortable in the mouth of the user. The lock is narrower than the band to which it is attached and this allows a portion of the band to pass under the gum and also permits the burnishing of the band at the occlusal. No nuts or threaded end sections are required to attach the wire parts to the lock. The construction also permits the use of a small arch or regulating wire, so that the structure will be smaller and thus less liable to irritate the soft tissue and interfere with the occlusal of the teeth with the opposite jaw. To effect the locking and interlocking between the arch or regulating wire and the locking member, a very small movement of the wire is required. The abutment piece being spaced from the extreme ends of the regulating wire, makes it possible for the wire to extend beyond the lock in order to come in contact with and move teeth distal from the anchoring tooth. Furthermore, these extended ends may be bent in order to retain the arch wire, where added retention is necessary. The locking members may be so arranged on the anchoring bands that the arch wire may be employed to move the anchor teeth in any direction. While, in this instance, the locking members are soldered to the anchoring members through its faces opposed to the seats of the arch wire, it is apparent that either of the other two faces of each locking member may be soldered to the anchoring members. However, the lock, when attached to the bands with the slots toward the median line, will permit the arch to be inserted laterally to the line. The horizontal position of the arch at the cervical border of the teeth when in place

in the lock gives the arch wire a decided mechanical advantage in exerting pressure for expansion and minimizes the possibility of tipping the teeth during treatment.

What I claim as my invention and desire to secure by Letters Patent is:

1. The combination with a regulating wire and an anchoring member, of an interlocking connection between the anchoring member and the regulating member embodying a transverse abutment carried by the regulating wire in spaced relation to one end of the latter, an abutment carried by the anchoring member, and engaging with said transverse abutment on the regulating wire, and means providing an opening through which the portion of the regulating wire beyond said abutment may be passed, the portion of the regulating wire on the inner side of the abutment being free of the anchoring member so that wire may be deflected laterally to disengage the two abutments.

2. The combination with a regulating wire and an anchoring member, of an interlocking connection between the regulating wire and the anchoring member comprising a cross piece carried by the regulating wire in spaced relation to one end thereof, a locking member secured to the anchoring member and provided with a seat in which the anchoring wire beyond the cross piece rests and also provided with a shoulder for engaging with the cross piece on the regulating wire, the portion of the regulating wire on the inner side of the cross piece being free from the locking member so that the wire may be deflected laterally to disengage the cross piece from the shoulder on the locking member.

3. The combination with a regulating wire and an anchoring member, of an interlocking connection between the anchoring member and the regulating wire comprising a cross piece carried by the regulating wire and a locking member carried by the anchoring member, having a seat on which the regulating wire beyond the cross piece rests and also having means providing an opening at one end of the seat through which the regulating wire extends, and also having a shoulder with which the cross piece engages, the regulating wire on the inner side of the cross piece being free from the locking member so that said wire may be deflected laterally to disengage the cross piece from the shoulder on the locking member.

4. The combination with a regulating wire having an extension at one end, and an anchoring member, of an interlocking connection between the regulating wire and the anchoring member comprising a transverse abutment on the regulating wire arranged in spaced relation to the extension

and a locking member having a shoulder with which said transverse abutment engages, the extension of the regulating wire extending beyond said locking member so as to provide for engaging a tooth distal from the tooth to which the anchoring member is secured.

5 5. The combination with a regulating wire having a reduced extension on one side at one end, and an anchoring member, of an interlocking connection between the regulating wire and the anchoring member comprising a transverse abutment on the regu-

lating wire arranged in spaced relation to the reduced extension, and a locking member having a shoulder with which the transverse abutment engages, said locking member also having a portion with an opening through which the portion of the regulating wire beyond the shoulder passes, said portion of the locking member being provided with a lateral passageway in which the reduced extension of the regulating wire lies.

RALPH W. EATON.