Jan. 4, 1938. J. W. FORD 2,104,192

ORTHODONTIC APPLIANCE

Filed Aug. 19, 1935

Fig. 1.

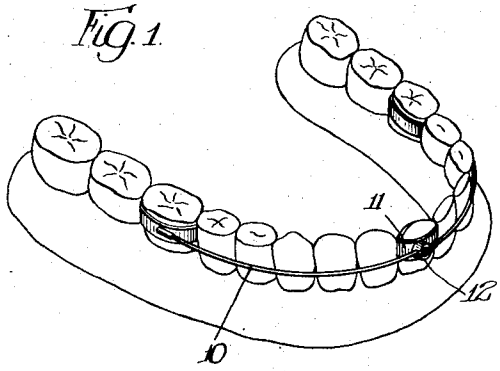


Fig. 2.

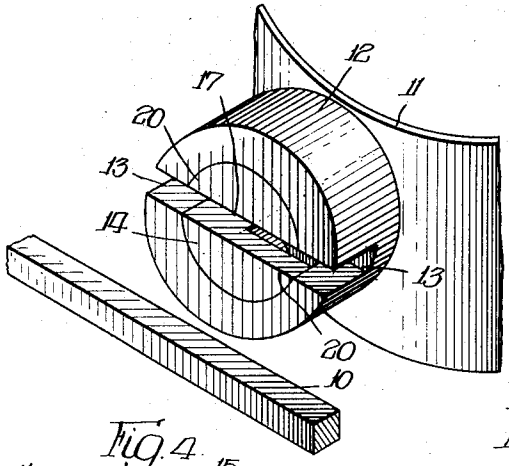


Fig. 3.

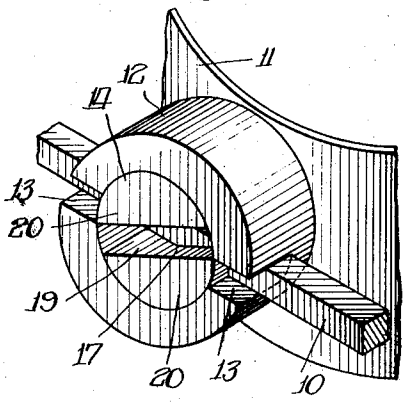


Fig. 4.

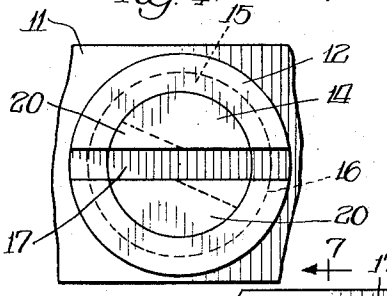


Fig. 5.

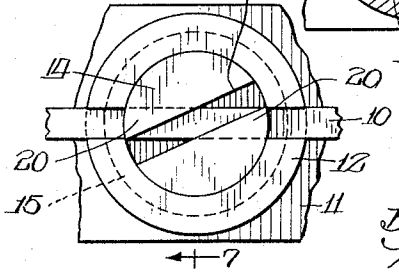


Fig. 6.

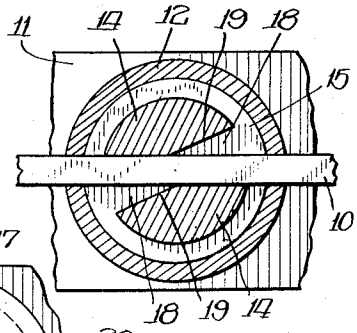
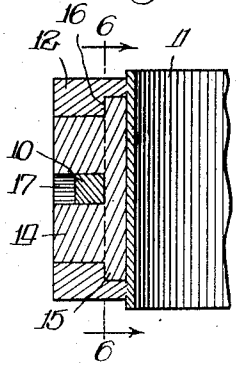


Fig. 7.



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UNITED STATES PATENT OFFICE

2,104,192

ORTHODONTIC APPLIANCE

James W. Ford, Chicago, Ill.

Application August 19, 1935, Serial No. 36,808

9 Claims. (Cl. 32—14)

The present invention has to do with the orthodontic appliance of the type and construction shown and described in Letters Patent of the United States 2,011,575 granted to me August 20, 1935. That appliance enables the arch-bar to be attached to and detached from a tooth band with the greatest ease and with the expenditure of but a minimum amount of time as compared with those appliances available before my invention of such appliance.

In the practical application and use of the appliance referred to it has been found that the same has a tendency to weaken at the point of connection of the anchoring stud thereof with the tooth band so that under the strains imposed on the stud at such point of connection a liability of fracture has arisen.

Moreover, because of the relatively small size of the parts it has been difficult to form the locking means embodied in the former appliance, and this has added to the cost of production of the device.

The present invention has as its object to improve the construction of the appliance covered by my aforesaid patent so as to strengthen the same and overcome the liability of fracture referred to, and also to incorporate in the appliance improved locking means of greater simplicity and durability than formerly employed and which may be included in the appliance at less cost and with the expenditure of less labor and effort than in the former appliance.

Other objects and advantages will appear as the nature of the improvements is better understood, the invention consisting substantially in the novel construction, combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawing, and finally pointed out in the appended claims.

While the form of the invention herein shown and described is believed to be a preferred embodiment thereof, it is to be understood that the same is susceptible of change, modification and variation in the form, construction and arrangement of its parts, so that the present disclosure is to be considered from an illustrative standpoint and not as imposing limitation or restriction on the invention.

In the drawing,

Fig. 1 is a perspective view illustrating conventionally the application of the hereindescribed invention to the teeth;

Fig. 2 is a similar view, on a greatly enlarged scale, of the appliance in its open position and the separated arch-bar ready for introduction to the appliance;

Fig. 3 is a view similar to Fig. 2, the appliance being shown in closed position, with the arch-bar introduced thereto and held thereby;

Figs. 4 and 5 are face elevations of the appliance showing the latter respectively in the open and closed positions as prior to the introduction of the arch-bar to the appliance and after the arch-bar has been introduced therein;

Fig. 6 is a transverse sectional view as on the line 6—6, Fig. 7; and

Fig. 7 is a similar view as on the line 7—7, Fig. 5.

Having reference now in detail to the accompanying drawing, the numeral 10 designates an arch-bar commonly employed in practicing orthodontia. In the present instance, and as clearly illustrated in Figs. 2 to 6, inclusive, the bar 10 is shown as preferably oblong in cross-section. But bars having any other cross-sectional shape may be used.

The numeral 11 designates a tooth band of the usual form and construction as employed for straightening teeth, the band 11 being intended to surround the tooth to be treated and to be applied thereto in the usual manner. According to the present invention, an anchoring collar 12 is mounted on the tooth band 11 so as to have a fixed connection therewith. This collar 12 is of cylindrical formation, being open at both sides, and the face thereof which lies next against the tooth band 11 is fixed thereto by any suitable means to unite the parts.

At opposite sides of the anchoring collar 12, and in alignment with each other, is provided a pair of slots 13 which extend in the direction of the length of the collar and to a point somewhat beyond the medial line thereof. The open ends of these slots lie at the face of the collar 12 which is outermost, or that face which is most remote from the tooth band 11.

Rotatably mounted within the anchoring collar 12 is a locking stud 14, which stud also is of cylindrical contour, and at the inner end of said stud 14 a peripheral flange 15 is provided which is of greater diameter than the diameter of the locking stud 14. The flange 15 is received by an undercut recess 16 that is formed in the inner face of the anchoring collar 12, and by reason of this construction the locking stud 14 is precluded becoming displaced from the anchoring collar 12 when this collar has been fixedly connected to the tooth band 11.

The locking stud 14 has a transverse groove 17 formed therein, which groove extends across the

entire width of the stud. The groove 17 is of the same width as the slots 13, as appears in Figs. 2 and 4, and the ends of the groove 17 register with the slots 13 when the locking stud 14 has been moved to the position shown in Figs. 2 and 4, thus permitting the easy introduction of the arch-bar 10 to the groove and slots, as when applying the arch-bar to the tooth band.

By reference to Figs. 2, 3, 4, 5 and 6, it will be observed that the ends of the groove 17, at the peripheral portions of the stud 14, are cut out or flared, as at 18, and these cut out or flared portions are reversely arranged with respect to each other, as clearly seen in Fig. 6, whereby the locking stud 14 is capable of a limited turning movement in reversed directions within the anchoring collar 12. By the formation of the cut out or flared portions 18 a pair of angularly-disposed contact faces 19 is provided within the groove 17, and these contact faces 19 are designed to abut against the opposite faces of the arch-bar 10 when the groove 17 is in alignment with the slots 13. Hence, in that position of the parts the arch-bar 10 either may be introduced to the anchoring collar and the locking stud or be removed therefrom.

By the formation of the cut out or flared portions 18 there is also provided a pair of overhanging retaining lips 20, and when the arch-bar 10 has been introduced into the groove 17 and the slots 13, and the locking stud has been rotated to the position shown in Figs. 3 and 5, the retaining lips 20 overlie the arch-bar 10 and thereby hold the bar in the slots 13 so as to maintain the arch-bar in locked relation to the tooth band 11.

In manipulating the locking stud 14 to rotate the same to both of its locking and unlocking positions the end of a screw-driver or similar implement may be inserted into the groove 17, thereby permitting the locking stud 14 to be rotated in either direction with freedom and ease, and when it has been positioned to the desired point the screw-driver is removed, and the locking stud 14 then will remain in the position to which it has been adjusted.

It will be understood that before the anchoring collar 12 is fixedly connected to the tooth band 11 the locking stud 14 is fitted within the band so that the flange 15 of the stud will be seated within the undercut recess 16. With these parts thus assembled the face of the collar 12 next adjacent to the tooth band 11 is fixedly connected to the band, and in this manner the locking stud 14 is held effectually in place but capable of free rotation so as to position the same for locking and unlocking purposes.

When it is desired to utilize the present invention the tooth band 11 is applied to the tooth to be treated, and with the application of the arch-bar 10 the locking stud 14 is rotated so that the ends of the groove 17 will register with the slots 13. Thereupon the arch-bar is inserted in the groove 17 and the slots 13 to occupy the position shown in Fig. 7, or at the bottom of the slots 13. When so positioned the arch-bar 10 is clear of the overhanging retaining lips 20 and the locking stud 14 is free to be rotated. That rotation will throw the retaining lips 20 over the arch-bar 10, as illustrated in Figs. 3 and 5, thereby acting to clamp or retain the arch-bar 10 in position within the appliance. With the rotation of the locking stud 14 to the position described the contact faces 19 will not be in abutting relation to the sides of the arch-bar 10 but spaced away from the same, as shown in Fig. 6. The appliance is now in locked position and remains so until the time arrives for further adjustment of the arch-bar on the tooth of the patient in accordance with the progress of the treatment being effected.

When it is desired to release the arch-bar from the appliance, the tip of the screw-driver or similar instrument is inserted into the groove 17 and the latter rotated to bring the contact faces 19 into abutting relation with opposite faces of the arch-bar 10, as illustrated in Figs. 2 and 4. The groove 17 is now aligned with the slots 13, and the overhanging retaining lips 20 have been retracted from their locking positions. The arch-bar 10 is now free to be moved outwardly from the slots 13 and thereby becomes released from the appliance.

By the present invention the fixed connection of the face of the anchoring collar with the tooth band 11, which extends around the entire circumference of the collar, gives a very strong mounting of the collar on the tooth band. This enables greater resistance to be offered to the strains imposed on the anchoring collar, and liability of fracture at this point of connection is reduced to a minimum.

Furthermore, with the locking stud 14 constructed as herein shown and described, and the provision therein of the groove 17, the flared portions 18 and the overhanging retaining lips 20, locking means of greater simplicity than in the former appliance referred to are provided, enabling the appliance to be moved to locking and unlocking positions through the simple expedient of a screw-driver applied to the groove 17. No special instruments, therefore, are required, and the simplicity of construction which has been included for the purposes described also permits the incorporation of the locking means at less cost and with the expenditure of less labor and effort than in the former appliance.

I claim:

1. In an appliance of the character described, the combination with a tooth band, of an anchoring device carried by said tooth band and having provision for receiving an arch-bar transversely thereof, a locking device carried by and rotatably mounted within said anchoring device and also having provision for receiving the arch-bar transversely thereof, and means carried by the locking device and engageable with the arch-bar to hold the latter within the anchoring and locking devices.

2. In an appliance of the character described, the combination with a tooth band, of an anchoring device carried by said tooth band and adapted to receive an arch-bar, a locking device carried by and rotatably mounted within said anchoring device and adapted also to receive the arch-bar, and means carried by the locking device and overlying the arch-bar at a point in its range of movement to hold the arch-bar within the anchoring and locking devices.

3. In an appliance of the character described, the combination with a tooth band, of an anchoring device carried by said tooth band and adapted to receive an arch-bar, a locking device carried by and rotatably mounted within said anchoring device and adapted also to receive the arch-bar, and a retaining lip carried by the locking device and adapted to overlie the arch-bar at a point in its range of movement to hold the arch-bar within the anchoring and locking devices.

4. In an appliance of the character described, the combination with a tooth band, of an anchoring collar carried by said tooth band and provided with slotted portions adapted to receive an arch-bar, a locking member rotatably mounted within said anchoring collar and slotted to receive the arch-bar, and means carried by the locking member and adapted to overlie the arch-bar to hold the latter within the anchoring collar and the locking member.

5. In an appliance of the character described, the combination with a tooth band, of an anchoring collar carried by said tooth band and provided with slotted portions adapted to receive an arch-bar, a locking member rotatably mounted within said anchoring collar and slotted to receive the arch-bar, and a retaining lip carried by the locking member and adapted to overlie the arch-bar at a point in its range of movement to hold the arch-bar within the anchoring and locking devices.

6. In an appliance of the character described, the combination with a tooth band, of an anchoring collar carried by said tooth band and provided with oppositely-disposed inwardly-extending slots adapted to receive an arch-bar, a locking member rotatably mounted within said anchoring collar and provided with a transverse groove adapted to receive the arch-bar, and means carried by the locking member and adapted to overlie the arch-bar at a point in the range of movement of the locking member to hold the arch-bar within the anchoring collar and the locking member.

7. In an appliance of the character described, the combination with a tooth band, of an anchoring collar carried by said tooth band and provided with oppositely-disposed slotted portions adapted to receive an arch-bar, a locking member rotatably mounted within said anchoring collar and transversely slotted to receive the arch-bar, the slots of the anchoring collar and the slotted portion of the locking member being adapted to register for receiving the arch-bar, and means carried by the locking member and adapted to overlie the arch-bar at a point in the range of movement of the locking member to hold the arch-bar within the anchoring collar and the locking member.

8. In an appliance of the character described, the combination with a tooth band, of an anchoring collar carried by said tooth band and provided with oppositely-disposed slotted portions adapted to receive an arch-bar, a locking member rotatably mounted within said anchoring collar and transversely slotted to receive the arch-bar, the slots of the anchoring collar and the slotted portion of the locking member being adapted to register for receiving the arch-bar, and a pair of overhanging retaining lips carried by the locking member and adapted to overlie the arch-bar at a point in the range of movement of the locking member to hold the arch-bar within the anchoring collar and the locking member.

9. In an appliance of the character described, the combination with a tooth band, of an anchoring collar carried by said tooth band and provided with slotted portions adapted to receive an arch-bar, a locking member rotatably mounted within said anchoring collar and slotted to receive the arch-bar, the slots of the anchoring collar and the slotted portion of the locking member being adapted to register for receiving the arch-bar, the slotted portion of the locking member having its ends flared, and a pair of overhanging retaining lips formed by the flaring of the ends of said slotted portion and adapted to overlie the arch-bar at a point in the range of movement of the locking member to hold the arch-bar within the anchoring collar and the locking member.

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