Dec. 22, 1942. S. R. ATKINSON 2,305,916

ORTHODONTIC APPLIANCE

Filed May 27, 1941

Fig. 1

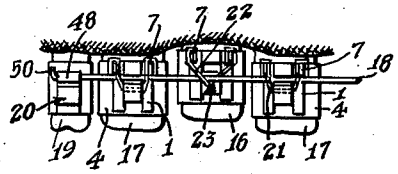



Fig. 7

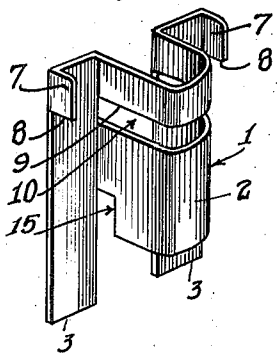



Fig. 8

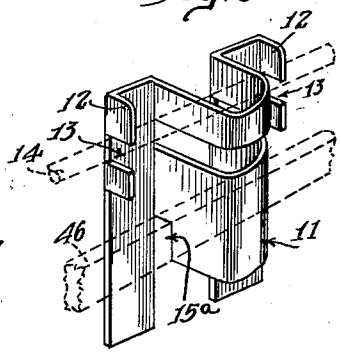



Fig. 2

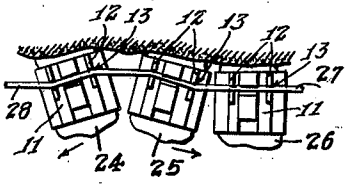



Fig. 3

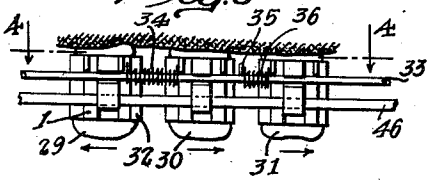



Fig. 4

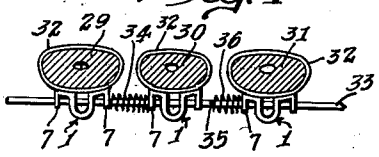
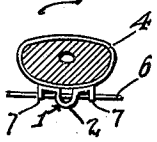



Fig. 6



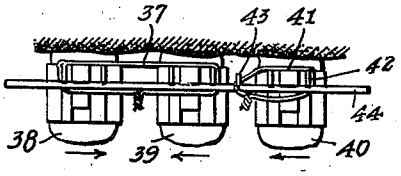
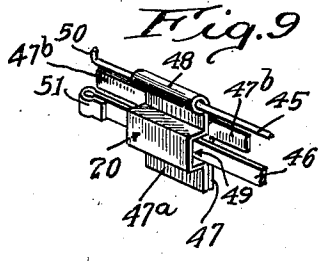




Fig. 5

Fig. 9




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# UNITED STATES PATENT OFFICE

2,305,916

## ORTHODONTIC APPLIANCE

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Application May 27, 1941, Serial No. 395,361

2 Claims. (Cl. 32—14)

This invention relates to improvements in orthodontic appliances and particularly to the construction of means to be attached to the teeth temporarily, cooperating with an orthodontic wire or wires.

One of the objects of the invention is to provide improved means for subjecting a tooth or teeth to corrective forces tending to correct defects of faulty alignment of a tooth or orientation of the tooth's axis; also to improve the means carried by the tooth which is to be corrected, for receiving and imparting the corrective force to the tooth, and the means for anchoring the orthodontic wire; also to correct faulty spacing.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combination of parts to be described hereinafter, all of which contribute to produce an efficient orthodontic appliance.

A preferred embodiment of the invention is described in the following specification, while the scope of the invention is pointed out in the appended claims.

In the drawing:

Figure 1 is a diagrammatic side elevation illustrating my improvements and showing an assembly operating to correct faulty alignment. This view also illustrates the anchor means of my invention for holding the end of the orthodontic wire.

Figure 2 is a view similar to Fig. 1, illustrating the assembly for correcting faulty orientation of two adjacent teeth.

Figure 3 is a view similar to Figs. 1 and 2 but showing the assembly for imparting lateral forces to teeth for correcting faulty spacing of the teeth.

Figure 4 is a horizontal section taken about on the line 4—4 of Fig. 3 to further illustrate the arrangement shown in Fig. 3.

Figure 5 is a diagrammatic view similar to Fig. 3 but illustrating the use of ligatures instead of springs for exerting the correcting lateral force upon the teeth.

Figure 6 is a horizontal cross-section through a tooth carrying a tooth-band provided with my improved bracket.

Figure 7 is a perspective upon a magnified scale of my improved bracket.

Figure 8 is a view similar to Fig. 7 but showing a slight modification of the bracket.

Figure 9 is a perspective also upon a magnified scale and illustrating my improved anchor with orthodontic wires about to be anchored therein.

Fig. 7 illustrates a bracket 1 which I employ in my orthodontic assemblies. This bracket is preferably formed of a plate having a body 2 which projects out from the tooth, the sides of the body having integral flanges 3, the inner faces of which form seat faces or substantially flat feet to be welded or otherwise secured to a tooth band 4. The body is formed with a slot 10 through which the orthodontic wire 6 may pass (see Fig. 6).

On the outer lateral edges of the bracket 1, I prefer to form means for engaging the orthodontic wire 6. This means is preferably in the form of a lug 7 which in the present instance is formed integrally with the body of the bracket. These lugs project outwardly from the plane of the feet, and I prefer to form these lugs at the point indicated because they are then spaced a very considerable distance apart and this increases the leverage or purchase of forces which may be applied to the lug 7 to impart the corrective force or forces to the tooth. The lower edge 8 of each of these lugs is substantially in the same plane as the upper edge 9 of a slot 10 which is formed across the body 2 and which extends inwardly, to the plane of the feet 3.

In Fig. 8 I illustrate a bracket 11 which is constructed substantially the same as the bracket illustrated in Fig. 7, but in this modification the lugs 12 are made quite wide and each lug is provided with a notch 13 into which the orthodontic wire indicated by the dotted line 14 is received. The advantage of this modification is that the orthodontic wire can exert a downward or upward force on each lug, as may be desired.

The lower end of the body 2 is cut away adjacent the feet 3 so as to form a notch 15 to receive a flat orthodontic wire, and a similar notch 15—*a* is employed in the embodiment of the bracket illustrated in Fig. 8.

In Fig. 1, I illustrate an assembly in which my improvements are employed to correct faulty alignment of teeth. In this view 16 indicates a tooth which is located in a retracted position and which should be corrected by developing a downward shift of the tooth bodily to bring it into line with the adjacent teeth 17. Under these circumstances I provide the two adjacent teeth 17 with tooth bands 4 to which the brackets 1 are rigidly secured. In this view 18 indicates the round orthodontic wire which extends through the notches 10 in the bodies of these brackets, engaging the lower edges of the lugs 7. The end of the wire is anchored on an adjacent tooth such as the tooth 19 by means of an anchor bracket 20, the

details of which will be described more fully hereinafter. The orthodontic wire 18 can if desired be secured to the brackets 1 by means of ligatures 21 secured over the upper edges of the lug 7, and a similar ligature 22 is provided passing up over the lugs 7 of the bracket on the intermediate tooth 16, the said ligature 22 being secured in place by twisting its ends as indicated at 23. When this ligature 22 is tightened up in this way it will exert a constant downward force on the lug 7, tending to bring the tooth 16 down into line with the outside teeth 17.

In Fig. 2, I illustrate another use of my improvements employing the bracket illustrated in Fig. 8. This view is employed to illustrate how my improvements may be used to correct the orientation of two teeth 24 and 25. If these teeth 24 and 25 are near enough in line to an adjacent tooth 26, I may apply an orthodontic wire 27 through the notches 13 of the brackets 11 in the manner indicated. The end 28 of this orthodontic wire would be anchored in an anchor device of any suitable construction, such as the anchor bracket 20, and the other end of the wire 27 would be anchored in any suitable manner with any usual means known to orthodontists for maintaining tension in the wire. The effect of this tension is of course to exert a downward pull on the lugs 12 which are relatively elevated, and an upward pull on any lugs which are located below the level of the lugs on the right-hand tooth or stabilizing tooth 26.

This bracket illustrated in Fig. 7 or Fig. 8 is also very useful in an assembly such as illustrated in Fig. 3 in which it may be necessary to correct the spacing of three teeth 29, 30 and 31 but which are in proper alignment with each other. In such a case a bracket 1 may be secured on a tooth band 32 on each tooth, and on the orthodontic wire 33 springs may be applied between the lugs 7 on the brackets. For example, if the teeth 29 and 30 are too close together a coil spring 34 can be applied on the orthodontic wire, thrusting toward the left on the tooth 29 and toward the right on the tooth 30. In other words, the lugs 7 form excellent seats to receive the thrust of the spring. This is illustrated quite clearly in Fig. 4, from an examination of which it will be seen that if the lugs were not present the coils of the spring could become jammed into the narrowing throat between the adjacent side of the tooth band and the orthodontic wire.

If it is necessary to exert force upon a tooth tending to move it laterally, in a situation where it is not desirable to exert any thrust against the adjacent tooth, this can be accomplished by soldering a laterally projecting pin 35 on the orthodontic wire. This pin 35 will act as a seat for a coil spring 36, the other end of which will thrust against the adjacent lug 7 on the tooth 31. In exerting lateral thrusts upon teeth in the manner indicated in Figs. 3 and 4, if desired I may employ the bracket illustrated in Fig. 8 instead of the bracket illustrated in Fig. 7, in which case the presence of the notch assists in stabilizing the axial orientation of the tooth. In other words, the edges of the notch engaging with the orthodontic wire will tend to prevent the tooth from tilting. In this way force would be exerted upon the tooth merely tending to shift it, while the tendency to orient the axis of the tooth is overcome.

In Fig. 5, I illustrate an arrangement somewhat similar to that illustrated in Figs. 3 and 4 but in which instead of employing springs for exerting force on the teeth, ligatures 37 may be employed. The lugs 7 are most useful in such a situation because the ligatures can be passed around the outermost lugs on two adjacent teeth 38 and 39 which are to be drawn closer together. If an adjacent tooth 40 should be shifted toward the left as viewed in Fig. 5, a ligature 41 can be employed, passed around the right-hand lug 42 of the tooth 40 and also passed around a pin 43 soldered on to the orthodontic wire 44.

In all of the above illustrations it should be understood that in practice frequently a flat orthodontic wire such as the orthodontic wire 46 would also be employed, as indicated in Fig. 3, and lying in the notches 15 or 15—*a* in the bodies of the brackets.

In Fig. 9, I illustrate the anchor bracket 20 in perspective, and in this view I also illustrate an orthodontic round wire 45 and an orthodontic flat wire 46. The anchor bracket 20 is preferably formed of a bent plate presenting two juxtaposed parts or leaves 47 and 47*a*, the inner leaf 47 having integral laterally projecting flanges 47*b* to be welded or otherwise secured to a tooth ring. One edge of this plate, for example, the upper edge, is bent around to form a sleeve 48 through which the round orthodontic wire 45 may be extended, and the body of the forward leaf 47*a* of the plate may be offset so as to form a rectangular socket or notch 49 through which the flat orthodontic wire 46 may extend. In forming the anchorage it is merely necessary to form bends, such as the bends 50 and 51, at the ends of these wires. The size of the rectangular socket 49 should be sufficient to permit the ends at the bend to be seated in the end of the socket. These bends will resist any necessary tension exerted upon the wires.

The end of the round wire is anchored simply by bending it laterally as indicated in Fig. 9, but with the bend up against the end of the socket.

Many other embodiments of the invention may be resorted to without departing from the spirit of the invention.

What I claim is:

1. An orthodontic bracket to be attached to a tooth band, having a body whose longitudinal axis extends substantially parallel with the axis of the tooth, said bracket having spaced substantially flat feet formed integral with the body for securing the body to the tooth band, the outer edges of said feet having lugs projecting outwardly from the plane of the said feet for engagement with a pressure member of the orthodontic assembly.

2. An orthodontic bracket as described in claim 1, in which the outwardly projecting lugs are formed with notches extending into the same from their outer edges to receive an orthodontic wire.

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