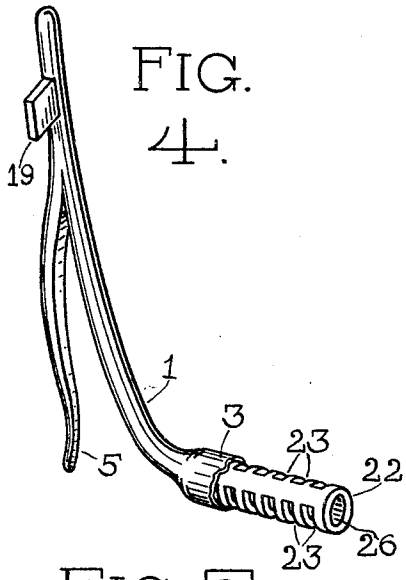
May 16, 1933. J. A. LINDE 1,908,853

ADJUSTABLE ORTHODONTIC APPLIANCE

Filed Oct. 9, 1930

FIG. 4.



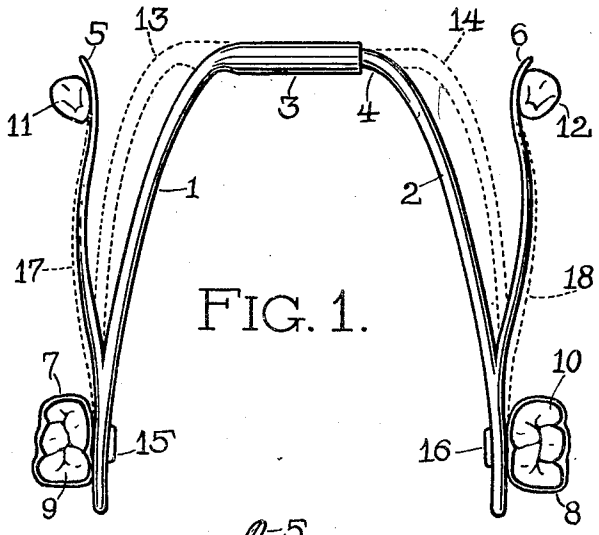
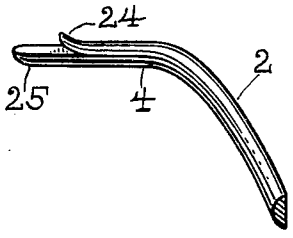


FIG. 1.

FIG. 5.



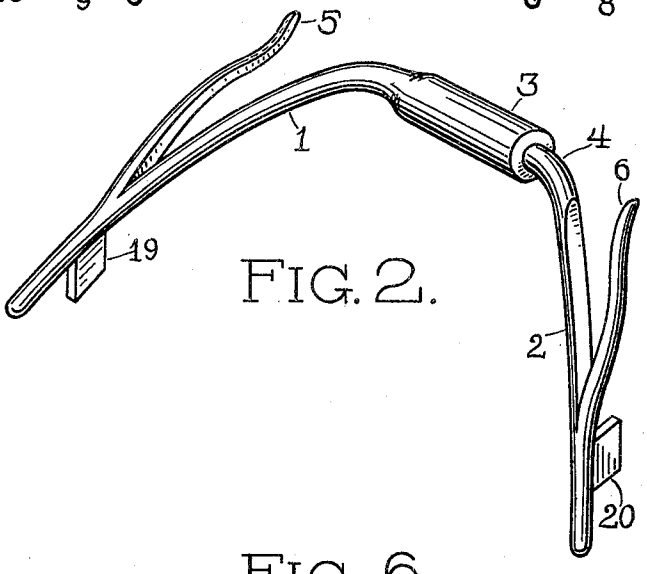


FIG. 2.

FIG. 3.

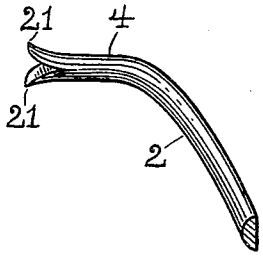


FIG. 6.

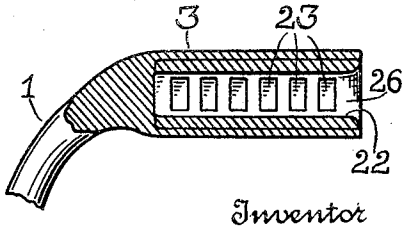
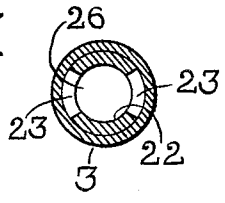


FIG. 7.



Inventor

John A. Linde

Patented May 16, 1933

1,908,853

UNITED STATES PATENT OFFICE

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ADJUSTABLE ORTHODONTIC APPLIANCE

Application filed October 9, 1930. Serial No. 487,477.

This invention relates to orthodontic appliance arches, and refers particularly to that class wherein such an arch primarily consists of two distinct corresponding members which may be more or less separated from each other while mutually engaged in order to expand or contract the arch as a whole, and without introducing new or different strains but merely increasing effectively whatever pressure or tension may already be exerted by the arch or its appurtenances in actual use.

The main object of my invention is to provide an arch of the character indicated which can be conveniently adjusted to expanded or contracted condition in order to increase or decrease the tension or pressure exerted by portions of said arch.

Another object is to provide an arch of this class with positive means for rigidly holding all expansion attained by adjustment and preventing return of the parts to contracted condition.

A further object is to introduce an arch into orthodontia particularly adapted to have springs attached thereto which may be directly adjusted by merely adjusting the arch proper.

Other objects and the various advantageous features of my invention will appear more fully in detail hereinafter.

In the accompanying drawing forming part hereof,

Fig. 1 is a view of an orthodontic arch made according to my invention and embodying the advantageous features thereof in practical form, the whole being shown in a typical operative position in relation to several teeth, two of which in this instance provide anchorage while two others represent teeth to be moved to new positions.

Fig. 2 is another view of the arch when removed from operative position and the parts turned into different planes for the purpose of contracting the whole arch or telescoping it.

Fig. 3 shows the inner end of one of the arch members which is hidden in the other two views.

Fig. 4 is a view of the opposite arch member with a portion removed to disclose details of construction thereof.

Fig. 5 is a modification of the part shown in Fig. 3.

Fig. 6 is a fragmentary sectional view of the larger end of the left member of the arch which is shown in another manner in Fig. 4.

Fig. 7 is a cross section of the same larger end of the same.

Throughout the views, the same reference numerals indicate the same parts, or duplicates thereof.

In orthodontia, it is often required to make adjustments to the appliances used in altering the positions of malpositioned teeth, and it is manifest that such adjustment must not introduce any new or different strains which might cause the teeth involved to move in new and undesired directions. Particularly is it desirable to adjust arch wires and springs thereon, if any, so that slack may be taken up or movements followed up so as to again exert pressure or tension where the same may have disappeared by virtue of attained movements of the teeth. Moreover, any means introduced for this purpose must be unobtrusive and of such nature that no food particles or germs are afforded any lodgement in the appliance. In addition, such means should be positive and effective in high degree, so that attained positions and adjustments are perfectly retained, allowing dependable progress to be assured in use. There are other considerations also, such as economy, simplicity, etc., which may not be overlooked but must also enter into the structure in a practical way, and the present invention particularly embodies all such points in a manner to distinctly advance the art.

In the practice of my invention, an arch for the general purposes of orthodontia is made in two branches 1, and 2, which may be anchored by the usual lugs 19 and 20 to the parts 15 and 16 of anchor bands 7 and 8 normally anchored on a pair of teeth 9 and 10, respectively. In some cases, only one branch or member of the arch need be anchored to a tooth, but the novel construc-

tion which will immediately be described is nevertheless the same in principle.

When, for example, it may be desired to move one or more teeth similar to 11 and 12, a spring such as 5 may be permanently secured to member 1 or a spring 6 may be secured to member 2, or both springs may be used, as the case may be. Now, in order to alter or increase the resilient pressure of the arch against either of teeth 11 and 12 or against both, through springs 5 and 6, the arch members are separate and made so that they may be forced apart more or less.

The arch member 1 has a sleeve formed at 3 upon the upper end thereof into which, in a general way the upper portion of the member 2 beyond the section 4 thereof may normally project. If the sleeve 3 were merely smooth within like an ordinary tube, the inner end of section 4 of member 2 would slide in or out in uncontrollable manner. But the interior is modified in a very special manner, for a plurality of interior depressions or pockets noted 23 have been formed in the interior wall. In this instance, for the sake of ready manufacture, an interior tube 22 has been permanently secured within sleeve 3 after having first formed said pockets in the form of slots in tube 22, the latter with sleeve 3 finally forming a single unit with the interior characteristics mentioned. This inserted tube is not absolutely necessary, as the interior of sleeve 3 may be directly indented to form such pockets 23. However, in order to use said interior pockets and introduce means to directly cooperate therewith, the upper end of arch member 2 beyond its bent section 4 is split to form either a pair of similar tongues 21, 21 shown in Fig. 3 or one tongue 24 and a guiding finger 25 as shown in Fig. 5. In either case, the general diameter of the member 1 or member 2, especially the latter above bend 4 may be about the same as that of the aperture 26 of the sleeve as a whole, so that the end of member 2 would normally slide readily into the sleeve. Now, owing to the tongues 21, 21 in the one case, or tongue 24 in the other case, the end of member 2 would not slide in very far into the sleeve 3, as one or both tongues would tend to engage the pockets 23, and this being end engagement of the tongue, will immediately stop all further movement into the sleeve on the part of member 2. In the case of the one tongue, of Fig. 5, the finger 25 serves as a convenient guide for the part into the sleeve aperture, but the finger is not essential; the principle of the tongue being the same, however, as when both tongues 21, 21 are present.

Whether one or two tongues are used, another feature remains to be explained in regard to the interior sleeve pockets. The latter are arranged preferably in two opposite and parallel rows, as shown in one form in Fig. 4, and in another form in Fig. 7. Because of this feature, it is possible to turn one arch member out of plane with respect to the other as shown in Fig. 2, when the one or two tongues will no longer register with either row of pockets but will readily slide along the smooth portions of aperture 26 between the rows. The arch may then be contracted or compressed so as to be narrower as shown in the full lines in the first view. Expansion of the arch as a whole, is on the other hand possible when the arch is in position, even in a patient's mouth, and while the tongues of one arch member engages the pockets in the sleeve of the other. If the members are forced apart by means of pliers or other convenient instruments, which need not be shown, the tongues may slide out of engagement with one set of pockets outward into engagement with another set further out near the end of the sleeve. But this expands the arch, possibly to a slight extent only, when desired, though it may be expanded very much further, if necessity arises, as shown in the first view. Here, the members 1 and 2 have in expanded positions assumed the positions indicated at 13 and 14, respectively, and the springs 5 and 6 have had their tension increased very obviously at 17 and 18. The members cannot be forced back into original narrow position, as the tongues positively engage the sleeve pockets and prevent this, hence, if teeth 11 and 12 have been moved by the appliance as a whole, the expansion thereof just described will take up all such movement and renew the tension or pressure of the springs for further action and movement.

When it is desired for some reason to again contract the arch, it is but necessary to release it from the parts 15 and 16 on the anchor bands 7 and 8 and lift it free, when the members may be twisted or relatively turned as already mentioned in connection with Fig. 4.

Very many modifications of the general arch may be made and there may be only one spring, or many, or even none at all in certain cases, but the great utility of the separable and adjustment feature inherent in the above new structure still remains the same in all forms of arches in general, hence, the absence or presence of the springs, or particular shape of either arch member does not alter my invention, nor minimize the same. One row of pockets could also be used instead of two.

Having now fully described my invention, I claim:—

1. An orthodontic appliance arch including the combination with a pair of distinct co-operating arch members arranged to form a single arch unit, of an open end sleeve

arranged upon one end of one arch member having a plurality of concealed stops disposed in a row within, means upon the corresponding end of the other arch member normally disposed within said sleeve and arranged to engage said stops, including a tongue on said extremity, said tongue solely engaging the stops in one way when the same is disposed in line with said row in order to prevent further insertion of the arch extremity and said tongue into said sleeve, and simultaneously providing for free withdrawal therefrom, and providing for unobstructed insertion and withdrawal from said sleeve when said extremity is turned out of register with respect to said row of stops, and means including a generally straight finger beside said tongue on said arch extremity for guiding the same into said sleeve.

2. An orthodontic arch including a pair of corresponding arch members, an open end sleeve disposed upon the end of one member having a row of stops within the same, a pair of similar one way tongues disposed upon the extremity of the other member and normally arranged to engage one of said tongues with one of said stops when said extremity is disposed within the sleeve and one of said tongues registers with said row of stops, whereby to prevent further insertion of said extremity into said sleeve while permitting withdrawal therefrom.

3. An orthodontic arch including the combination, with a pair of corresponding arch members, of an open end sleeve fixed upon the end of one arch member having a row of concealed stops within the same, the corresponding end of the other arch member being divided so as to provide two prongs, at least one of which tends to resiliently expand away from the other and form a one way tongue which normally engages one of said concealed stops when said corresponding end is disposed within said sleeve and said tongue registers with said row of concealed stops, whereby to prevent further insertion of said end into said sleeve while providing for free withdrawal therefrom.

JOHN A. LINDE.