No. 678,453. Patented July 16, 1901.

E. H. ANGLE.

TOOTH REGULATOR.

(Application filed Jan. 21, 1901.)

(No Model.)

Fig.1.

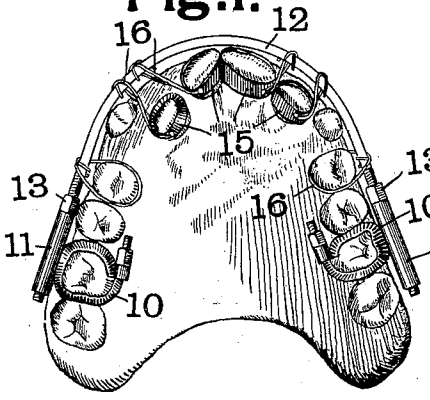


Fig.2.

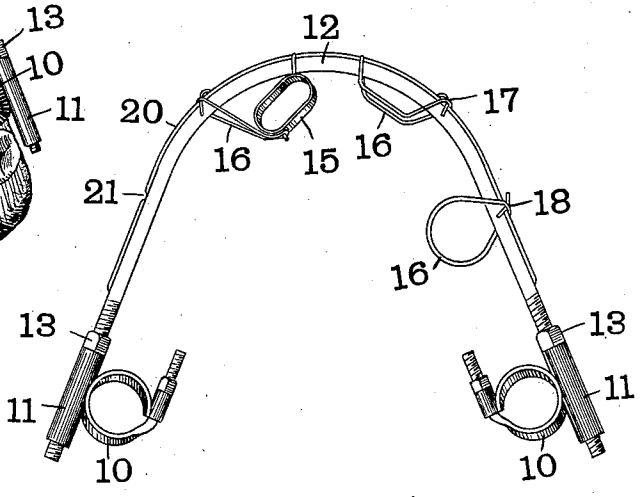


Fig.3.

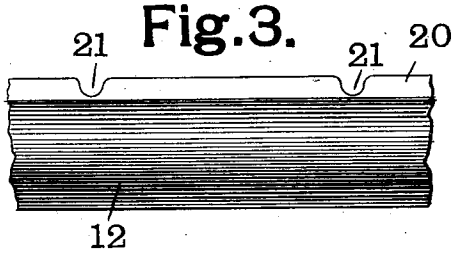


Fig.4.

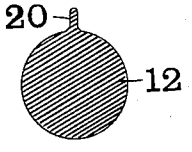


Fig.5.

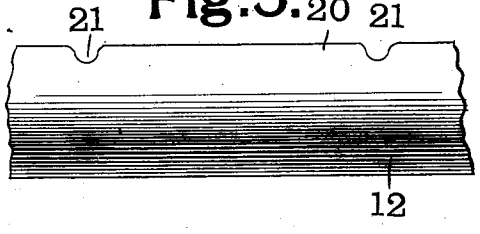
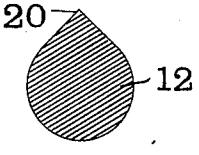


Fig.6.



Witnesses

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UNITED STATES PATENT OFFICE.

EDWARD H. ANGLE, OF ST. LOUIS, MISSOURI.

TOOTH-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 678,453, dated July 16, 1901.

Application filed January 21, 1901. Serial No. 43,965. (No model.)

To all whom it may concern:

Be it known that I, EDWARD H. ANGLE, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Tooth-Regulator, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to those tooth-regulating appliances which are composed of bands adapted to encircle the dental arch and to be fastened at their rear ends to the anchor-teeth by means of other bands clamped or cemented upon said teeth. It is usual to employ with such encircling bands or, as they are often called, "expansion-arches" ligatures of wire, silk, or rubber passing around or attached to the teeth to be moved and carried over and twisted upon the expansion-arch, which ligatures act in coöperation with the expansion of the arch to twist or move the malposed teeth into their proper positions. Considerable difficulty has been experienced in attaching these ligatures securely to the expansion-arch, so that they could be depended upon to remain in proper position upon the arch and exert the force applied to the teeth evenly and in the desired direction, thus securing perfect control of the movement of the teeth.

The object of my invention is to overcome this difficulty and provide a means which will insure a firm and dependable attachment for the ligatures and at the same time be unobtrusive in appearance, easily adjusted, and capable of being employed without fear of injuring the strength or temper of the metal of which the expansion-arch is composed.

In the drawings attached hereto, in which like characters of reference indicate similar parts in the different views, Figure 1 represents an expansion-arch attached to and in use upon the teeth of the upper jaw. Fig. 2 is a view of an expansion-arch embodying my invention, with its attached ligatures for twisting and otherwise changing the positions of the teeth. Figs. 3 and 4 are respectively a side view and a cross-section of one form of band embodying my invention upon an enlarged scale; and Figs. 5 and 6 are similar views, also enlarged, of a somewhat-modified form of my invention.

Referring first to Fig. 1, 10 10 represent bands clamped upon the anchor-teeth and bearing on their surfaces next the cheeks the rigidly-attached tubes 11 11, usually called the "resistance-tubes." Closely fitting these tubes and extending around the dental arch is the resilient-wire band 12. This band is preferably shaped to conform to the ideal dental arch, and its ends are screw-threaded and have upon them immediately in front of the resistance-tubes 11 11 the screw-threaded nuts 13 13, which bear against the resistance-tubes and act when rotated to move the band forward or backward through the resistance-tubes, as desired.

The teeth to be moved or rotated have either entirely surrounding them or attached to them by means of studded bands, as at 15, the ligatures 16, preferably composed of soft-brass wire. The ends of these ligatures are twisted together on the opposite side of the arch 12 and are used to put the requisite pressure upon the teeth either by occasionally twisting the ligatures themselves or by causing the whole arch to advance by rotating the nuts 13 in the appropriate direction or by a combination of both of these operations. It will be readily understood that when strain is put upon the ligatures they will if not firmly held at their points of contact with the arch 12 tend to slide backward toward the rear ends of the arch. Especially will this tendency be noticeable if the ligatures are situated well down on the sides of the arch, as at 17 18. This slipping of the ligatures seriously impairs the control of the operator over the movement of the teeth and changes the direction of the force exerted upon the tooth to be moved. These results necessitate readjustment or renewal of the ligatures, and thus cause considerable delay and pain. It has heretofore been sought to remedy this defect in various ways, such as by passing the ligatures through perforations in the arch or by soft-soldering to the exterior surface of the arch small spurs of wire. The former of these methods and all similar expedients had, however, the serious disadvantage of impairing the strength of the arch,

which in order to avoid conspicuity must be of slender proportions, and acted, moreover, to afford lodgment for particles of food, thus making the breath offensive. It has therefore generally given way to the use of the spurs soft-soldered to the exterior of the arch. These, however, are difficult to apply, and the heat from the soldering is apt to destroy the temper of the arch. The spurs also seriously interfere with the burnishing which must be done from time to time to prevent the arch becoming discolored and unsightly. This latter objection also applies to another expedient which has been used to prevent the slipping of the ligatures, and that is the employment of an arch screw-threaded throughout its entire length. This way has also additional disadvantages, such as the likelihood of the ligatures to slip over the threads and the probability of irritation of the lips from contact with the rough surface.

My invention, as will be seen from the drawings, consists in providing the exterior surface of the arch with a finely-drawn longitudinal rib 20, in which may be cut at pleasure minute notches 21, with which the ligatures attached to the teeth are adapted to engage and by which they will be firmly held in position and will exert their force in the proper direction to move the teeth as desired. This rib is preferably in the form of a thin flange projecting from the wire forming the arch, as shown in Figs. 3 and 4; but it may also consist in simply drawing to a point one side of the wire arch, as shown in Figs. 5 and 6. It will be observed that this rib does not in any way interfere with the requisite burnishing of the arch, nor does it weaken in any way its strength. The notches may be cut in the rib either when the arches are manufactured or when they are put in use by the operator. It will be apparent that several minor changes of form may be made in my invention, and it will be seen that it is not necessary that the position of the rib should conform exactly to that shown in the drawings, but that it may be situated either above or below the extreme exterior surface of the wire constituting the expansion-arch.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. As a new article of manufacture, a resilient arch adapted to be fastened to the anchor-teeth, and having upon its exterior surface a longitudinal rib adapted to receive notches for holding the tooth-attaching ligatures in position upon said arch.

2. In a tooth-regulating appliance, a resilient arch adapted to be fastened at its ends to the anchor-teeth, and having upon its exterior surface a projecting longitudinal rib having notches for coöperating with the tooth-attaching ligatures for holding said ligatures in position upon said arch.

In testimony whereof I have hereunto set my hand and affixed my seal in the presence of two subscribing witnesses.

EDWARD H. ANGLE. [L. S.]

Witnesses:

JAMES H. BRYSON,

W. A. ALEXANDER.