No. 626,476. Patented June 6, 1899.

# E. H. ANGLE.

## TOOTH REGULATING DEVICE.

(Application filed Oct. 24, 1898.)

(No Model.)

Fig. 1.

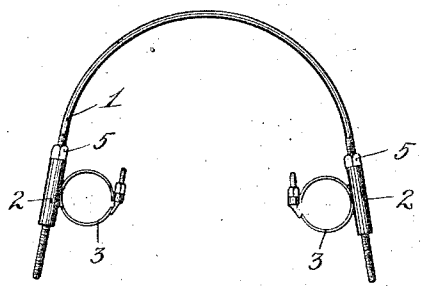



Fig. 2.

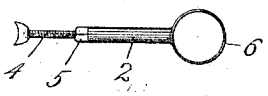



Fig. 3.

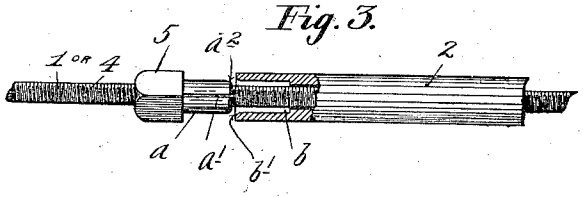



Fig. 4.

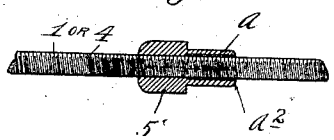
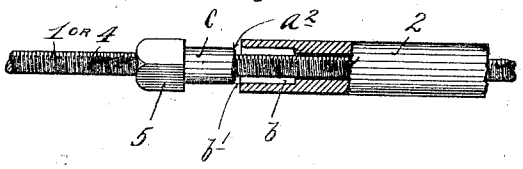



Fig. 5.




Witnesses.
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# UNITED STATES PATENT OFFICE.

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

## TOOTH-REGULATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 626,476, dated June 6, 1899.

Application filed October 24, 1898. Serial No. 694,364. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD H. ANGLE, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Tooth-Regulating Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to teeth-regulating devices for use in dentistry; and it consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In what is known as the "Angle" system for the regulation of teeth, several of the regulators include telescoping parts, which are adjustable in respect to each other, by means of nuts working on the screw-threaded portion or portions of the tension or delivery members and reacting against the relatively fixed or anchored members as bases of resistance. An illustration may be seen in my prior patent, No. 399,177, of date March 5, 1889.

In the class of devices above noted I have found in practice that the adjusting-nuts will remain where set fairly well as long as considerable tension is kept thereon by the pressure from the tooth which is to be moved. When, however, the tooth to be regulated begins to adapt itself to the desired adjustment, thereby relieving the device from tension, more or less, I have found that the adjusting-nuts are liable to be accidentally moved under the engagement therewith of the tongue or lips of the wearer.

The object of my invention is to overcome this defect, so as to secure a regulating device of simple and efficient construction wherein the telescoping parts will be securely held in whatever position relative to each other they may be set.

My invention is illustrated in the accompanying drawings, wherein like notations refer to like parts throughout the several views.

Figure 1 is a plan view showing my improvement as applied to an artificial arch. Fig. 2 is a similar view showing my improvement as applied to a fish-tail or jack-screw regulator. Fig. 3 is a detail, chiefly in plan, but partly in section, with some portions broken away, illustrating, on an enlarged scale, a pair of telescoping parts equipped with the preferred form of my improvement. Fig. 4 is a detail in longitudinal section showing the relation of the nut and rod, as illustrated in Figs. 1, 2, and 3. Fig. 5 is a view similar to Fig. 3, illustrating a modified construction.

In the form of regulator illustrated in Fig. 1 the screw-threaded ends of the arch-wire 1 or delivery member of the device extend through anchor-tubes or bearing-blocks 2, which are shown as provided with clamping-bands 3 for securing the same to the anchor-teeth. In the form of regulator illustrated in Fig. 2 the fish-tail delivery-rod 4 is screw-threaded and extends into a corresponding anchor-tube or bearing-block 2, which is shown as provided with a band 6, adapted to be cemented to an anchor-tooth. In both forms the members 1 and 4 are the delivery or tension members and the members 2 are the relatively fixed or anchored members of the regulators. In both forms the delivery or tension members are provided with an adjusting nut or nuts 5, according to the form of the regulator, which serve to effect the desired adjustment of the two telescoping members relative to each other. Instead of an ordinary nut, however, as in my prior patent, the nut 5 is now provided with a threadless extension *a* or *c*, which is adapted to serve as a friction-sleeve for telescoping frictional engagement with the anchor block or tube 2.

In the preferred form of my improvement, as illustrated in Figs. 1 to 4, inclusive, the friction-sleeve *a* of the nut is of less exterior diameter than the nut proper and is of greater diameter than the screw-threaded portion of the delivery wire or rod on which the nut works. The said friction-sleeve *a* is also split axially or lengthwise thereof in the preferred form, as shown at *a'* in Fig. 3. The anchor tube or block 2 when the friction-sleeve is of less diameter than the nut proper, as shown, is counterbored, as shown in Fig. 3, to provide a seat or recess *b* of the proper size to receive the friction sleeve or surface *a*, projecting from the nut 5. This counterbore *b* is of slightly less diameter than the outside diameter of the friction-surface *a*, so as to radially press or spring the split sleeve *a*,

and thereby hold the nut under considerable friction when the sleeve is in its innermost or working position in respect to the anchor tube or block 2, as shown in Figs. 1 and 2. The end of the friction-sleeve *a* is slightly rounded or reduced, as shown at $a^2$, and the mouth of the anchor-tube 2 is slightly beveled or flared outward, as shown at $b'$, to insure a ready entrance of the friction-sleeve in the counterbored seat of the anchor-tube 2. The counterbore *b* only need be slightly greater in diameter than the bore proper of the anchor-tube 2, but should be of a length greater than the length of the friction-sleeve *a*.

With the construction above described it is obvious that the adjusting-nut 5 will be securely held in whatever position it may be set on the screw-threaded portion of the delivery member of the regulating device by a friction or tension which is independent of the tooth-shifting tension. Hence the telescoping delivery and anchored members of the regulator will be securely held in whatever position they may be set relative to each other when in use. Accidental displacement of the adjusting-nut under the action of the tongue or lips of the wearer cannot take place. The regulators are therefore very greatly increased in efficiency.

In the modification illustrated in Fig. 5 I have shown a friction-sleeve *c* which is not split. This form of friction-sleeve is an improvement over the ordinary nut, but is by no means the full mechanical equivalent of the split sleeve *a* shown in the main view. No compression or spring action between the friction-surfaces is available in this modification. The sleeve *c* must simply be made of a size to afford a close fit with the anchor-tube 2. When thus properly made, this device will work fairly well and give much better results than the ordinary nut, but is far less reliable than the split sleeve *a* illustrated in the main views.

The friction-sleeve of the nut has been shown of a size to engage a counterbored seat in the anchor tube or block of the regulator, and this is by far the most desirable construction for comfort to the wearer, as it gets the engaging parts out of the way of the tongue. It must be obvious, however, that the reverse construction would work—to wit, a construction wherein the friction-sleeve had a bore of the proper size to telescope with the outer surface of the anchor-tube 2 under frictional engagement therewith. Likewise it is apparent that the anchor-tube might be split for a portion of its length instead of the friction-sleeve being split, as shown, to secure the radial spring action between the engaging friction-surfaces.

The important point of the improvement is that means is thereby afforded for putting the adjusting-nut 5 under a friction or tension which is entirely independent of the tooth-shifting tension. This is sufficient to prevent accidental rotary motion thereof under the tongue or lip action of the wearer, and hence the nut and the telescoping parts of the regulator will remain in whatever position they may be set relative to each other as desired for this class of work.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a tooth-regulator having extensible parts, an adjusting-nut working on one and reacting against the other of said parts, which nut has an abrupt shoulder that resists the end thrusts or strains, and is provided with a friction sleeve or section that puts the said nut under a friction or tension against rotation, independently of the end strains on the said nut, substantially as described.

2. In a tooth-regulator having telescoping parts, an adjusting-nut working on one and reacting against the other of said parts, which nut has an abrupt shoulder that resists the end thrusts or strains, and is provided with a friction-sleeve that puts the said nut under friction or tension against rotation with respect to the part frictionally engaged, independently of the thrust or end strains on the said nut, one of the said frictionally-engaging parts being split longitudinally and the two being of sufficiently different diameters to afford a radial springing action, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD H. ANGLE.

Witnesses:
ANNA HOPKINS,
W. E. BERGE.