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E. H. ANGLE.

TOOTH REGULATOR.

APPLICATION FILED SEPT. 9, 1901.

NO MODEL.

Fig.1.

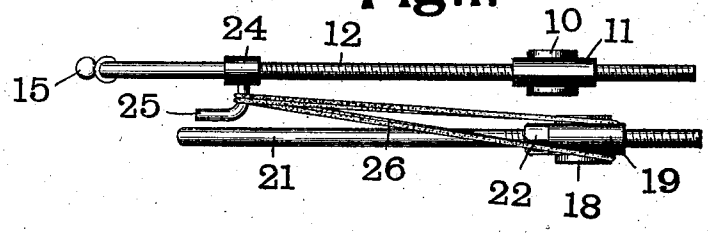
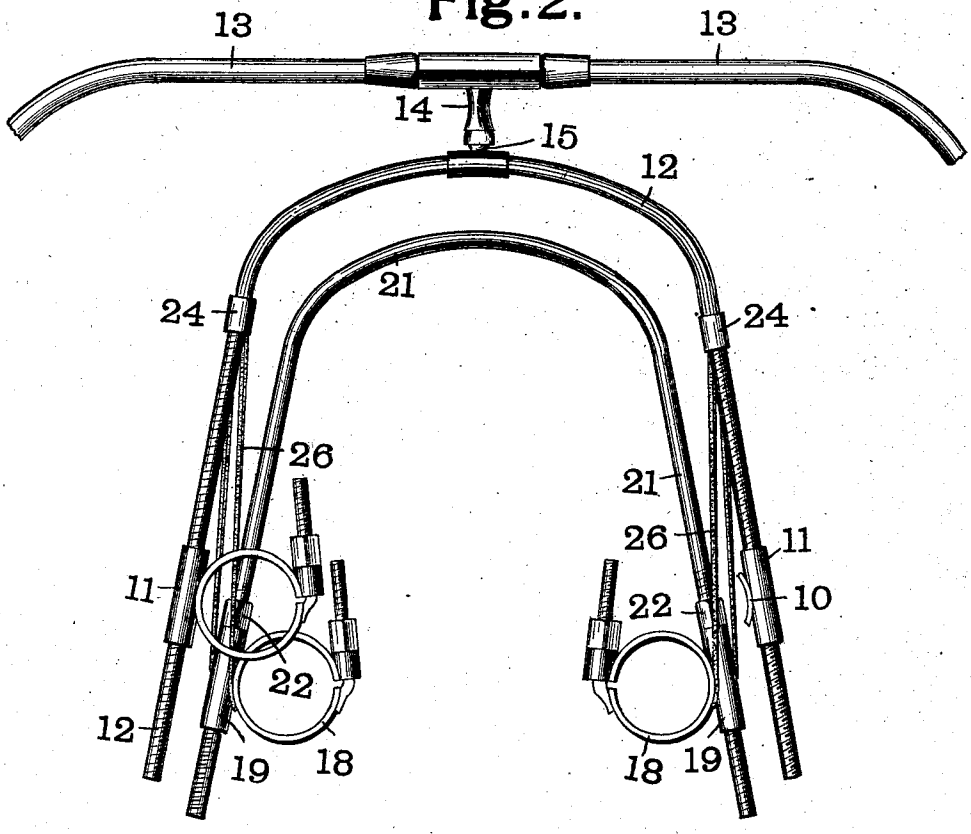


Fig.2.



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UNITED STATES PATENT OFFICE.

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

TOOTH-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 721,655, dated March 3, 1903.

Application filed September 9, 1901. Serial No. 74,763. (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 Improvement in Tooth-Regulators, 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 improvements in those appliances which are used for shortening the dental arch or moving distally-protruding incisors and cuspids, and has for its object to provide a simple, durable, and easily-adjusted means for attaching the retaining-ligatures to the retracting-arch customarily employed with such apparatus. In apparatus of the kind in which the retracting force necessary to press back the teeth is wholly or partly obtained by means of an external retracting-bar attached at its ends by elastic means to a head-gear worn by the patient it is not intended that the head-gear and external bar should be constantly worn; but the same are as a rule laid aside during a greater portion or the whole of the day, and during the time that the teeth are released from the pressure thus exerted upon them they are subjected to a retaining-pressure by means of small rubber ligatures or other elastic means attached at one end to the anchor-teeth and at the other end to the retracting and retaining arch surrounding the teeth to be moved and holding the same in position. This attachment to the surrounding arch has heretofore been accomplished by passing through the rubber loop composing the elastic retaining-ligature a piece of floss-silk or a string of other suitable material and tying the same in advance of a small collar securely fastened upon the arch in the proper position. Such a means is shown and described in my United States Patent No. 415,829, issued to me November 26, 1889. In practice considerable annoyance is experienced by the breaking of this attaching means during the time that the head-gear and its attached bar are laid aside. Such breakage may occur from a variety of reasons. For instance, the floss-silk is frequently bitten through by the patient or slips back over the retaining-collar, and when such breakage or slipping occurs it is unless promptly repaired a serious matter, since the teeth immediately begin to move back into their former positions, thus causing considerable pain to the patient when pressure is again applied, delaying the regulating operation, and giving rise to injurious irritation at the roots of the teeth. I have obviated these and several other serious disadvantages by means of the construction shown and described below.

In the drawings, in which like characters of reference refer to similar parts in the different views, Figure 1 is a side view of a tooth-regulating apparatus embodying my invention; and Fig. 2 is a top view of the apparatus shown in Fig. 1, including also the external retracting-bar mentioned above.

In the figures, 10 represents clamping-bands adapted to be fastened to the anchor-teeth of the upper jaw in the usual manner, one of these bands being shown in Fig. 2, for the sake of clearness, as partly broken away. Soldered to the exterior of the bands 10 are the tubes 11, in which the screw-threaded ends of the arch 12 are adapted to freely reciprocate. This arch 12 surrounds the dental arch in the usual manner. 13 represents the external retracting-bar, the ends of which are broken away, but which is adapted to be fastened at its ends by means of elastic connections to the head-gear customarily worn in such cases, and which forms no part of the present invention. At its middle part this bar 13 carries the socketed projection 14, adapted to engage with the ball 15, carried by the arch 12, to form a ball-and-socket joint, such as described in my patent mentioned above.

18 represents clamping-bands adapted to be fastened to the anchor-teeth of the lower jaw. To these bands are fastened the resistance-tubes 19, through which pass the ends of the expansion-arch 21, which is adapted to surround externally the teeth of the lower jaw. The ends of this expansion-arch 21 are screw-threaded, as shown, and carry upon them in advance of the tubes 19 the nuts 22, which by proper rotation will cause the ex-

pansion-arch to advance, carrying with it those teeth of the lower jaw which have been suitably attached to it.

In practice it is frequently desired that, in addition to retracting the teeth of the upper jaw, the teeth of the lower jaw should be moved forward, thus elongating the lower dental arch. Besides the rotation of the nuts 22 above described the lower dental arch may also be carried forward by the same force which serves to retain in position and partly to retract the teeth of the upper jaw when the exterior means for retracting the same are laid aside. This is done by anchoring the rear end of the retaining elastic ligature to the anchor-teeth of the lower jaw, thus causing the ligature to exert a retaining and retracting force upon the teeth of the upper jaw and a forward pressure upon the teeth of the lower jaw. In the drawings I have shown the following means for accomplishing this form of what is known as "reciprocal anchorage:" 24 represents an internally screw-threaded collar secured to the arch 12 surrounding the teeth of the upper jaw by being screwed up over the screw-threaded end of said arch to the desired position. Projecting downward from this collar 24 is a spur in the form of a forwardly-opening hook 25. The elastic retaining-ligature 26 is first passed over the tube 19, carried by the clamping-band 18, secured to one of the lower anchor-teeth, and is then stretched and passed over the hook 25, thus securely fastening the ligature to the upper arch and exerting upon that arch the desired retracting and retaining force and at the same time exerting a forward force upon the lower arch, such as is desired. It will also be observed that such a form of attachment for the ligature 26 besides being very secure is easily made, and if the band 26 should break for any cause another band may be immediately placed in position by the patient by first being carried over the tube 19 and then stretched over the hook 25 and the retaining force thus restored to the upper arch without delay and without the necessity of any assistance whatever. Such a form of attachment is also inconspicuous and from its downward position is not liable to irritate the mouth of the wearer. This is of particular importance in view of the fact that these parts of the apparatus are intended to be constantly worn by the patient. I have found it to be the better practice to attach the collar 24 and its hook 25 to the arch by the screw-threaded means above described for the reason that the arch having screw-threaded ends or sides has become a standard piece of apparatus for other purposes in this art, and for the further reasons that when so attached the hook is easily adjustable to any desired position on the arch and does not involve in its attachment soldering or other operations difficult to perform without drawing the temper of the arch.

It will be noticed that in Fig. 2 I have shown the upper arch 12 as considerably larger than the lower arch 21. This proportion is of course not true in practice, but has been used here for clearness and simplicity of illustration. In actual practice the arches are more nearly the same in size and are, especially at their bases, more nearly superposed one above the other.

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

1. As an improved article of manufacture, a retaining-arch provided with hook-like projections extending downwardly and in line with the same, to thereby lie alongside the exterior of the teeth and adapted to receive the ends of the elastic ligatures.

2. In a tooth-regulating mechanism, a retracting and retaining arch surrounding the teeth of one of the jaws, a projecting spur upon said arch, and an elastic retracting and retaining means attached at its forward end to said spur and at its rear end to one of the anchor-teeth of the other jaw.

3. In a tooth-regulating mechanism, a retaining-arch having screw-threaded ends, a collar adapted to be screwed upon one of said ends, and a projecting spur held in position upon said arch by said collar for attaching said arch to the anchor-tooth by an elastic retaining means.

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

EDWARD H. ANGLE. [L. S.]

Witnesses:
JAMES H. BRYSON,
JESSIE R. WATKINS.