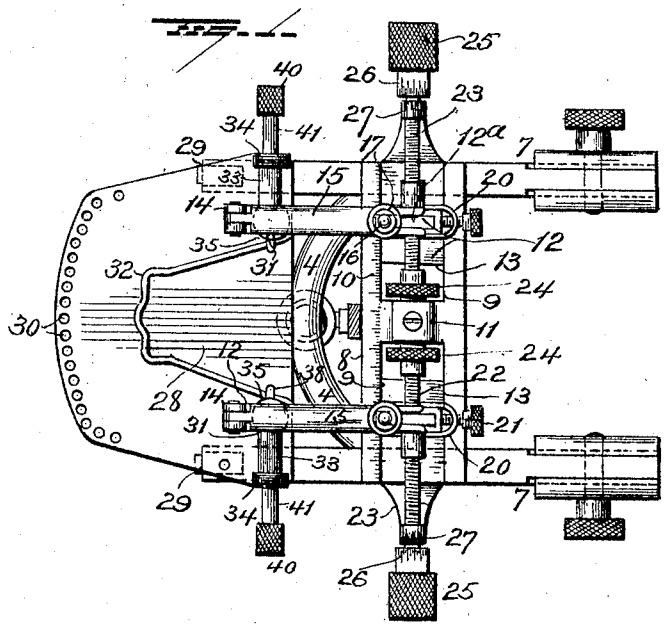
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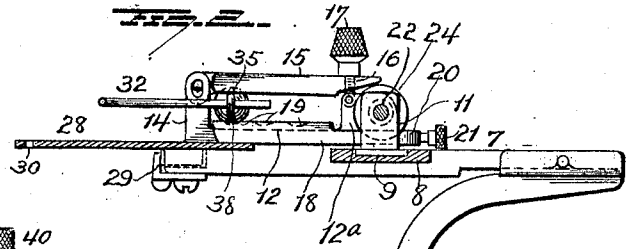
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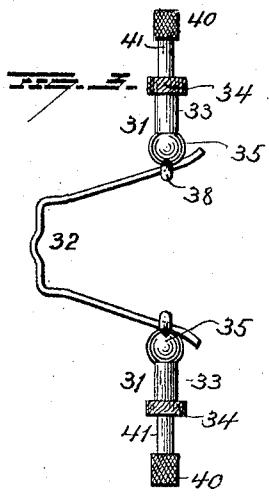
N. C. LEONARD

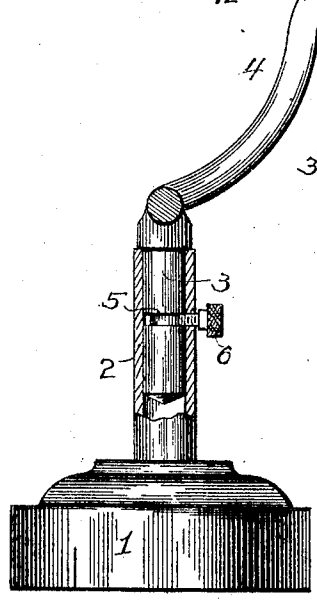
DENTAL APPLIANCE

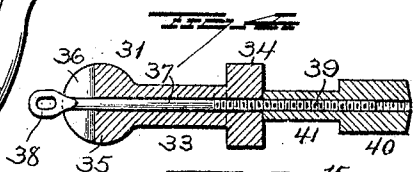
Filed April 11, 1922

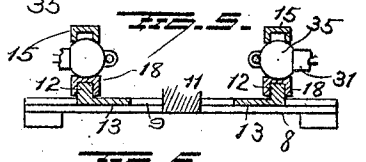


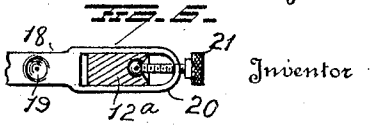












Inventor

N. C. Leonard

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Attorneys

Patented Jan. 20, 1925. 1,523,810

UNITED STATES PATENT OFFICE.

NORRIS C. LEONARD, OF BALTIMORE, MARYLAND.

DENTAL APPLIANCE.

Application filed April 11, 1922. Serial No. 551,580.

To all whom it may concern:

Be it known that I, NORRIS C. LEONARD, a citizen of the United States, and a resident of Baltimore, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Dental Appliances; 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.

This invention relates to improvements in dental appliances and more particularly to an orthodontic instrument for making and measuring changes or adjustments of aligning wires or arch bars used in connection with the movement of irregularly placed or mal-posed teeth, in the treatment for correction of mal-occlusions.

Alignment-wires, or arch-bars, which are worn in the mouth of the patient, attached usually to two, or more, of the teeth, called "anchor teeth", are removed from the mouth from time to time, and changed slightly, so as to give the wires or bars greater tension, or bearing, against the teeth that are being moved. As it is of the greatest importance that the increase, or lessening, of force to be applied after each successive change, or adjustment, of the alignment-wire, should be very slight, and in the direction that will produce the desired movement of the teeth, the changes, or adjustments, to be made each time in the alignment-wire should be very delicate, and in measured amounts, so as to gauge both the tension and limit, and insure the direction of the movement when replaced in the locking devices which secure them to the anchor teeth.

The anchor teeth are usually fitted with metal bands (anchor bands), carrying one member of the locking device for holding the alignment-wire in position in the mouth, these bands being ordinarily cemented to the anchor teeth and remaining fixed to these teeth during the entire time of the corrective treatment.

Alignment-wires, or arch-bars that are in general use by specialists in this field of work are of two kinds: "labial", which are used on the outside of the dental arch, between the lips and teeth; and "lingual bars", or "alignment wires", which are used on the inside of the arch, between the teeth and tongue. It is to the latter form of alignment-wire that my invention applies particularly, though it may be used for the adjustment of either.

The usual method of making the desired changes in the U-shaped alignment-wires, to give the necessary tension for the movement required, is by the use of wire bending pliers, increasing or lessening the arc of the circular section as the stem sections are carried nearer together or wider apart; then compensating bends are made in the stem sections so that the anchor teeth with which these ends engage by means of a non-rotating lock, or latch, will not be given a rotating movement as the distance between them is changed, by the action of the spring tension given the alignment-wire.

The changes made by hand with the wire bending pliers are more or less inaccurate, since it is difficult to measure all the little bends; and the undesired changes of alignment given the locking devices of the alignment-wires may produce an undue and damaging strain on the anchor teeth.

The object of my invention is to provide a simple and efficient implement with the use of which, the difficulties heretofore encountered in adjusting aligning-wires or arch-bars will be overcome and the accurate measuring and making of changes in the aligning-wires or arch-bars, insured.

With this and other objects in view, the invention consists in certain novel features of construction and combinations of parts as hereinafter set forth and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of an instrument embodying my invention. Figure 2 is a central longitudinal vertical section. Figure 3 is a view showing the two clamps and an alignment-wire held between the same. Figure 4 is an enlarged sectional view of one of the clamps, and Figures 5 and 6 are sectional views illustrating details of construction.

A base member is illustrated at 1 and provided with tubular standard 2,—the latter forming a socket for a pivot member 3 at the lower end of a supporting frame comprising curved arms 4—4, and said pivot member 3 may be provided intermediate of its ends with an annular groove 5 to receive the end of a screw 6 passing through the wall of the standard whereby the supporting frame may be turned but prevented from escape from the standard 2.

The free end portions of the arms 4 are

disposed horizontally and support parallel bars 7, which latter may be adjustably secured to said arms. The parallel bars 7 constitute portions of the supporting frame and they are connected by a plate 8 having a longitudinally disposed recess or groove 9, and said plate is provided adjacent to one side of said groove with a scale, as indicated at 10 for a purpose hereinafter explained. The groove 9 may be made in two parts separated by a lug 11 rising from the central portion of said plate. The groove or grooves 9 serve as guideways for slides 12, the base portions 13 of which are movable in said grooves. The slides 12 project forwardly beyond the plate 8 and are disposed parallel with the supporting bars 7. At their forward ends, the slides 12 are provided with posts 14 to which clamping arms 15 are hinged. The free rear ends of these clamping arms are bifurcated to receive bolts 16 hinged to the slides and these bolts are threaded to receive thumb nuts 17 whereby said arms 15 will normally be held in locked position. A seat member 18 is slidingly mounted on each slide 12 so as to underlie the hinged arm 15 and provided in its upper face with recesses 19. The seat member 18 is provided at one end with a loop 20 which embraces the slide 12 and through the free end of said loop an adjusting screw 21 is threaded and this adjusting screw is swiveled in the slide 12. It is apparent that by turning the screw 21 the seat member 18 may be adjusted longitudinally with respect to the slide 12.

The centrally located lug 11 on the plate 8 serves as a mounting for the intermediate portion of a shaft 22, said shaft also having mountings in bearing brackets 23 which project laterally from the respective bars 7 of the frame. The shaft 22 is provided at respective sides of its central portion with right and left handed threads respectively and these threaded portions of said shaft pass through threaded holes in posts 12^a on the slides 12, so that when said shaft is turned, the slides will be caused to move in directions toward or away from each other according to the direction in which the shaft is turned. To prevent the shaft 22 from turning after the slides shall have been adjusted, lock nuts 24 may be provided. The shaft 22 will preferably be made in two independently movable sections and each section is provided at its outer end with a knob 25 for manipulating it, and said knobs are provided with graduated portions indicated at 26 to register with marks 27 on the bearing brackets 23 so that the extent of turning of the shaft sections may be indicated.

A scale plate 28 is removably secured to the bars 7 of the frame, as indicated at 29 and, this scale plate may be approximately semi-circular in shape and provided near its curved edge with perforations 30 whereby suitable auxiliary tools or instruments may be attached to said plate.

The purpose of the slides 12 and hinged arms 15 is to carry and support clamps or holders 31 for an aligning-wire 32, and when the latter is in position, as indicated in Figure 1, it will project over a portion of the scale plate 28. Each clamp or holder 31 comprises a tubular member 33 provided at one end with a knurled head 34 and at its other end with a spherical head 35, the latter having a recess 36. A rod 37 is movable through the tubular member 33 and provided at its free end with a loop or hook 38 to receive an arm of the aligning-wire 32. The rod 37 is provided with a threaded portion 39 to receive a threaded nut 40 and sleeve 41, the latter extending from the nut to the head 34 and spacing these parts from each other. It is apparent that when an arm of the aligning-wire is inserted in the loop or hook 38 and the nut 40 is turned, the rod 37 will be moved longitudinally and the aligning-wire will be clamped in the groove 36 of the spherical head 35. When the aligning-wire shall have been connected with the two clamps or holders 31, as indicated in Figure 3, the spherical heads of said holders will be mounted in recesses 19 of the seat members 18 and the arms 15 will then be brought to the position shown in Figure 2 and locked. Before mounting the clamps or holders and aligning-wire in the slides, the latter will be adjusted by operation of the shaft or shaft sections 22, to such distance apart as to permit the mounting of said clamps or holders without putting tension on the aligning-wire.

When the clamps or holders shall have been securely locked in place, the changes or adjustments of the aligning-wire may be made as follows:

If the anchor teeth are to be carried further apart, and it is desired in other respects they shall retain their relative positions; the slides 12 carrying the clamps or holders for the alignment-wire will be moved in directions away from each other by turning the screw shaft or shaft sections 22. It will be observed that the movements of the slides may be measured in millimeters on the scale 10 and fractional parts of millimeters will be indicated on the scales 26. If one, or both of the anchor teeth are to be rotated, or tipped, a corresponding movement will be given one or both of the clamps or holders 31,—the spherical portions 35 of said clamps or holders representing the corresponding anchor teeth. The torsional tension thus produced in the alignment-wire may then be removed by heating the wire with a small flame and the guage plate or apron 28 may

be removed for more conveniently applying the flame. After this treatment, the wire remains passive in the new position after removing the aligning-wire from the instrument.

The reason for making the seat members 18 adjustable or movable is to provide means for "warping" the alignment-wire so as to produce a forward movement of one anchor tooth and at the same time, a backward movement of the other.

Various changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope and hence I do not restrict myself to the precise details herein set forth.

Having described my invention what I claim as new and desire to secure by Letters-Patent, is:

1. An instrument of the character described comprising a support, alined slides mounted on said support and movable thereon toward and from each other, devices carried by the slides to engage and hold an alinement wire disposed between them for holding a device to be adjusted and means for moving said slides to effect change in form of the alinement wire.

2. An instrument of the character described comprising a support, slides mounted on said support, and movable toward and from each other and holding means for a device to be adjusted, said means being carried by the slides and being independently adjustable laterally relative to the slides and to each other.

3. An instrument of the character described comprising a support, slides mounted thereon and movable relatively to each other, means for moving said slides, clamping arms hinged to said slides, means for locking said clamping arms, and holders for a device to be adjusted removably clamped to said slides by said hinged clamping arms.

4. An instrument of the character described comprising a support, slides mounted on said support and movable relatively to each other, means for adjusting said slides, clamping arms attached to said slides a seat member mounted on each slide so as to be disposed under the clamping arm thereof, means for adjusting said seat members longitudinally, and holders for a device to be adjusted mounted between said seat members and clamping arms.

5. A device of the character described comprising a support, slides mounted thereon and adjustable relatively to each other, means for adjusting said slides, clamps or holders for respective arms or ends of an alignment-wire or arch-bar, each clamp or holder having a spherical head to which the alignment-wire or arch-bar may be clamped, and means for clamping the spherical head of said clamps or holders to the adjustable slides.

6. In an instrument of the character described, the combination with a supporting frame including parallel bars and a grooved plate connecting said bars, of slides projecting forwardly from the plates and having parts movable in the groove of said plate, means for moving said slides relatively to each other, and holders removably connected with the slides for a device to be set.

7. In an instrument of the character described, the combination with a supporting frame, of slides mounted on said frame and movable toward and from each other, a guage plate removably connected with the supporting frame in front of the slides, and holders carried by the front sides of the slides to support an alinement wire to be set over said guage plate.

8. In an instrument of the character described, the combination of holders to engage and support between them an alinement wire to be set, means to adjust said holders toward and from each other, and means for adjusting said holders laterally with respect to each other.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

NORRIS C. LEONARD.

Witnesses:
A. LEE MICHALSON,
DAREL R. SCULLY.