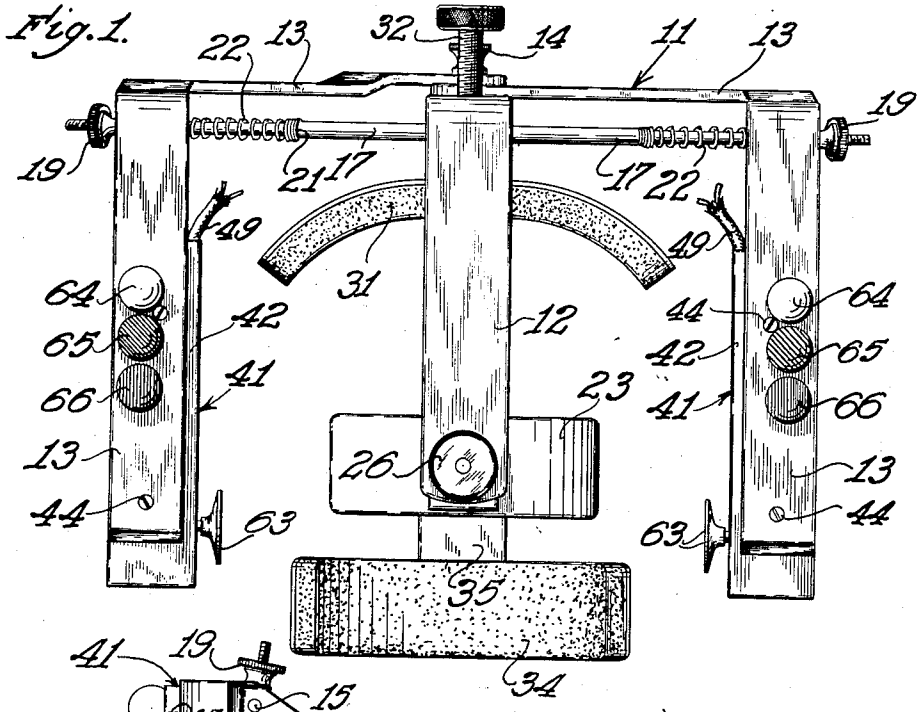
June 25, 1940. J. HENCZ 2,205,775

INDICATING DEVICE

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Fig. 1.



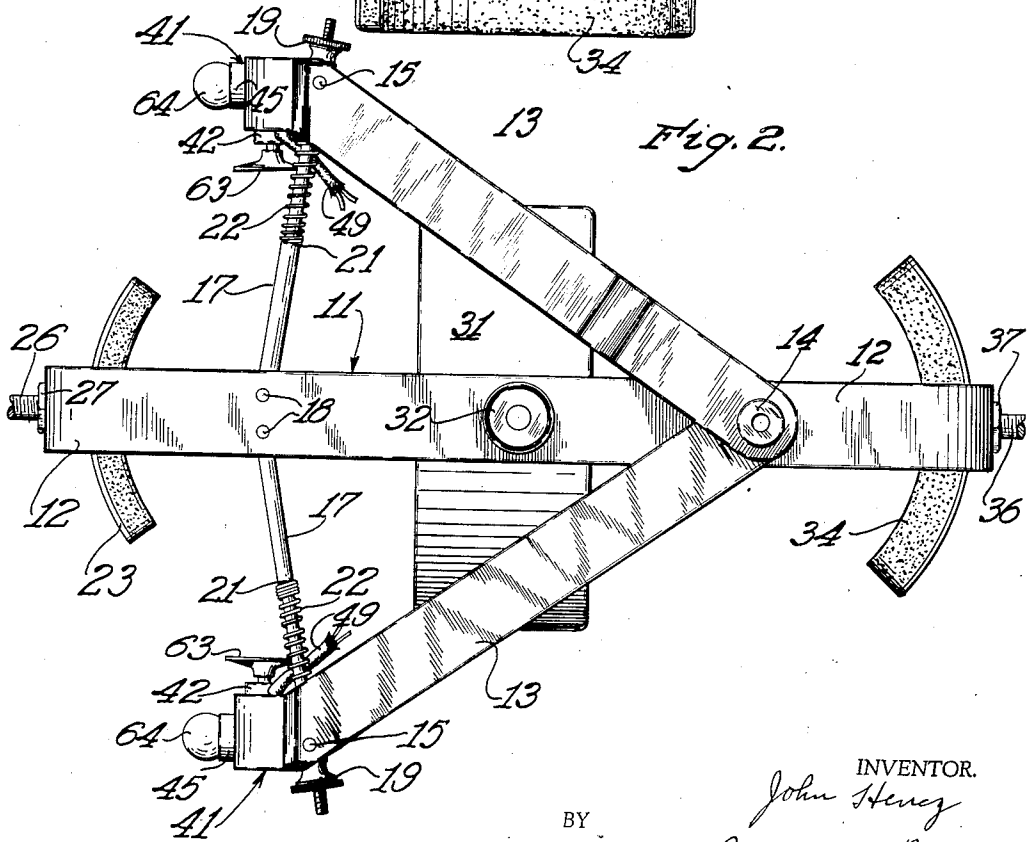


Fig. 2.

INVENTOR.
John Hencz

BY

Rasmussen & Brugman
ATTORNEYS.

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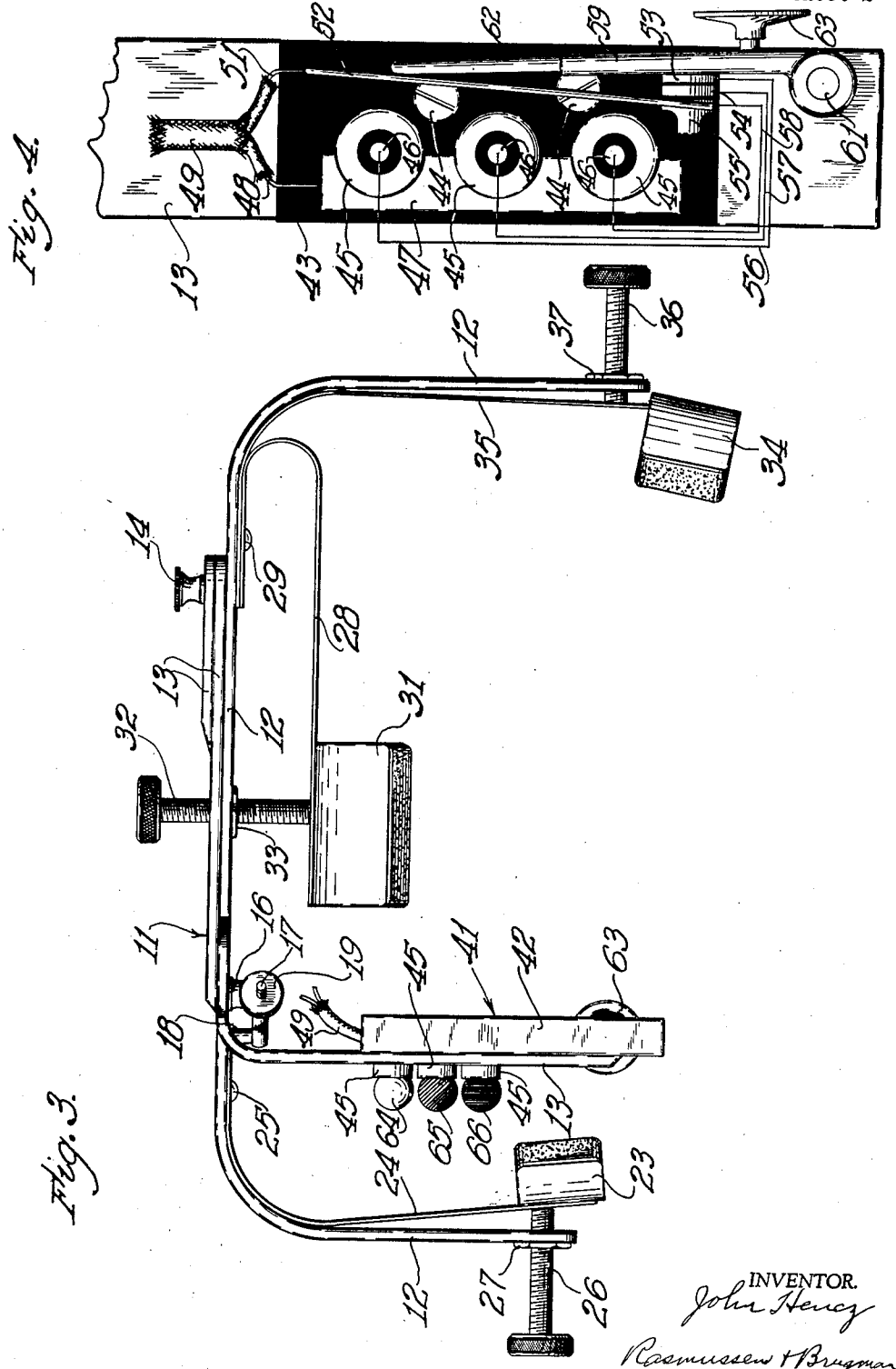


Fig. 3.

Fig. 4.

INVENTOR.
John Hencz
Rasmussen & Brugman
ATTORNEYS.

Patented June 25, 1940 2,205,775

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2,205,775

INDICATING DEVICE

John Hencz, Chicago, Ill.

Application June 21, 1937, Serial No. 149,358

4 Claims. (Cl. 177—311)

This invention relates in general to indicating devices, and more particularly to a device which is adapted to accurately indicate the correct bit of a dental patient.

In dentistry, in order to make a successful denture for a patient, it is absolutely necessary to obtain the correct bite, that is, the correct relation of the upper and lower jaws while the mouth is closed, so that a correct occlusion will be obtained. The muscles of mastication play an important role in this respect, since by their action the mandible or lower jaw is opened and closed and is moved forwardly and backwardly. The most important of these muscles are the temporal, masseter, external and internal pterygoid, and buccinator muscles.

The temporal muscles, which are fan-shaped at their upper ends, are situated at the sides of the head, and each occupies the entire extent of the temporal fossa. The temporal muscle attaches to many bones of the head and face, but the main insertions as pertaining to dentistry, are into the coronoid process of the mandible or lower jaw and the anterior border of the ramus of the mandible, this muscle arising from the temporal fossa.

The masseter muscle is short and thick and consists of two portions, the larger of which arises from the maxilla or upper jaw and is inserted into the lower half of the outer surface of the ramus, while the other or deeper portion arises from the zygomatic arch and is inserted into the coronoid process of the mandible.

The external pterygoid muscle is also short and thick and arises in two heads, the upper head from the greater wing of the shenoid or face bone and the lower head from the external pterygoid plate, both heads being inserted into the condyloid process of the mandible. The internal pterygoid muscle arises from the pterygoid fossa and is inserted into the inner side of the ramus.

The buccinator muscle occupies the interval between the jaws, crossing the temporal and masseter muscles, and its action contracts or sucks in and compresses the cheek. The temporal, masseter and internal pterygoid muscles raise the mandible or lower jaw with great force. The external pterygoid muscle assists in opening the mouth, and its main action is to protrude the lower jaw. The lower jaw is retracted by portions of the temporal muscle.

When the patient bites correctly, the resulting contraction of the muscles of mastication in producing this action can be readily felt at the sides of the face and head. It is this contraction of these muscles which the instant invention contemplates using to actuate an indicating device to give an indication of whether or not a correct bit has been obtained. Such an actuation may be obtained at any of several points, such as adjacent the tempro-mandibular joint, but there is no assurance at most such points that a true indication will result, because of the above-described interrelation of the several muscles of mastication. In other words, if such indications of a correct bite were attempted to be obtained at certain of such points, movements of the lower jaw forwardly or backwardly while the mouth was open would result in actuation of the indicating device to give a false indication.

The upper, fan-shaped end portion of the temporal muscle is only contracted, however, when a correct bite at that side of the jaws is obtained. This point of attachment or origin of the temporal muscle where it arises from the temporal fossa is consequently the best point at which to obtain an actuation of an indicating device to give a true indication of a correct bite.

A principal object of the invention, therefore, is the provision of an indicating device which is adapted to be actuated by the contraction of the upper, fan-shaped portion of the temporal muscle to give an accurate indication of the correct bite of a dental patient.

Another important object of the invention is the provision of such a device for indicating the correct bite of a patient which is adapted to be adjustably mounted upon the patient's head so as to correctly position the indicator actuating means employed therein at the desired points, and so as to facilitate its use upon any individual.

A further important object of the invention is the provision in such a device of separate indicating means which are adapted to be adjustably positioned adjacent the upper ends of the temporal muscles to give different indications so as to dictate the corrections to be made to obtain a perfect occlusion.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, when taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

In the drawings,

Figure 1 is a front elevational view of an indicating device embodying the features of the instant invention;

Fig. 2 is a top plan view of the device of Fig. 1;

Fig. 3 is a side elevational view; and

Fig. 4 is a detail rear elevational view of one of the indicators with the outer casing removed.

Referring more particularly to the drawings, the instant mechanism comprises a frame or supporting member, indicated generally by reference numeral 11, which is made up of a substantially U-shaped member 12 and a pair of right-angled members 13 which are pivotally connected at their upper, rear ends to the top portion of the member 12 by a thumb screw, or the like, 14. Pivotally connected by means of a pin 15, or the like, to the under surface of each of the members 13 adjacent the forward bent portion thereof is a supporting bracket 16 which depends downwardly therefrom. A transverse, substantially horizontally disposed rod 17 is pivotally connected at its inner end by a pin 18 to the upper portion of the frame member 12, and is provided with a reduced outer end portion which is slidably mounted in one of the brackets 16. There are two of these rods 17 provided, one associated with each of the pivotally mounted frame members 13.

The outer end of each of the rods 17 is externally threaded to receive an adjusting nut 19 which is adapted to engage against the outer surface of the associated bracket member 16. The inner end of the reduced portion of each of the rods 17 constitutes a shoulder 21 against which the inner end of a coil spring 22 engages, the coil spring surrounding the reduced portion of the rod 17 and engaging at its outer end against the inner surface of the associated bracket member 16. With this arrangement, the outer or forward ends of the pivotally mounted frame members 13 may be accurately adjusted inwardly or outwardly relative to the central frame member 12.

At its forward end (to the left in Figs. 2 and 3) the central frame member 12 is provided with an adjustable head engaging pad 23. The pad 23 is secured to the lower, free end of a substantially right-angled spring member 24 which is riveted at its upper end at 25 to the lower surface of the upper portion of the frame member 12. An adjusting screw 26 is mounted in a suitable tapped aperture adjacent the lower forward end of the frame member 12, so as to engage the forward surface of the spring member 24 adjacent the pad 23 to move the latter inwardly relative to the frame 12. A lock nut 27 may be mounted upon the adjusting screw 25 to lock the latter in any desired position.

Referring more particularly to Fig. 3, a substantially U-shaped spring member 28 is secured at its upper, shorter end by a rivet, or the like, 29 to the under surface of the central frame member 12 adjacent the rear portion thereof. A head engaging pad 31 is rigidly secured in any suitable manner to the forward, free end of the spring member 28. An adjusting screw 32 is threaded through a suitable tapped aperture in the upper portion of the frame member 12 for engagement at its lower end with the spring member 28 directly above the head engaging pad 31. A suitable nut 33 may be mounted upon the screw 32 for engagement with the frame member 12 to lock the screw in any desired adjusted position.

At its rear end, the central frame member 12 is provided with a third head engaging pad 34 which is secured to the lower, free end of a spring member 35. The spring member 35 is similar to the member 24, and is secured at its upper end to the frame member 12 by the rivet, or the like, 29 which also secures the spring member 23 thereto. An adjusting screw 36 is threaded through a suitable tapped aperture adjacent the lower end of the rear depending portion of the frame member 12 for co-operating with the spring member 35 to adjustably position the pad 34 relative to the frame member. A suitable nut 37 may be mounted upon the screw 36 for engagement with the frame member 12 to lock the screw in any desired adjusted position.

A device, indicated generally by reference numeral 41, is mounted upon the forward depending portion of each of the pivotally mounted frame members 13 for giving the desired indications in a manner to be later described. Each of these indicating devices 41 includes an outer casing 42 which is mounted upon the rear surface of the forward depending portion of its associated movable frame member 13. In Fig. 4, a rear view of one of the indicating devices 41 is shown with this outer casing 42 removed. A plate 43 of any suitable insulating material is mounted upon the rear surface of the vertically disposed forward portion of each of the movable frame members 13 by suitable screws 44, or the like. Mounted in this insulating plate 43 and extending forwardly through the frame member 13 are a plurality of light bulb sockets 45, shown herein as three in number. Each of these sockets 45 comprises a central contact point 46 (Fig. 4) which is suitably insulated from the outer tapped portion of the socket. A metal plate 47 of suitable conducting material is mounted upon the rear surface of the insulating plate 43, and is electrically connected in any suitable manner, as by soldering, to the outer tapped portion of each of the sockets 45.

The plate 47 is electrically connected to a conductor 48, comprising one of the leads of a cord 49 which is adapted to be connected to a suitable source of electrical energy. The associated lead 51 of the cord 49 is connected in any suitable manner to the upper stationary end of a spring rod 52 which is mounted at this end in the insulating plate 43. The lower, free end of the spring rod 52 is adapted to wipe across three alined segments 53, 54 and 55 which are formed of any suitable conducting material and are insulated from each other in any desired manner. The segments 53, 54 and 55 and their separating disks of insulating material are mounted in any suitable manner upon the lower end of the insulating plate 43. The segment 53 is connected by a suitable lead or conductor 56 to the central contact point 46 of the upper light bulb socket 45. The segments 54 and 55 are similarly connected by means of suitable conductors 57 and 58, respectively, to the central contact points 46 of the middle and lower light bulb sockets 45, respectively. In this manner, it will be seen that when the lower end of the spring member 52 engages any one of the segments 53, 54 or 55, an electric circuit will be completed to the associated light bulb socket 45.

A rod 59 is provided with an upper, forwardly extending end portion for engagement with the spring rod 52 intermediate its ends and an eyelet portion at its lower end which rotatably engages a pivot pin 61 mounted upon the lower end of the frame member 13. The rods 52 and 59 are insulated from each other in any suitable manner so that any current in the spring rod 52 will not be transmitted by the rod 59 to the frame member 13. Since the spring rod 52 is rigidly secured to

the insulating plate 43 at its upper end, it tends to swing the rod 59 outwardly relative to the frame member 13 in a clockwise direction viewing Fig. 4. Such movement of the rods is limited by a suitable stop pin 62 mounted in and upstanding from the insulating plate 43 adjacent the inner edge thereof. Intermediate its ends and adjacent the pivot pin 61, the actuating rod 59 is provided with a suitable button 63 which is adapted to contact the side of the head or face of the patient in a manner to be later described. A plurality of light bulbs 64, 65 and 66 are mounted in the upper, middle and lower sockets 45, respectively.

Referring to Fig. 4, when the several parts are in normal position, that is when no pressure is exerted upon the button 63, the stop member 62 will limit the outward movement of the rod 59 by the spring rod 52 so as to permit the rod 52 to assume an outer position in which its lower end is disposed substantially below the rod 59 out of contact with any of the segments 53, 54 or 55. Inward pressure upon the button 63 (which is pressure outwardly thereon when viewing Figs. 1 or 2) will move the lower end of the spring rod 52 into contact with the outer segment 53. This will complete a circuit through the upper socket 45 to light the top bulb 64. Further inward movement of the spring rod 52 will cause its lower end to contact the central segment 54 to complete a circuit to the intermediate socket 45 and light bulb 65. At the same time, the circuit to the light bulb 64 will be broken. Similarly, further inward movement of the lower end of the spring rod 52 will complete a circuit to the lower socket 45 and light bulb 66 to energize the latter and break the circuit to the intermediate bulb 65. It will be noted that the inner segment 55 is of a greater width than the segments 53 and 54, so that continued inward movement of the lower end of the spring rod 52 will result in the lower bulb 66 remaining lighted. The upper bulb 64 is colored white, the intermediate bulb 65 is colored green and the lower bulb 66 is colored red, so that the differential positions of the button 63 will be accurately indicated.

In the use of the above described device, the frame 11 is mounted upon the upper portion of the patient's head, the adjusting screws 26, 32 and 36 being actuated to properly position the pads 23, 31 and 34 to rigidly secure the frame 11 to the patient's head. By adjusting the screws 19, the indicating devices 41 may be brought into proper relationship with the patient's head and face so that the buttons 63 firmly but gently contact the sides of the patient's head or face. This contact of the button 63 is initially adjusted by means of the screws 19 so that the rods 59 and 52 are moved to position the lower end of the latter in contact with the segment 53 to light the upper light bulb 64. The lighting of the bulb 64 will thus give an indication of the correct positioning of the indicating device upon the patient's head.

The contact buttons 63 are preferably so positioned with relation to the frame of the indicating device that they will contact the patient's head at a point opposite the temporal fossae. Consequently, contraction of the upper, fan-shaped end portion of either of the temporal muscles which will result, as previously described, when a true bite is obtained on that side of the jaws, will move the associated contact button 63 outwardly relative to the head (inwardly viewing Fig. 4) to successively light the bulbs 65 and 66. A partial or incomplete bite will thus be indicated by the intermediate or green light bulb 65, and a true or correct bite will be indicated by the lighting of the lower or red bulb 66. The additional width of the contact segment 65 will compensate for different degrees or extent of contraction of the temporal muscle of different individuals.

A perfect occlusion will be accurately indicated by a lighting of both of the lower red bulbs 66, as will be readily understood from the above description. When both of the lower red bulbs 66 are not lighted after a patient has been told to bite, the condition of the bulbs will accurately indicate to the dentist what corrections must be made to obtain a perfect occlusion. It is to be understood that other points of contact for the buttons 63 may be employed, but it is preferred to position these buttons opposite the temporal fossae.

It is also apparent that any other suitable type of indicating devices may be employed, if desired, in lieu of the light bulbs 64, 65 and 66.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A device for indicating the correct bite of a patient, comprising an adjustable frame member adapted to be rigidly positioned upon the patient's head, head engaging pad means adjustably mounted upon said frame member, a second and third frame member mounted upon said first frame member for pivotal movement relative thereto, means for adjusting said second and third frame members relative to said first frame member, a pair of indicating devices mounted upon and depending from each of said second and third frame members respectively, adjacent the forward part thereof, and means associated with each of said indicating devices for operating the same, said means being so positioned as to be actuated by the upper, fan-shaped portion of a temporal muscle as it contracts when the patient bites.

2. A device for indicating the correct bite of a patient, comprising a supporting member adapted to be adjustably mounted upon the upper portion of the patient's head, a pair of indicating devices adjustably mounted upon and depending from said supporting member adjacent the forward portion thereof, and means for operating each of said indicating devices separately, comprising a member adapted to engage the patient's head adjacent the upper end of a temporal muscle by the adjustment of its associated indicating device to operate the latter to give one indication and adapted to be actuated by said temporal muscle to operate said indicating device to give a different indication.

3. A device for indicating the correct bite of a patient, comprising a supporting member adapted to be adjustably mounted upon the upper portion of the patient's head, second and third supporting members mounted upon said first supporting member for pivotal movement relative thereto, a pair of electrical indicating devices adjustably mounted upon and depending from said supporting member adjacent the forward portion thereof, and means for controlling each of said indicating devices separately, comprising a member adapted to engage the patient's head ad-

jacent the upper end of a temporal muscle by the adjustment of its associated indicating device relative to said first supporting member to cause the latter device to give one indication and adapted to be actuated by said temporal muscle to cause said indicating device to give a different indication.

4. A device for indicating the correct bite of a patient, comprising an adjustable supporting member adapted to be rigidly mounted upon the upper portion of the patient's head, head engaging pad means adjustably mounted upon said supporting member, second and third supporting members mounted upon said first supporting member for pivotal movement relative thereto, means for individually adjusting said second and third supporting members relative to said first supporting member, a pair of electrical indicating devices mounted upon and depending from said second and third supporting members, respectively, adjacent the forward part thereof, and means associated with each of said indicating devices for controlling the same separately, comprising a button adapted to engage the patient's head adjacent the upper end of a temporal muscle and to be actuated thereby as said temporal muscle contracts to cause the associated indicating device to give a true indication of the patient's bite.

JOHN HENCZ.