Dec. 31, 1935. C. P. ROHR 2,026,065

DENTAL APPARATUS

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Fig. 2.

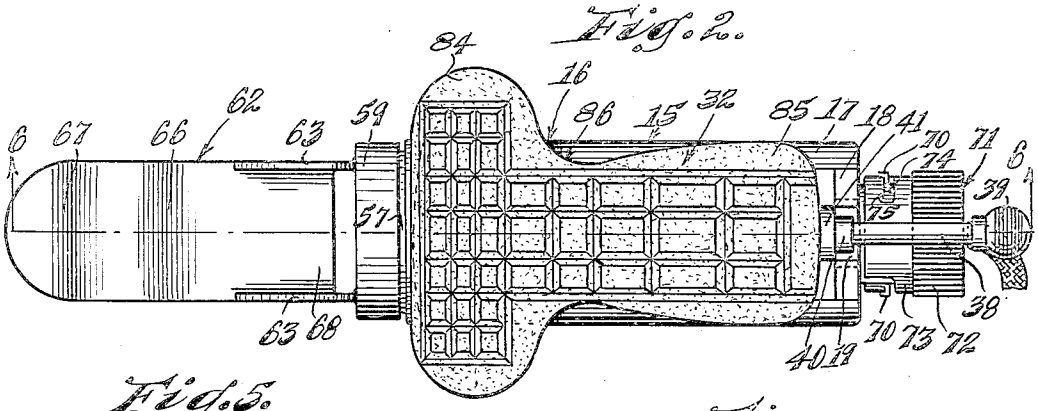


Fig. 5.

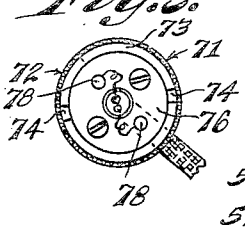


Fig. 1.

Fig. 3.

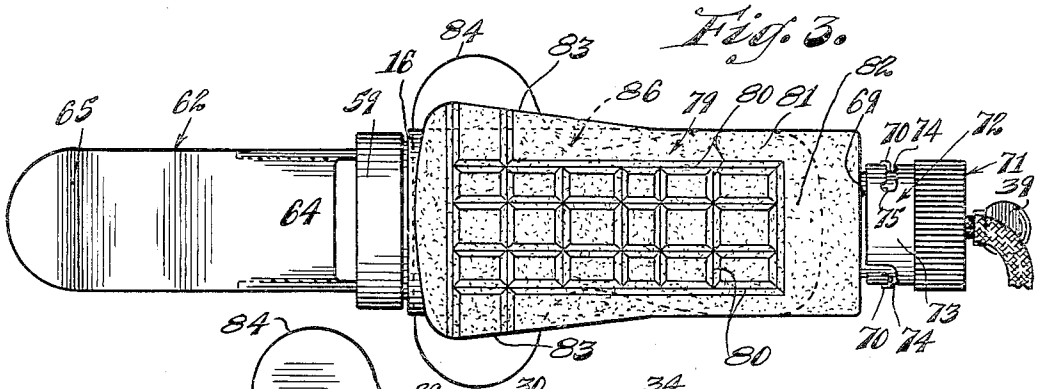
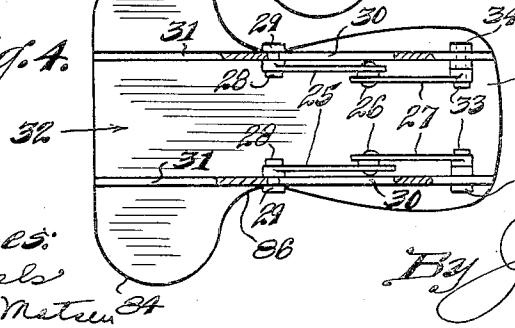


Fig. 4.



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DENTAL APPARATUS

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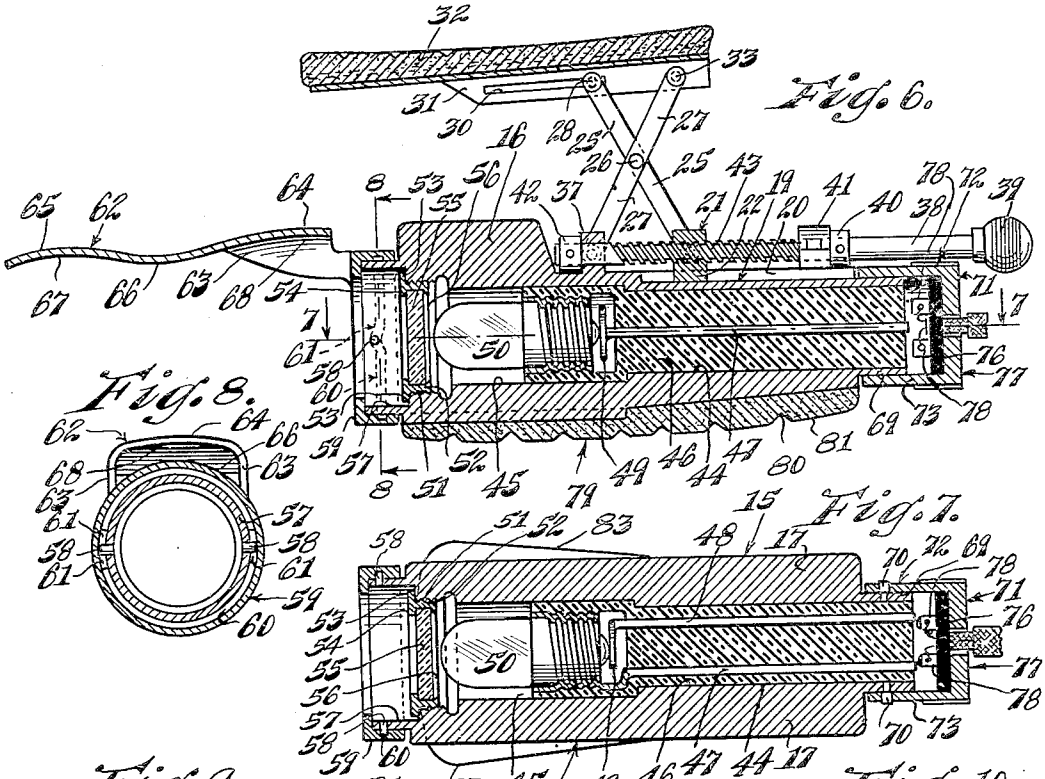


Fig. 6.

Fig. 8.

Fig. 7.

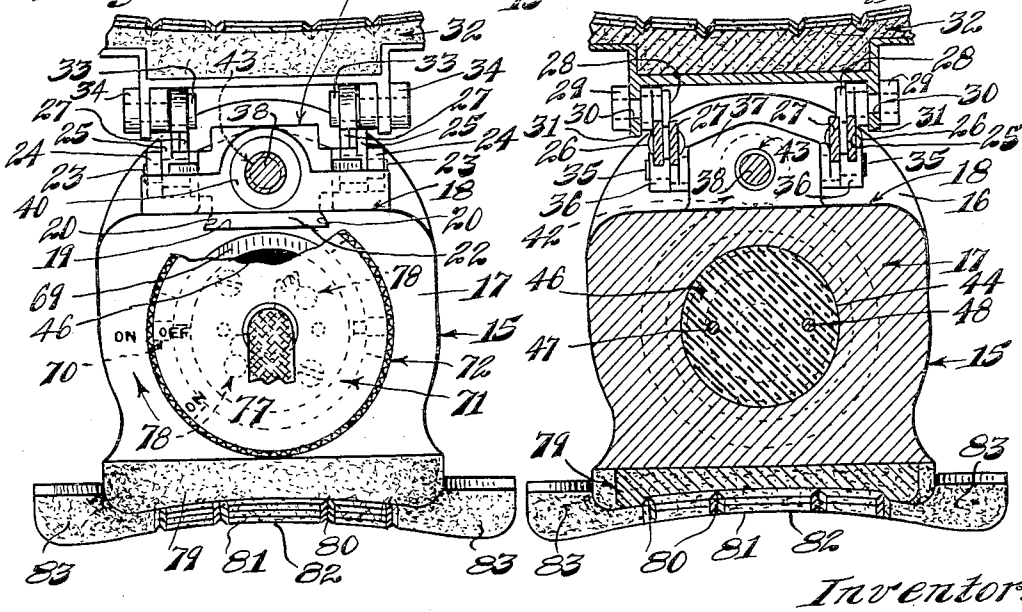


Fig. 9.

Fig. 10.

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UNITED STATES PATENT OFFICE

2,026,065

DENTAL APPARATUS

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Application February 8, 1933, Serial No. 655,708

4 Claims. (Cl. 128—13)

This invention relates to dental apparatus, and an object of the invention is the provision of apparatus for fixing a field of operation in which an operation may be performed by a dentist or a doctor on the mouth of a patient, for example.

Another object is the provision of apparatus for illuminating the field of such operation.

Another object is the provision of apparatus which will afford a maximum field of operation.

Another object is the provision of such apparatus which is adaptable to peculiarities of mouths and teeth in respect to size and form, for example.

Another object is the provision of novel cooperating means for positioning the tongue out of the field of operation, either up or down, and for accomplishing other objects hereinafter set forth with a maximum of certainty and convenience.

The invention involves not only the provision of novel means for accomplishing the aforesaid and other objects, but also contemplates means for accomplishing those objects which are simple and durable in construction and operation, economical to manufacture, and capable of being easily and thoroughly sterilized.

The apparatus of my invention not only provides means for accomplishing the aforesaid objects and results, but eliminates changes in the position of the jaws of a patient, with consequent interference with the operation and the frequent consequence of injury to patient or dentist, or doctor, or both.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings, forming a part of this specification, and in which:

Fig. 1 is an elevational view of a preferred form of my invention;

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

Fig. 3 is a bottom plan view of the same;

Fig. 4 is a bottom plan view of the upper resilient rest member shown at the top of Fig. 1;

Fig. 5 is an internal end view of the switch cap member;

Fig. 6 is a longitudinal sectional view, taken on the line 6—6 of Fig. 2, showing the upper rest member in elevated condition;

Fig. 7 is a sectional view, taken on the line 7—7 of Fig. 6;

Fig. 8 is a sectional view, taken on the line 8—8 of Fig. 6;

Fig. 9 is an elevational view, partly in section, taken on the line 9—9 of Fig. 1; and

Fig. 10 is a cross-section, taken on the line 10—10 of Fig. 1.

In its preferred form the device of my invention comprises a body element 15 having an enlarged portion 16 and a reduced portion 17. This body element may be composed of bakelite or stainless steel, properly insulated, vulcanized rubber, or any one of a number of elements particularly adapted to fit in with the sanitary purposes of the device. The reduced portion 17 has a flat upper surface 18, and formed in the upper surface 18 and within the body 17 is a groove 19 having sides 20 inclined upwardly toward each other, as appears particularly from Figs. 6 and 9. This groove and its side constitute a guiding trackway for a movable block 21 The block is provided with a base shoe portion 22 which is conformed to the groove 19 so as to fit therein and be guided thereby and retained therein. The block is provided with a pair of studs 23. Mounted on the outer end of each stud is a collar 24 which retains on each stud a link 25. This link is pivoted at 26 to another link 27. It should be understood that there are two of these links 25 and two of the links 27, and that there is therefore another pair of links 25 and 27 which are similarly pivoted at the central portions thereof. At its other extremity the link 25 is mounted upon a stud 28 and retained thereon by means of a collar 29. The stud 28 extends through a slot 30 provided in each of a pair of vertical walls or flanges 31 which support a member 32 which may be designated a resilient upper jaw rest member for the teeth of the upper jaw. Affixed to each of the flanges 31 is a stud 33 having a collar 34 adapted to retain on the stud one extremity of a link 27. The other extremity of the link 27 is mounted upon a stud 35 and retained thereon by a collar 36. These latter studs, of which there are two, for the pair of links 27, are formed integrally in the preferred form with a bearing block 37 which is mounted upon the upper surface of the reduced portion of the body element 17, as particularly shown in Figs. 6 and 10.

As has been stated, and as is apparent from the drawings, the block 21 is threaded. Adapted to extend through the block 21 and the block 37 is a shaft 38 which has a knurled knob 39 at one end and which is provided with a collar 40. Shaft 38 extends through a bearing 41

and the collar 40 is positioned adjacent said bearing to function to prevent movement of the shaft through the bearing in one direction. The operating shaft extends through a second bearing 37, and on the other side of said bearing the shaft is provided with a collar 42 which functions to prevent longitudinal movement of the member 38 in a direction opposite to the direction controlled by collar 40. The member 38 is provided with a worm 43 which threads into the threaded portion of the movable block 21.

The parts just described function as follows: By manipulating the member 38 the worm thereon causes the movable block 21 to move longitudinally in one direction or the other upon said member 38, and the consequence of this is that the rest member 32 is raised or lowered, according to the direction in which the knurled knob 39 is turned. At the same time the rest member itself is moved longitudinally in a direction away from the knurled knob 39. As will be obvious, the operating member 38 does not change its position relative to the main body element.

The two extreme positions of the mechanism just described are illustrated in Figs. 1 and 6. In Fig. 1 the rest member 32 is shown in its lowermost position with one end of the rest member prone upon the forward enlarged portion 16 of the main body element, while the rear portion is superimposed over the mechanism for operating the rest member, which mechanism itself is retained in the space above the upper surface of the reduced portion 17, in such a manner that the rest member 32 in its lowermost state lies in a relatively horizontal position excepting for the curvature of its upper surface.

The main body element 15 is provided with a bore 44, and also with a bore 45 which is of a larger diameter. Fitted within the bore is a socket 46 adapted to accommodate the ordinary electric light bulb. The socket 46 contains a pair of wires 47 and 48 the latter of which terminates in a contact plate 49. The arrangement includes the usual threads for the reception of the threaded portion of an ordinary electric light bulb 50. The bulb 50 is inserted in the bore 45 and threaded into the socket. The bore 45 is enlarged and threaded, as at 51, for the reception of a threaded glass supporting member 52 which is flanged at 53 and 54, as is clear from Fig. 6. The container 52 is adapted to receive therein a glass 55 and retain the same therein by means of a flange 56. By virtue of this arrangement of the glass supporting member 52 and the glass supported therein, the chamber in which is located the electric light bulb is sealed off.

The body element 15 is provided with a neck portion 57 and a pair of pins 58 which project outwardly from the circumference of the neck portion. Adapted to fit over this neck portion is a circular ringed member 59 provided with a groove 60, and the groove 60 is in turn provided with offset portions 61. Attached to the circular ringed portion 59 is a tongue positioning member 62, the attachment in the preferred form shown being by means of two braces 63, as particularly appears from Figs. 1, 2, 6, and 8. Also in the preferred form shown the tongue positioning member 62 is concaved at its outer ends, as at 64 and 65, and convexed in the middle portion, as at 66, as the tongue positioning member is viewed from below in the position shown in Fig. 6.

By virtue of this arrangement the tongue positioning member 62 may be moved from the position shown in Fig. 1 to the position shown in Fig. 6, where the tongue positioning member is in its uppermost position instead of in its lowermost position. To change the position of the tongue positioning member 62, the circular ringed member may be manipulated by the finger so that the grooved portion thereof may be caused to ride about the pins 58 of the neck portion of the main body element 15. By means of the offset portions 61 of the groove, when those portions are rotated to contact the pins the circular ringed member 59 will slip closer to the body element and will be locked more securely in position, and also the operator will know that the tongue positioning member 62 is in proper position itself. The tongue positioning member functions to reflect the light from the electric light bulb, and to that end is constructed of a suitable reflecting material, which in my preferred form is chromium plated. When the light rays are projected from the lamp in the chamber through the opening in the circular ringed member 59 a certain number of the rays will strike the under surface 67 of the tongue positioning member, and, for example as shown in Fig. 6, the rays will be directed downwardly into the lower portion of the mouth. It will of course be understood that in the position shown in Fig. 6 the tongue positioning member 62 will position the tongue on top of the same, the tongue resting thereon. In my preferred form I have shown the tongue positioning member 62 in a definite form. This may be changed, as for example, the tongue positioning member 62 might be more or less concaved, looking upward at the member as shown in Fig. 6. In the preferred form shown, as appears from Fig. 8, the tongue positioning member 62 is concaved transversely, as at 68, looking upward.

The reduced portion 17 of the main body element 15 has another neck portion 69 at its other end, and integral therewith are a pair of outwardly projecting pins 70. Adapted to fit upon the neck portion is a switch cap member 71 which comprises a cap 72 having a circular wall 73 provided with a pair of bayonet slots 74. The cap member is illustrated particularly in Figs. 1, 6, and 9. The bayonet slots 74, which are adapted for cooperation with the pins 70, are provided with notched portions 75. The cap member 72 has a disc 76 located therein flush with the end wall 77. The disc carries supports, the usual terminals, and wire connections from a source of supply, including two contact members 78.

By virtue of this arrangement the switch cap member, which may be knurled, may be manipulated by the fingers to bring the notched portions of the bayonet slots in contact with the pins, in which case the structure is so arranged that the contact points 78 will be in contact with the wires 47 and 48. Any further manipulation will move the notched portion from the pins, and contact will be broken. For example, as is apparent from Figs. 1 and 9, where the slot is shown in dotted lines, the word "On" indicates the point where the notch is located in the bayonet slot. In the position shown, the current is

off, but if the knurled switch cap member 71 is manipulated in a clockwise direction, as shown in Fig. 9, the notch portion 75 will be moved into engagement with the pin and the circuit will be closed. By means of the arrangement of the bayonet slots the switch cap member may be obviously disconnected from the main body element 15.

The main body element 15 has secured to it a lower jaw member 79 which, in the preferred form shown, is notched as at 80 in checker fashion, as is clearly apparent from Fig. 3. The surface 81 thereof is curved in a manner corresponding to the ordinary line of curvature of the teeth from the back to the front of the mouth so that the surface 81 will conform to the lower teeth when inserted in the mouth. The notches also function to give the teeth a firm hold in the body member and insure against slipping. In the form shown the element 79 which contacts the lower teeth has been indicated to be a separate part from the main body element, but it is obvious that this may be made integral therewith.

As will be manifest from Figs. 9 and 10, the surface 81 of the member 79 is concaved, as at 82, transversely to the longitudinal concavity, hereinbefore described. By this means the teeth engage the member 79 at the center of the concaved portion, and the device is further secured against accidental change of position. It will also be apparent from Fig. 3 that the member 79 is flared outwardly toward one end, as at 83. By this arrangement the member 79 is narrowest where it is most likely to contact the mouth so as to permit as little interference from the mouth and to give a wider latitude of positioning, besides adding to the convenience of the patient in that little or no pressure is exerted on the edges of the mouth.

From an examination of Figs. 2 and 4 the contour of the upper rest member 32 is clear. The member 32 has an enlarged portion 84 and a reduced portion 85, with the two together making up the form of a T. Between the portions 84 and 85 the member 32 is narrowmost, as at 86. The result of this arrangement is that not only the proper distention, but the greatest clearance will be given where the same is most needed, and the narrow portion 86 permits the entire device to be advanced well into the side of the mouth without exerting undue pressure upon the tissue of the mouth. The narrow portion also functions to secure the entire device more firmly in a fixed position because of the manner in which the adjacent mouth portion fits into the groove and about the device.

The upper resilient rest member 32 is curved longitudinally and transversely on its upper surface, as shown in Figs. 1, 6, 9, and 10; is notched in a manner similar to the member 79, and it is grooved longitudinally and transversely in a similar manner also.

The method of operation will be manifest from the description. The tongue positioning member will be adjusted in accordance with the location of the field of operation desired, this being accomplished by manipulating the circular ringed member 59. The device will then be inserted into the mouth of the patient and placed in an appropriate position on the teeth, and the operating member 38 is then manipulated by means of the knob 38 to gently raise the upper rest member 32 to the proper elevation. The upper rest member 32 is not only elevated, but is moved forwardly into the mouth, which serves to increase both the field of operation and the convenience of the patient. When this has been done the jaws will have been separated to a sufficient degree and will be held firmly separated in a definite manner as long as desired, and the tongue also will be effectively and comfortably positioned out of the field of operation. The switch cap member may be manipulated by means of the fingers on the knurled portion thereof, and the light turned on. The rays from the light will effectively illuminate the field of operation, and the effectiveness will be enhanced by the co-operation of the reflection and concentration of the rays by the tongue positioning member 62.

The wires 47 and 48 do not require as much space as the socket and light bulb, and it will be understood that this space may be reduced to a minimum and advantage taken of this fact to reduce the main body portion at 17 as much as possible to locate the mechanism for operating the upper rest member in the space above the reduced portion containing the wires. It will be desirable to use the smallest light bulb practicable and to make the casing and its enlarged portion in which the light bulb is located as small and thin as practicable to secure the maximum in compactness, to the end that the maximum field of operation and general utility may be attained.

While I have shown a worm arrangement for elevating the upper rest member to the desired degree, it is plain that other mechanical means may be employed to perform this function. The same is true of the other parts and functions and features of my invention. Thus, while I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. In a device of the character described, an upper jaw member and a lower jaw member adapted to hold the teeth of the upper and lower jaws in separated condition so as to provide a field of operation, means for adjusting the relation of the two jaw members, said means including a worm shaft mounted on the lower jaw member, a threaded block adapted to be operable by said shaft, a link connection between the block and the upper jaw member, and another link connection between said upper jaw member and the lower jaw member whereby said shaft is operable to cause the upper jaw member to move longitudinally and vertically relative to the lower jaw member.

2. In a device of the class described, a body portion having a longitudinal bore, a lower jaw engaging member on the bottom of said body portion, an upper jaw engaging member mounted above said body portion, means for raising and lowering said upper jaw engaging member, illuminating means within said bore, a transparent closure sealing the end of said bore and permitting a beam of light to be projected therethrough, an annular member rotatably mounted on the end of said body, and a tongue depressing

member projecting from one side of said annular member and in substantial alignment with the body, substantially as described.

3. In a device of the class described a body portion having a longitudinal bore, a lower jaw engaging member on the bottom of said body portion, an upper jaw engaging member mounted above said body portion, a block slidably mounted on the upper surface of the body, a pair of pivotally connected levers, the ends of one of said levers being pivotally connected to said body and to said upper jaw engaging member respectively, the ends of the other lever being pivotally connected to said sliding block and to said upper jaw engaging member, means adjacent the outer end of said body for actuating said block, substantially as described.

4. A device as set forth in claim 3 in combination with an electric lamp arranged within said bore and a switch on the end of said body portion for controlling said electric lamp, substantially as described.

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