Sept. 16, 1924. 1,509,041

H. T. HYAMS

DENTAL APPLIANCE

Filed Dec. 5, 1922

Fig. 1.

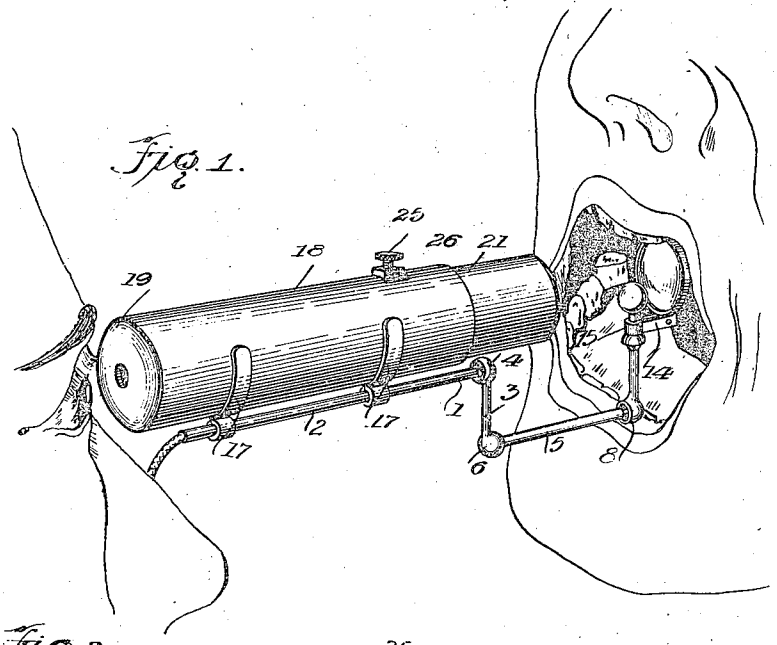


Fig. 2.

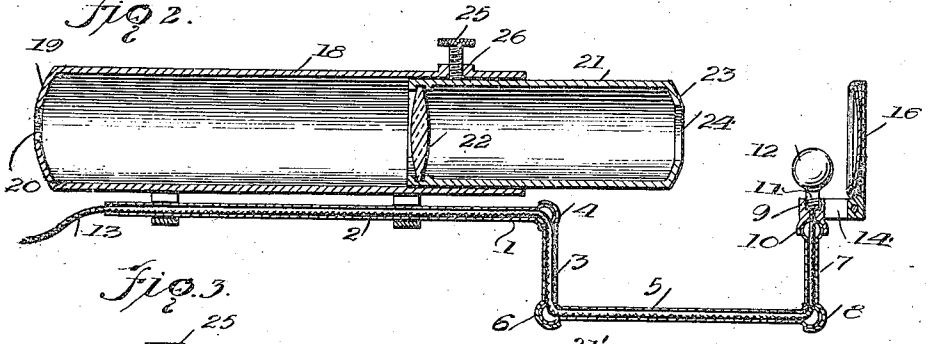


Fig. 3.

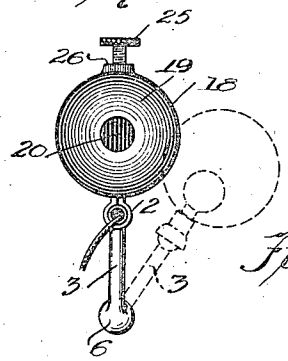


Fig. 5.

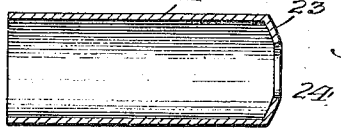
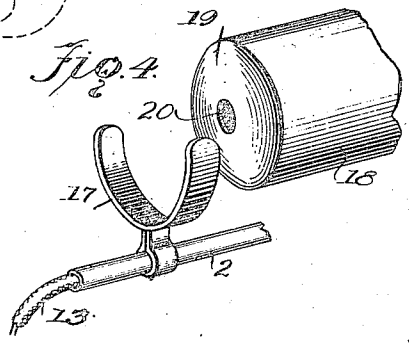


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

HARRY T. HYAMS, OF DE KALB, TEXAS.

DENTAL APPLIANCE.

Application filed December 5, 1922. Serial No. 605,082.

To all whom it may concern:

Be it known that I, HARRY T. HYAMS, a citizen of the United States, and resident of De Kalb, in the county of Bowie and State of Texas, have invented certain new and useful Improvements in Dental Appliances, of which the following is a specification.

This invention relates to improvements in surgical instruments, more particularly to diagnostic instruments for the examination of cavities, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of my invention is to provide an instrument of the character described which includes means for illuminating the interior of the mouth so that the teeth may be conveniently examined and cavities therein, necrosed parts thereof, defects in the enamel and other diseased or defective parts thereof located, inspected and treated.

A further object of the invention is to provide a device of the character described which embodies adjustable means for directing rays of light upon various portions of the interior surface of the mouth or of individual teeth therein so as to permit close and thorough inspection of such portions.

A still further object of the invention is to provide a device of the character described which is of simplified construction, convenient to manipulate and which is thoroughly practical commercially.

Other objects and advantages will be apparent from the following description, considered in conjunction with the accompanying drawings, in which—

Figure 1 is a perspective view showing a practical embodiment of the invention operatively applied,

Figure 2 is a longitudinal vertical section through the device,

Figure 3 is an end view of the device,

Figure 4 is a fragmentary perspective view showing a portion of a telescope body comprised in the device detached from a holder therefor, and

Figure 5 is a longitudinal section through a modified form of focusing tube or cylinder which may be substituted for the focusing tube shown in Figures 1 and 2.

In carrying out my invention, I provide a handle or holder which is indicated generally at 1. The handle or holder 1 is shown as comprising a relatively long straight tubular section 2, a shorter tubular section 3 which extends at right angles to the tubular section 2 and is connected at one end to the latter by a ball and socket joint 4, the arrangement being such that the section 3 may be swung about the axis of the section 2 but will normally remain in any position to which moved in respect to the section 2 because of the friction existing between the relatively moving parts of the joint 4 at the meeting ends of the two sections. The handle or holder 1 also includes a straight tubular section 5 which is connected by a ball and socket joint 6 to the outer end of the section 3 so that the section 5 extends in parallel relation to the plane of the section 2 and is spaced from the latter. The arrangement is such that the section 5 may rotate about its longitudinal axis. An additional tubular section 7 comprised in the handle or holder is connected by a ball and socket joint 8 to the second end of the section 5 so that the section 7 may be swung about the longitudinal axis of the section 5. With this arrangement, the section 7 will be disposed in parallel relation to the section 3 and a half loop will be provided in the holder or handle at one end thereof.

The section 7 carries at its outer end a block 9 which is connected thereto by a ball and socket joint 10 and which is provided with a socket 11 adapted for the reception of the base of an incandescent lamp 12. Electrical conducting means 13 lead from the incandescent lamp 12 through the lamp carrying block 9 and through the several sections of the handle or holder 1 and project from the end of the handle or holder 1 remote from the lamp for connection with any suitable source of electric current supply.

The block 9 also carries a lateral arm 14 having a hub portion 15 rotatably mounted on the block. The arm 14 at its outer end supports a reflector or mirror 16 which lies in a plane extending substantially at right angles to the arm 14 and consequently also at right angles to the planes of the sections 5 and 2 of the holder or handle. The ball and socket joints 4, 6, 8 and 10 are similarly constructed and the relatively moving parts of each frictionally co-engage so that the elements or sections connected thereby will normally remain in any position in respect to each other to which they are moved. The arm 14 may be swung to a complete revolution about the axis of the block 9 and the

angular relation of the longitudinal axis of the latter in respect to the longitudinal axis of the section 7 may be varied within limits. The section 7 and the parts carried thereby may be swung to a complete revolution about the longitudinal axis of the section 5 or the section 3 and the parts connected with the outer ends thereof may be swung as a unit about the longitudinal axis of the section 2 of the handle or holder. It will thus be apparent that the range of adjustment of the lamp 12 in respect to the section 2 of the handle or holder is relatively large and that the mirror or reflector 16 may be adjusted relatively to the lamp 12 when the latter is in any desirable position so that the rays of light from the lamp 12 will be directed as desired.

The section 2 of the handle or holder is provided at intervals along its length with spring clips 17 which are substantially semi-annular in form and are adapted to clampingly embrace the cylindrical body 18 of a telescope or elongated tubular eye-piece comprised in the device in such manner as to tend to hold the cylindrical body in spaced parallel relation to the section 2 and to permit the cylindrical body 18 to be moved axially relatively to the section 2 when desired.

The cylindrical body 18 is open at one end and is provided at its other end with an integral end wall 19 which is convexo-concaved and is formed with a central opening 20 which constitutes a peep or sight opening, as will presently appear. The telescope of which the body 18 is a part also includes a cylindrical focusing cylinder 21 which slidably interfits the body 18.

The focusing cylinder shown in Figures 1 and 2 has a magnifying lens 22 mounted therein at one end thereof and is provided at its other end with a convexo-concaved end wall 23 having a central opening 24 formed therethrough. In Figure 5, a focusing cylinder 21′ is shown and is identical in construction with the focusing cylinder 21 with the exception that no provision is made in the cylinder 21′ for the mounting of the magnifying lens 22 therein, the one end of the focusing cylinder 21′ being entirely open and unobstructed. As stated, the focusing tube or cylinder 21′ telescopes into the cylindrical body 18 and may be secured in adjusted position along the latter by means of a set screw 25 which is threaded through an opening in an embossed portion 26 of the cylindrical body 18.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. The lamp and reflector carrying portions of the the handle or holder may be partially or completely inserted into the mouth of a patient in the manner in which illustrated in Figure 1. The mirror or reflector 16 is then positioned in a desirable relation to the lamp 12 so as to illuminate any predetermined portion of the interior of the mouth of the patient or of teeth therein. The focusing tube 21 is adjusted along the body 18 to suit the eye of an observer who gazes through the peep hole 20 and through the focusing tube 21 or 21′ at the illuminated spot or portion within the mouth.

When the focusing tube 21 is used, the illuminated spot or portion will be magnified and when teeth or portions thereof are illuminated, cavities therein, defects in the enamel thereof, necrosed parts and other diseased or defective portions thereof will be clearly visible and may be carefully and critically examined with a view to determining the proper treatment therefor.

The offset or half loop portion of the handle or holder at the lamp and reflector carrying end thereof permits of convenient manipulation of the holder or handle to position the lamp and reflector within the mouth in a desirable relation to a tooth or teeth which are to be inspected and without causing any obstruction of the line of vision extending through the telescope to the said tooth or teeth. When the handle or holder is in the position in which illustrated in Figure 1, the lamp 12 is substantially in line with the longitudinal axis of the telescope but as stated, the position of the lamp in respect to the longitudinal axis of the telescope may be varied at will by adjusting certain of the joined together sections of the holder or handle 1 in respect to one another. The reflector or mirror 16 may be adjusted in respect to the lamp 12 to illuminate teeth or portions of the interior wall of the mouth which are located at either side of the lamp or at the front or rear thereof.

Obviously my invention is susceptible of embodiment in forms other than that illustrated in the accompanying drawings and I therefore consider as my own all modifications and adaptations of the form of the device illustrated herein which fall within the scope of the appended claims.

Having thus described the invention, what I claim is:—

1. In an instrument of the character described a handle having a rigid longitudinal portion and a flexible portion connected to the rigid portion, a light emitting means at the extremity of the flexible portion of the handle, a reflector adjustably connected to the flexible portion of the handle in adjacent relation to the light emitting means and being movable relatively to the latter, and an elongated tubular eye-piece carried by the rigid longitudinal portion of the handle in position to cooperate with the reflector.

2. In an instrument of the character de-

scribed, a handle comprising a straight rigid section, a second straight rigid section swingingly supported at one end of the first rigid section in offset relation to the latter, a short rigid section swingingly attached to the extremity of the second rigid section and extending at right angles to the plane of the first section, a light emitting means movably supported at the extremity of the third rigid section and a reflector supported for revolution about the axis of the third rigid section and in adjacent relation to the light emitting means, and a telescope supported on the first rigid section in parallel relation thereto.

3. In an instrument of the character described, a hollow handle comprising a plurality of tubular sections, each two adjacent sections being joined together by a ball and socket joint, an incandescent lamp carried at the one end of the handle, electrical conducting means extending from the lamp through the handle, a reflector rotatably supported upon the handle and being adapted to cooperate with the incandescent lamp, and a telescope supported upon the handle.

4. In an instrument of the character described, a tubular eye-piece comprising two telescopic sections, having end walls at their remote ends, said end walls having aligned openings therethrough, means for releasably securing the sections together in adjusted relation, a handle having a rigid portion supporting the eye-piece and extending at one end beyond the forward end of the latter, said handle also including a flexible portion connected at one end to said one end of the rigid portion, a light emitting means carried by the handle at the other end of the flexible portion and in advance of the forward end of the eye-piece, and a reflector carried by the handle in adjacent relation to the light emitting means.

5. In an instrument of the character described, a telescope comprising two telescopic sections having end walls at their remote ends, said end walls having aligned openings therethrough, a magnifying lens mounted in one of said sections, means for releasably securing the sections together in adjusted relation, a handle having a rigid portion supporting the telescope and extending at one end beyond the forward end of the latter, said handle also including a flexible portion connected at one end to the said one end of the rigid portion, a light emitting means carried by the handle at the other end of the flexible portion and in advance of the forward end of the telescope, and a reflector carried by the handle in adjacent relation to the light emitting means.

HARRY T. HYAMS.