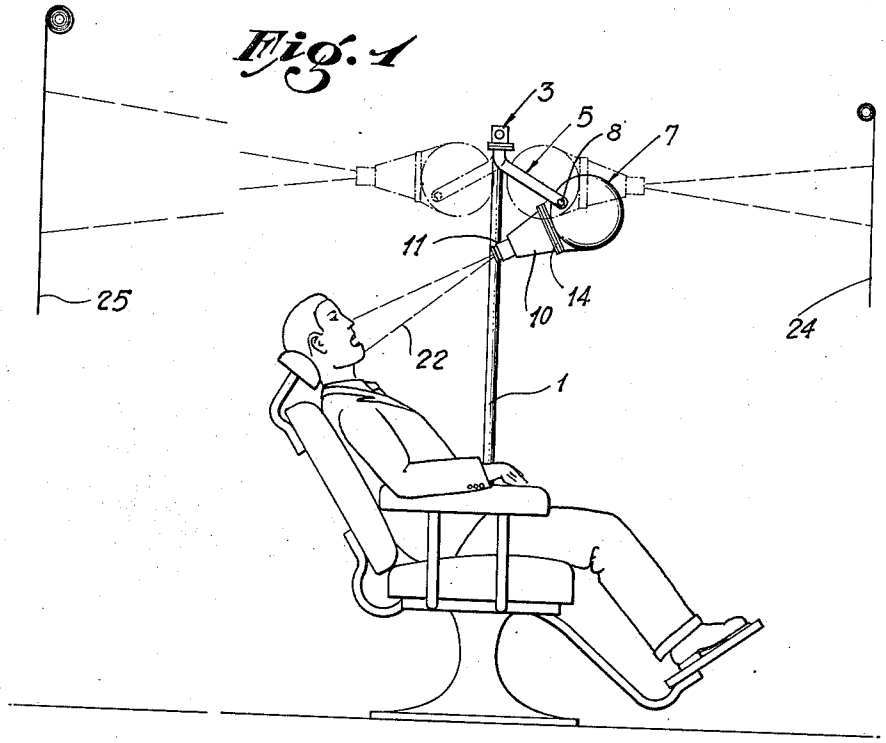
Dec. 10, 1940. W. J. HOLROYD 2,224,225

DENTIST'S ILLUMINATING LAMP AND PROJECTOR

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Fig. 1



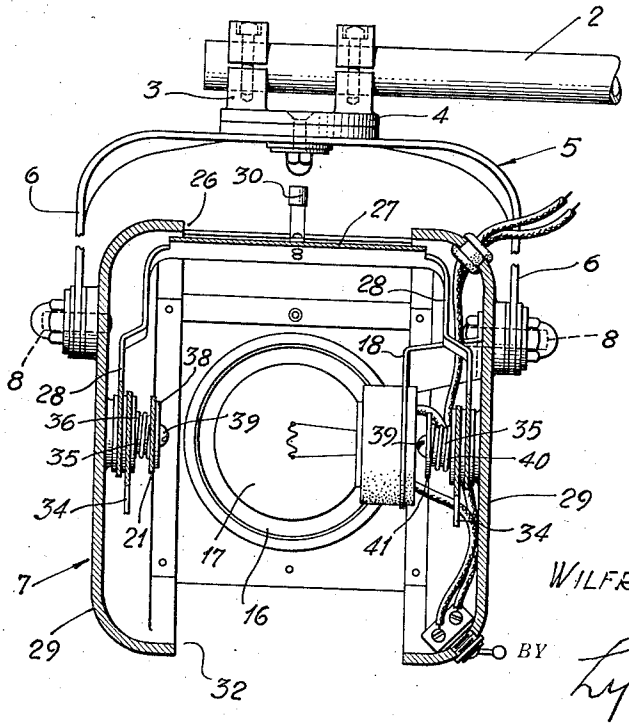




Fig. 4

WILFRID JAMES HOLROYD,
INVENTOR;

BY Lyon & Lyon
ATTORNEYS.

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Fig. 2

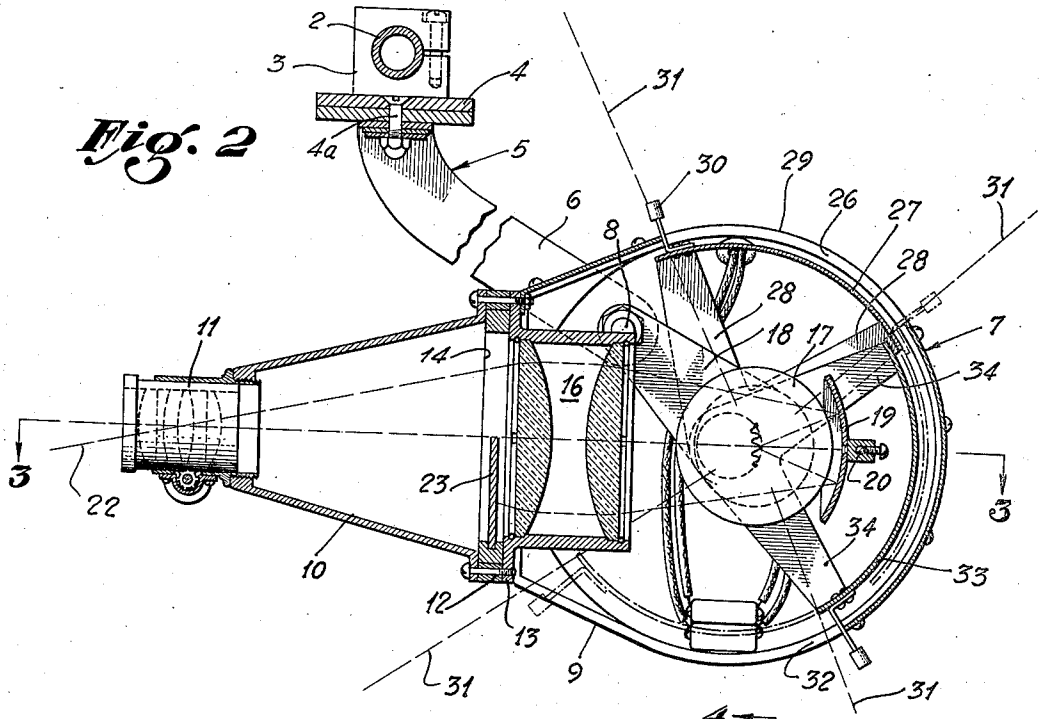
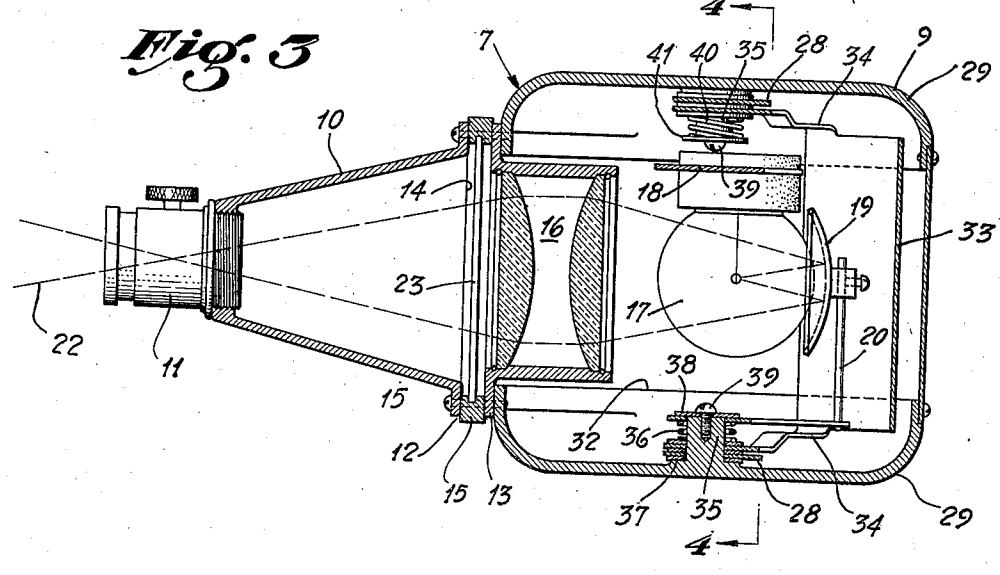



Fig. 3




WILFRID JAMES HOLROYD,
INVENTOR;

BY Lyon & Lyon
ATTORNEYS.

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# UNITED STATES PATENT OFFICE

2,224,225

## DENTIST'S ILLUMINATING LAMP AND PROJECTOR

Wilfrid James Holroyd, Los Angeles, Calif.

Application April 15, 1939, Serial No. 268,077

5 Claims. (Cl. 88—24)

This invention relates to dentists' lighting apparatus. Dental offices are frequently dependent upon daylight through a window in front of a patient's chair, to provide light for operating in the patient's mouth. Unless the sun light is bright, such lighting is usually insufficient, and in many dental offices artificial lighting must be employed. In modern practice of dentistry, it is usual to make X-ray pictures of the patient's teeth, and the showing in these pictures operates as a guide to the dentist. These pictures, however, are quite small, and the indications are usually meaningless to the patient, and also frequently present difficulties to the dentist. In some cases it is desirable for the patient and the dentist to examine these X-ray pictures together.

One of the objects of this invention is to provide illuminating equipment for a dental office, which will be of simple construction but which will afford means for illuminating the patient's mouth, and which can also be used when desired, as projection apparatus to cast an enlarged image of the X-rays of the teeth on a screen.

A further object is to provide apparatus of this kind, with means for enabling it to be used at will for illuminating the dental offices, thereby enabling the lighting equipment for illuminating the patient's mouth, and for casting images on the screen, to be used also for the general illumination of the dentist's office or room.

A further object of the invention is to provide means whereby the patient's eyes may be shaded from the powerful beam of light that is cast by the lighting equipment into the patient's mouth.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combination of parts to be described hereinafter, all of which contribute to produce an efficient dentist's illuminating lamp and projector.

A preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims.

In the drawings:

Fig. 1 is a side elevation illustrating my apparatus and its relation to the dentist's chair and the patient, and also illustrating how the apparatus can be used for projecting images onto a screen in front of a patient or on a wall back of the patient.

Fig. 2 is a vertical central section through the casing and support for the same upon an enlarged scale.

Fig. 3 is a horizontal section taken about on the line 3—3 of Fig. 2, and further illustrating details of the mechanism.

Fig. 4 is a vertical section taken about on the line 4—4 of Fig. 3, and further illustrating details of the invention. This view shows a portion of the support broken away.

Before proceeding to a more detailed description of the invention, it should be stated that the equipment involves the use of a lamp casing and lamp, mounted in such a way that a condensed light beam can be projected downwardly in an inclined direction into the patient's mouth, to assist the dentist in his operations there. The equipment includes a guide for a slide carrying a picture, or pictures, of teeth; and in another position of the casing, images from these pictures can be cast upon a screen. The screen used may consist of a shade roller and shade at the window in front of the dentist's chair. This will enable the image to be shown to the patient, and discussed with him by the dentist. As the distance from the lighting equipment to such a front screen would be short, of course, the size of the image cast on the screen would be small, though much more satisfactory for viewing than the slide or film itself. If desired, a second screen at the back can be employed at a greater distance from the lighting equipment, upon which an enlarged image can be cast. The lamp can be swung through 360° to enable its beam to be projected in any desired direction.

By providing an opaque slide or light stop that can be slipped into the slide guide, I am enabled to screen the patient's eyes from the light. In other words, a portion of a strong light beam that is cast into the patient's mouth, can be cut off so that it does not produce a glare in the patient's eyes.

The casing of the instrument is also preferably constructed with upper and lower openings closed by movable shutters, either or both of which can be opened. This enables the lamp within the casing to be employed for casting its rays up on the ceiling for indirectly lighting the dentist's office, and for casting a light toward the floor. In this way a single lighting equipment can be employed for performing the function of lighting the patient's mouth for operating therein, casting images of pictures of the teeth on a screen for inspection, and also providing the illumination for the dentist's office.

Referring more particularly to the parts, the equipment at present includes a support that may be in the form of a stanchion 1 that may be rigidly secured to the floor if desired, or stepped

in a sufficiently heavy movable base. This stanchion preferably terminates above in a substantially horizontally extending arm 2 upon which the lamp construction is supported. This support may be effected through the medium of a double clamp 3 presenting a base plate 4 (see Fig. 2) in which the lamp bracket 5 is secured through the medium of a pivot bolt 4a. It will be evident that the bracket 5 can be rotated on the axis of this bolt or pin 4a, which is substantially vertical. The lamp bracket 5 preferably includes two arms 6 that extend laterally in an inclined direction and downwardly from the head of the bracket. Between the ends of these arms a lamp casing 7 is supported on suitable pivot bolts 8. The casing 7 includes a substantially circular body 9 to which a radially projecting trunk 10 is attached, said trunk being preferably tapered as shown, and carrying the focusing lens box 11 at its outer end. At the point 12 the large end of the trunk 10 is secured to its seat 13 at the side of the body 9, and at this point a transverse slide guide or slot 14 is provided. This enables a slide 15 to be slid into position on the axis of the lens box 11 and in line with the condensing lens box 16 back of which the lamp 17 or the equipment is located, said lamp being preferably supported on a bracket plate 18, one end of which is supported on one of the bolts 8 (see Fig. 2). Back of the lamp a reflector 19 is provided adjustably secured on a transverse stem 20 that is carried on a friction-tight arm 21 (see Fig. 3).

In Fig. 1, I illustrate the equipment in full lines in the position to cast a condensed light beam 22 into the patient's mouth. At this time, in order to screen the patient's eyes, I prefer to slip an opaque slide or light stop 23 into the slide guide 14. This screen 23 will intercept any desired amount of the beam so as to insure that a shadow will be cast at the patient's eyes.

By rotating the casing on the studs 8, it can be swung up so that the axes of the lenses are substantially horizontal, and this will enable the apparatus to be employed to cast an image of the film (inserted at 14) of the teeth onto a screen 24 in front of the patient. This screen may consist of an ordinary shade roller and shade such as used on windows. As dentists' chairs are usually quite near a window, the screen 24 will, of course, be quite close to the lamp equipment. For this reason if desired, a second screen 25 may be employed more remote from the equipment and back of the patient. In using this second screen 25, the lamp can be rotated around as indicated in the dotted lines in Fig. 1, so as to enable the image of the slide to be projected onto the screen 25, at the same time adjusting the focusing lens box 11 so as to cast an enlarged image on this screen.

In order to enable the lighting equipment to be employed to light the dentist's office by casting light beams onto the ceiling and floor if desired, the body 9 of the casing is provided above with an opening 26 (see Fig. 2) and this opening can be closed at will by means of a curved shutter 27 secured to a quadrant 28 near each end wall or head 29 of the casing body. This shutter or light gate 27 can be moved to its open or closed position by means of a small outwardly projecting handle 30 (see Fig. 2). When this shutter 27 is in its open position, it will be evident that a light beam is indicated by the dotted lines 31, which can be cast from the lamp 17 up on the ceiling of the room or office, thereby illuminating the room.

A similar light opening 32 may be formed in the under side of the body 9, capable of being closed by a curved shutter 33 similar to the shutter 27, and mounted in a similar manner on quadrants 34. These quadrants 34 are preferably mounted friction-tight so that they will hold themselves in any position in which they are left. For this purpose the inner face of the heads 29 of the body 9 may be provided with studs 35 which operate as pivots for the quadrants, and one of these studs also may operate as a pivot for the arm 21 already referred to, which carries the reflector 19 (see Fig. 3).

A coil spring 36 is provided, that thrusts at its outer end against the quadrants 28 and 34 so as to press them frictionally against a cap disc 38 that is held on the end of the stud 35 by a small screw 39.

A similar spring 40 is employed on the other side of the casing, as illustrated in Fig. 3, but on that side, of course, the spring thrusts directly against a cap disc 41 because there is no arm such as the arm 21 for supporting a reflector 19 on that side.

The fact that the lamp bracket 6 extends laterally from the pivot bolt 4a is advantageous because it enables the distance of the casing from the patient and from the screens 24 and 25, to be regulated if desired; for example, by rotating the lamp bracket 5 on the pivot 4a to an opposite position from that shown in full lines in Fig. 1, the position of the supporting studs 8 for the casing, can be brought much nearer to the patient's mouth.

It will be evident that this equipment enables a patient's mouth to be very highly illuminated for operating therein, and also enables the patient's eyes to be screened from a portion of the beam. The equipment also enables pictures of the teeth to be cast on a screen in front of a patient to be viewed by him, and also provides illumination for the room by opening shutters 27 and 33 more or less.

Many other embodiments of this invention may be resorted to without departing from the spirit of the invention.

What I claim is:

1. In a dentist's lighting apparatus, the combination of a casing, means for supporting the same for rotation on a substantially horizontal axis in a location above the patient's chair, a lamp carried within the same, projection lenses mounted in the casing on an axis extending substantially radially from said lamp, a guide in said casing for receiving a slide and located on the axis of said lenses, a screen located forward of the dental chair upon which an image of the slide may be cast through the agency of said lenses, said casing having an opening on the upper side of its wall, a shutter in said opening movably supported on the casing, held closed while the said image is cast on the screen, and capable of being opened at will to enable light from the said lamp to be cast upon the ceiling for lighting the dentist's room at other times.

2. In a dentist's lighting apparatus, the combination of a casing, means for supporting the same for rotation on a substantially horizontal axis in a location above the patient's chair, a lamp carried within the casing, projection lenses mounted in the casing on an axis extending substantially radially from said lamp, a guide in said casing extending across the axis of the lenses for

receiving a slide in projection position, a screen located forward of the dental chair upon which an image of the slide may be cast through the agency of said lenses, and a removable opaque light stop in the form of a slide to be received in said guide to cast a shadow over the patient's eyes when the said casing is rotated on said horizontal axis into a reversed position to cast a light beam into the patient's mouth.

3. In a dentist's lighting apparatus, the combination of a casing comprising a substantially circular body having a projecting trunk extending substantially radially from the axis of the body, lenses mounted in the casing on the axis of said trunk, for casting light into the patient's mouth, means for supporting said body for rotation on a substantially horizontal axis, and enabling the same to be rotated on said horizontal axis into a reversed position in which the trunk extends forwardly, a guide formed in the casing to receive a slide to enable an image in the slide to be projected upon a screen, said body having an opening in the upper side thereof, a lamp within the body to cooperate with the lenses for projecting the image from the slide onto the screen, and a movable curved shutter mounted on the casing for rotation substantially on the axis of the body and operating in its open position to permit light from the lamp to be cast upon the ceiling for lighting the dentist's room, and cooperating with the casing in its closed position to shut off light and darken the room while the image is thrown on the screen.

4. In a dentist's lighting apparatus, the combination of a casing comprising a substantially circular body having a projecting trunk extending substantially radially from the axis of the body, lenses mounted in the casing on the axis of said trunk, means for supporting said body for rotation on a substantially horizontal axis, a guide formed in the casing extending transversely to the axis of the lenses to receive a slide to enable an image in the slide to be projected upon a screen, said circular body having an opening in the upper side thereof, a lamp within the body to cooperate with the lenses for projecting the image from the slide onto the screen, and a movable curved shutter in said opening mounted for rotation substantially on the axis of the body cooperating with the casing in its closed position to darken the room while the image is on the screen, and operating in its open position to permit light from the lamp to be cast upon the ceiling for lighting the dentist's room, said casing also having an opening in the under side thereof with a shutter adapted to be closed when the image is on the screen, and movably mounted on the said body, said last-named opening operating in its open position, to permit light to be cast down from the lamp toward the floor for lighting the same.

5. In a dentist's lighting apparatus, the combination of a lamp support, a bracket arm for supporting a lamp structure pivotally connected with said support to enable the bracket arm to swing on a substantially vertical axis, said bracket arm extending laterally from the said vertical axis of rotation, a lamp casing pivotally supported on the bracket arm to rotate on a substantially horizontal axis, said lamp casing having a substantially circular body and a projecting trunk extending substantially radially therefrom, projection lenses in said trunk and a lamp carried in said casing in axial alignment, a guide for a slide extending across the axis on which said lenses are disposed and adapted to receive a slide for projecting an image therefrom onto a screen, the body of said casing having an opening on the upper side thereof, and a movable shutter for closing said opening when the image is on the screen to darken the room and operating in its open position to permit the said lamp to illuminate the ceiling, said casing being capable of rotation on its pivotal support on the bracket into a reversed position, for assuming a position in which said trunk is inclined downwardly to project an illuminating beam into the patient's mouth.

WILFRID JAMES HOLROYD.