Jan. 17, 1928 1,656,754

R. A. NORRIS

POCKET LAMP FOR ORAL USE

Filed Dec. 8, 1926

Fig. 1

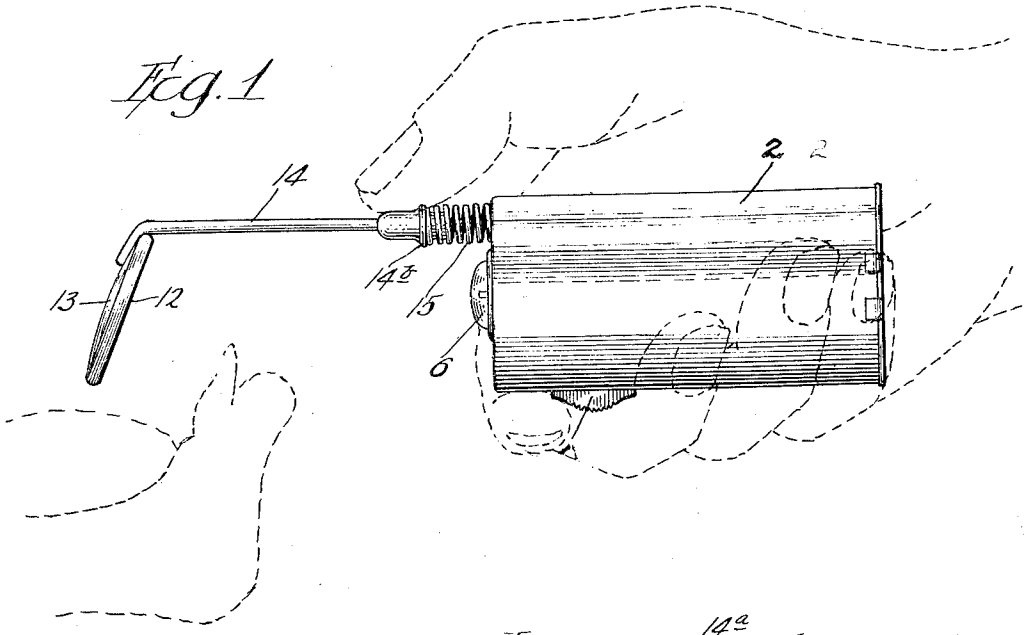


Fig. 3

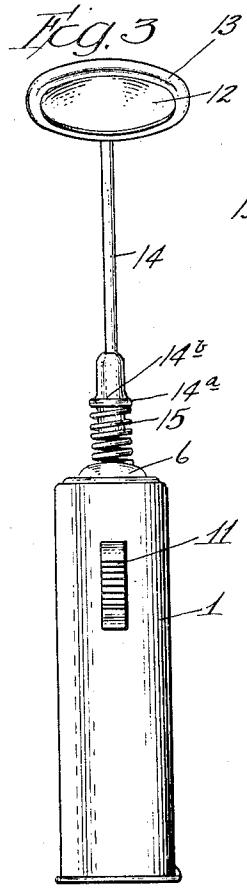


Fig. 2

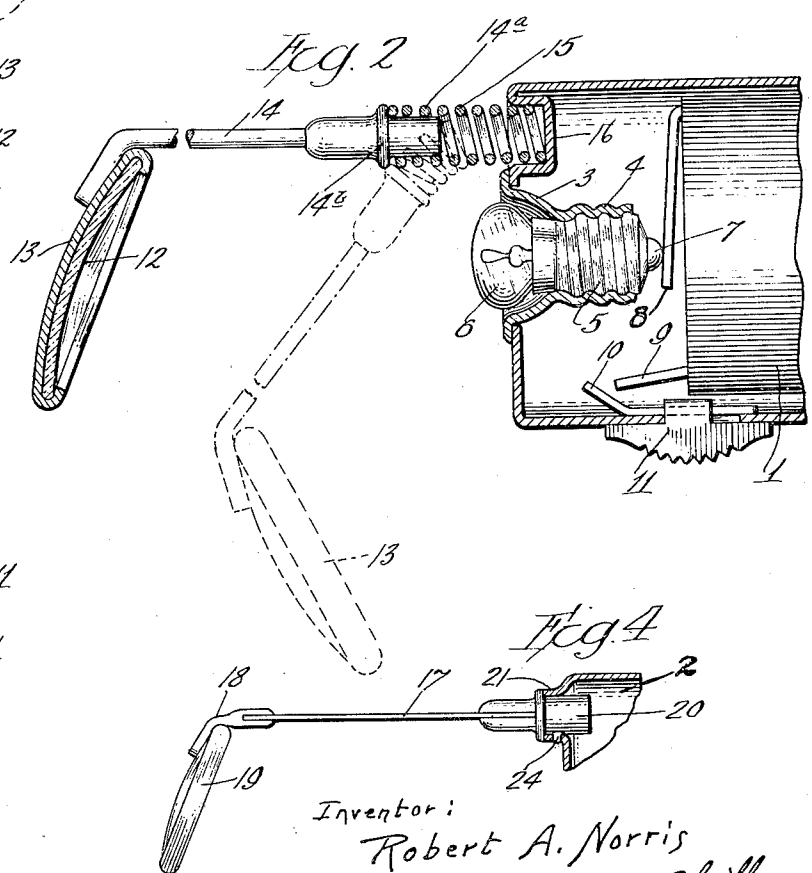


Fig. 4

Inventor:
Robert A. Norris
by Albert Scheible
Attorney

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UNITED STATES PATENT OFFICE.

ROBERT A. NORRIS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO CANUTE L. BRUDEWOLD, OF CHICAGO, ILLINOIS.

POCKET LAMP FOR ORAL USE.

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My invention relates to mirror attachments for flashlights, whereby the lamp of the flashlight may be employed effectively for lighting desired portions of an object and whereby such lighted portions can easily be viewed in their mirrored reflections.

Dentists, throat specialists, oral specialists and even general physicians are continually confronted with the problem of securing an adequate illumination of interior portions of the mouth and of the throat while examining such portions with the aid of a mirror inserted in the mouth. If the needed light is furnished by an ordinary lamp disposed at a distance from the patient, the latter is usually obliged to open his mouth to an abnormal and tiresome extent and often is also compelled to hold his head in an uncomfortable position.

To overcome this, a small lamp bulb attached to the mirror is sometimes inserted in the patient's mouth with the mirror. This has the serious objection that the lamp bulb cannot be kept out of contact with the usually restless tongue of the patient, so that saliva is deposited on this bulb, and when the deposited saliva is dried by the warmth of the lamp bulb, an undesirable odor is emitted. Hence the lamp bulb needs to be cleaned frequently and in any case should be sterilized before it is again employed, which is not easily done without affecting the insulation of the wires leading to this bulb. Besides, both the lamp bulb and the wires connected to it require considerable room, thus limiting the extent to which the mirror may be moved within the patient's mouth and also interfering with the ready use of tools or instruments employed by the dentists or doctors.

My present invention aims to overcome all of the above recited objections by providing a battery, lamp bulb and mirror combination which will afford the needed illumination and mirrored examination without requiring the lamp bulb to be inserted in the mouth of the patient. Moreover, it provides an arrangement for this purpose which will enable the user to vary the position of the mirror greatly without shifting the position of the battery and lamp bulb, which will permit a ready detaching and replacing of the mirror. So also, my invention provides a flashlight and mirror combination adapted to have both the manipulating of a current controlling switch and the change in position of the mirror effected by fingers of the single hand which supports the entire device.

Still further and also more detailed objects will appear from the following specification and from the accompanying drawings, in which

Fig. 1 is a side elevation of a flashlight embodying my invention, with dotted lines showing parts of a human mouth and parts of a hand holding the appliance in position for viewing the rear of the lower gums and teeth.

Fig. 2 is an enlarged central, vertical and longitudinal section through the same embodiment, with the rearward portions of the battery and casing cut away, and with dotted lines showing the mirror swung considerably out of its normal position.

Fig. 3 is a bottom view of the embodiment of Fig. 1.

Fig. 4 is a fragmentary view of another embodiment of my invention, namely one in which the mirror-supporting stem consists of a flat and resilient strip.

Referring first to Figs. 1 and 2, these show my flashlight and mirror combination as including a dry battery 1 housed by a relatively flat casing 2 into which the battery is inserted from the rear end of the casing. A reflector 3 is mounted in the forward end of the casing and has a rearwardly directed tubular extension 4 which is threaded for holding the metal shell 5 of a miniature lamp bulb 6, so that this lamp bulb will have its axial terminal 7 in engagement with one spring terminal 8 of the battery. The companion battery terminal 9 is disposed so that it can be engaged by a contact strip 10 which is fastened to a finger-piece 11 disposed at one edge of the casing, thereby permitting the lamp bulb to be switched on or off in the usual manner by sliding the said finger-piece rearwardly or forwardly on the casing.

To utilize light from the lamp bulb within the mouth of a patient, I provide a mirror 12 which has its general plane oblique to the axis of the lamp bulb and which desirably presents a concave face toward this bulb. This mirror is carried by a support which is detachably mounted on the battery casing and which permits the mirror to be shifted considerably in position with respect to the lamp bulb. For this purpose, Fig. 1 shows

the mirror 12 as mounted in a metal backing 13 soldered to the bent forward end of a rigid stem 14 which has its rear end enlarged in diameter and socketed in the forward end of a spiral spring 15. The bore of the spring is preferably such that the spring will grip the enlarged rear end 14^A of the stem, so as to hold the stem both against rotation and against accidental detaching although allowing the stem (with the mirror) to be detached by a spiral unscrewing movement of the stem. The rear end of the spring is secured to the front of the casing, as for example by soldering it to the bottom of a recess 16 which formed in the casing front, and the enlargement on the stem has a peripheral bead 14^B which limits the insertion of the rear stem end in the spring.

Thus constructed, the flashlight and mirror combination can readily be manipulated with one hand for viewing parts disposed in all directions radial of the axis of the lamp bulb. For example, in using such an appliance for viewing mouth and teeth portions, the dentist can grasp the battery casing approximately as shown in dotted lines in Fig. 1, namely with his thumb resting on some portion of the stem and with his index finger disposed for moving the sliding finger-piece 11 to which the switching contact strip 10 is fastened, while his other three fingers grip the clamp casing to the palm of his hand. When held in this manner, the mirror and the forward part of the stem can be inserted in the patient's mouth so as to dispose the mirror considerably inward of the gums and teeth of the patient while keeping the lamp bulb as well as the casing and all except possibly the dentist's thumb tip outside of the patient's mouth, and by simply twisting his hand the dentist can rotate the entire appliance about the axis of the stem so that the mirror will reflect gum and teeth portions below the stem and at either side of the latter. Moreover, by pressing his thumb against the stem to flex the spring, the dentist can shift the location of the mirror through a wide range of positions, one of which changed positions shown by dotted lines in Fig. 2, so that the mirror will reflect correspondingly different lower gum and teeth portions.

For upper mouth portions, the same appliance can be manipulated with equal facility by inverting it in the hand, so that the thumb will engage the finger-piece while the tip of the forefinger bears upwardly against the stem to dispose this finger for moving the stem. Since the hand can easily be twisted to rotate the casing about 180 degrees, and since the axis of the casing can also be shifted through a wide range while holding the mirror out of contact with the patient's gums, tongue or teeth, even an inexperienced user can use such an appliance for a quite extensive observation of interior mouth portions.

By keeping the lamp bulb outside the mouth and out of contact with the tongue, lips or gums, I entirely avoid the depositing of any saliva on it. After use, the mirror can instantly be detached by merely withdrawing the stem from the spring which affords a resilient socket for it, after which both the mirror and the stem can be sterilized. For dentists' use, I desirably proportion the parts so that the center of the mirror will be about two and one-quarter or two and one-half inches forward of the lamp bulb, and also desirably employ a concave mirror so as to magnify the reflection observed in it, while for throat diagnosis I may use a considerably longer stem.

However, I do not wish to be limited to any particular dimensions or to the concaving of the mirror, since these as well as other details of the above described embodiment may be varied considerably without departing either from the spirit of my invention or from the appended claims. Nor do I wish to be limited to the use of my mirror attachment in connection with a flat casing, although the latter readily lends itself to a convenient manipulating of the switch and shifting of the mirror position by different fingers of one hand.

So also, I do not wish to be limited to the use of a spring as a socket for a rigid stem, since other arrangements can be employed both for the socketing and for affording the desired changes in the position of the mirror. For example, Fig. 4 shows an embodiment of my invention in which a flat and resilient metal strip 17 is fastened at its forward end to a bracket 18 carried by a flat mirror 19. In this case, the rear end of the resilient strip 17 is secured to a plug 20 socketed in a tube 21 formed on the casing 1, and the plug has a lateral projection 22 fitting a slot in the tube 21 to prevent the stem from rotating. The strip 17 and the plug 20 secured to it from the stem member of this embodiment, while in Figs. 1 to 3 the stem member consists of the stem 14 and the spring 15 from which that stem is detachable.

With either of these embodiments, it will be obvious that no wires are introduced into the patient's mouth, although the lamp bulb can be disposed sufficiently close to this mouth to give an effective interior illumination. Owing to the oblique disposition of the mirror, this also reflects light from the lamp effectively, but without directing rays back into the eyes of the dentist or physician. In practice, I have found it advantageous to dispose the general plane of the mirror at an angle of about 60 degrees to the axis of the lamp bulb (which axis is also that of the reflector behind the lamp bulb). I also de-

sirably dispose the mirror so that it will be intersected by the axis of the reflector when the supporting stem for the mirror is in its normal position, thereby enabling my appliance to be used for a wide range of observations even without changing the position of the stem, and likewise insuring the effective reflection of the more concentrated portion of the light which is projected forwardly by the reflector.

For dentists' use, I may supply duplicate stem-equipped reflectors with each appliance, so that a freshly sterilized one can be substituted and used while the previously used ones are being sterilized. This detachability also permits the ready substitution of mirrors of different sizes according to the size and location of the parts which are to be examined, thus adapting my appliances for use in connection with a wide variety of internal diagnoses and operations. This range of adaptability, together with variations in the angle at which the mirror may be disposed, also make my appliance suitable for inspecting the interiors of containers or the like, or for examining normally concealed parts, such as inaccessible parts of radio receiving sets, hence I also do not wish to be limited to the use of my invention in connection with the diagnosing and treating of human ailments.

I claim as my invention:

1. The combination with a flash lamp having its lamp bulb at the forward end of its casing, of a mirror, and a stem member extending forwardly from the flash lamp, the stem member including a rigid forward portion secured to the mirror and a rear resilient portion secured to the flash lamp, the resilient portion being constructed so as normally to hold the mirror at an oblique angle to the axis of the casing and so as to permit the forward portion of the stem member to be moved toward the said axis.

2. The combination with a flash lamp having its lamp bulb at the forward end of its casing, of a spiral spring supported at its rear end by the casing and extending forwardly from the casing, a rigid stem supported by the forward end of the spring and extending forwardly from the spring, and a mirror fast upon the forward end of the stem and normally extending obliquely across the axis of the casing.

3. The combination with a flash lamp having its lamp bulb at the forward end of its casing, of a spring detachably socketed in the casing at side of the axis of the casing and extending forwardly from the casing, a stem supported by the forward end of the spring and extending forwardly from the latter, and a mirror carried by the forward end of the stem, the spring being constructed and disposed for normally supporting the stem so that the mirror will extend obliquely across the said axis.

4. The combination with a flash lamp having its lamp bulb at the forward end of its casing and having a socket formation at the forward end of the casing, of a spiral spring extending forwardly from the casing and parallel to the axis of the casing, the spring having its rear end snugly socketed in the said socket formation; a rigid stem having its rear end tightly socketed in the bore of the forward end of the spring, the said stem extending forwardly from the spring; and a mirror rigidly secured to the forward end of the stem and extending obliquely across the said axis when the spring is in its normal position; the spring having a freely flexible portion between the said socket formation and the rear end of the stem to permit a flexing of the spring by pressure on the stem toward the said axis, so as to permit the stem to be inclined toward and across the said axis for varying the position of the mirror with respect to the lamp.

Signed at Chicago, Illinois, November 26th, 1926.

ROBERT A. NORRIS.