

H. M. HAYS & W. R. ROSENBAUM.
HEAD LAMP.

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1,019,895.

Patented Mar. 12, 1912.

Fig. 1.

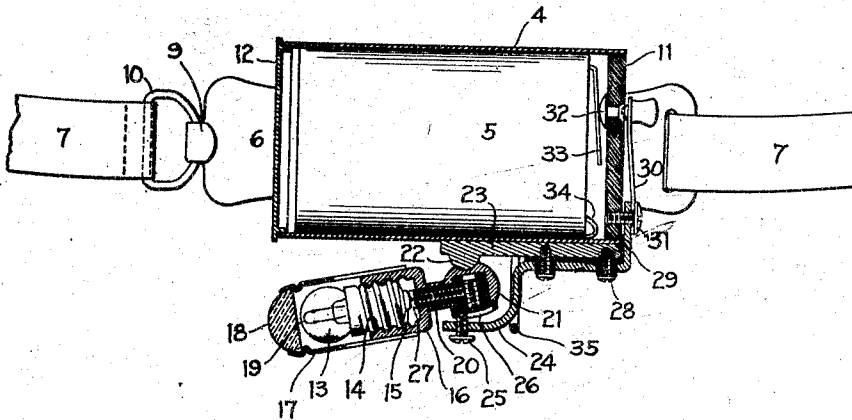


Fig. 2.

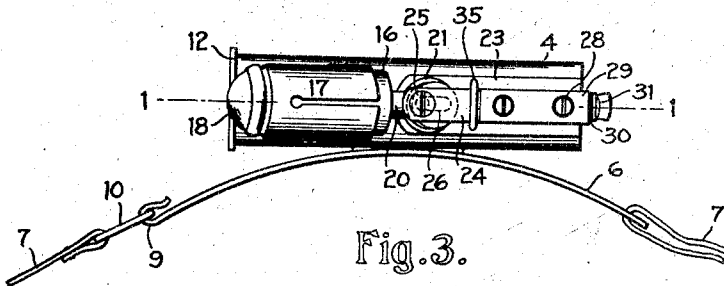
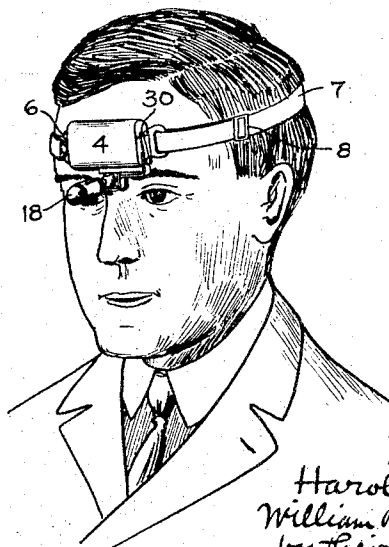


Fig. 3.



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UNITED STATES PATENT OFFICE.

HAROLD M. HAYS, OF NEW YORK, AND WILLIAM R. ROSENBAUM, OF ROCHESTER, NEW YORK, ASSIGNEES, BY MESNE ASSIGNMENTS, TO FRANK S. BETZ COMPANY, OF HAMMOND, INDIANA, A CORPORATION OF ILLINOIS.

HEAD-LAMP.

1,019,895.

Specification of Letters Patent.

Patented Mar. 12, 1912.

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To all whom it may concern:

Be it known that we, HAROLD M. HAYS, a citizen of the United States, residing at New York city, in the county of New York and State of New York, and WILLIAM R. ROSENBAUM, a subject of the Emperor of Germany, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Head-Lamps, of which the following is a specification.

This invention relates to electric head-lamps adapted for various uses, but particularly to head-lamps employed by surgeons, dentists, or oculists, in diagnosis or in operating.

The object of the invention is to produce a device of the kind in question which is compact, simple and light, and in which the electric lamp may be adjusted to direct its rays in any required direction while, at the same time, flexible conducting wires are entirely dispensed with.

To the foregoing ends we employ a battery-case of such form that it may be mounted upon the forehead of the user, and an electric lamp which is carried by the battery-case but is connected therewith by a universal joint, this joint permitting the necessary movements of the lamp and also preferably constituting the electrical connections between the battery-case and the lamp.

Various other objects and features of the invention will be set forth in connection with the following description of the illustrated embodiment of the invention.

In the accompanying drawings:—Figure 1 is a front-elevation of a head-lamp embodying the present invention, shown in vertical section on the line 1—1 in Fig. 2; Fig. 2 is a bottom-view of the head-lamp of Fig. 1; and Fig. 3 is perspective view showing one way in which the head-lamp may be used.

The illustrated embodiment of the invention comprises a battery-case 4, which is of a flattened and elongated form as shown in Figs. 1 and 2. Owing to this form and to the small size of the battery-case it may be mounted without inconvenience directly upon the head of the user of the lamp, as shown in Fig. 3, resting close against the

forehead, so that it may be securely supported without discomfort to the user.

The battery-case incloses a battery 5, which is of a standard commercial form, such as is used in pocket lamps.

In order to secure the battery-case firmly upon the head the case is provided, at the back, with a head-piece 6 consisting of a sheet-metal strip bent to engage and conform to the forehead or other portion of the head of the user. One end of the head-piece 6 is slotted to receive the doubled end of a strap 7, this strap encircling the head and being adjustable by means of a buckle 8. The other end of the head-piece is provided with a hook 9 and a ring 10, to which the end of the strap is fixed.

One end of the battery-case is closed by a fixed plate 11 of insulating material, while the other end 12 is removable, for the purpose of renewing the battery when necessary.

The light is furnished by an incandescent electric lamp 13 of any ordinary or suitable form, having the usual screw-threaded metal base 14, constituting one electrode of the lamp, and the usual central insulated electrode 15.

The electric lamp is screwed into a screw-threaded lamp-socket 16, and upon this socket is frictionally mounted a split sleeve 17, carrying a condensing-lens 18 by which the rays of the lamp are concentrated. The filament 19 of the lamp is preferably arranged as close as possible to the front surface of the bulb, so that it may be brought close to the lens.

The lamp-socket is provided with a narrow neck-portion 20 and a head 21. This head is recessed at its upper surface to form a spherical socket, which engages a hemispherical bearing-member or projection 22, which is formed on a bar 23 fixed upon the battery-case. The head 21 and the projection 22 thus constitute a universal joint of the ball-and-socket type, which permits movements of the lamp and the lamp-socket in various directions. To maintain the ball-and-socket members in engagement the battery-case is provided with a resilient arm 24 having a screw 25 at its end. The upper end of this screw engages a recess in the head of a screw 26 fixed in the head of the lamp-socket. The surface formed by

this recess is convex, being substantially concentric with the center of the ball-and-socket joint. Accordingly, the lamp-socket may be swung up or down to vary its inclination to the horizontal, while at the same time it may be swung about a vertical axis, the projection 22 and the screw 25 constituting pivots for this purpose. As rotation of the lamp-socket about its longitudinal axis is unnecessary and undesirable, the recess in the screw 26 is made narrow in one direction, while elongated in the direction of the longitudinal axis of the lamp-socket.

The connections just described, between the lamp-socket and the battery-case, constitute electrical as well as mechanical connections. The screw 26, as shown in Fig. 1, is insulated from the head 21, and its shank is engaged by a second screw 27 also insulated from the lamp-socket. The latter screw constitutes a contact-device engaged by the insulated contact 15 of the electric lamp, while the lamp-socket constitutes the other connection, in the usual manner. The battery 5 is provided with the usual spring-terminals 33 and 34, of which the latter engages the inner surface of the battery-case. The current is thus conducted from the battery through the lamp-casing and the projection 22 to the lamp-socket, and thus to the base of the lamp. The current returns from the lamp through the terminal 15 and the screws 27 and 26 to the screw 25 and the arm 24. Between the latter part, however, and the other battery-terminal 33 a switch is interposed, by which the current may be turned on or off from the lamp. For this purpose the arm 24 is formed on the end of a conducting-strip which is insulated from the bar 23, but is fixed thereto by screws 28. The outer end 29 of the conducting-strip is bent upwardly at the end of the casing, and a switch-arm 30 is pivoted thereon by means of a screw 31. This switch-arm coöperates with a fixed contact-stud 32, which is engaged by the battery-contact 33, thus completing the circuit. To disconnect the lamp from the battery the switch-arm is swung aside out of engagement with the contact-stud 32, so as to rest against the insulating-plate 11. This switch is so located that it may be conveniently operated while the lamp is in position on the head.

To prevent accidental contact and a resulting short-circuit between the lamp-socket and the arm 24 when the socket is swung to an extreme position, a U-shaped guard 35 is fixed on the bar 23 and depends at each side of the arm.

For most purposes the lamp is employed as shown in Fig. 3, the battery-case being supported upon the forehead with the head-piece 6 resting flat against the face, and thus supporting the battery firmly and without discomfort to the user. In this position

of the device the lamp may be adjusted to project its rays forward from a point between, and substantially on the level of, the eyes, so that the ways approximate as nearly as possible to the line of sight. Accordingly, the lamp may be used to great advantage in inspecting deep cavities, such as the throat, or the aural or nasal passages.

The lamp may also be employed, in optical work, by mounting it upon the head of the patient, with the battery-box at one side of the head, and the electric lamp swung into the position of Fig. 1. In this manner the head-lamp may be employed to project its rays against the mirror of an ophthalmoscope upon the head of the oculist, and thence into the patient's eyes in the usual manner.

When the lamp is not in use it is adapted to be folded into a very small compass. At such time the lamp is swung into the position of Figs. 1 and 2, and the strap is then folded or wound about the battery-case, and in this condition the lamp may be conveniently carried in the pocket, or packed in a small carrying-case.

Our invention is not limited to the embodiment thereof hereinbefore described and illustrated in the accompanying drawings, but may be embodied in various forms within the nature of the invention, as it is defined in the following claims.

We claim:—

1. A head-lamp having, in combination, a battery-case provided with a head-piece adapted to rest against and conforming to the user's head, means for securing the battery-case in place on the head, and an electric lamp carried by the battery-case and connected therewith by a universal joint comprising both mechanical and electrical connections, whereby the lamp may be moved to vary the direction in which the light is projected.

2. A head-lamp having, in combination, a flat battery-case provided with a concave head-piece adapted to rest against and conform to the user's head, means for securing the battery-case upon the forehead, and an electric lamp provided with a condensing-lens and carried by the battery-case, the lamp being connected with the bottom of the case by a joint comprising both mechanical and electrical connections, so as to depend therefrom into a position between the eyes of the user, and being movable into position to direct the light in the line of vision.

3. A head-lamp having, in combination, a flat, elongated battery-case, means for securing the battery-case upon the forehead of the user, and an electric lamp carried by the battery-case and connected therewith, at substantially the middle of the lower edge of the case, by means of a joint adapted to permit the lamp to be swung either into the

plane of the battery-case or into a position normal to said plane.

4. A head-lamp having, in combination, a battery-case, means for securing the battery-case upon the head of the user, an electric lamp carried by the battery-case and connected therewith, at substantially the middle of the case, by a universal joint comprising both mechanical and electrical connections between the case and the lamp, and a switch at one end of the battery-case connected in series with the lamp through said joint.

5. A head-lamp having, in combination, a battery-case, an electric lamp, and a universal joint connecting the battery-case and the lamp and comprising cooperating ball-and-socket members, one of said members being connected with the battery-case and the other with the lamp, and the latter member being provided with a recessed surface substantially concentric with the ball-and-socket joint, and a resilient member fixed to the battery-case and engaging said surface so as to hold the ball-and-socket members resiliently in engagement while permitting relative movements thereof to adjust the position of the lamp.

6. A head-lamp having, in combination, an electric-lamp, a lamp-socket, in which the lamp is mounted, provided with a head having a rounded recess, a battery-case having a rounded projection engaging said recess, a contact-member mounted upon, but insulated from, said head and electrically connected with a terminal of the lamp, said contact-member being provided with a surface sub-

stantially concentric with said recess and projection, and a resilient member mounted on the battery-case and yieldingly engaging said surface so as to make electrical connection therewith and also maintain the recess and projection in engagement, the projection and the resilient member being insulated from each other, and a battery in the battery-case of which the terminals are electrically connected with the projection and the resilient member, respectively.

7. A head-lamp having, in combination, an electric lamp, a lamp-socket in which the lamp is mounted, a battery-case connected with the socket by a universal joint, a contact member carried by, but insulated from, the lamp-socket and electrically connected with a terminal of the electric lamp, a resilient conductor fixed to, but insulated from, the battery-case, one end of said conductor yieldingly engaging said contact-member and the other end of the conductor extending to the end of the battery-case, a switch, at the end of the battery-case, having a movable member directly engaging said conductor, and a battery in the battery-case and connected, through the before-mentioned parts, with the electric lamp.

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