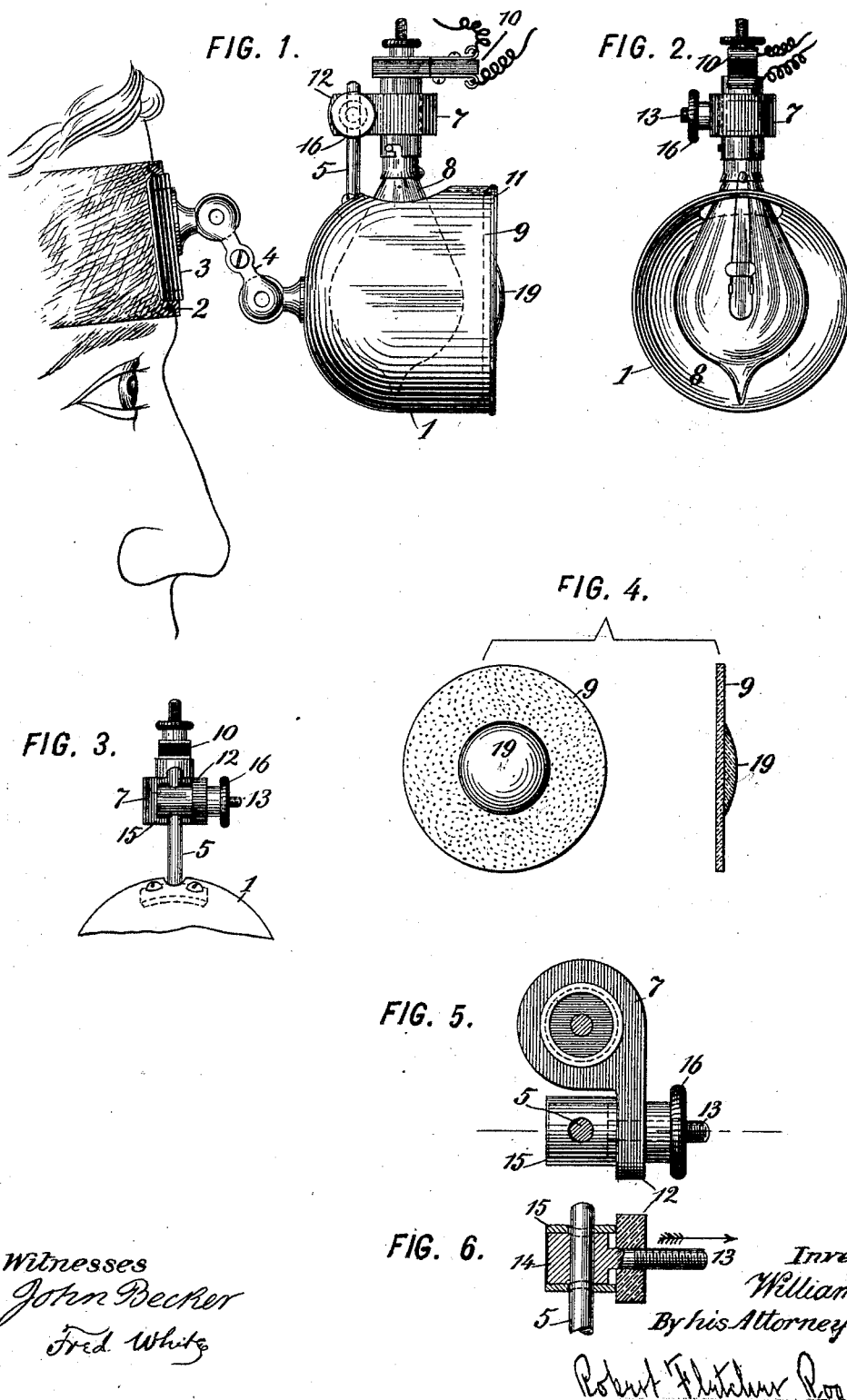


(No Model.)

W. MAIN.
ELECTRIC HEAD LAMP.

No. 491,713.

Patented Feb. 14, 1893.



UNITED STATES PATENT OFFICE.

WILLIAM MAIN, OF BROOKLYN, NEW YORK.

ELECTRIC HEAD-LAMP.

SPECIFICATION forming part of Letters Patent No. 491,713, dated February 14, 1893.

Application filed October 29, 1892. Serial No. 450,376. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MAIN, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric Head-Lamps, of which the following is a specification.

My invention relates to electric head lamps, or rather to such electric lamps, as may be conveniently disposed on the person of an operator or observer for the purpose of illuminating the object or matter to be observed or operated upon. These lamps are used principally by physicians and surgeons when examining or operating upon physical organs, such as the eye or ear, but it is obvious that they are of equal value to scientists making close examinations, as in botany, and in fact to all whose purpose it is to obtain a concentrated or brilliant local illumination.

For purposes of illustration I have shown my invention as applied to a form of lamp which may be strapped to the head of the observer or operator, but it will be obvious that much of my invention is capable of wider application in its essential details, and I do not desire to have it limited by the specific mode of its illustration.

My invention then consists in the broad construction and combination presently to be described, and finally pointed out in the claims.

Figure 1 of the drawings shows an improved form of head-lamp embodying my invention, the electric lamp proper being shown in dotted lines. Fig. 2 is a front view of the same, the glass or lens being removed. Fig. 3 is a rear view in detail of the universal joint which supports the lamp-socket. Fig. 4 shows the glass or lens in front view and cross-section. Fig. 5 is a plan view of the lamp-socket, the terminal-piece being removed, and Fig. 6 is a sectional detail of the socket joint.

The shell or case 1 of the lamp I preferably form of aluminium, by reason of its lightness and neat appearance.

3 is a metal plate attached to strap 2, whereby the whole may be firmly fastened to the head of the observer. Connection between plate 3 and case 1 is effected by the universal joint 4, which permits of the swinging and adjustment of the lamp in any desired position. These parts, however, may be of any form

and character, as they constitute no part of my present invention.

Fast to the rear of case 1 is the upright post or spindle 5, which by means of the universal-joint hereinafter to be described, serves as the support for socket 7 and electric-lamp 8. The electric-lamp 8 is held in socket 7 in the customary way and projects through an opening into case 1 in such manner that its light may be focused through lens 19 on any desired object. The current for lamp 8 is supplied from any convenient source of power to terminal-piece 10, and is thence transmitted to the lamp in the manner well understood. The glass or lens which will be described more in detail at a later point in the specification, is fastened at the front of case 1 by means of the annular flange 11, as clearly shown in Fig. 1.

In order to permit of the accurate adjustment of lamp 8 and the exact focusing of its rays through lens 19, I have devised a simple form of universal joint whereby the socket and lamp may be moved readily in all directions, relatively to the lens, and then fastened in adjusted position by the turning of a single screw. To this end, one side of the socket 7 is provided with a projection or lug 12 which is formed with a circular opening to admit the screw-threaded extension 13 of the cylindrical piece 14. This cylindrical piece 14 is placed within a sleeve 15, and both are perforated transversely to admit the upright post or spindle 5. It will be noticed on reference to Fig. 6 that the main portion of cylindrical piece 14 is somewhat shorter than the surrounding sleeve 15, and a certain amount of relative play of these parts, one within the other, is thus provided for. The screw-threaded extension 13 of piece 14 is provided with thumb-nut 16, and as the latter is turned up on extension 13 until it presses against the side of the projection 12, it follows that where- as the extension 13, together with cylindrical piece 14, are moved in the direction of the arrow in Fig. 6 by the further turning of said thumb-nut, the pressure of lug 12 on sleeve 15 will tend to move said sleeve in the opposite direction by reason of its freedom of play on cylindrical piece 14. This opposite movement of the parts of course produces a bind on post 5, and it thus follows that the turn-

ing-up of thumb-nut 16 locks the parts in all their adjusted positions. Upon relieving the pressure of thumb-nut 16, the parts are again released and the lamp and socket may be moved vertically up or down on post 5, may be swung vertically about extension 13, or may be swung horizontally about the post 5. This complete freedom of movement of the lamp and the simplicity of its adjustment permits of the greatest accuracy in focusing the light, and I regard this feature as a most important point of my invention.

The form of glass or lens which I prefer to employ is shown in Fig. 4, and consists of the external or annular portion 9 of flat ground glass, and the interior plano-convex portion 19 of clear glass, which constitutes the lens proper. A convenient mode of making these glasses and one far less expensive than having them cast and ground in a single piece, is to make them in two parts,—one, the part 9 consisting of a flat disk with the external annular portion ground and the central portion left plain, and the other, the convex portion or lens proper 19, which is cast separate and may be cemented to the part 9 by silicate of soda or other colorless cement. By means of this compound glass or lens I am enabled to direct the central portion of the beam and obtain it in its greatest intensity, and at the same time secure a diffused and softened light by means of the surrounding ground glass.

It is obvious that my improvement may be varied in details without departing from the spirit of my invention, and that it may be applied to lamps using other sources of light than electricity. As before noted, I do not desire its scope to be limited to the more specific details of construction and mode of illustration herein presented.

Having described the character of my invention and presented a mode of its application, I claim and desire to secure by Letters Patent of the United States:

1. In an electric head lamp, the combination of the compound glass consisting of the annular ground-glass portion and the central plano-convex lens of clear glass, the lamp, and a universal joint, whereby may be obtained a central direct beam of light accu-

ately focused, and in addition a surrounding diffused light, substantially as described.

2. In an electric head lamp, the combination of a lamp case or shell, the compound glass therein, consisting of the annular ground-glass portion and the central plano-convex lens of clear glass, a lamp, and a universal joint attached to said lamp-case, and supporting the lamp, whereby the light from the lamp may be accurately focused, so as to secure a central direct beam of great intensity, and in addition a surrounding diffused light, substantially as described.

3. The combination of a lamp-case or shell, a lens therein, a lamp, an upright or post on said lamp-case, a universal joint playing on said upright and supporting the lamp, whereby the light from the lamp may be accurately focused, substantially as described.

4. The combination of a lamp-case or shell, a lens therein, an upright or post on said lamp-case, a cylindrical piece provided with a screw-threaded extension, a sleeve surrounding said cylindrical piece and both perforated to receive the upright or post, the lamp and lamp-socket, which latter is provided with a lug perforated to receive the screw-threaded extension of the cylindrical piece, and a thumb-nut on said screw-threaded extension, substantially as described.

5. The combination of an electric lamp with the universal joint comprising the post or upright, a cylindrical piece and surrounding sleeve, both perforated to receive said post or upright, and means for moving said cylindrical-piece and sleeve in opposite directions and securing them in adjusted position, substantially as described.

6. The combination of an electric lamp with the universal joint comprising upright or post 5, perforated sleeve 15, perforated cylindrical piece 14 provided with screw-threaded extension 13, perforated lug 12, and thumb-nut 16, substantially as described.

Signed at New York, in the county of New York and State of New York, this 26th day of October, A. D. 1892.

WILLIAM MAIN.

Witnesses:

R. F. ROGERS,
GEO. L. WRIGHT.