H. L. DE ZENG.

DIAGNOSTIC INSTRUMENT.

APPLICATION FILED MAR. 14, 1919.

1,395,264. Patented Nov. 1, 1921.

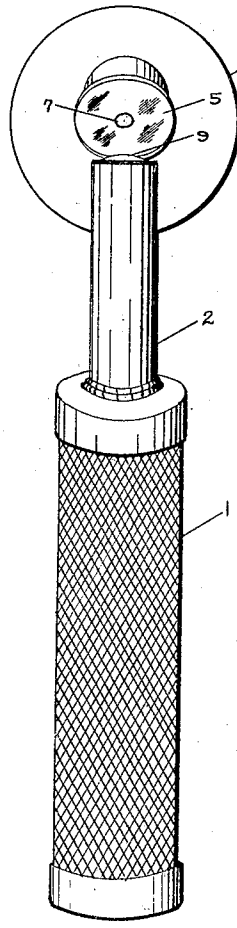


FIG. I

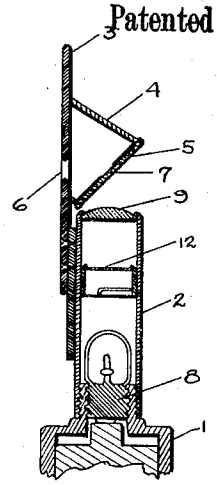


FIG II

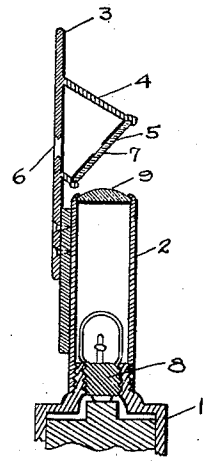


FIG. VII

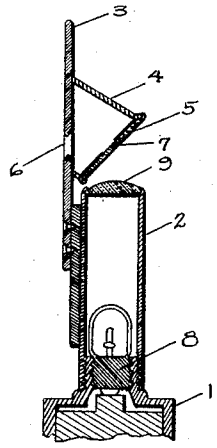


FIG. III

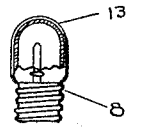


FIG. IV

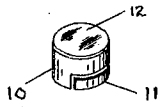


FIG. V

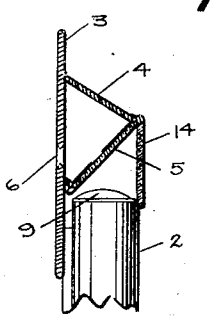


FIG. VI

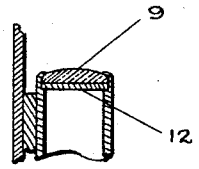


FIG VIII

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UNITED STATES PATENT OFFICE.

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DIAGNOSTIC INSTRUMENT.

1,395,264. Specification of Letters Patent. Patented Nov. 1, 1921.

Application filed March 14, 1919. Serial No. 282,553.

To all whom it may concern:

Be it known that I, HENRY L. DE ZENG, a citizen of the United States, residing at Moorestown, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Diagnostic Instruments, of which the following is a specification.

This invention relates to improvements in diagnostic instruments, and particularly to instruments of this character intended for use in the examination of the eye.

The principal object of the present invention is the provision of a novel retinoscope or other diagnostic instrument of that general type which shall be so constructed as to reduce to a minimum the irritation or uncomfortable effect on the patient of the reflection of the examining light on the eye.

A further object of the invention is the provision of a novel and improved attachment embodying the generic principles of my invention, which may be employed in connection with and applied to standard types of instruments now on the market to improve the efficiency and desirability thereof.

Other objects and advantages of my improved construction should be readily apparent by reference to the following specification taken in connection with the accompanying drawings, and it will be understood that I may make any modification in the specific details of construction shown and described within the scope of the appended claim without departing from or exceeding the spirit of my invention.

Figure I represents a front view of one form of instrument embodying my invention.

Fig. II represents a longitudinal sectional view of the upper portion thereof.

Fig. III represents a similar sectional view of a slightly different construction.

Fig. IV represents a sectional view of a modified form of bulb for carrying out the purposes of my invention.

Fig. V represents a perspective view of the attachment for applying my invention to present standard instruments.

Fig. VI represents a sectional view of another form of my invention.

Fig. VII represents a sectional view of another form.

Fig. VIII represents a backed up condenser lens.

In the drawings, the numeral 1 designates the handle or base portion of an Ideal electric retinoscope, this base portion being adapted to contain a battery for furnishing the necessary illumination or light for the instrument, and having rising therefrom the tubular support 2, having secured at its upper end the target or disk 3, from which extends diagonally the supporting casing 4 for the reflecting mirror 5. The target 3 and the mirror 5 are provided with the alined peep apertures 6 and 7, respectively, through which the diagnostician may view the eye of the patient. A bulb or suitable source of luminosity 8 is preferably contained within the tube 2, while at the upper end of the tube is a condenser or collimator lens 9, preferably of such power and so disposed as to render the emergent rays from the tube which strike upon the mirror 5 substantially parallel so that they will be reflected in a satisfactory beam toward the eye of the patient. It will be understood that the intensity of light necessary to properly examine and diagnose the condition of the eye of the patient is frequently sufficient to cause certain irritation or uncomfortable feeling to the eye during the examination. This it is desirable to avoid so far as possible, that the examination may be most satisfactorily conducted with maximum comfort to the patient and minimum disturbance of the eye on account of the light.

One of the objectionable features to be coped with in this connection is the fact that most illumination, and particularly artificial illumination such as here employed, contains a considerable percentage of what are known as the ultra-violet rays, a ray of the chemical type having a general irritating effect upon the eye, and in fact an injurious effect if the eye is subjected to such rays for any appreciable length of time, such as is required in making an examination. It is, therefore, the object of my present invention to eliminate these harmful rays through the insertion in the path of the rays, of means which will selectively retard them by either reflection or absorption, as may be preferred.

In the accomplishment of this result, as illustrated in Fig. II, there is disposed within the tubular member 2, the sleeve or

carrier 10 slotted to provide the retaining spring finger 11, and provided with the disk or lens 12 formed from a glass having the property of selective retardance of the ultra-violet rays. Radiations from the source of luminosity 8 in reaching the mirror 5 will, therefore, pass through the transparent disk 12 and the necessary effective illumination be obtained, while the undesirable rays will have been eliminated and will not reach the eye of the patient. It will be noted that by the use of the sleeve with its spring finger carrying the disk, the device in question may be readily inserted within the usual tubular portion 2 of a standard instrument and thus improve the efficiency of that instrument. In the construction of new instruments or the like, or in any event if preferred in place of making use of a separate attachment, the lens 9 may itself be formed from or backed up with a glass having the desired properties as shown in Fig. VIII, or provided with a film or coating possessing these properties, and thus the condenser lens may serve to eliminate the undesirable invisible rays.

In Fig. IV, I have shown another possible embodiment of my invention, in which the bulb 8 is either formed from glass of the character just described, or may be provided with the film 13 having the property of selective retardance of the harmful radiations, while being transparent to ordinary visual light rays.

In Fig. VI, I have illustrated another form of my invention, in which the instrument is of the construction previously described, but in place of interposing the means for eliminating the undesirable or harmful radiations between the source of luminosity and the reflecting mirror, a supplemental plate 14 is employed extending substantially parallel with the disk 3 and disposed between the mirror and the eye of the patient whereby the desirable light radiations as reflected forwardly from the mirror will pass through the member 14, while those which it is desired to eliminate will be retarded selectively by absorption or reflection, as may be preferred, the device in this form being equally efficient, though slightly less compact than in those forms previously described.

In Fig. VII, I have illustrated another slight modification of my invention, in which the mirror itself is formed of a glass having the properties of selective elimination of the undesirable chemical rays so that as the light passes into the mirror to the back reflecting surface thereof and thence forwardly from the mirror the undesirable chemical rays are eliminated.

It will thus be seen that in all forms of my invention I have provided an improved self contained diagnostic instrument, including means for producing the light used in the test, coupled with means which will eliminate from the artificial light thus employed the undesirable chemical rays, and will provide a satisfactory non-irritating beam of light for projection into the eye of the wearer, which will thus facilitate the examiner in making the examination, and obviate the irritating or harmful effects of the light on the eye of the patient.

I would further call attention to the fact that in the majority of forms illustrated I have shown an improved type of self contained diagnostic instrument, which includes means for producing the light used in the test coupled with means for projecting the beam in the direction of the eye of the patient and means affording vision by the examiner, in which instrument the harmful ultra violet or chemical rays produced by the artificial source of light are eliminated and prevented from reaching the eye of either the examiner or the patient. This is of importance since the patient is subjected to an intense beam though but for a short time; the examiner while subjected to much less rays as to quantity, through numerous examinations from day to day, is subjected to the continuing effect of these rays if some means is not provided for their elimination and for the protection of his eye. Both of these results are accomplished by my improved instrument.

I claim:

An attachment for a retinoscope comprising a sleeve bearing a transparent member having the property of selective retardance of light radiations, said sleeve having an L-shaped slot formed therein providing a laterally deflected spring finger for resiliently holding the attachment in position.

In testimony whereof I have affixed my signature, in presence of two witnesses.

HENRY L. DE ZENG.

Witnesses:

EDNA MCDEVITT,

SAMUEL W. CAFFERTY.