

central sight hole the diameter of which is about $\frac{1}{8}$ of an inch. Let E (fig. II.) represent the eye under examination, and U its optical centre, NR are diverging rays from MQ a flame, falling upon the mirror OS which reflects them convergingly as KL towards the eye E. At a short distance from the eye the rays are intercepted by G a bi-convex lens of 2-inch focal length, which so increases their convergence that they form a focus near the optical centre and again diverge and illuminate a large portion of the fundus of the eye as at TP.

The pencils of light from any point in the retina, as *a*, fig. II., pass from the cornea, very nearly parallel* and meeting the bi-convex lens G they converge to a focus at the principal focal length of the lens, (see definition 3) at 2 inches where they form an enlarged and inverted image, which, with the rays from I, form an aerial (def. 7) image of the fundus of the eye visible to an observer's eye looking through the sight hole of the mirror OS. This aerial image may again be enlarged by placing a convex lens V in the clip which is adapted to the back of the mirror.†

In the combination which I have arranged I have succeeded in being able to receive this aerial image upon a screen of ground glass, and by substituting a "sensitized" plate for the ground glass, I have succeeded in being able to demonstrate that photographs can be taken showing the details of the fundus of the eye.

This instrument consists of a small photographic camera, to which are adapted two brass tubes (A and B) which meet each other at right angles (fig. 1), $1\frac{1}{2}$ inches in diameter, being respectively 4 and $2\frac{1}{2}$ inches in length. The longer tube B moves freely in the aperture of the camera and the shorter tube A is turned towards the source of light.

A tube of the same width C, $1\frac{1}{2}$ inches in length is joined to the side of the outer extremity of the tube B, opposite to and in a line with the tube A. The outer extremity of the tube B extends $\frac{1}{4}$ of an inch beyond its juncture with the tubes A and C, and is termi-

* When the accommodation of the eye is paralyzed by a strong solution of Atropine the eye is adjusted for parallel rays, or rays that are very slightly convergent.

† There is another mode of examining the fundus of the eye, with this instrument, called the direct method. The mirror and eye of the observer are brought within one or two inches of the eye under examination. If the eye under examination is a normal eye and has its accommodation paralyzed by Atropine, the rays of light that are reflected from the eye are parallel, and are brought to a focus on the retina of the observed eye if its refractive media are normal. But if either eye is myopic a concave lens is placed in the clip at the back of the mirror in order to give the reflected rays the necessary parallelism or divergence.