

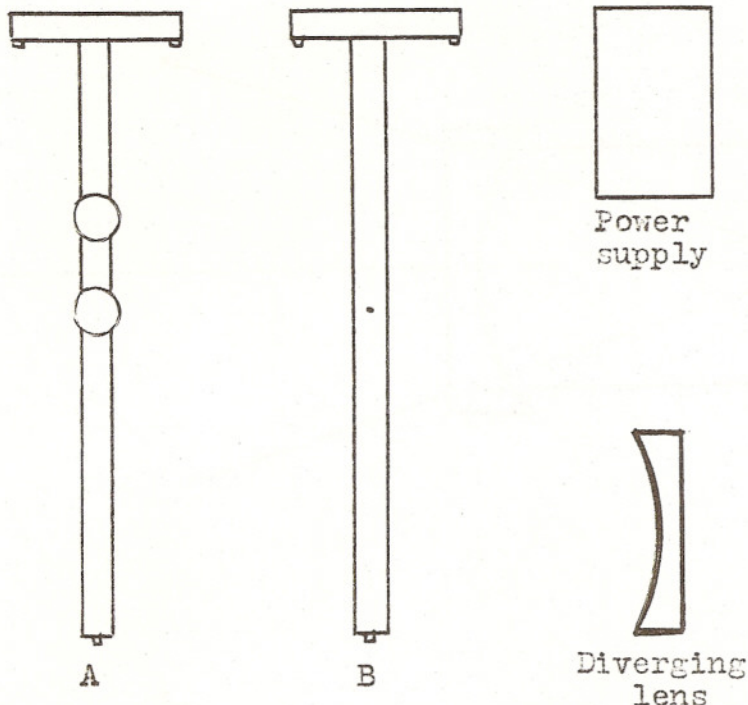
Diverging

Image Formation

Chalkboard Optics

A & B: E-6 End
All Else: L-3 S-1

1A (10-ft)



Hang power supply at extreme left end of rod below chalkboard. Hang support A from the two rods, somewhat to the right of the power supply, and support B approximately 70 cm to the right of A. Mount the diverging lens on support B. Darken the room as desired. (The darker the room the better light rays show up, but some light is helpful in seeing the apparatus.)

Although the lecturer will probably wish to improvise frequently, the following basic demonstrations are suggested:-

1. (a) Using two rays parallel to the axis (from S_1 and S_2) as indicated in Fig. 1 (see back of sheet), determine, and mark the position of, the principal focus F . Leave the lens in this position for all subsequent demonstrations. (b) Using a single source S placed well off the axis, orient the ray so that it strikes first one and then other portions of the lens. In particular, note the refracted ray when the incident ray is:- (1) Parallel to the axis; (2) Directed toward the center of the lens.
2. Using two rays crossing appropriately as indicated in Fig. 2, observe the virtual, erect image I formed between the object and the lens. By moving S_2 vertically and/or reorienting this ray, thus changing the position of the object, show that the image is always virtual, erect, and smaller than the object regardless of the position of the object.
3. For one particular arrangement draw in both the object O and the virtual image I . Place a single source S at the point farthest from the axis in the object drawn, nearly fill the lens with a divergent beam as indicated in Fig. 3, and note that all rays from a given point in the object appear to have come from a common, corresponding point in the virtual image.

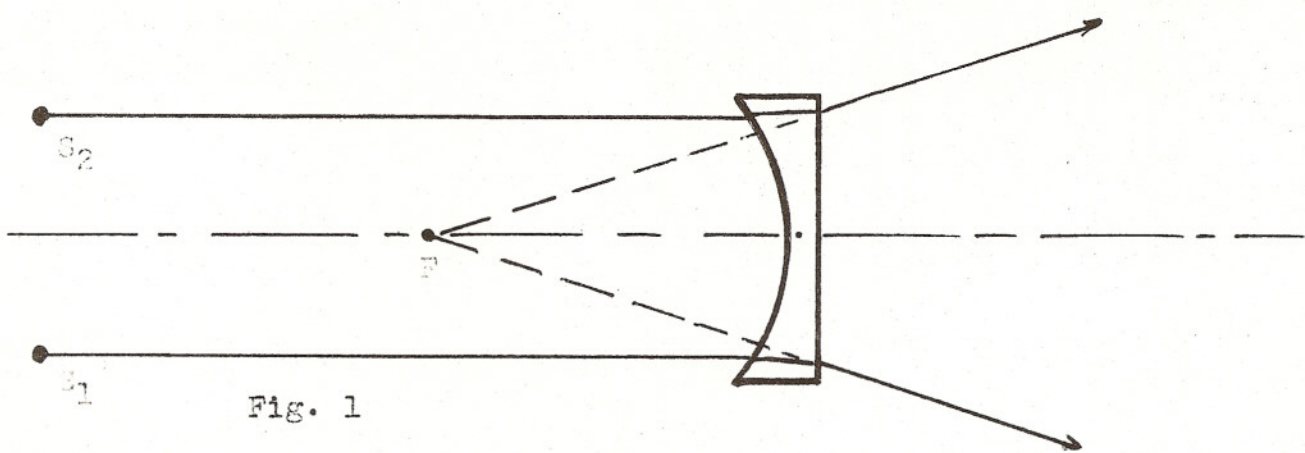


Fig. 1

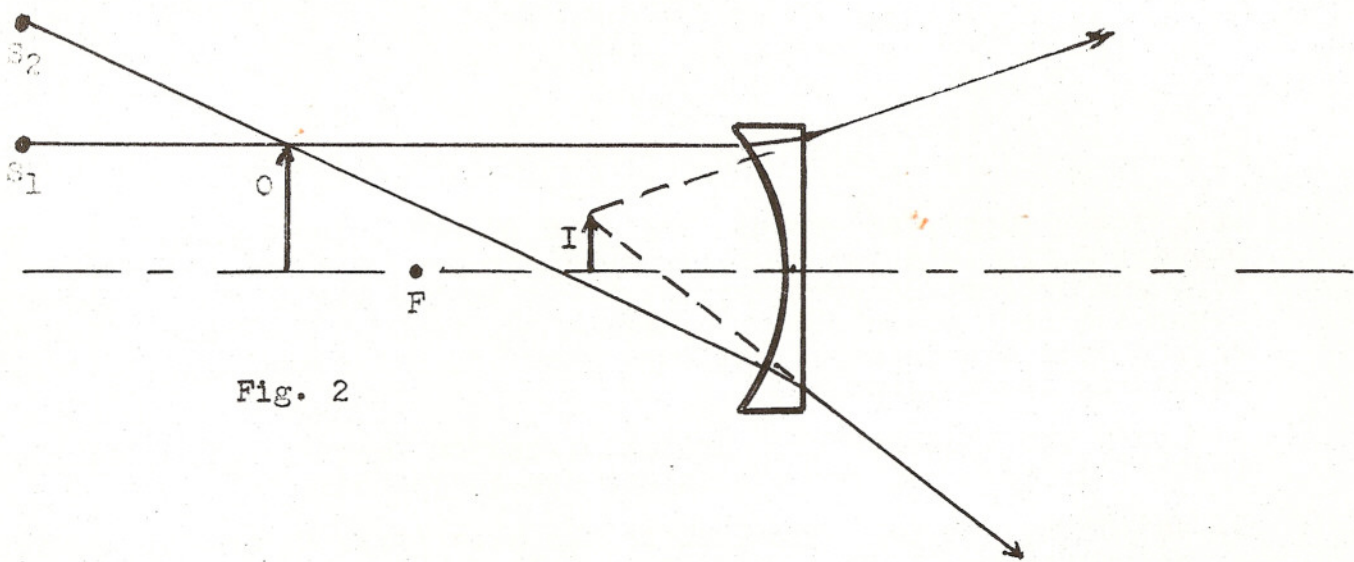


Fig. 2

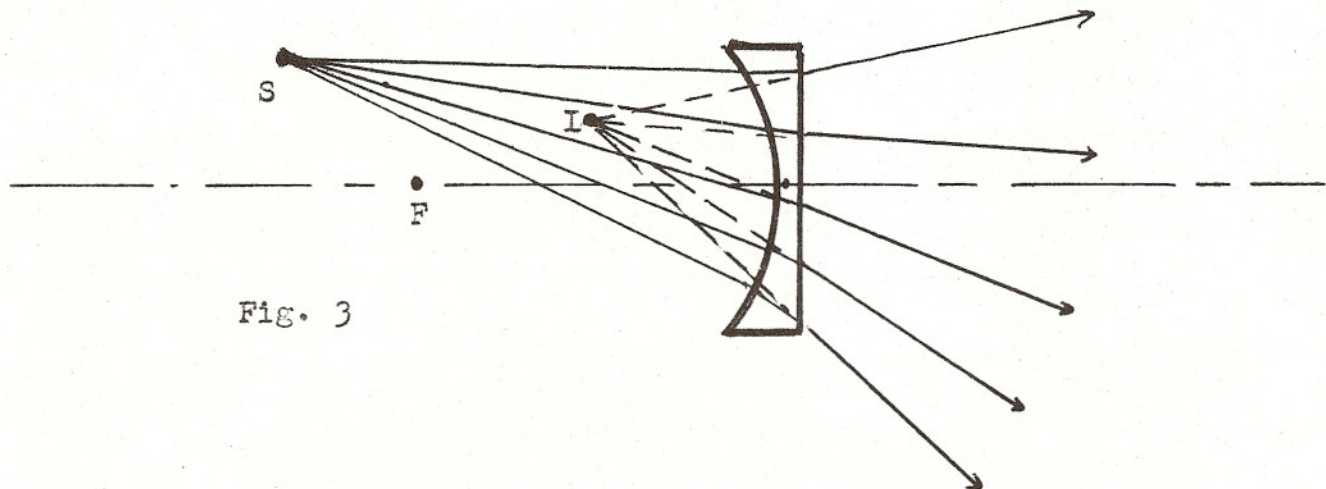


Fig. 3