Virtual images with a convergent lens

Principle and equipment

Principle

Show that virtual images can also be formed by a convergent lens; at the same time show the properties of the images.

Equipment

Position No.	Material	Order No.	Quantity
1	Demo Physics board with stand	02150-00	1
2	PHYWE Multitap transformer, DC: 2/4/6/8/10/12 V, 5 A / AC: 2/4/6/8/10/12/14 V, 5 A	13533-93	1
3	Lamp,halogen,mag.held,12V/50W	08270-20	1
4	Light box 12V/20W,w.magn.base	09804-00	1
5	Opt. block,planoconvex, magn.held	08270-02	2
Additional material:			
	Ruler		
	Water-soluble white board pen		

Robert-Bosch-Breite 10
D - 37079 Göttingen
Tel: +49 551 604 - 0
Fax: +49 551 604 - 107
info@phywe.de
www.phywe.com

Set-up and procedure

- Draw the optical axis approximately in the middle of the magnet optics panel.
- Delimit the plane of the lens, and draw in F_1 and F_2 (f = 180 mm).
- Position the biconvex lens, which consists of the two optical blocks.
- Draw in object arrows, which are 40 mm high, a distances of, e.g., 100 and 125 mm in front of the lens (cf. Fig. 1).
- Position the magnet-held lamp with a one-slit diaphragm so that the light beam passes through the arrow heads as a parallel beam.
- Use the light box with a one-slit diaphragm to generate optical centre beams which successively pass through the heads of each of the arrows.
- Observe the path of the beams.
- Draw the beams as completely as possible.
- Remove the lens and the lamp.
- Complete the light paths and using dashed lines extend the rays which have passed through the lens backwards on the object side of the lens until they intersect. Draw in the image arrows (Fig. 1).

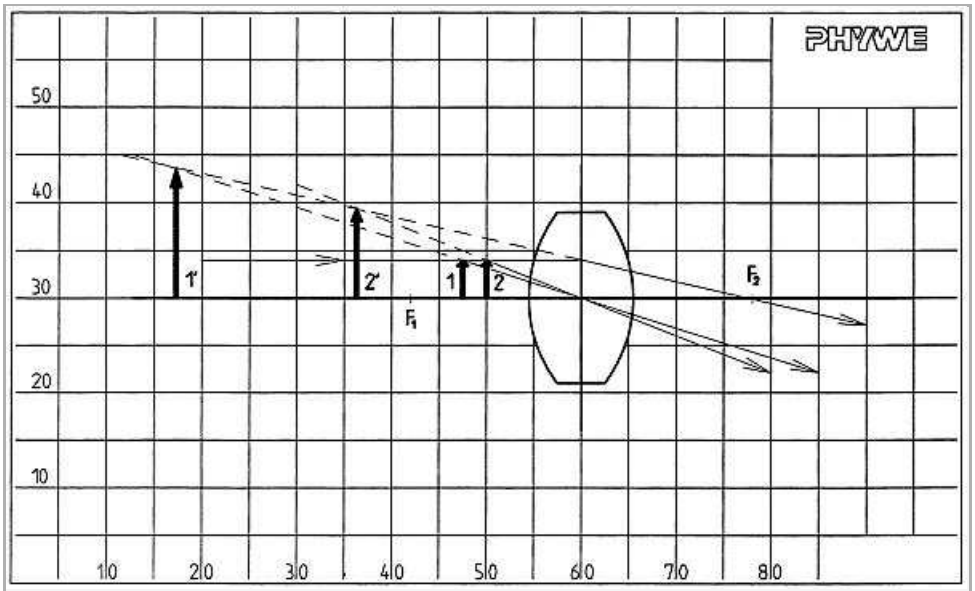

Fig. 1

Observation and evaluation

Upright, enlarged virtual images are formed in front of the lens for objects whose location lies inside the focal length of a convergent lens. The closer the object is to the focal point, the larger the images.

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