The magnifying glass

Principle and equipment

Principle

Demonstrate the function of a magnifying glass.

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		

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Set-up and procedure

- Delimit the optical axis on the magnet optics panel.
- Place a biconvex lens, which is made with the two planoconvex optical blocks, on the right half of the magnet optics panel. Label the focal points F_1 and F_2 (f = 180 mm).
- Using the magnet-held lamp and the light box, send two beams through the arrow head (parallel and optical centre beam or any arbitrary beam which is close to the optical axis, Fig. 1).
- Draw the paths of the rays as completely as possible.
- Remove the lens and the lamps.
- Complete the light paths (it is sufficient to draw the refracted rays behind the lens).
- Draw the backward extensions of the rays which emerge from the lens on the lamp side of the lens as dashed lines.
- Draw the image arrow (Fig. 1).

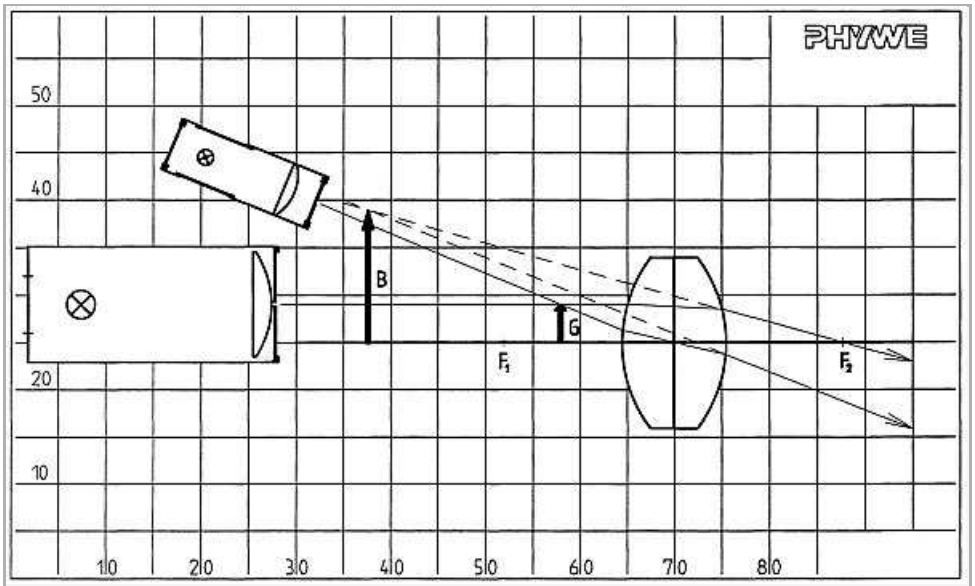

Fig. 1

Observation and evaluation

Observation

The convex lens generates an enlarged, upright, virtual image of the object arrow.

Evaluation

A convex lens functions as a magnifying glass when an object which is located within its single focal length is examined with it. An enlarged, normally oriented, upright, virtual image is obtained.
With a magnifying glass the visual angle is enlarged; therefore, smaller details of the object become more clear. One can examine the image with the "relaxed" eye when the object is located about at the lens' focal length.

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