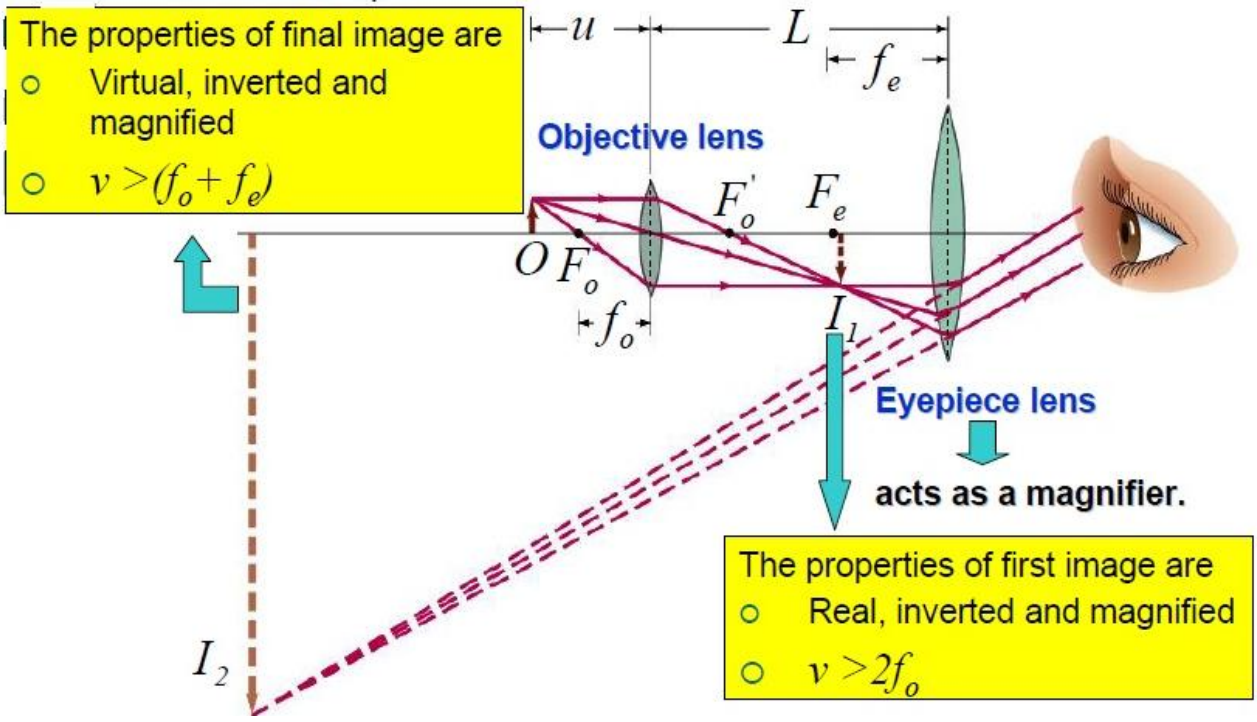
3.3.Compound Microscope

- Because it makes use of two lenses, the magnifying power of the compound microscope is much greater than that of the magnifier.
- The two lenses are converging lens and is known as **objective lens** (close to the object) and **eyepiece lens** (close to the eye).
- The figure below shows the schematic diagram of the compound microscope.



- The properties of the compound microscope are
  - *The distance between two lenses,* $L > (f_o + f_e)$
  - $f_o < f_e$
  - *The final image is* I_2.
  - *The angular magnification formula is given by*

$$M_a = -\frac{L}{f_o}\left(\frac{D}{f_e}\right)$$

where

f_e : focal length of the eyepiece lens

f_o : focal length of the objective lens

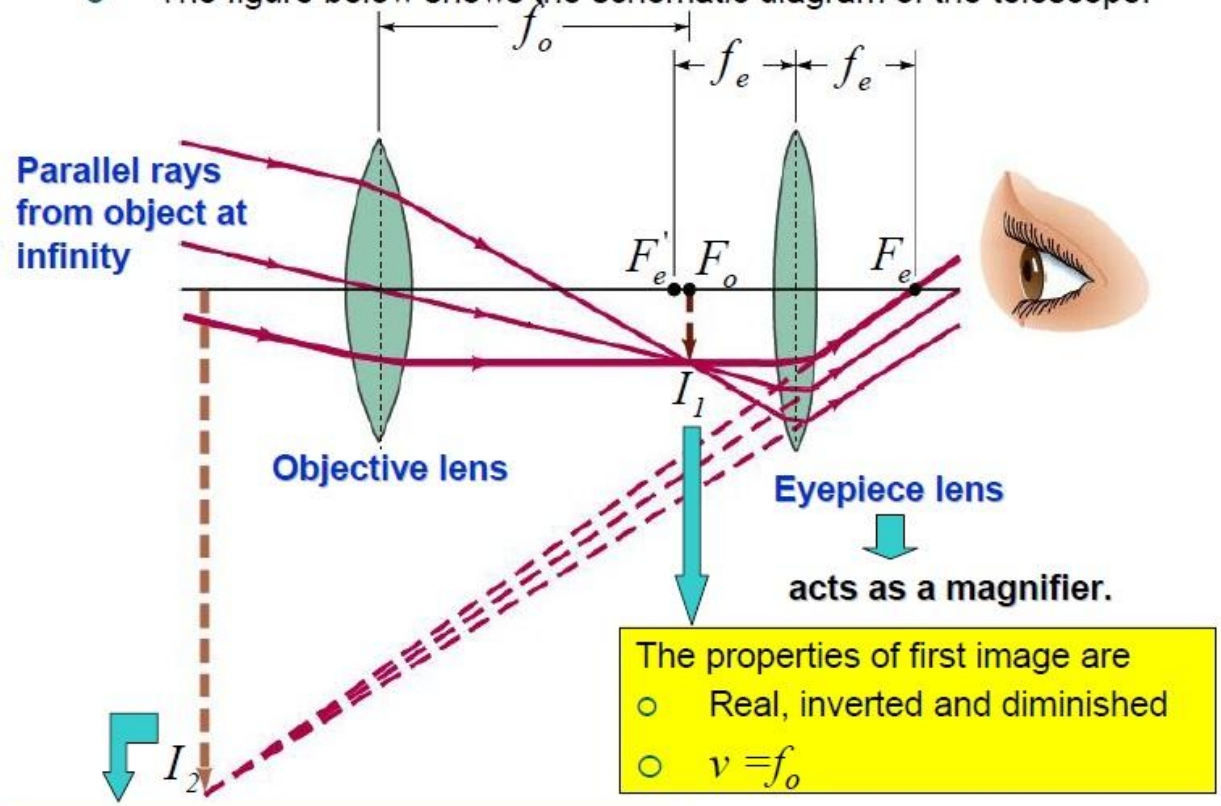
D : distance of distinct vision = 25 cm

The negative sign indicates that the image is inverted.

- It is used for viewing small objects that are very close to the objective lens.

4.3.Astronomical (refracting) Telescope

- This telescope consists of two converging lenses.
- Like compound microscope, the two lenses are **objective** and **eyepiece** lens.
- It is used to magnify objects that are very far away (considered to be at infinity).
- The figure below shows the schematic diagram of the telescope.



The properties of first image are
- Real, inverted and diminished
- $v = f_o$

The properties of final image are
- Virtual, inverted and magnified
- $v > (f_o + f_e)$

- The properties of the telescope are
  - *The distance between two lenses,* $L < (f_o + f_e)$
  - $f_o > f_e$
  - *The final image is* I_2.
  - *The angular magnification formula is given by*

$$M_a = -\frac{f_o}{f_e}$$

The negative sign indicates that the image is inverted.