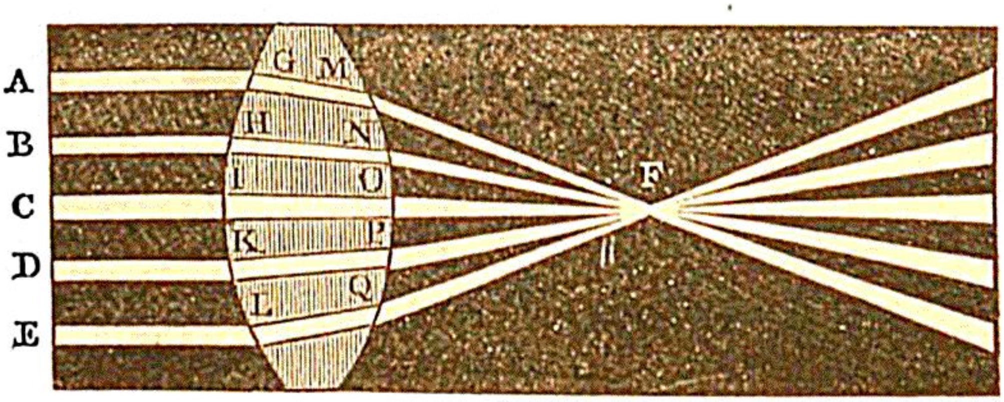
liquity of the ray to the surface which refracts it; and is mathematically expressed, by the law, that the sines of the two angles formed with the perpendicular by the incident, and the refracted rays retain, amidst all the variations of those angles, the same constant proportion to one another. We may hence derive a simple rule for placing the plane of the refracting surface so as to produce the particular refraction we wish to obtain. When a ray is to be deflected from its original course to a particular side, we have only to turn the surface of the medium in such a manner as that the perpendicular line to that surface, contained within the denser medium, shall lie still farther on the same side. Thus, in Fig. 408, if we wish to turn the ray R S, from S O to S T, we must place the dense medium so that the perpendicular S P, which is within it, shall be still farther from S O, than S T is; that is, shall lie on the other side of S T. The same rule applies to the contrary refraction of the ray S T from T V to T U, when it passes out of a dense, into a rare medium; for the perpendicular T I must still be placed on the same side of T V as T U is situated.

Let us now apply these principles to the case before us; that is, to the determination of the form to be given to a dense medium, in order to collect a pencil of rays, proceeding from a distant object, accurately to a focus. We shall



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suppose the object in question to be very remote, so that the rays composing the pencil may be considered as being parallel to each other; for at great distances their actual de-