where D = distance of the planet from the Sun at any point and p = perpendicular from the Sun on the direction of motion at that point.

But in a conic section,

$\frac{2}{D}$ is greater than, equal to, or less than $\frac{l}{p^2}$, where l is the semilatus rectum, according as it is an ellipse, a parabola or a hyperbola.

Hence, the path of a planet is a conic section where $h^2 = \mu l$ and it is an ellipse provided it is found to possess a suitable velocity at any particular point, that is, if V^2 is *less* than $\frac{2\mu}{SP}$, V being the velocity at a point P. As the body has always the same velocity, whenever it comes to the same position, it must have started at some unknown point of time with a certain definite velocity which was suitable for the description of the elliptic path.

The third law follows from the relations that have been obtained already, but it is unnecessary to trouble you with the analysis.

Note on a Brickwork Stage for a Siderostat.

BY W. HANLEY.

In deicding on the form of the stage for the siderostat we had to consider the ventilation of the adjacent building, and on this account it was settled to adopt the form sometimes used on railways for tank stages. This type of staging is economical in cost while providing ample base area.

In Bengal the pressure permissible on the ground may be taken as ½ to ¾ of a ton per sq. ft., but in order to avoid as far as possible any trouble from settlement, the pressure in the case of this stage was reduced to about ¼ ton per sq. ft. by floating the structure on a large base of concrete about 1 ft. thick.

The stage consists of 2 parallel rows of 3 columns of brickwork 2′—1″ × 1′—8″ each, tied at the bottom by segmental inverts so as to ensure even distribution of the weight, and at top by semicircular arches. It is hoped that this method of construction will prevent vibration. If, however, vibration is noticed while walking about on top it will be possible to fill in the spaces between the area with brickworks and then fill up the interior with earth up to any height that may be found necessary.

The roof has been made in the usual way by jack arching and concrete filling, and in order to compensate for the thrust of the arch 5 tie bolts 1″ thick have been fitted at 3 ft. intervals. Under the siderostat the arch has been made twice as thick as in the rest of the roof, and in order to ensure the siderostat against movement due to the arch cracking from settlement or from the weight on the siderostat itself 4 rolled steel joists 4″ × 1½″ by 6 ft. in length have been built into the concrete.

In order to avoid having to provide independent access to the roof the stage had to be put close to the building so as to enable the operator to get at the instruments, etc., from the roof, and situated as it is in the re-entrant angle of the building, the width was practically limited to its present dimension. In order to provide sufficient room to move about all round the instruments a light gallery of planking carried on joists will be built as shown in the cross section.

In fixing the height two factors had to be considered. The structure had to be high enough to enable the siderostat to command a clear view all round over the top of the main roof and yet be not so much above verandah roof as to make it difficult of access.

The length of the tube and the angle at which it had to be placed was the other factor. At the time the design was made the actual height from ground to the centre of the reflector had not been fixed, but it was assumed to be 4 ft. The upper end of the tube will rest on a saddle of wood resting on a baulk timber built into the brickwork. This arrangement will allow of adjustments being made as required hereafter both vertically and horizontally.

To get the general direction of the longitudinal axis of the stage an approximated meridian line was laid down by direct observation on ursæ minoris with a theodolite. It was found, however, after the concrete was put down that there was a slight error in this line owing either to the shifting of the pegs by the workmen or to some errors in the instrument, or both combined. A new theodolite was borrowed for the occasion and a provisional meridian line obtained using the old peg. This line would have brought the centre line of the masonry 7 to 7½ inches to one side of the mean centre line of the concrete. By shifting the theodolite the meridian line and the centre line of concrete were eventually got to coincide as near as was practicable.