This is not the only advantage which can be claimed for the double faced level. By using this level we need no longer feel anxious lest some results might be vitiated on account of dust or dirt having adhered to the feet of the independent or striding level or to the collars on which it rests; nor are we likely to have to spend as much time in adjusting the level after carrying it for a short time over rough ground, and especially after jumping fences or ditches and climbing over rocks, as when working with a detached striding level, the steel spiral springs of which become easily distended or else flattened.

The double faced level need never be detached from the telescope during the progress of the field operations, whether they are carried on with the ordinary instrument (No. 1) or with tacheometer No. 115. In the latter case, when the instrumental work to be done from a station is completed, the recorder must lift the telescope, inclusive of level, out of the wyes to take it in a special leather case hung over his shoulder, to the next station, thus relieving the observer of $5\frac{1}{2}$ pounds of the part of the instrument he usually has to carry and reducing the weight left in his charge to $20\frac{1}{4}$ pounds, tripod included. The tacheometer of the ordinary construction weighs but $18\frac{1}{4}$ pounds with tripod, exclusive of double faced level, which has a weight of from $\frac{1}{2}$ to $\frac{3}{4}$ pound. The United States Coast and Geodetic Survey precision level weighs 23 pounds with tripod, not including the striding level which has to be carried separately.

Now a telescope with the magnifying power increased to about 50 diameters, permits of hundredths of a yard being read and thousandths of a yard being estimated on a rod suitably divided into hundredths and half hundredths of a yard, at distances up to from 275 to 350 yards according to the strength of the observer's eye sight. That is to say: when the telescope is pointed to zero on the rod the number of whole yards contained in the distance R, rod to instrument, may be read off directly by displacing the optical axis so as to intercept a height on the rod equal to $\frac{1}{100}$ of the said distance R, or equal to $0{\cdot}01R$, and tenths of yards can be estimated by the eye. It appears therefore that in order to be able to read on a rod the three intervals corresponding to: $\frac{10}{1000}$, $\frac{18}{1000}$ and $\frac{22}{1000}$ of a distance, without moving the clamp, it would be necessary to have at one's command a rod $0{\cdot}022 \times 350 = 7{\cdot}7$ yards in height, which is nearly double the length of the rods commonly used for precision levelling operations.

By making use of a rod 12 to 13 feet long, viz., a rod of as great a length as practical experience has shown can be easily held vertical, conveniently handled, carried in the field and put up for the transportation and kept tolerably straight and in good order generally, for any length of time, many of the sights that can be easily taken with a telescope of the power mentioned necessitate a second pointing and some a third pointing, in order to secure at every sight three consecutive rod intervals intercepted by visual rays, respectively equal to: $\frac{10R}{1000}$, $\frac{8R}{1000}$ and $\frac{4R}{1000}$

But it may be asked, what great necessity is there for establishing at every sight the values of the whole three intervals in question, in connection with precision levelling, considering it is not essential that the distance rod to instrument, be very accurately known for determining the difference in elevation between two points.