objective, viz., several inches from its centre of gravity. On the right and left hand sides of the telescope small steel straight edges K are fixed to the tube near its eye end, having their flat faces in planes perpendicular to the azimuth circle and those edges which rest on and slide over the steel knife, one at a time, parallel to the optical axis or line of collimation.

The inclination of the telescope can thus be modified at will; after having loosened the clamp P, we can slide it together with the telescope along the prismatic guide rod T, to screw it tight again when the object to be sighted comes within the field of view. The slow motion screw R enables us afterwards to rectify the pointing of the telescope in a vertical plane. The vernier carried by the clamp P indicates (usually) on the vertical divided straight edge, or scale of slopes, the inclination of the visual ray in decimal parts of the horizontal projection r, of the portion of the said ray extending from the axis of rotation of the telescope to the line of the knife edge, taken as unity.

The telescope of the "Tachéomètre Sanguet," is a simple astronomical telescope, similar to that of an ordinary inverting level, transit or theodolite, with but two wires at right angles to each other for sighting, and having no supplementary lenses or cross hairs or other lines for sighting purposes of any kind. As there is but one horizontal wire, it is clearly impossible to read on a speaking rod, a height above 0 different from that which the telescope points to, so long as the inclination of the latter remains unchanged. The measure of distances is based on several successive rod readings which are obtained as follows:—

The nut of the slow motion screw R is connected by means of a vertical crank, to the end of the short arm of a lever L having as a fulcrum a horizontal axis imbedded at M in the rear face of the divided vertical straight edge or slope scale FH, and the long flat arm of which extends past the fork shaped pillar Y where it is terminated by a rounded handle. In the long flat handle L there is screwed near its free end, a cylindrical steel pin or peg, the flat end of which touches the lateral face of the fork shaped pillar while the lever remains in one and the same position; the upper side of the peg butting against one or other of four similar steel pegs or pins a, b, c, d screwed into the side of the pillar, along an arc of a circle described from the fulcrum axis as a centre; a being the lowest and d the highest of this series of pins.

Solicited by its own weight, by that of the telescope, and by the action of a spiral spring S, the prismatic guide rod T always tends to descend. And by drawing the long lever arm lightly to one side, so as to make the pin inserted in it clear that in the pillar against which it abuts, the rod T together with the short arm of the lever drops with a snap and the next higher peg in the pillar is struck hard by the pin in the long arm in its upward motion; at the same time the telescope turns on its transverse axis.

As the lever L can take the four positions corresponding to pins a, b, c and d, the inclination of the optical axis or line of collimation of the telescope, can be made to assume four different values by the simple handling of this lever, which give us four readings on the rod affording differences that bear constant ratios to the horizontal distance to be measured. There being six such differences (for six is the number of possible combinations of four readings taken two by two), the result is that we have at our command six elementary ratios between rod interval and distance,