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to the unents erviceountry stretches as have to be measured when crossing wide streams, ravines, valleys, etc. (b.) That would permit of angles being measured in degrees and minutes, or according to the sexagesimal division of the eirele, as is still the custom in Canada and English speaking countries in general, in place of the grades and centrigrades of the centesimal division now almost exclusively used in France.

As a result of our deliberations, Tacheometer No. 115 supplied to the Department was constructed so as to meet my views just stated, as far as practicable: the fundamental principles of the original invention were, however, in no way departed from.

The modifications and additions just referred to which I considered necessary, will be described in detail, and the reason of their introduction explained, after we shall have gained an insight into the working and resources of this new measuring instrument from the following summary description of its parts and their combination, which is on much the same lines as that given by the inventor himself in the pamphlet he sends out with each tacheometer.

The "Tachéomêtre Sanguet" (see Illustration No. 1) is composed of two principal parts, one of which is destined for measuring azimutal or horizontal angles, and the other for measuring distances and deelivities. The same as in all theodolites, the first part consists in a graduated horizontal limb which revolves about a vertical axis mounted on a metal stand having three arms, each of which is provided with a levelling serew C. An improved declination tube D is screwed to the under side of the divided eircle.

The base of the second or upper portion is an alidade eircle provided with verniers which turn round inside the divided eircle, being concentric thereto. On top of this inner eircle is fixed a horizontal bar B which carries to the right: a fork-shaped pillar Y with wyes for the journals of the transverse axis around which the telescope revolves to turn in, to the left: a divided vertical straight edge FH, and in the centre a spirit level N, for levelling the instrument.

As in all transits and theodolites, the rotation of the whole instrument about its vertical axis, as well as that of the alidade or vernier eirele alone can be stopped at will, viz.: by tightening the clamp screws P' and P'', and the positions in azimuth of both the divided and vernier circles can be adjusted respectively with the aid of the tangent screws R' and R''.

At each end of the divided flat straight edge FH there is a lug G, fixed at right angles to its axis, and cylindrical guide holes are bored through both lugs on one and the same vertical axis. In these holes turn the close fitting ends of a prismatic guide rod T, which is parallel to the straight edge, and rests on the point of a vertical adjusting serew R.

A elamp carrying a vernier is fitted to the rod T, which can be moved from end to end and fixed at any point of its eourse by means of a tightening screw P. To this clamp is fixed in the middle of its rear face, a steel knife intended for use as a support for the telescope at its eye end.

The telescope is actually not in equilibrium when supported only on the journals of its transverse axis; the latter being secured to the telescope near the