PERISCOPIC SEXTANT FOR AERIAL OBSERVATIONS

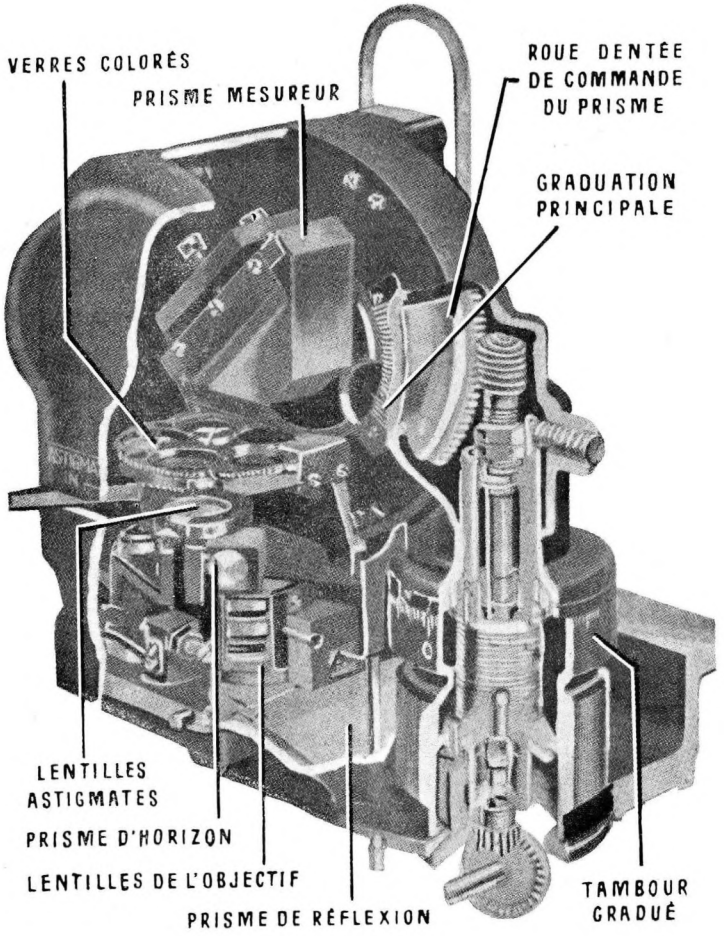

Fig. 1. — Pioneer Sextant.

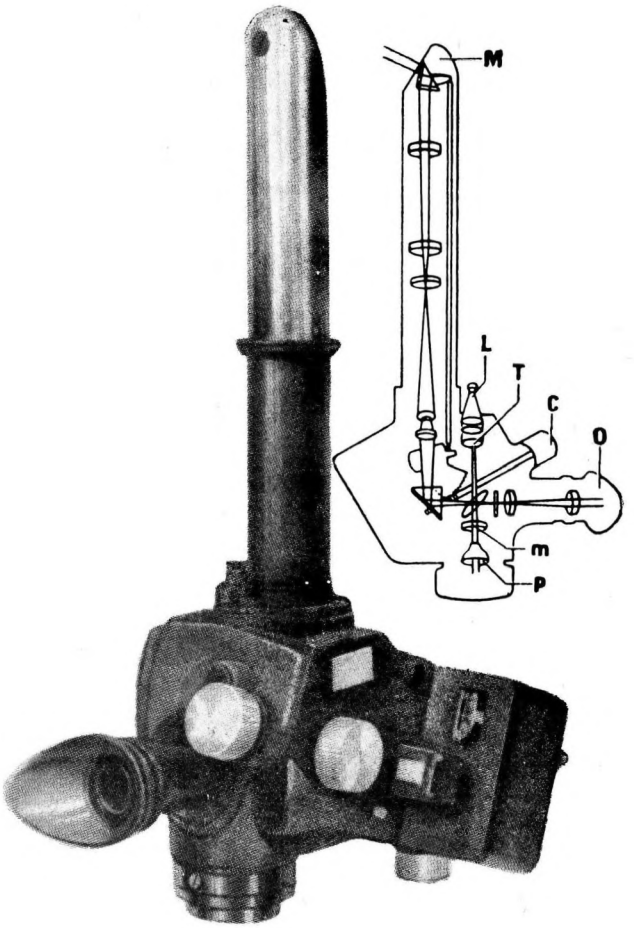

Fig. 2. — Kollsman periscopic Sextant.

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Information extracted from « La Science et la Vie », No. 429, Paris.

In spite of constant improvements in radio-navigation instruments and the considerable extension of their range, astronomic navigation, that is, the old method of sextant navigation, has maintained its position. On aircraft, the sextant has been adapted to aerial navigation by the addition of artificial horizons, generally of the bubble type, and a chronometer averaging apparatus which allows for the easy shooting of a large number of sights plotted on the same star. However, the development of flights at high altitude has made sextant observations impossible in the open air, while the installation of revolving glass observation domes in the upper part of the cockpit has the disadvantage of deflecting the light rays emanating from the star under observation and, consequently, of necessitating the shooting of sights on stars of comparatively high altitude.

The production of a periscopic sextant has overcome these disadvantages. The Kollsman periscopic sextant, which is also fitted with an improved Diemal-Black-Ball altitude integrator, allows for the immediate determination of the average altitude of a star at any time of observation, such observation being able to last for as long as a maximum of two minutes.

The June, 1953, issue of « Science et Vie » (No. 429), Paris, contains an article by Antoine Bastide setting out the most recent improvements attained in aeronautical observation instruments. The following two illustrations are taken from it :

Figure 1 — *Pioneer Sextant*

Although this model does not include the artificial bubble horizon or the chronometer averaging apparatus, the sectional illustration opposite shows, in one compact unit, the intricacy of the aviation sextant.

Figure 2 — *Kollsman periscopic sextant*

The Kollsman periscopic sextant overcomes the disadvantages of the revolving dome by means of a small, luminous slot, « T », kept in the horizontal position by a pendulent device, « p », reflected at « M » by the mirror « m », and supplying the artificial horizon.

« M » is the measurement prism controlled by knob « C »; « L » is the light lamp; the sight is taken through the eye-piece, « O ».

In aerial navigation, an effort is being made to replace logarithm calculations of the position line of a star by simple and rapid means using either mechanical devices, such as the Kaster Spherant, or various mechanographical methods employing transparencies which allow for the direct plotting of altitude curves. In the case of heavy aircraft with accomodations for navigation it is possible to employ special navigational charts or tables which allow for a more accurate use of data and for the use of special ephemerides designed specifically for the aviator.