



No. 22.

LIETZ PRELIMINARY TRANSIT.

(Patent applied for.)

For details and price see following page.

No. 22. Lietz Preliminary Transit.

[Patent applied for.]

Price of instrument as shown on page 165 with tripod and box, containing all the usual accessories, such as plumb bob, screw-driver, reading glass, etc., \$60.00. The extras for which additional charge is made are as follows :

Stadia hairs fixed.....	\$3 00
Extension tripod in lieu of ordinary.....	2 50

DIMENSIONS AND WEIGHT.

Length of telescope.....	6	inches
Diameter of objective.....	$\frac{3}{4}$	"
Length of needle.....	$3\frac{1}{4}$	"
Diameter of horizontal plate.....	3	"
Magnifying power to telescope (diameters).....	4	
Weight of the instrument.....	2	lbs.
Weight of case.....	2	"
Weight of tripod.....	$2\frac{1}{2}$	"

This Transit when used as a needle instrument admits to lay off the magnetic variation, so that the combination incorporates a variation plate.

No. 22. The Lietz Preliminary Transit.

[Patent applied for.]

For many purposes where great accuracy is not required, it is often far more convenient to use some small instrument which will admit of measurements within practical limits. The irrigator, farmer, ditcher, grader, building contractor, gardener, forester, road builder, etc., often require means of obtaining heights and relative positions, for which higher grade instruments would be unnecessarily refined.

It is for the use of such men that we have constructed the Lietz Preliminary Transit. This combines portability with accuracy and reliability, within a reasonable limit, at a minimum expenditure. In appearance it is identical to an engineer's transit. It possesses four leveling screws, but no shifting center. The lower axis moves in the star piece which carries the four leveling screws. It is readily clamped in any position by means of a milled head screw, working directly on the center. The

second spindle carries the top plate together with the standards and telescope. The compass is centrally located, and has a diameter of 3 inches. The plate is graduated into quadrants, in the regular way, and this graduation is utilized for reading horizontal angles, by means of a vernier, to 2 minutes of arc. The vertical arc is graduated from 0 degree to 100 degrees each way, reading to 2 minutes by a vernier which is clamped readily into any position on the telescope axis by a milled head screw, so that the position of the arc, which is stationary on the standard, admits of reading any vertical angle, by means of repetition, if over 90. The telescope is 6 inches long, has erect lenses, magnifying 4 diameters. The cross-hairs inside the telescope are not adjustable. We found this quite an improvement in this class of instruments. They are so set that the line of collimation cannot be deranged, except by a heavy fall, when the telescope axis would be bent. Stadia wires may be inserted. The telescope possesses a level $2\frac{1}{2}$ inches in length, and a tangential movement, so that the instrument represents a complete transit of modern construction, having, of course, a limited degree of accuracy, but capable of carrying out preliminaries where high-grade instruments would otherwise have to be used. Its cost is within the reach of all, and we know of no instrument better adapted to the use of the student than one of these complete little field instruments with which so much can be accomplished and so much can be learned. Every feature of the transit is represented here and it admits of obtaining results approaching those of the surveyor's transit and level.

Crude instruments are placed on the market to supply the demand for a fairly reliable measuring tool of small cost. These are usually worthless, as they are made without any regard for the underlying principles that should govern the make of such an article. But with the Lietz Preliminary Pocket Instrument, for which patent has been applied, the object has been attained. Every part is carefully made and neatly finished and its cost is less in comparison than the inferior articles that are usually offered for sale in the market.