(No Model.)

A. J. LESCHORN.

INSTRUMENT FOR TRIGONOMETRICAL COMPUTATIONS.

No. 378,257. Patented Feb. 21, 1888.

Fig. 1.

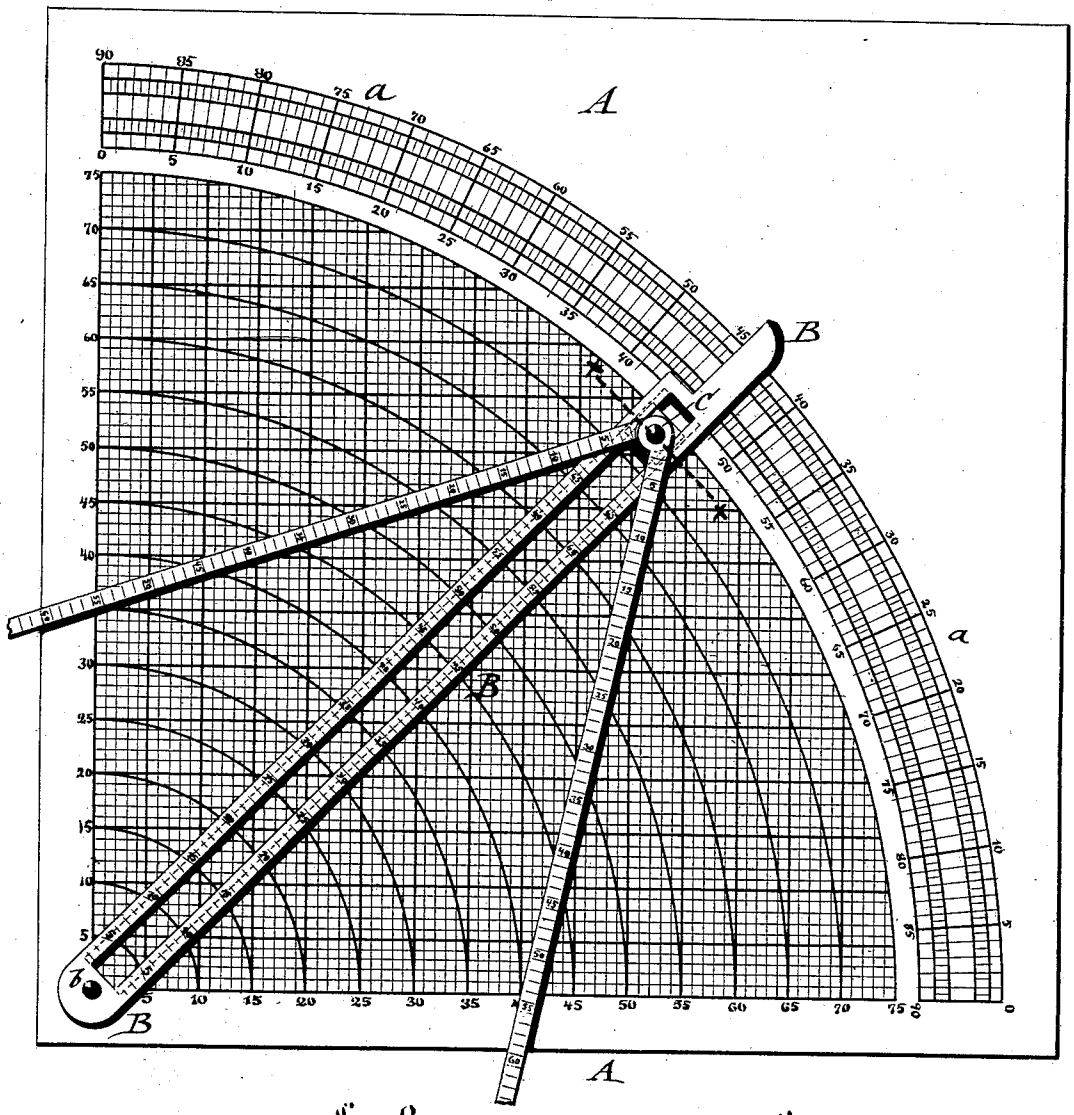


Fig. 3.

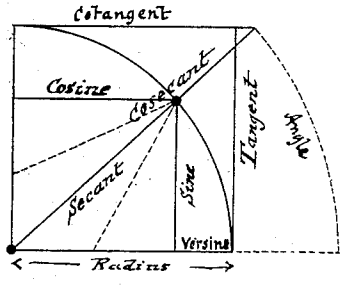
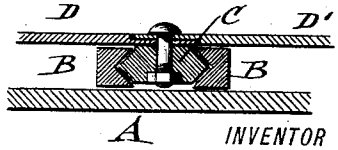


Fig. 2.



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ALEXANDER J. LESCHORN, OF PHŒNIXVILLE, PENNSYLVANIA.

INSTRUMENT FOR TRIGONOMETRICAL COMPUTATIONS.

SPECIFICATION forming part of Letters Patent No. 378,257, dated February 21, 1888.

Application filed December 21, 1887. Serial No. 258,560. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER J. LESCHORN, of Phœnixville, in the county of Chester and State of Pennsylvania, have invented certain new and useful Improvements in Trigonometers, of which the following is a specification.

This invention relates to an improved trigonometer or instrument by which a number of trigonometrical computations can be quickly performed in a graphical manner, so as to be useful for making proportional calculations, for determining the length of the sides of a triangle when the angles are given in degrees, for finding by one setting the secant, cosecant, sine, versine, cosine, tangent, and cotangent of any angle, and for making calculations required in graphostatics and for other purposes.

The invention consists of a trigonometer or measuring-instrument, which is composed of a base plate or sheet provided with a graduated quadrant of a circle and a scale formed of the subdivided sides of said quadrant, and the co-ordinates of said subdivisions. To the apex of the angle of the quadrant is pivoted a slotted graduated arm for setting off any angle on the graduated quadrant, said arm supporting a slide-piece to which are pivoted graduated auxiliary arms, by which, in connection with the radial arm and the quadrant, the different computations are made.

In the accompanying drawings, Figure 1 represents a top view of my improved measuring apparatus for trigonometrical computations. Fig. 2 is a detail vertical transverse section on line *x x*, Fig. 1; and Fig. 3 is a diagram illustrating the trigonometrical lines on which my improved measuring-instrument is based.

Similar letters of reference indicate corresponding parts.

In the drawings, A represents a base plate or sheet, which is made either of paper, wood, metal, or other suitable material. On the base-plate A is arranged a quadrant of a circle, *a*, which is divided in ninety degrees, each degree being again subdivided according to the size of the base-plate. The radii which form the sides of the quadrant *a* are also subdivided and connected by concentric arcs of quadrantal shape, and by intersecting co-ordinates arranged at right angles to said sides and extending to the outermost quadrantal arcs, as shown in Fig. 1. A slotted arm, B, is pivoted to the apex of the angle of the quadrant *a* at *b*, the slot of the arm B serving to guide a dovetailed slide-piece, C, to which are pivoted auxiliary arms D D′, of equal length, which, like the radial arm B, are subdivided in the same manner as the sides of the radii. The pivoted radial arm B can be moved over the quadrant, and the auxiliary arms D D′, which are pivoted to the slide-piece C, can be set into any position to the radial arm as required in reading off the measurements.

A number of mathematical computations, which are based on the problems of trigonometry, can be made by graphical means in a quick and accurate manner, so that the instrument is useful for architects, engineers, mechanics, and others who desire to make computations of the class described in an approximately correct manner.

The use of the instrument will be readily comprehended by any one conversant with trigonometry, it being not necessary to go into descriptive details of the different computations which can be performed by the same.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

A measuring-instrument for trigonometrical computations, composed of a graduated quadrantal base-plate, a slotted radial arm pivoted to the apex of the angle of the quadrant, a slide-piece guided in the radial arm, and auxiliary arms pivoted to said slide-piece, the radial and auxiliary arms being graduated so as to correspond to the graduation of the sides of the quadrantal base-plate, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ALEXANDER J. LESCHORN.

Witnesses:
PAUL GOEPEL,
MARTIN PETRY.