

Jan. 24, 1950

N. PORGES ET AL

2,495,675

PLANIMETER

Filed Nov. 29, 1945

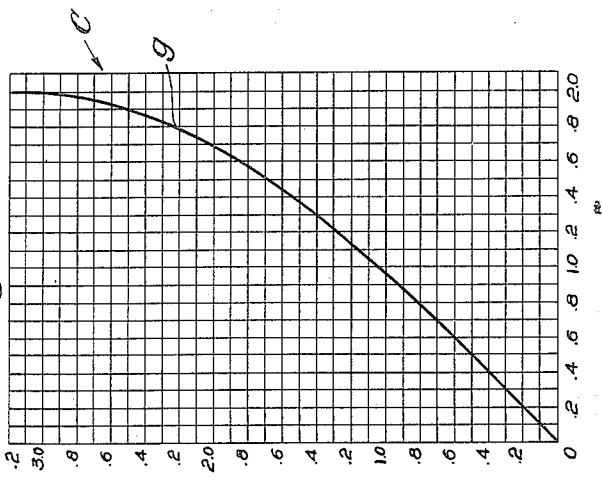


Fig. 3.

INVENTORS
Nandor Porges
BY *Joseph T. Hogan*

Nandor Porjes

BY *Joseph T. Hogan.*

James Atkins.
Attorney.

Attorney.

UNITED STATES PATENT OFFICE

2,495,675

PLANIMETER

Nandor Porges, Newark, N. J., and Joseph T. Hogan, New Orleans, La.; said Hogan assignor to said Porges

Application November 29, 1945, Serial No. 631,582

4 Claims. (Cl. 33—122)

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This invention relates to a planimeter.

Planimeters have been in use for some time and are adapted for ascertaining the areas of irregular figures. The planimeter now in use generally comprises an elongated arm provided at one end thereof with a tracing point and at the other end thereof with an impression marker or spatula.

In the use of such instruments in measuring the area of an irregular figure, a straight line is drawn from the approximate center of gravity of the figure to a point in the right edge thereof. The tracing point is then placed on the center of gravity and the planimeter set so that the marker or spatula rests at a point almost perpendicular to the line and away from the operator and the point at which the spatula rests is marked.

The tracing point is now moved along the straight line to the periphery of the figure, then along the periphery clockwise or counterclockwise until the straight line is reached and then back to the center or starting point. The point where the spatula comes to rest is then marked.

The path of movement of the tracing point may be reversed about the figure, and the average distance between the starting and ending points of the spatula multiplied by the length of the arm is the area of the figure.

Planimeters as heretofore constructed have been of a rigid and cumbersome construction and not adapted for convenient disposal in the transportation thereof.

A primary object of this invention is the provision of a planimeter capable of being folded into a compact form readily receivable in the pocket of a user thereof, as well as being readily distensible for use thereof.

In prior structures of this kind, the tracing point was grasped directly by the fingers with a resulting frictional movement of the point on the fingers in the movement of the point about the perimeter of the figure.

A further object of the present invention is the provision of a finger grasping element freely rotatable relative to the tracing point.

A still further object of the invention is the provision of a planimeter which is simple in construction, relatively light in weight, dependable in operation, and one which is capable of being manufactured at relatively low cost.

With the above and other objects in view, the invention includes the following novel features and details of construction, to be hereinafter

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more fully described and illustrated in the accompanying drawing.

In the drawing:

Figure 1 is a side elevational view of the planimeter in a distended position and ready for use.

Fig. 2 is a view of the planimeter folded into a compact form for ready storage and transportation.

Fig. 3 is a detail view of the tracer point on an enlarged scale and showing the finger engaging collar in section.

Fig. 4 is a side elevational view of the spatula.

Fig. 5 is a side elevational view of a modified form of spatula.

Fig. 6 is a correction chart.

Referring now in detail to the drawing, the complete rod or radius arm comprises a pair of rods 10 and 11 which are of equal length and preferably of rectangular section.

Adjacent ends of the rods 10 and 11 are pivotally connected to a link 12 at 13, thereby adapting the rods to fold into adjacent parallel relation as in Fig. 2.

At the opposite end of rod 11 is pivotally connected at 15 an end of an arm 14 which, as indicated in Fig. 3, comprises a relatively long cylindrical portion 16 and a relatively short cylindrical portion 17 forming the tracing point.

The cylindrical portion 17 is of greater diameter than the cylindrical portion 16 defining a shoulder therebetween, and a finger engageable collar 18 is rotatably supported on the cylindrical portion 16 between the shoulder and the pivotal connection 15. The collar 18 is preferably roughened or serrated as indicated.

At the opposite end of the rod 10 is an arm 19 which is preferably of the same cross-section as rod 10 and which is pivotally connected thereto at 20.

The arm 19 at its end opposite the pivot 20 is bifurcated, as is more clearly shown in Fig. 2, and receives the upper portion of the relatively flat spatula 21. The spatula 21 is removably retained in position by means of a screw 22 extending through the bifurcated arm portion and a semi-circular notch 23 in the upper edge of the spatula 21. With this construction, the spatula 21 may be readily removed or replaced merely upon loosening the screw 22.

In Fig. 5 is illustrated a modified form of spatula which includes a shank 24 having a roller 25, which roller as well as member 21 is provided with a relatively sharp edge for marking by im-

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pression upon pushing down on the adjacent end of rod 10.

From the foregoing, it will be appreciated that a planimeter is provided which is capable of being readily folded for placement in a pocket, as in Fig. 2, wherein arms 14 and 19 are aligned with the respective rods 11 and 10 and the rods are folded into parallelism.

From the folded position in Fig. 2 the planimeter may be readily distended for use upon swinging the rods 10 and 11 about the pivots 13 into alignment and swinging the arms 14 and 19 about the pivots 15 and 20 into positions substantially at right angles to the respective rods as in Fig. 1.

Upon moving the tracing point 17 about the margin of the figure whose area is to be measured, the collar 18 is grasped by the thumb and forefingers and due to the collar being rotatably mounted on the arm 14 no relative movement between the device and fingers occurs as in previous constructions.

A novel chart C, indicated in Fig. 6, is provided with a horizontal series of numerals indicating straight distances traveled by the spatula divided by the distance between the tracing point and the surface engaging point of the spatula and a vertical series of numerals correlated with the numerals of the first series by the graph g.

The numerals or values in the vertical series multiplied by the square of the distance between the tracing point and spatula give the correct area of the figure measured.

It will be observed that where the straight distances of movement of the spatula are relatively small, the area is substantially equal to such distances multiplied by the distance between the tracing point and spatula. When, however, the straight distance is large, e. g. 20 inches, and the distance, as in the present case, is 10 inches between the engaging points of the spatula and tracing point, the area will be 300 square inches instead of 200 square inches which a straight line movement computation would give.

The invention is susceptible of various changes in form, proportions and minor details of construction, and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:

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1. A planimeter comprising a pair of rods having adjacent ends thereof pivotally connected to opposite ends of an intervening link for alinement of the rods in operative condition of the device and for folding of the rods into adjacent parallel relation in an inoperative condition of the device, a pair of arms having one end thereof pivotally connected to the opposite end of one of the rods, a tracing point unitary with one of the arms and a spatula removably supported by the opposite end of the other arm.

2. The structure according to claim 1, wherein the tracing point supporting arm comprises a cylindrical portion, and a finger engageable collar rotatably supported on the cylindrical portion.

3. The structure according to claim 1, wherein the spatula supporting-arm is bifurcated at its opposite end and wherein said spatula comprises a flattened portion removably disposed between the bifurcations of the arm, a screw extending through the bifurcations, and a slot in an edge of the spatula receiving a portion of the screw.

4. A planimeter comprising a pair of equal length straight rods having corresponding ends thereof pivotally connected to opposite ends of a link with the axes of said pivotal connections parallel, and a tracing point and spatula pivotally connected to respective opposite ends of the rods on axes at right angles to said first axes.

NANDOR FORGES.

JOSEPH T. HOGAN.

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