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PATENTED JAN. 19, 1904.

N. G. DAVIDSON.  
PLOTING INSTRUMENT.  
APPLICATION FILED OCT. 27, 1902.

NO MODEL.

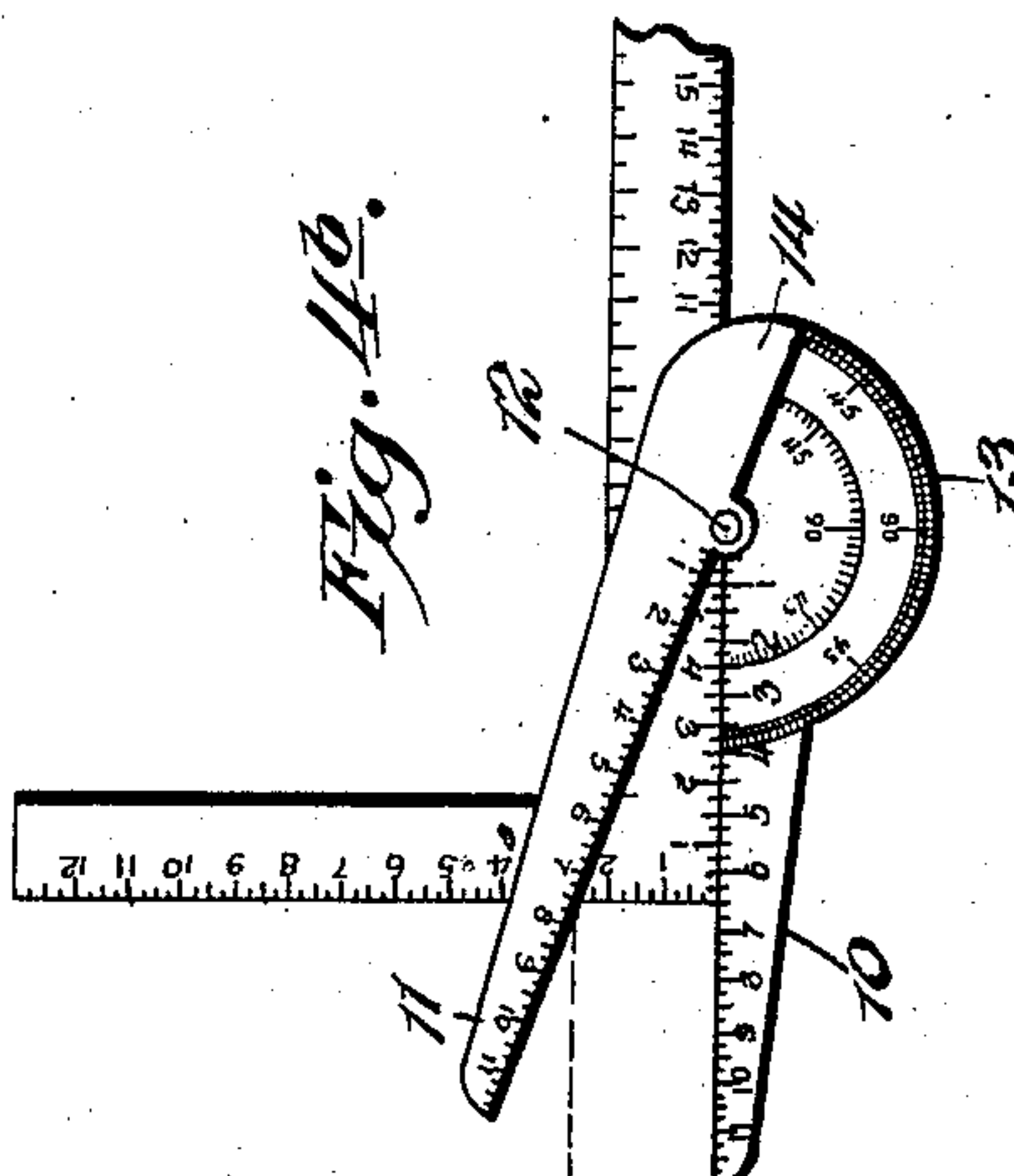
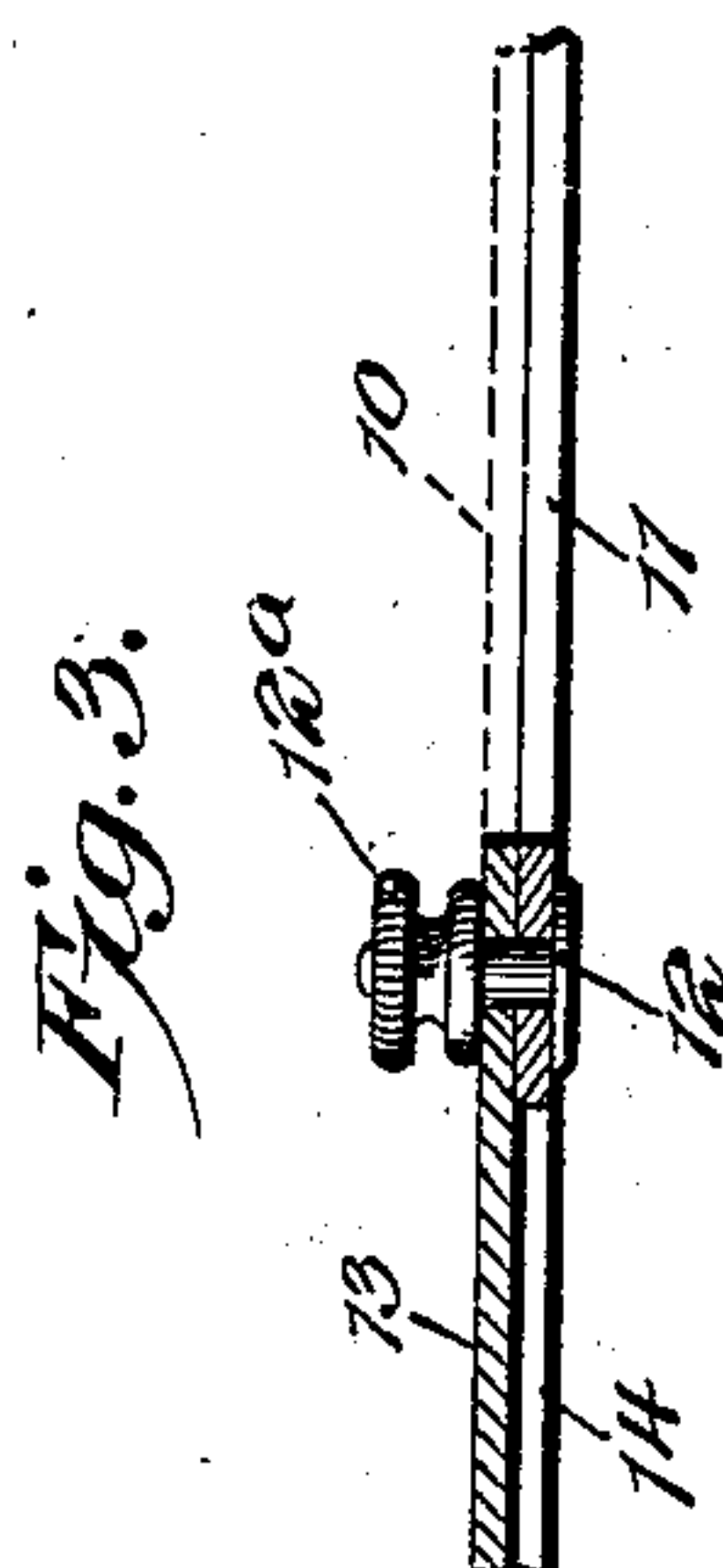
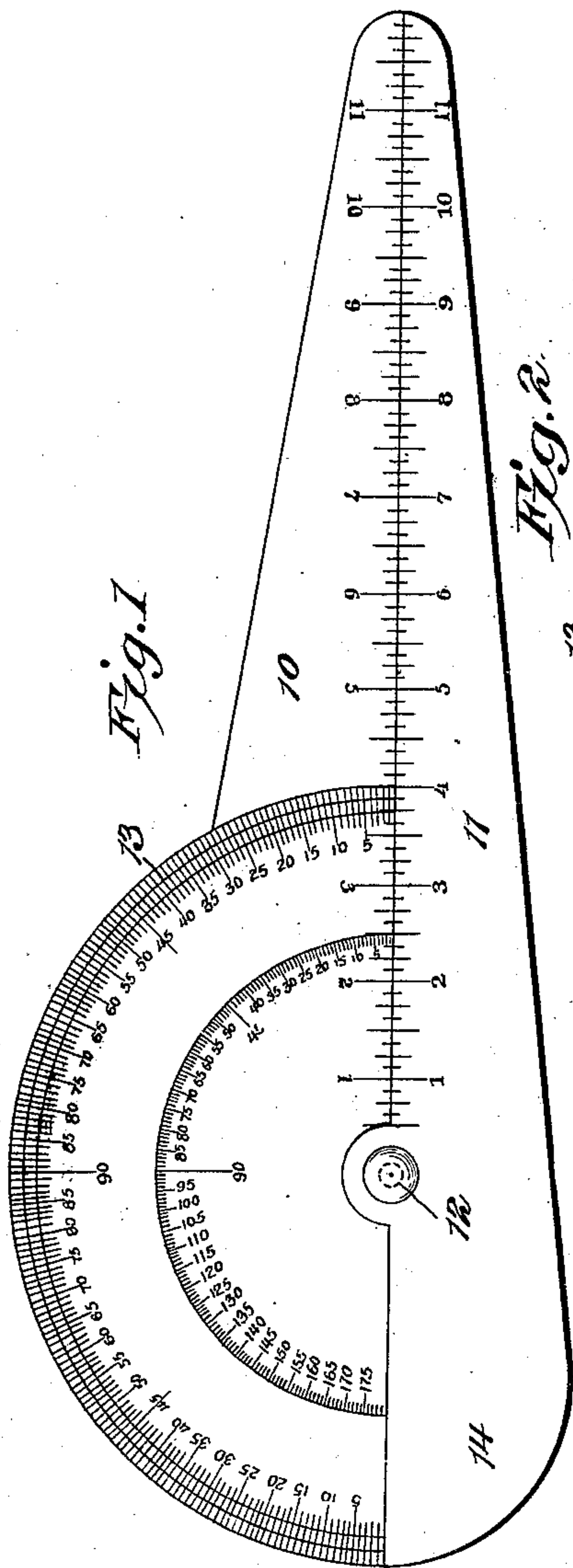
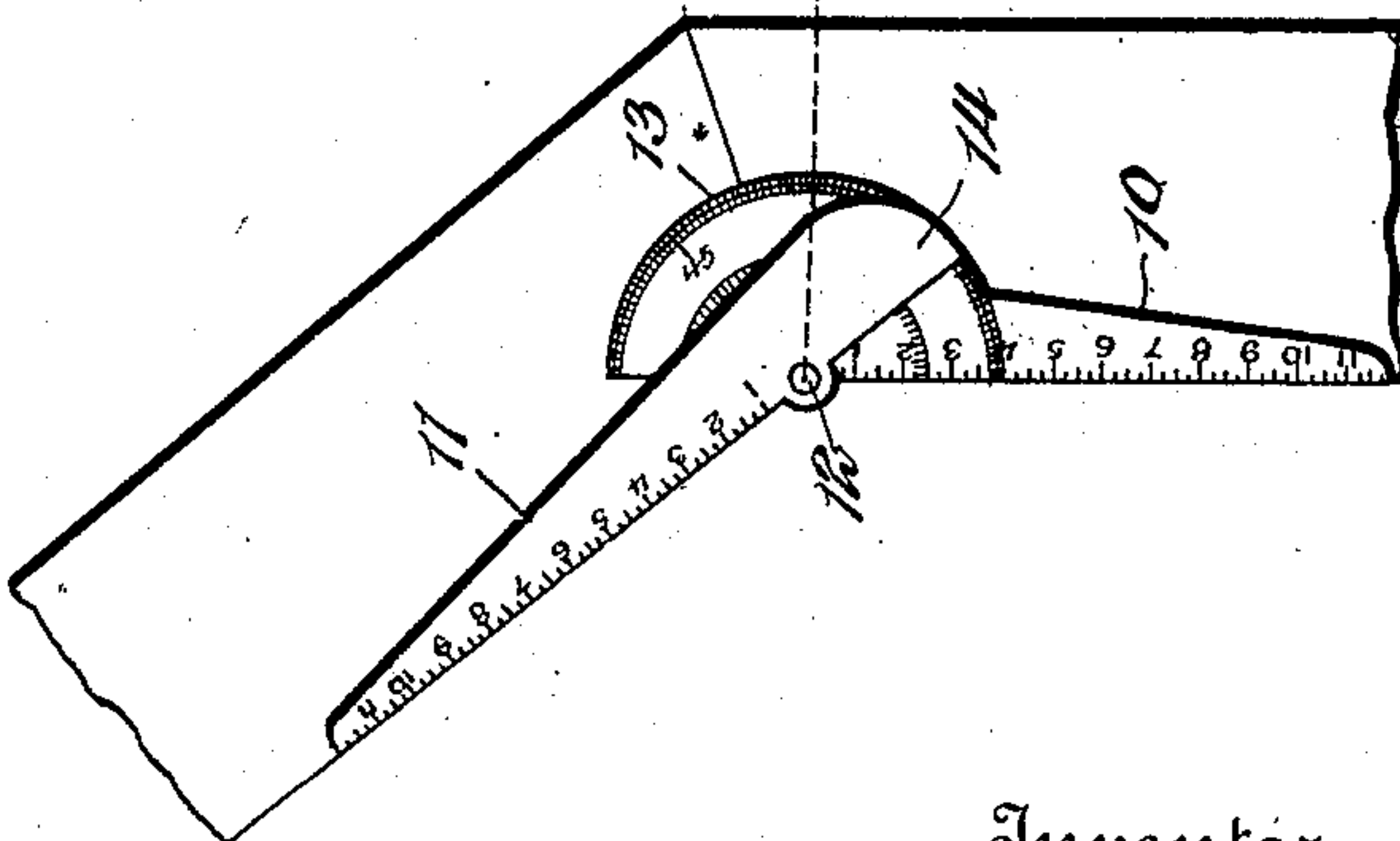


Fig. 4a.



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# UNITED STATES PATENT OFFICE.

NELS GEORGE DAVIDSON, OF ANACONDA, MONTANA.

## PLOTTING INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 749,921, dated January 19, 1904.

Application filed October 27, 1902. Serial No. 129,007. (No model.)

*To all whom it may concern:*

Be it known that I, NELS GEORGE DAVIDSON, a citizen of the United States, residing at Anaconda, in the county of Deerlodge and State of Montana, have invented a new and useful Plotting Instrument, of which the following is a specification.

This invention relates to plotting instruments for use by pattern-draftsmen and sheet-metal workers in obtaining the desired angles and pitches for cutting pipe-elbow blanks and the like.

The object of the invention is to provide a simple instrument of this character which will be readily understood by those skilled in the above-noted arts and will obviate the necessity of profile drawings and involved calculations now generally employed in laying out this class of work.

In the accompanying sheet of drawings there is illustrated the preferred embodiment of the invention, and the construction and operation thereof is described in the following specification.

In said drawings, Figure 1 is a view in elevation of the instrument. Fig. 2 is a detail sectional view of the same, showing the construction of the pivot. Fig. 3 is also a detail sectional view showing a slightly-modified form of pivot. Figs. 4<sup>a</sup>, 4<sup>b</sup>, and 4<sup>c</sup> are diagrammatic views showing one manner of using the instrument.

Similar numerals of reference designate corresponding parts in all the figures of the drawings.

The instrument, as shown, comprises two members or arms 10 and 11, connected intermediate their ends by means of a pivot 12. This pivot may be in the form of a rivet, as shown in Fig. 2, or a headed and threaded shank may be employed, upon which a clamping thumb-nut 12<sup>a</sup> may be screwed. The two arms 10 and 11 are located in different planes of movement, and their inner edges are straight, each of said edges being provided with a scale, the starting-point of which is the center of the pivot. The center of this pivot, as will be noted by reference to Fig. 1, is in direct alinement with the inner edges of the arms. One end of the arm 10 is enlarged, as

shown, and is preferably in the form of a sector 13, said quadrant being provided with a plurality of scales disposed concentrically to the pivot 12. The scales are marked into degrees and fractions thereof, the inner running from zero to one hundred and eighty degrees, the outer being marked from the edge to the center, or ninety degrees, as illustrated. The corresponding end of the arm 11 constitutes an indicator 14, which moves over the sector-scales, the straight edge of said indicator co-acting with the same. This arrangement is obtained by having the sector located on the side of the pivot opposite the straight edge, which is provided with the scale.

The manner of using the instrument may probably be best explained as follows: For example, if it is desired to lay out a six-and-one-half-inch-pipe elbow having an angle of one hundred and forty degrees and formed of two pieces, as shown in Fig. 4<sup>a</sup>, the arms of the instrument are first arranged at the desired angle, thus showing upon the sector-scale the difference between the same and one hundred and eighty degrees, or a half-circle. The number of degrees thus found is divided by two, or the number of pieces to be employed in the elbow. The result is twenty degrees, and the instrument is then set with the arms at this angle, after which one arm is placed alongside one blade of a square and the six-and-one-half-inch mark thereon (representing the diameter of the pipe) located at the corner of said square. The point of intersection of the inner edge of the other arm of the instrument and the outer edge of the other blade of the square will indicate the distance between the throat and the back of the pipe-section to be cut. This arrangement is clearly illustrated in Fig. 4<sup>b</sup>. The distance thus obtained is then laid out upon the pipe-blank, as shown Fig. 4<sup>c</sup>, and the line of cut is obtained in a manner well understood. This of course is an example of the simplest character, but it will serve to indicate the usefulness of the instrument, and it will be evident to those skilled in the art that computations of a much more involved nature can be readily made.

As the results obtained must be accurate, certain features should be noted, all of which



are important to the successful operation of the instrument. In the first place the pivot for the two members or arms must be alined with the inner or active edges of the same, and  
5 the scales located along said edges must have their starting-points at the center of the pivot. Furthermore, the sector-scales should be concentric to the pivot, and the indicator edge of the pointer should aline with the active edge  
10 of the arm. This construction affords a simple instrument by means of which angles for various purposes can be quickly and accurately plotted and the necessity of profile drawings thereby avoided.

15 From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood  
20 that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

25 Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

As an article of manufacture, an instrument of the class described comprising a pair of flat  
30 members pivoted together between their ends and swinging side by side in different planes, said members having adjacent straight edges, one of which extends from end to end thereof, coacting scales arranged on said coacting edges  
35 and extending from the pivot toward one end of the instrument, the portion of one arm surrounding the pivot being provided on one face with a sector-scale disposed concentrically to the pivot and extending on opposite sides of  
40 the same, the other member being movable over said face and having its straight edge co-acting with the scale thereof.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

NELS GEORGE DAVIDSON.

Witnesses:

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