(No Model.)

O. TYBJERG.

PROTRACTOR.

No. 346,519. Patented Aug. 3, 1886.

Fig. 1.

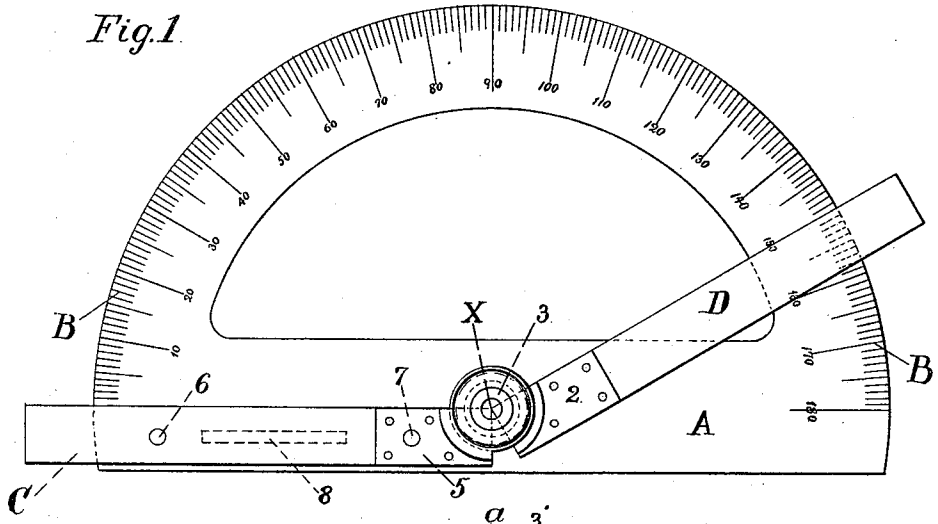


Fig. 2.

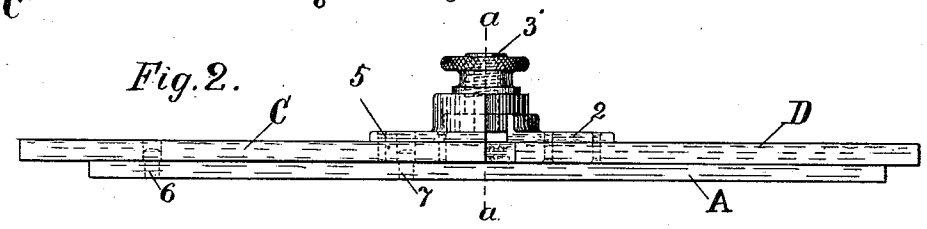


Fig. 4.

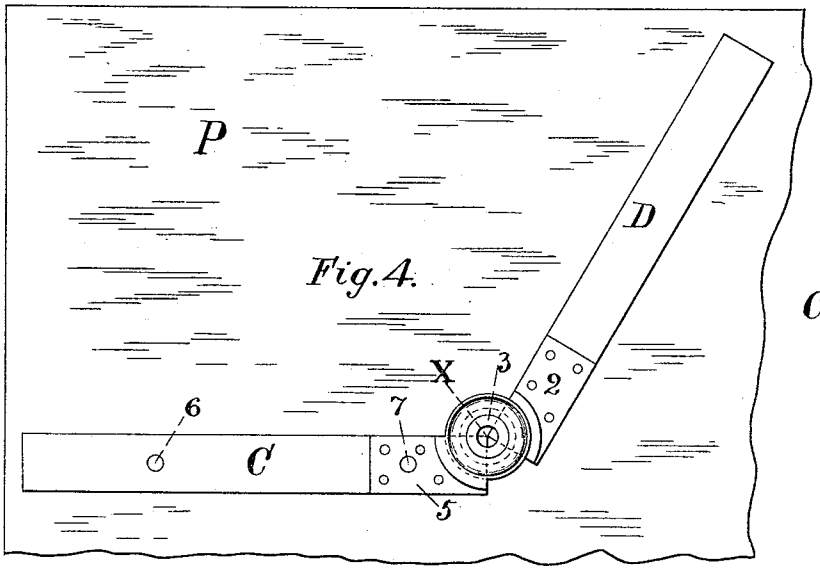


Fig. 3.

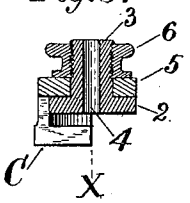
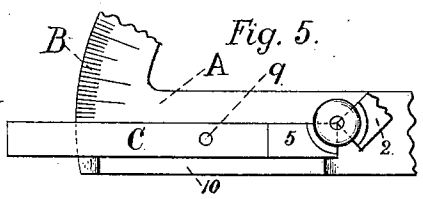


Fig. 5.



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UNITED STATES PATENT OFFICE.

OLUF TYBJERG, OF COPENHAGEN, DENMARK.

PROTRACTOR.

SPECIFICATION forming part of Letters Patent No. 346,519, dated August 3, 1886.

Application filed December 4, 1885. Serial No. 184,708. (No model.)

To all whom it may concern:

Be it known that I, OLUF TYBJERG, a subject of the King of Denmark, and a resident of Copenhagen, in the Kingdom of Denmark, now temporarily residing at Hartford, in the county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Protractors, of which the following is a specification.

This invention relates to improvements in that class of protractors used by draftsmen and tool-makers for laying off angular distances, the object being to furnish a more convenient instrument whereby such distances may be set off with precision.

To this end the invention consists in the improvements and combination hereinafter set forth.

In the drawings accompanying and forming a part of this specification, Figure 1 is a top view of a complete instrument embodying my improvements. Fig. 2 is a side elevation of the same. Fig. 3 is a section in line *a a*, Fig. 2. Fig. 4 is a view illustrating the application of the protractor to the laying out of angles. Fig. 5 is a top view of a part of the instrument, showing a modified construction thereof.

Similar characters designate like parts in all the figures.

My improved protractor consists, substantially, of a graduated table or plate, a jointed ruler, and means for accurately placing and replacing the ruler on the plate.

In the drawings, A designates the plate, having the usual graduation-lines, as B, which generally indicate degrees.

The jointed ruler comprises two parts, C and D, connected by a joint, the axis of which coincides at X with the inner corner of each part. Said joint may be of any suitable construction consistent with the aforesaid condition; but I prefer one made as follows: A short plate, 2, rigidly fixed to ruler D, has formed thereon a stud, 3, whose center is the axis of the joint, and which stud has a central opening, 4, through which to observe the edges meeting at the axis X. Another plate, 5, similar to plate 2, is fixed to ruler C, and bored to fit accurately on stud 3. A nut, 6, fitting a screw-thread formed on stud 3, serves to firmly clamp together the two joint-plates, and thus hold the rollers C and D in any desired position relative to each other within their working limits. The jointed ruler is placed on the plate with its axis accurately corresponding to that of the graduate arc B B, and with one part, C, coinciding with one extreme of said arc, as shown in Fig. 1. Part C is removably held in that position by fixed stops or guides. These should be placed at some distance apart, to secure the uniformly accurate setting of the ruler. As shown in the first four figures of drawings, said stops are two short plain dowel-pins, 6 and 7, fixed in plate A, and closely fitting holes in ruler C. Said pins being neither of them at or close to the axis of the joint, they do not prevent (as they otherwise would do) the rulers meeting at X, as above described.

Instead of the two pins 6 and 7, above described, I may use, as an equivalent therefor, one long and narrow pin, as indicated by dotted lines at S in Fig. 1, this pin fitting a slot of similar form in ruler C. Another modification for the same purpose consists in a single dowel-pin, 9, Fig. 5, fitting a hole in said ruler, and a rib or ledge, 10, fitting against the side thereof, to prevent it turning on said pin. In practice, however, the simple pins, first described, are considered preferable to the other forms of guides.

In using the instrument the jointed ruler is laid on the graduated plate A, with part C on the stops, as described, and the joint being unclamped, part D is swung to the required division of the arc, when the joint is clamped. The ruler thus adjusted is next removed from the plate and laid on the sheet of paper P, or other surface on which the angle thus transferred is to be set off.

It will be understood that my improved instrument may be made of various materials, and constructed of such proportions as will adapt it for use in the various situations wherein protractors in general are applicable.

Having thus described my invention, I claim—

1. The improved protractor herein described, it comprising a graduated plate, a

jointed ruler, and fixed guides, substantially as described, whereby said ruler may be accurately placed and replaced on said plate, substantially as set forth.

2. In a protractor, the combination, with a graduated plate, of a jointed ruler having parts C and D, and of guide-pins fixed in the plate, and fitting holes in part C, said pins being arranged to hold the rule with the axis of its joint coincident with the center of the graduated arc, substantially as set forth.

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