J. R. MAHON.

PROTRACTOR.

APPLICATION FILED MAY 16, 1919.

1,414,033. Patented Apr. 25, 1922.

Fig. 1.

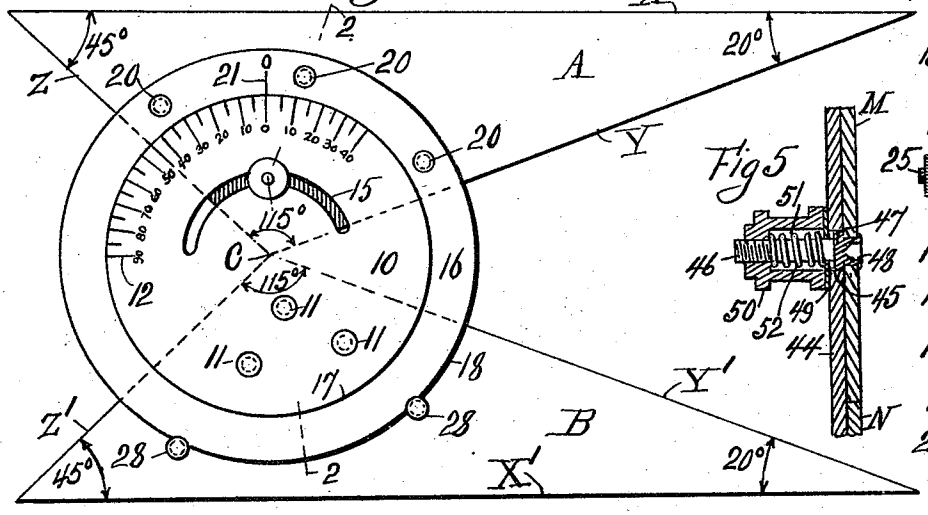


Fig. 2.

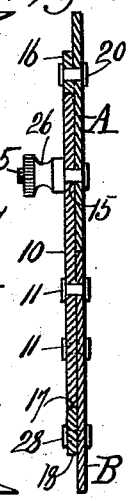


Fig. 5

Fig. 3.

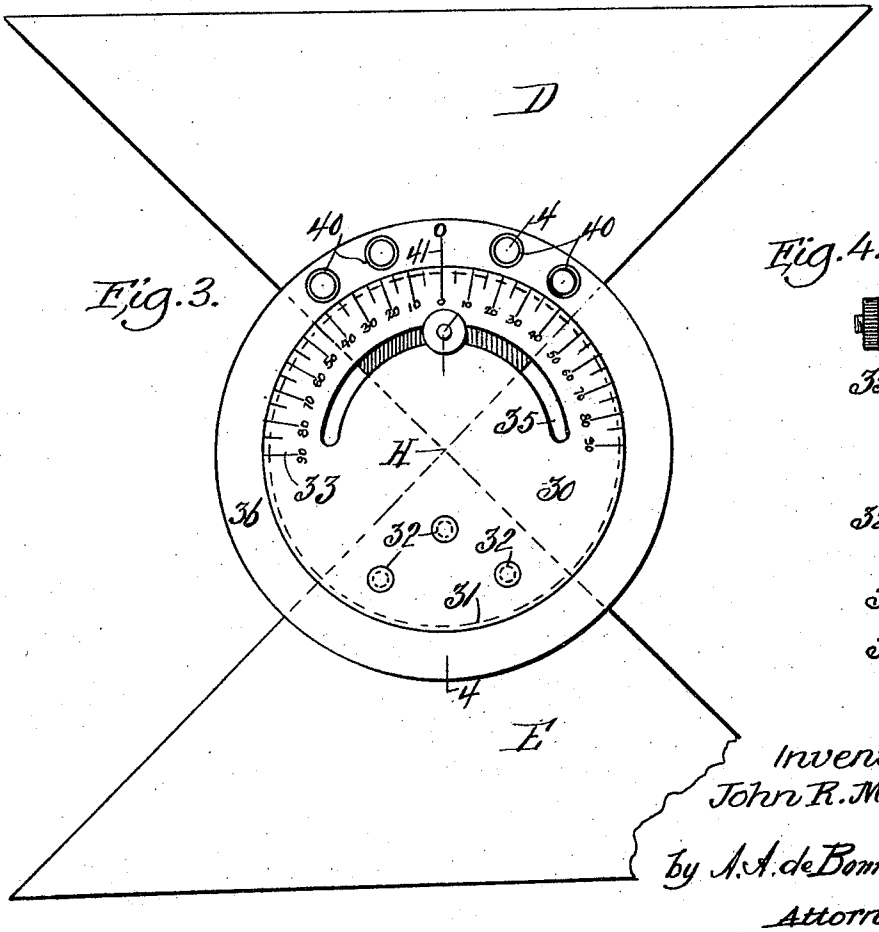
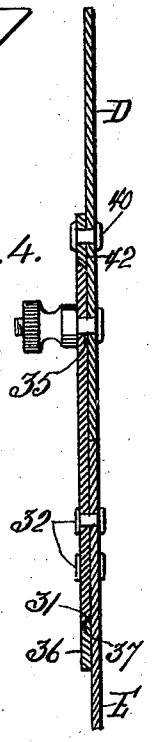


Fig. 4.



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UNITED STATES PATENT OFFICE.

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PROTRACTOR.

1,414,033. Specification of Letters Patent. Patented Apr. 25, 1922.

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To all whom it may concern:

Be it known that I, JOHN R. MAHON, a citizen of the United States and a resident of the borough of Manhattan, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in a Protractor, of which the following is a specification.

This invention relates to a protractor the novel construction of which comprises a pair of similar triangular members, adjustably connected at corresponding apexes, so that they can be rotatively adjusted about said apexes.

In the accompanying drawings which exemplify the invention, Fig. 1 shows a plan view of the protractor with a pair of obtuse triangular members; Fig. 2 represents a section of Fig. 1 on the broken line 2, 2 with some elements in full; Fig. 3 shows a plan view of another form of the protractor with a pair of right angled triangular members; Fig. 4 is a section of Fig. 3 on the broken line 4, 4 with some elements in full and Fig. 5 shows a sectional view of a modification.

Referring to Figs. 1 and 2 a pair of equal and obtuse triangular members A and B, with their surfaces in the same planes, are located with the apexes of their obtuse angles at a point C. A central circular disc 10 is fastened to the triangular member B by means of the rivets 11. The disc 10 at a portion adjacent to its circumferential edge has formed thereon a scale 12. A slot 15 concentric with the point C is formed in said disc. A ring 16 has its inner circumferential edge 17 and its outer circumferential edge 18 perpendicular to the plane of the face thereof, and it is securely fastened to the triangular member A by means of the rivets 20. An indicator line 21, marked O is indicated on the outer face of the ring 16. The disc 10 and ring 16 constitute a joint for the members A and B.

The inner circumferential edge 17 of the ring 16 registers with the outer circumferential edge of the central disc 10. A screw 25 is tightly secured in the triangular member A, extends through the slot 15, and is provided with the thumb nut 26. A pair of rivets 28 secured to the member B rotatively engage the ring 16.

In Figs. 3 and 4 the protractor is shown to comprise the equal right angled triangular members D and E with their faces in the same planes and said members are located so that their apexes at their right angles meet at the point H. A central disc 30 with the beveled circumferential edge 31 is fastened to the triangular member E, by means of the rivets 32. The disc 30 at a portion adjacent to its circumferential edge has formed thereon a scale 33. A slot 35 concentric with the point H is formed in said disc 30. A ring 36 with the inner beveled circumferential edge 37 is securely fastened to the triangular member D, by means of the rivets 40. An indicator line 41 marked O is indicated on the outer face of the ring 36. The inner beveled circumferential edge 37 of the ring 36 registers with the beveled circumferential edge 31 of the central disc 30 and thereby the lower side 42 of the ring 36 is maintained in contact with the adjacent face of the triangular member E.

In the modification shown in Fig. 5, a sectional view of a pair of triangular members M and N respectively similar to A and B, are indicated with the sectional view of a central disc 44 similar to 10, having a slot 45 similar to 15. A screw 46 has formed on its shank the flange 47, that has extending therefrom the sleeve end 48. The screw is fastened to the member M by locating the flange 47 on the top face thereof and riveting the sleeve end 48 thereto. A washer 49 is carried on the shank of the screw 46 and bears on the central disc 44. A thumb nut 50 in threaded engagement with the screw 46 has a cavity 51. A spring 52 bears between the crown of the cavity 51 and the washer 49. The thumb nut 50 with its washer 49 and screw 46 constitute a friction clamp to adjustably clamp the central disc 44 to the triangular member M.

Referring to the Figs. 1 and 2 the triangular members A and B have each an obtuse angle of 115 degrees, an acute angle of 20 degrees and a third angle of 45 degrees. Each of the edges X, Y and Z can be used as a ruling edge. The protractor is preferably used with the edge X′ of the member B bearing against the ruling edge of a T square, a triangle or straight edge. In this instance the member A has its edge X located parallel to the edge X′. The member A can be rotated up to the left so that its ruling edges will make angles of from 0 degrees to 90 degrees with their present

positions, and down to the right so that said ruling edges will make angles of from 0 to 40 degrees with their indicated positions.

The member B is shown with the ruling edges X′, Y′ and Z′ and can be moved down to the left so that its ruling edges will make angles of from 0 to 90 degrees with their present positions, and up to the right so that its ruling edges will make angles of from 0 degrees to 40 degrees with their present positions. The members are rotated by slightly unscrewing the thumb screw 26 or overcoming the tension of the spring 51, when the modification shown in Fig. 5 is used.

By placing the edge X of the triangular member A against a T square, or the like, and using the edges of the member B the directions of the lines made with the edges of the latter member are reversed from those made with the ruling edges of the member A, thereby permitting included angles to be drawn with the lines initially drawn with the ruling edges of the member A.

The protractor shown in Figs. 3 and 4 can be used in a manner similar to that just described, with this modification. Each of the members D and E can be swung through angles from 0 degrees to 180 degrees and the edges of the members can be made to take corresponding directions.

The construction shown in Figs. 1 and 2 permits the edges X′ and X to be a comparatively short distance apart when they are parallel to each other.

Having described my invention what I desire to secure by Letters Patent and claim is:

1. In a protractor the combination of a pair of triangular members each with three ruling edges, a central disc fastened to one of the members and adjustably connected to the other member, a ring registering with said central disc fastened to the member that adjustably carries the disc and bearing on the other member and means to maintain the disc and ring in register with each other.

2. In a protractor the combination of a pair of triangular members, each with ruling edges, a central circular disc with a scale adjacent to its circumferential edge fastened to one of the members, said disc having a slot concentric with its center, a screw with its shank fastened to the second member and extending through said slot, a thumb nut in the screw to clamp the disc to said second member, a ring registering with said disc fastened to said second member, said ring having an index line to coact with the scale on the central disc and means to rotatively connect said ring with said first member.

3. In a protractor the combination of a pair of triangular members, each with ruling edges, a central circular disc with a scale adjacent to its circumferential edge permanently fastened to one of the members, a friction clamp adjustably connected to said disc and permanently connected to the second member, and a ring registering with said disc permanently connected to the second member and rotatively connected to the first member.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 30th day of April, A. D. 1919.

JOHN R. MAHON.