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PROTRACTOR

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5 Claims. (Cl. 33—75)

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This invention relates to improvements in protractors and more particularly to protractors such as used by draftsmen, artisans or students for measuring and laying out angles on drawings or flat surfaces.

An object of this invention is to provide a protractor having improved means for supporting the center-pin thereof in such a manner that it may be easily adjusted.

A further object of the invention is the provision of improved means for supporting the center-pin of a protractor so that it may be retracted from its operative position when the protractor is not in use.

Further objects and advantages of this invention will be more clearly understood from the following description and the accompanying drawings in which:

Fig. 1 is a plan view of a protractor embodying my invention.

Fig. 2 is an elevational view thereof.

Fig. 3 is an end view.

Fig. 4 is an enlarged side view, partly in central vertical section, on line 4—4 of Fig. 1.

Fig. 5 is an enlarged front view on line 5—5 of Fig. 1.

Fig. 6 is a similar view, but illustrating the center-pin in retracted position.

Fig. 7 is an enlarged front view in section on line 7—7 of Fig. 4.

In the embodiment of my invention illustrated in the drawings, the numeral 5 generally denotes a protractor plate which is preferably made of a thin plastic material or the like. This plate has a semi-circular portion 6 which is provided along its peripheral edge with a graduated scale 7 divided in degrees as shown in Fig. 1. A blade portion 8 extends radially from the portion 6 and has a scale 9 divided in inches and fractions thereof along its straight front edge 9-a.

In accordance with the present invention, I provide a supporting block 10 which has circular studs 11—11 thereon that extend through spaced apertures in the plate 5 and are headed over so as to firmly secure the said block to the plate as shown in Figs. 4 and 7.

A supporting shaft 12 is rotatably and slidably mounted in a bore 13 which extends longitudinally through the block 10 and the said bore has a reduced portion 14 which provides an annular shoulder 15 therein. The shaft 12 also has a reduced portion, indicated at 16, that provides an annular shoulder 17. The reduced portion 16 of the shaft 12 projects through the reduced portion 14 of the bore 13 and a spring 18 sur-

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rounds the said reduced portion 16 of the shaft and is located between the shoulders 15 and 17 of the bore and shaft respectively.

The portion 16 of the shaft 12 has a transverse opening extending therethrough in which there is slidably mounted a center pin 19 which is provided with a needle point 20. The pin 19 is secured to the said shaft by means of a clamping screw 21 that is threaded into the front end of the reduced portion 16.

The block 10 has a vertical groove 22 and a horizontal notch 23 in its front end and the axis of each of said notches extends diametrically across the bore 14.

The rear end portion of the shaft 12 is knurled, to facilitate rotation thereof with the fingers.

In the use of my present invention, the center-pin 19, when in its operative position, is located within the vertical groove 22 and is retained therein by means of the endwise thrust applied against the shaft 12 by the spring 18. The center-pin may be adjusted for height by loosening the clamping screw 21 and moving the center-pin until the point 20 thereof projects below the bottom surface of the protractor plate for the desired distance.

My improved protractor is useful for measuring angles or for drawing lines of a desired length from a center point, but is particularly useful for drawing equally spaced radial lines. This may be done by placing the needle point 20 at the origin of the radial lines and then rotating the protractor about said point to bring the desired angles into register with a reference line, such as indicated at 24. The radial lines are then drawn along the straight edge 9-a of the blade 8.

When it is desired to retract the center-pin into the position shown in Fig. 6, so as to withdraw the needle point 20 and thereby avoid the possibility of damage thereto when the protractor is not being used, the shaft 12 may be forced inwardly against the tension of the spring 18 and then rotated a quarter turn and released to permit the said spring to urge the center-pin into the horizontal groove 23.

It will be noted that as the pin is rotated from one position to another, the point 20 thereof will clear the front edge of the blade portion 8 so that as the center-pin is swung into the desired position, it will not strike a portion of the said blade. The semi-circular portion 6 is also cut away as at 25 to clear the point 20 of the center-pin when the pin is rotated in its direction.

I claim:

1. A protractor comprising a flat plate having a semi-circular portion, a supporting block on the upper surface of said plate, a center-pin for said protractor, means mounted in said block for adjustably and retractably supporting said center-pin; the said means comprising a bore in said block on an axis parallel to the plane of the said plate, a shaft slidable in said bore and projecting beyond the front end of the block, a transverse opening through the projecting portion of the shaft for slidably receiving the center-pin, a clamping screw threaded to the end of said shaft and extending into said transverse opening for adjustably clamping the center-pin to the shaft and spring means urging the said shaft rearwardly and thereby adjustably retaining the said center-pin against the front end of the block.

2. A protractor comprising a flat plate having a semi-circular portion with a degree scale along the peripheral edge thereof, a supporting block on the top surface of said plate having a bore extending therethrough on an axis parallel to the plane of said plate and spaced from the said surface thereof, a shaft rotatable and slidable in said bore and extending therethrough with the front end of said shaft projecting beyond the front end of the block and the rear end of the shaft projecting beyond the rear end of the block; the said front end of the shaft having a transverse opening therethrough, a center-pin slidably carried in said transverse opening, a clamping screw for adjustably securing said center-pin in said opening, a groove in the end of said block adapted to receive said center-pin and position it with its axis extending vertically from the center of the said semi-circular portion, and spring means within said bore and surrounding the shaft for urging the said center-pin into said groove.

3. A protractor comprising a flat plate having a semi-circular portion with a scale along the peripheral edge thereof and a blade portion extending radially from the semi-circular portion, a supporting block on the upper surface of said plate having a bore extending longitudinally therethrough on an axis parallel to and spaced from the top surface of the plate and intersecting the vertical axis of said semi-circular portion, a shaft rotatable and slidable in said bore and projecting from the opposite ends of the block; the projecting front portion of said shaft having a transverse opening therethrough, a center-pin extending through said transverse

opening and slidably adjustable therein, means for clamping said center-pin to the shaft, the front end of the block having a groove therein adapted to position the center-pin with its vertical axis in register with the vertical axis of the said semi-circular portion and a separate groove for positioning the center-pin in retracted position and spring means surrounding said shaft and contained within the bore for retaining the center-pin within said grooves.

4. A protractor comprising a flat plate having a semi-circular portion and a blade portion extending radially therefrom, a block mounted on the upper surface of said plate and having a bore extending therethrough on an axis spaced from and parallel to the top surface of the plate, the said bore having a reduced portion in the front end of the block providing a shoulder within the bore, a shaft rotatable and slidable in said bore and having a reduced portion fitting within the reduced portion of the bore and projecting from the front of the block and an enlarged portion fitting within the enlarged portion of the bore and projecting from the rear of the block, the front projecting portion of the block having a transverse hole therethrough, a center-pin slidably mounted in said hole, a clamping screw for adjustably securing said pin to the shaft; the front of the block having a vertical groove for vertically positioning the center-pin with its axis upon the center of the semi-circular portion and a horizontal groove for horizontally positioning said center-pin and spring means between the said shoulder and the enlarged portion of the shaft for normally urging said shaft rearwardly to retain the pin within said grooves.

5. A protractor as set forth in claim 4 wherein the front end of the block is disposed adjacent to the front edge of the blade portion so as to prevent engagement of the point of the center-pin with the said blade as the center-pin is moved into and out of operative position.

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