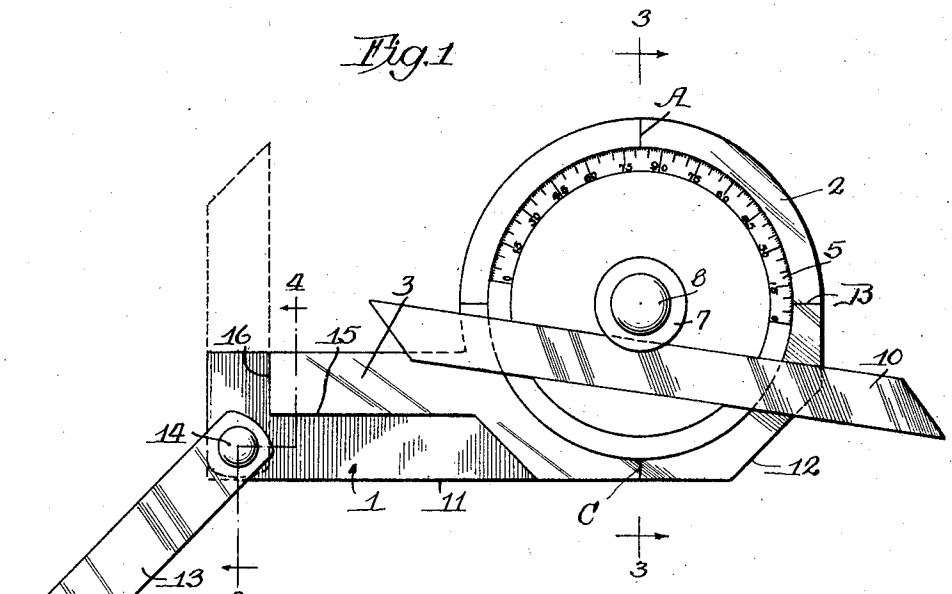
C. STRAUB.

BEVEL PROTRACTOR.

APPLICATION FILED DEC. 23, 1920.

1,392,607. **Patented Oct. 4, 1921.**

Fig. 1



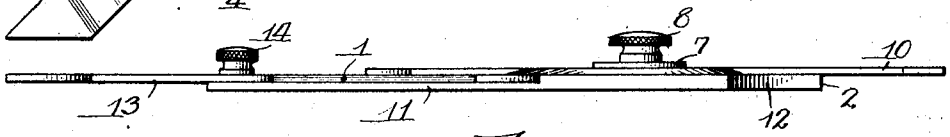


Fig. 2

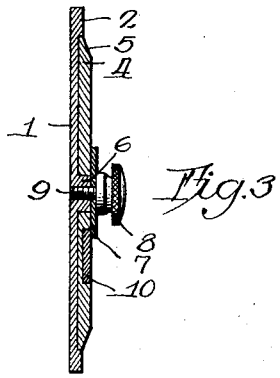


Fig. 3

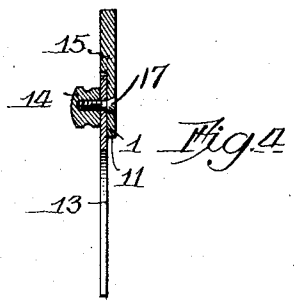


Fig. 4

Inventor:

Charles Straub

by Albert Scheible

Attorney

UNITED STATES PATENT OFFICE.

CHARLES STRAUB, OF CHICAGO, ILLINOIS.

BEVEL-PROTRACTOR.

1,392,607. Specification of Letters Patent. Patented Oct. 4, 1921.

Application filed December 23, 1920. Serial No. 432,753.

To all whom it may concern:

Be it known that I, CHARLES STRAUB, citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in a Bevel-Protractor; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to bevel protractors and in its general aspects aims to provide a bevel protractor for the use of machinists, draftsmen and the like, which protractor will afford decided advantages over the types heretofore in use. It also aims to provide a simple, compact and easily manipulated protractor which can be used with equal facility for a wide variety of work.

More particularly, my invention aims to provide a bevel protractor having a sliding arm and aims to provide single means for locking the arm both against sliding and against rotation with respect to the back or main member of the protractor. It also aims to provide a dial arranged so that it can be read equally well from a number of points, and to provide an exact peripheral angle permitting the speedy laying out of angles of 45 degrees or 135 degrees. Moreover, my invention aims to provide an independently adjustable auxiliary blade so positioned that it can readily be used either in connection with one edge of the protractor or in combination with the dial and the sliding blade for determining angles, and preferably aims to provide this auxiliary blade or arm in a convenient position for use in checking the grinding of long tapers, such as those on lathed centers or on worm thread tools. Still further and more detailed objects will appear from the following specification and from the accompanying drawings, in which drawings—

Figure 1 is a plan view of a protractor embodying my invention and showing both of the blades in position for use.

Fig. 2 is an elevation of the same.

Fig. 3 is a transverse section through the same protractor, taken centrally of the dial and along the correspondingly numbered line of Fig. 1.

Fig. 4 is a section taken along the correspondingly numbered line in Fig. 1 to show the mounting of the auxiliary blade.

In the illustrated embodiment, the protractor of my invention has a back or base portion 1, desirably of hardened steel, which back desirably includes a raised rim 2 surrounding the movable dial of the protractor, and a wing or arm 3 extending substantially tangential of the rim. Seated within the raised rim 1 is a dial 4, which dial preferably is thicker than the height of the rim 2 and preferably has a bevel edge 5 extending somewhat below the top of the rim 2. This beveled edge carries the graduations, which are therefore protected against mechanical injury by the slight projection of the rim 2 above the latter.

The dial 4 is journaled upon a hub 6 which projects upwardly from the back 1, both this hub and the bore of the dial being preferably hardened and ground, so as to insure an accurate fitting of these parts while permitting the dial to rotate freely about this hub when the protractor is to be adjusted. To lock the protractor in any desired position, I desirably provide a washer 7 under the knob 8 of a screw 9 which is threaded into the hub 6, the washer being of such size that it partly overlaps the dial 4 and will be clamped directly against a portion of the dial when the screw 9 is tightened by turning the knob 8.

The face of the dial 4 has a groove which extends substantially tangential of the hub 6 and also partly extends under the washer 7, so as to afford a guideway for receiving the main blade 10 of the protractor. This blade is of such a thickness that it will also readily be clamped by the washer 7, so that the single operation of turning the knob 8 will lock the dial against rotating and will clamp the blade 10 against sliding upon the dial. Consequently, I reduce the number of movements necessary for such purposes during the adjusting, and also reduce the expense of manufacture, as it has heretofore been necessary to employ separate provisions for locking the dial and for clamping the blade in a longitudinally adjusted position.

To coöperate with the blade in determining the angles, I desirably provide the arm or wing 3 with a lower straight edge 11 forming an extension of one edge of the rim 2, and also preferably provide the rim with an adjacent edge 12 disposed at an angle of exactly 135 degrees to the said straight edge 11. Then I equip the rim 2 with indicating markings A, B and C respectively spaced by

90 degrees about the common axis of the hub and the dial, and equip the dial with a suitable marking for coöperating with the said marks on the rim in indicating the degrees to which the dial has been turned from any given starting point. Thus arranged, it will be obvious that the position of the blade 10 can readily be read with respect to the edge 11, and that the marks on the rim can be used interchangeably so as to make each one available even when one of the others is concealed by the blade.

To further increase the usefulness of my protractor at only a trifling addition to its cost, I desirably provide an auxiliary blade 13 pivoted to the arm 3 on a screw 17 having a nut 14, this auxiliary blade being adapted to be swung about its pivot to various positions with respect to the edge 11 and to be locked in position by turning the knob 14. I also desirably recess the arm 3 under the blade 13 so that this arm can be swung to protect it against damage and to permit a more compact storing of my protractor. When thus swung to its inoperative position, the auxiliary blade 13 engages a ledge 15 which forms a stop for this blade and which affords a mechanical protection for it when the protractor is folded up for storage. This ledge 15 preferably has its end 16 so disposed that it will act as a stop for limiting the outward swinging of the auxiliary blade to a position in which the latter has its longitudinal edges exactly at right angles to the straight edge 11 of the main arm of the protractor, or at angles of 135 degrees to the edge 12. The dotted lines show the arm in this position.

Thus arranged, it will be obvious that the auxiliary blade 13 can readily be employed for transferring angles and for other purposes, both with or without the coöperation of the blade 10, so that I am able to secure an unusually wide range of adaptability in a quite simple, easily manipulated and compact instrument and in one which invloves no great difficulties of manufacture. However, while I have illustrated and described my invention in a highly desirable embodiment, I do not wish to be limited to the particular details of construction and arrangement here disclosed, since numerous variations might obviously be made without departing from the spirit of my invention or from the appended claims.

I claim as my invention:—

1. In a protractor, a base member having a fixed hub with a threaded opening therein and an annular recess surrounding said fixed hub, a graduated dial disposed in the recess and journaled on the hub and having a groove across its face adjacent to the hub, a blade slidable in the said groove, a washer concentric with the hub and having opposite edge portions respectively overlapping parts of the blade of the dial, and means engaging the threaded opening in the hub for clamping the washer against the said overhung parts.

2. In a protractor, a base member having a straight edge, a graduated dial rotatable on the base member, a blade slidably mounted on the dial, a washer having different portions contiguous to and overlapping portions of the dial and the blade, and a screw threaded into the base member and having its head engaging the washer to clamp the latter against the said portions overlapped by it.

3. In a protractor, a base member having two outer straight edges at an angle of 135 degrees to each other and having an annular recess in its face, there being index markings on the base outwardly of the said recess and relatively at right angles to each other about the axis of the recess, a graduated dial rotatably mounted in the recess, a blade slidably mounted on the dial and projecting beyond the dial, and common means for locking the dial against rotation and for preventing the blade from sliding on the dial.

4. In a protractor, a base member having a circular portion with an annular recess in its face and having a straight-edged arm tangential to the circular portion, a dial rotatably mounted in the said recess, a blade carried by the dial and projecting beyond the dial, there being coöperating markings on the dial and base member for indicating the angle of the blade with respect to the straight edge of the said arm, means for locking the dial against rotation, an auxiliary blade pivoted to the said arm, and means for locking the auxiliary blade against movement about its pivot.

5. A protractor as per claim 4, in which the arm has a recess adapted to house the auxiliary blade when the latter is in inoperative position and in which the arm also has a shoulder adapted to stop the auxiliary blade in a position at right angles to the straight edge of the arm after the auxiliary blade has been swung 270 degrees about its pivotal mounting from its said inoperative position.

Signed at Chicago, December 18th, 1920.

CHARLES STRAUB.