May 15, 1923. 1,455,708

M. BROWN

PROTRACTING SQUARE

Filed Jan. 6, 1921

Fig. 1.

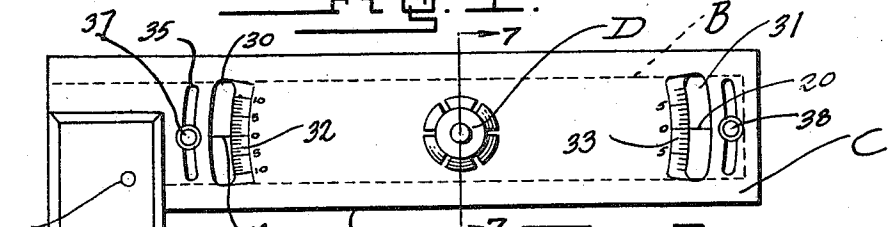


Fig. 2.

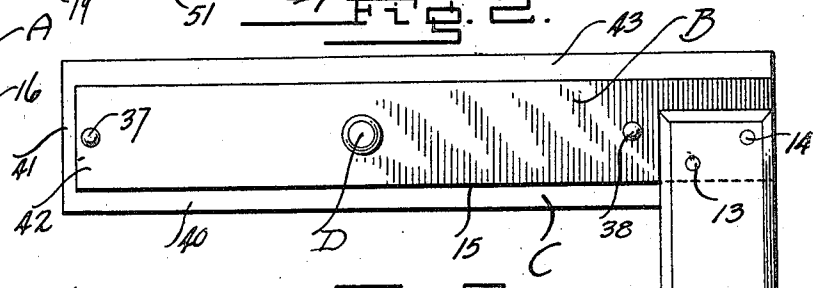


Fig. 7.

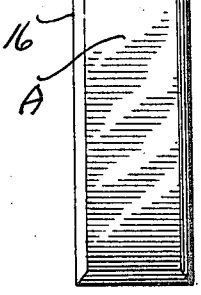
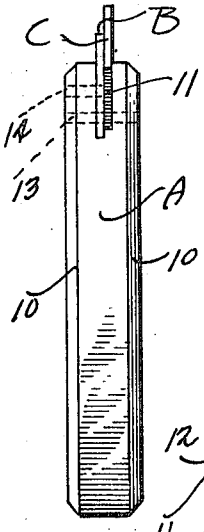
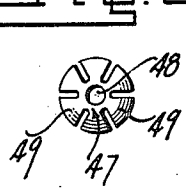


Fig. 6.

Fig. 3.





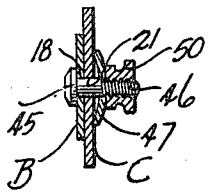


Fig. 4.

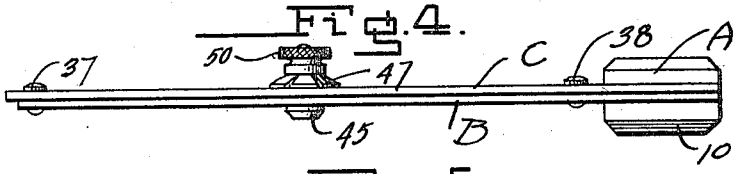
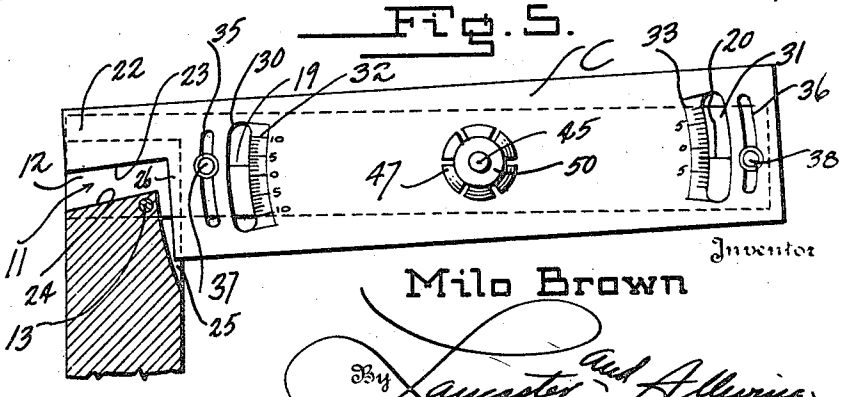


Fig. 5.



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UNITED STATES PATENT OFFICE.

MILO BROWN, OF ANDERSON, INDIANA.

PROTRACTING SQUARE.

Application filed January 6, 1921. Serial No. 435,437.

To all whom it may concern:

Be it known that I, MILO BROWN, a citizen of the United States, residing at Anderson, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Protracting Squares, of which the following is a specification.

This invention relates to a protracting or indicating square for use in determining the error in a square measurement.

An important object of the invention is the provision of a protracting square which is self-adjusting, and upon application to an object will show the degree of error, or precision in the angular dimensions of such object.

A further object of the invention is the provision of a device of the above described character, which is so constructed as to make it of practical use for carpenters, or other skilled workmen.

Other objects and advantages will be apparent during the course of the following detailed description.

In the accompanying drawings, forming a part of this specification, and in which like reference characters designate like parts throughout the same:

Figure 1 is a side elevation of the improved protracting square, showing the face thereof.

Figure 2 is a side elevation of the improved protracting square.

Figure 3 is a rear elevation of the improved protracting square showing the association of the various parts thereof.

Figure 4 is a plan view of the improved protracting square.

Figure 5 is a fragmentary sectional view of the protracting square showing the various cooperating elements thereof.

Figure 6 is a plan view of a detail embodied in the protracting square.

Figure 7 is a cross sectional view taken on the line 7—7 of Figure 1.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the letter A designates the stock of a square, having the blade B rigidly mounted thereon; and upon which blade B, the blade C is pivotally mounted, as by detachable means D.

The stock A is of ordinary construction comprising a relatively thick piece of hard wood or steel having its edges bevelled as at 10; and provided with the slotted recess 11 in one end thereof.

The blade B is preferably of steel and relatively thinner, than the stock A, and has an end 12 thereof disposed within the slot 11 in the stock, and rigidly secured thereto by a rivet 13 extending laterally and entirely through the thickness of the stock A, and by a rivet 14 extending laterally through one side of the stock A and engaging the blade B in such manner that the slot 11 upon one side of the rigidly mounted blade B remains unobstructed for the free reception of the blade C and which will be hereinafter more fully described. It is preferred that a longitudinal edge 15 of the blade B be disposed at exactly a right angle to the inside edge 16 of the stock A, the relation of the stock A and the blade B in reality being that of the ordinary carpenter's square. The blade B is provided centrally of its longitudinal length with an aperture 18, and provided with aligning indicating marks 19 and 20, upon each side of the aperture 18, and which indicating marks are aligned substantially parallel with the edge 15 in such manner that they intersect the edge 16 of the stock A at a right angle.

The blade C is relatively greater in width than the blade B and is provided with an aperture 21 therein, adapted to align with the aperture 18, whereby the blade C can be pivotally mounted upon the blade B by the detachable means D. The blade C is preferably provided with a projecting end 22 adapted for reception within the slot 11 of the stock A, said projection 22 however, not extending the entire width of the blade C, but having a face 23 inclining inwardly from the outer end of the blade and adapted to abut against the side 24 of the stock A, when the blade C is in one of its extreme positions. The slot 11 is of peculiar formation, and is provided with an extension 25, adapted to receive the end 26 of the blade C lying adjacent the projecting end 22. This construction is provided, in order that a secure and stable square is provided by the stock A and blade B, upon which the blade C may be pivotally mounted to withstand the rough usage sometimes given or necessarily imposed upon the tools of workmen.

The blade C is provided with slots 30

and 31, concentric with the aperture 21, and upon each side thereof, which slots are provided in the body of the blade C transversely to the longitudinal run of the blade. The slots 30 and 31 are provided with graduations 32 and 33 respectively, it being preferred that the graduations 32 be such graduations as found in the centesimal system, or in other words each one of the graduations as noted adjacent the slot 30 denotes a grade. The graduations 33 are those of the sexagesimal system, and are of course each equivalent to one degree, the angular measurement in common use, throughout the United States. However, any special system of angular measurement may be incorporated adjacent either of the slots 30 or 31, to suit the requirements of the trade or profession adopting the protracting square. Slots 35 and 36 are provided upon the opposite sides of the slots 30 and 31 respectively to the graduated portions thereof, and adapted to receive rivets or guiding lugs 37 and 38 respectively, having suitable heads thereon adapted to guide the movement of the blade C in its pivotal movement over the blade B. The slots 35 and 36 are concentric with the aperture 21, and of course, lie in parallel relation to the slots 30 and 31 respectively. When the blade C is disposed upon the blade B, a portion 40 will project inwardly from the side 15 of the blade B, the purpose of which will hereinafter be more fully described. It is preferred that an end 41 projects from the end 42 of the blade B, and that a longitudinal edge 43 projects upon the opposite side of the blade B from the projecting portion 40. In this arrangement, the blade C, entirely overlies the blade B, at all times, even in its most extreme positions.

The detachable means D includes the pivot pin or rivet 45, provided with a screw threaded end 46, the said pin 45 being adapted for pivotal insertion through the apertures 18 and 21 of the blades B and C respectively. The screw threaded end 46 projects from the face of the blade C, and receives the lock washer 47 thereon. The lock washer is of peculiar formation, and is provided with the aperture 48 for free insertion over the pivot pin 45, and with extending leaves 49 which are sufficiently resilient to provide a lock washer which will have an even clamping action upon the face of the blade C. A thumb nut 50 is provided for engaging with the screw threads of the end 46 and adapted to compress the resilient lock washer 47, whereby the same may clamp the blade C to the blade B either for pivotal movement or rigidly in one position.

In order to operate, the blade C is pivotally disposed upon the blade B by the detachable means D, in such manner that the indicator marks 19 and 20 will be visible through the slots 30 and 31 respectively. In order to test the accuracy of any object the sides of which should lie at exactly 90° to each other, the stock A is positioned upon one side and the same drawn thereover, until the forward edge 51 of the blade C abuts the adjacent side of said object and the said edge 51 will conform to the plane of the side of the object which it is measuring, throughout its length. Should one side of the object be out of alignment with respect to the other and form an angle greater than 90° the blade C will swing into a position substantially as illustrated in Figure 5 of the drawings, and the discrepancy in the angular measurement between the sides of the object will be indicated upon the graduations 32 or 33, by the indicator marks 19 and 20.

In normal position, the edge 51 of the blade C lies at exactly right angles to the edge 16 of the stock A, and in which position the zero marks of both the graduations 32 and 33, lie in longitudinal alignment with the indicator marks 19 and 20. Thus it can be seen that any variance in the angle measurement as indicated by the edges 16 and 51 will be instantly measured upon both of the scales 32 or 33 by the indicator marks 19 and 20. It is of course, optional which of the graduated measurements 32 or 33 is used, since either one or both may be supplanted by other methods of angular measurement. Attention is called to the fact that the end 26 has been so constructed that it will not ride out of the extended portion 25 of the slot 11, thus doing away with any liability of chips, or other foreign material getting into the slot and interfering with the pivotal operation of the blade C.

Should it be desired to do away with the self adjusting feature as provided by the pivoted blade C, the nut 50 can be tightened upon the pivot pin 45, forcing the washer 47 into secure clamping engagement with the face of the blade C, thus rigidly and securely binding the blade C to the blade B to indicate an angle of 90° intermediate the edges 51 and 15, or in fact a greater or a less angle as desired.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. In a protractor, the combination of a stock, a blade rigidly mounted upon said stock and having an indicator mark thereon, a second blade relatively wider than said rigidly mounted blade, detachable means pivotally mounting said wider blade upon

said rigidly mounted blade, and centrally thereof, said wider blade having graduations thereon adapted to cooperate with said indicator mark upon the rigid blade for indicating the angle between the two blades, and guiding means for limiting movement of said pivoted blade.

2. In a protracting square, the combination of a stock, a blade of less thickness than said stock, said blade rigidly mounted upon said stock and having indicator marks thereon, a second blade wider than said first mentioned blade pivotally mounted upon said rigidly mounted blade and having slots therein adapted to expose the indicator marks upon said rigid blade, said pivoted blade having graduations adjacent said slots, and guiding means for said pivoted blade.

3. A protracting square comprising a stock, a blade rigidly mounted with respect to said stock, said blade having an indicating mark thereon, and a second blade pivotally mounted upon the rigidly mounted blade and having a slot therein adapted to expose the indicating mark upon said rigidly mounted blade, said pivotally mounted blade having graduations thereon adjacent a marginal edge of said slot adapted for cooperation with said indicating mark upon the rigidly mounted blade for measuring the angle between the two blades.

4. In a protracting square, the combination of a stock, a blade rigidly mounted on an end of said stock substantially at right angles thereto, and a second blade pivotally mounted upon said first mentioned blade substantially midway of the stock and the free end of said first mentioned blade, said second mentioned blade being adapted for oscillation upon said first mentioned blade and when in alignment therewith having a longitudinal edge portion thereof normally extending outwardly of the adjacent edge of said first mentioned blade, and means on said blades for determining the relative angular relation of the same.

MILO BROWN.