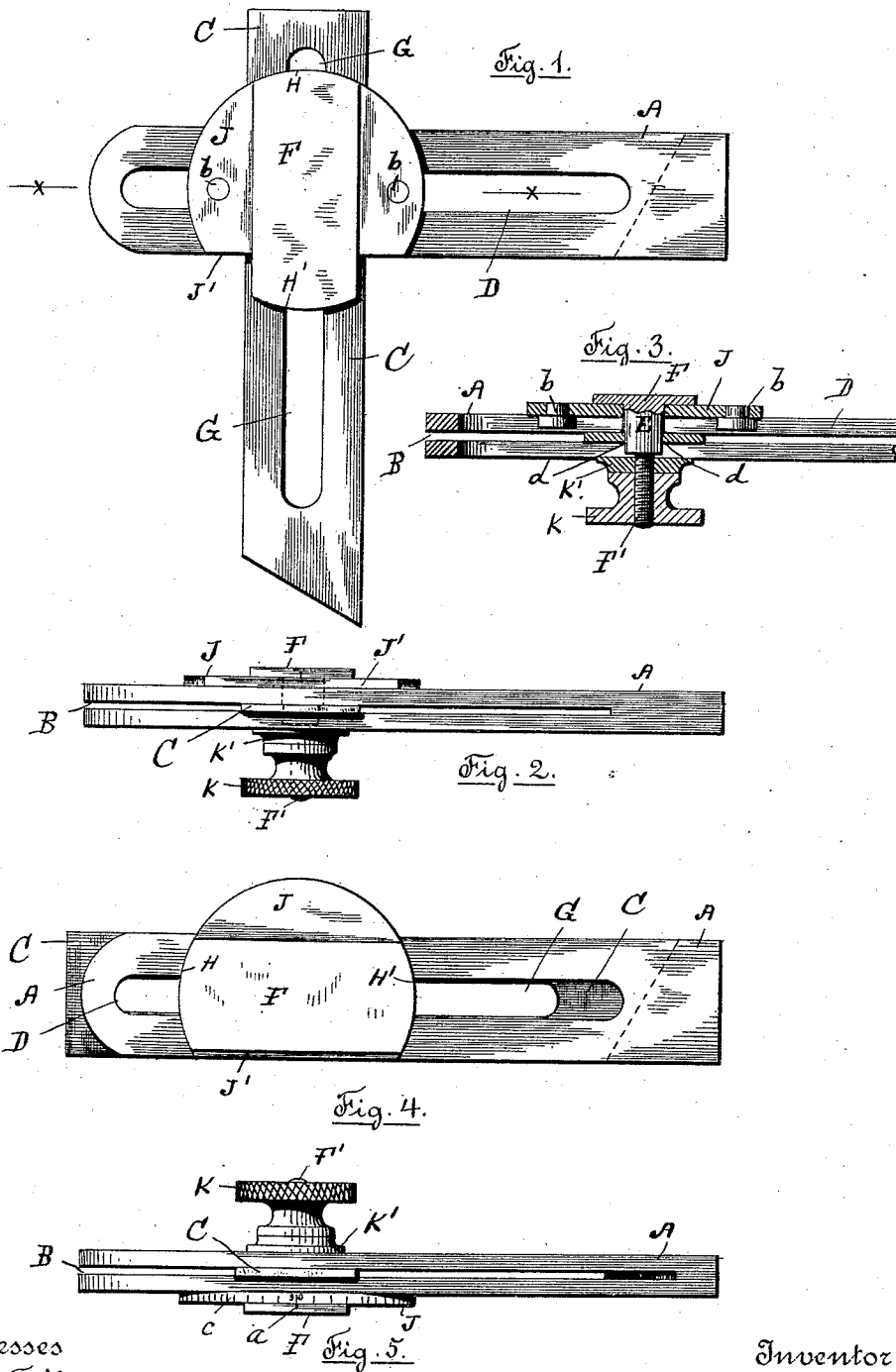


(No Model.)

E. M. LONG.
PROTRACTOR AND BEVEL.

No. 474,393.

Patented May 10, 1892.



Witnesses
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UNITED STATES PATENT OFFICE.

EDWARD M. LONG, OF WORCESTER, MASSACHUSETTS.

PROTRACTOR AND BEVEL.

SPECIFICATION forming part of Letters Patent No. 474,393, dated May 10, 1892.

Application filed December 30, 1889. Serial No. 335,362. (No model.)

To all whom it may concern:

Be it known that I, EDWARD M. LONG, a citizen of the United States, and a resident of Worcester, in the county of Worcester, and in the State of Massachusetts, have invented a new and useful Improvement in Protractor-Squares, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a side view of a protractor-square embodying my invention and represented with the blade open. Fig. 2 represents an edge view of the protractor-square with its blade open, as shown in Fig. 1. Fig. 3 is a sectional view disclosing the construction and illustrating the operation of the operating parts. Fig. 4 represents a side view with the blade closed, and Fig. 5 represents an edge view opposite that shown in Fig. 2 and with the blade opened.

Similar letters refer to similar parts in the different figures.

Referring to the accompanying drawings, A denotes the stock provided with a longitudinal slot B, extending from one end nearly the entire length of the stock A to receive the blade C, and also with a slot D to receive the bolt E. Within the slot B is placed the blade C, also provided with a slot G, through which the bolt E passes. The bolt E is provided with an elongated head F, having the curved ends H H', concentric with the axis of the bolt itself, and having index-marks, one of which is represented at a in Fig. 5.

Upon the side of the stock A is a disk J, provided with lugs, or, as represented, with pins b b, fixed in the disk and entering the slot D to prevent the rotation of the disk J around the bolt E. The disk J is cut away at J' flush with the side of the stock A, and through the center of the disk is the bolt E, with its head F resting against the outer side of the disk J and with its opposite end screw-threaded and F' provided with a nut K and washer K'. The slot G in the blade C is somewhat smaller than the slot D in the stock, and the bolt E is cut away upon opposite sides d d to fit the slot G, causing the angular movement of the blade C to rotate the bolt E, which turns freely in the slot D of the stock A, and also in the disk J. The circular periphery of

the disk J is graduated, as shown at c, to indicate the position of the blade in degrees of a circle, or with such other marks or indices as the nature of the work may determine. When the blade is brought into position with reference to the stock A to indicate the angle inclosed between the edge of the blade and the edge of the stock, the movable parts are securely clamped in position by tightening the nut K upon the bolt E. The disk J and blade C are so united by the bolt E that sliding the blade along the slot B will cause the disk J to be moved along the side of the stock A, the blade C, disk J, and bolt-head F always maintaining the same relative positions upon the stock A.

I am well aware that a combination of a slotted stock carrying a metallic blade capable of a sliding and rotating movement and having a graduated scale sliding along the stock, by which the angular motion of the blade is indicated, is not broadly new, and I do not herein claim such.

In the square forming the subject of my present invention I employ a large disk J of much greater diameter than the width of the stock A, having one side cut away, as at J', so as not to interfere with the working edge of the stock, and outside of the disk J, I elongate the bolt-head F, providing it with curved ends concentric with and of the same diameter as the disk J. The enlarged disk J lies against the side of the stock A and is held from rotation by the pins b b, entering the slot D. I thereby secure an increased friction between the head F and the disk J, allowing the blade C to be securely held in position by a slight strain upon the tightening-bolt E. I also increase the circular arc inclosing the disk J, allowing a coarser graduation to be placed upon its edge, where it is never concealed by the head F.

The within-described construction of disk J, pin b b, and head F secure advantages in the use of the square not hitherto possessed by squares of this class.

What I claim as my invention, and desire to secure by Letters Patent, is—

In a protractor or bevel square, the combination, with a stock A, provided with slots B and D and a slotted blade C, held in said stock

and capable of an angular motion therein, of a segmental disk J of greater diameter than said stock, said disk J being cut away at J' to correspond with the working edge of said
5 stock and having its curved periphery graduated, pins *b b*, held in said segmental disk and entering the slot D in said stock, bolt E, passing through said segmental disk and said slotted blade and having a common angular motion with said blade, head F, having its ends curved and concentric with the periphery of said segmental disk, and a tightening-nut K, substantially as described.

Dated the 28th day of December, 1889.
EDWARD M. LONG.

Witnesses:

RUFUS B. FOWLER,
KATIE CARROLL.