

L. S. STARRETT.
 COMBINED SQUARE AND BEVEL PROTRACTOR.
 APPLICATION FILED AUG. 27, 1909.

980,362.

Patented Jan. 3, 1911.

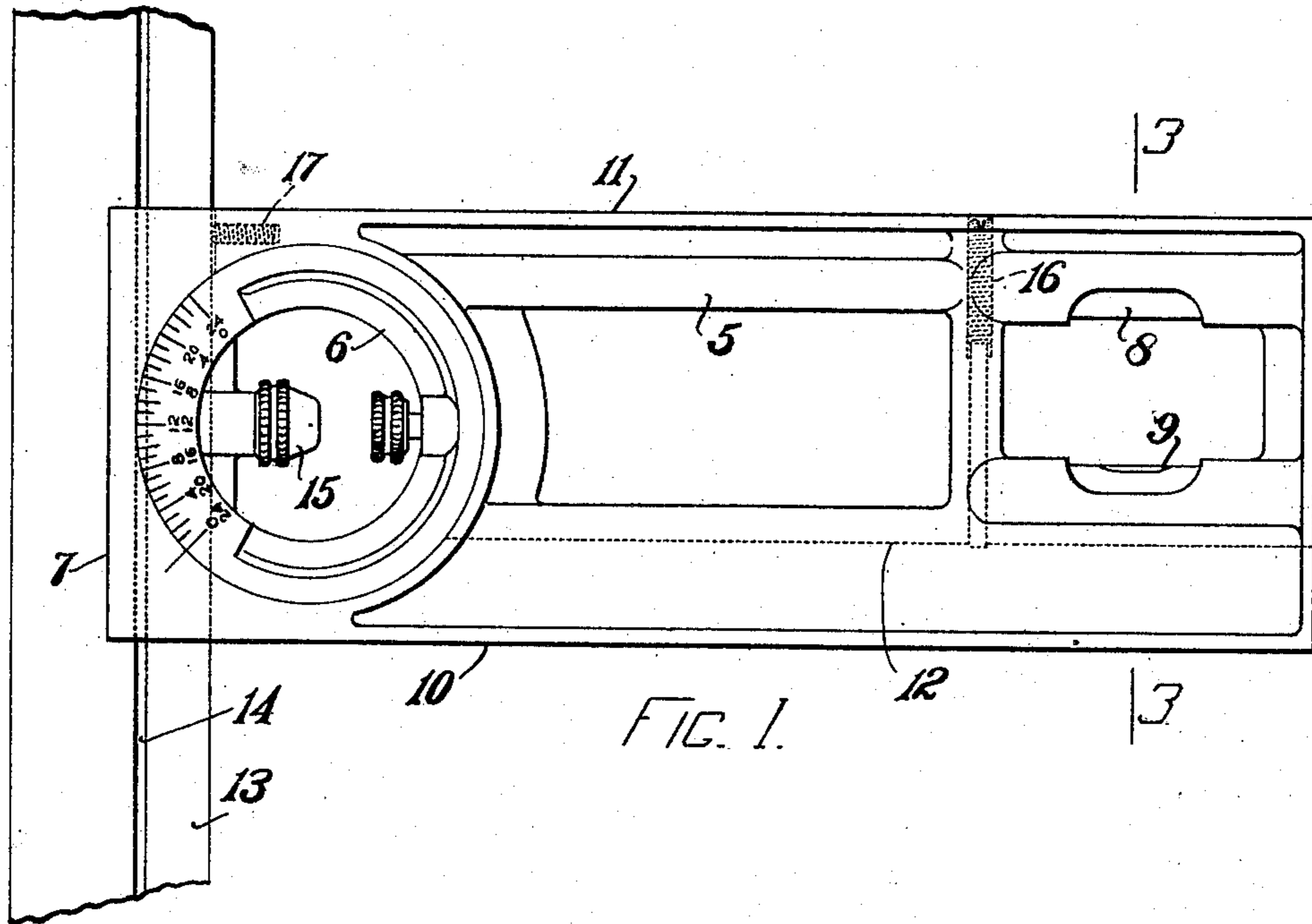


FIG. 1.

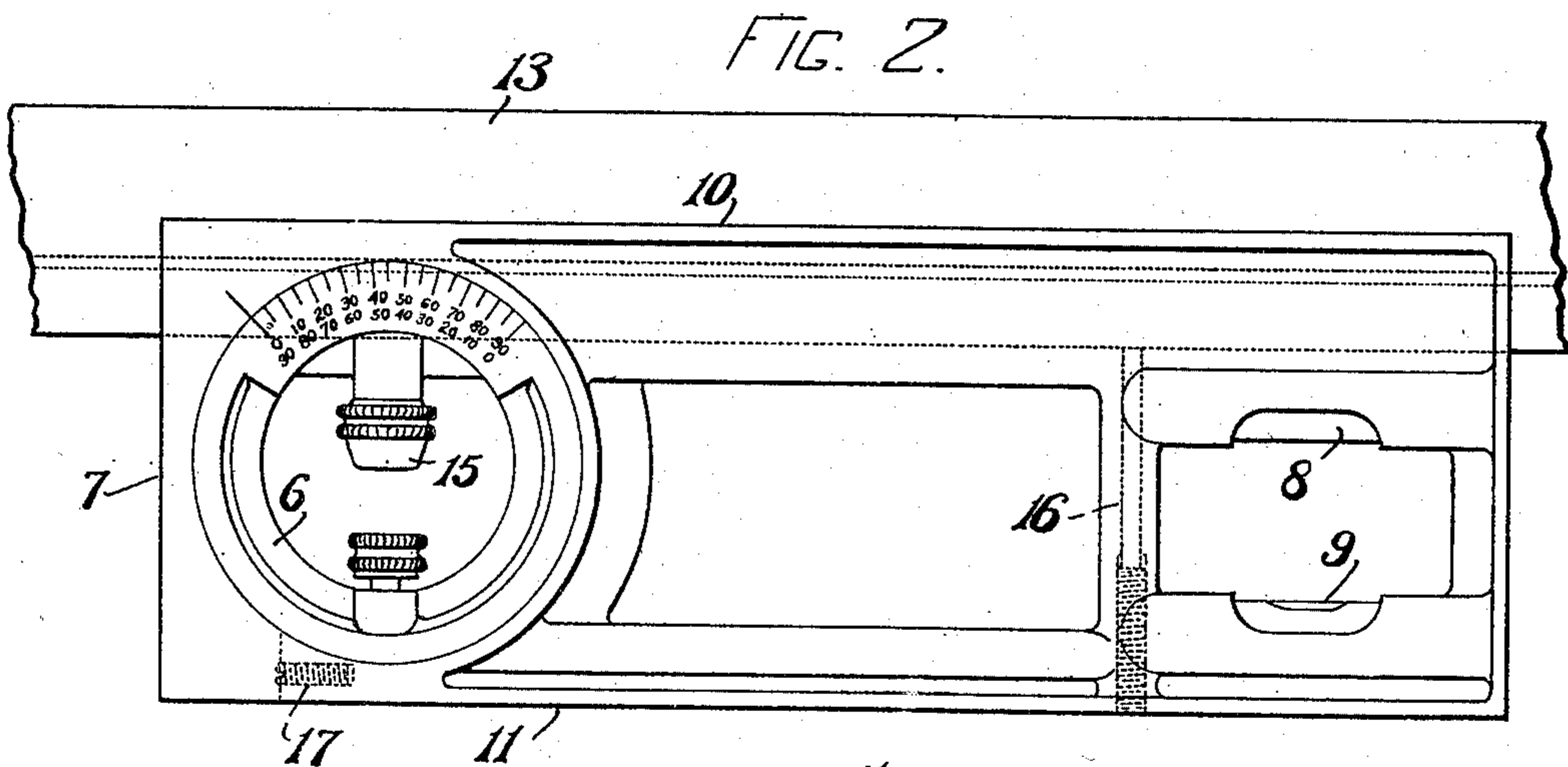


FIG. 2.

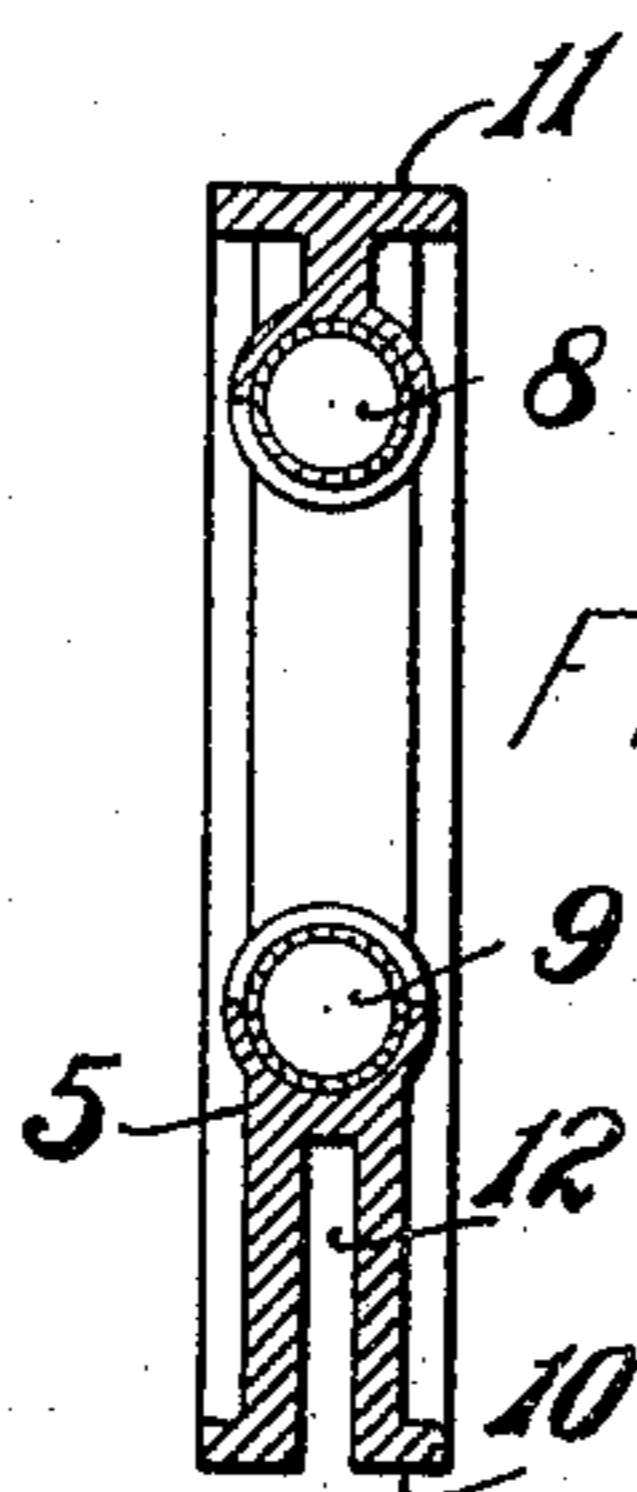


FIG. 3.

WITNESSES

A. T. Palmer
 L. K. Dole

INVENTOR
 LARBY S. STARRETT
 BY

Wm. S. Spear
 ATTY

UNITED STATES PATENT OFFICE.

LARROY S. STARRETT, OF ATHOL, MASSACHUSETTS, ASSIGNOR TO L. S. STARRETT COMPANY, OF ATHOL, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

COMBINED SQUARE AND BEVEL-PROTRACTOR.

980,362.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed August 27, 1909. Serial No. 514,887.

To all whom it may concern:

Be it known that I, LARROY S. STARRETT, a citizen of the United States, residing at Athol, Worcester county, Massachusetts, have invented certain new and useful Improvements in Combined Squares and Bevel-Protractors, of which the following is a specification.

This invention is in the nature of an improvement on that set forth in my Letters Patent, #778,808, dated December 27, 1904, for "square and bevel protractor." The tool so patented had a stock or head having two integral arms standing at 90 degrees to each other, with working edges slotted to receive, edgewise, a movable blade, adjustably held in position by means of a screw bolt mounted in a circular oscillating turret and formed with an offset terminal hook adapted to enter a longitudinal groove in one face of said blade. A nut on the inner end of said bolt, within the annular turret, tightens the blade upon its edgewise seat in a deep slot in the turret, enabling the blade to be folded into corresponding slots in the respective arms of the stock.

In my present improvement the stock is of elongated rectangular form, with the blade-carrying turret located at one end thereof, one end and one side of the stock being deeply slotted to receive the blade when moved to either of its extreme positions. The parallelism of the sides and of the edges of the stock gives to the tool a double capacity, since it may be used either side or edge up, to utilize either of the spirit levels, according to circumstances. The ends of the stock are also preferably parallel and at right angles to the edges and sides, thus giving three free working faces or edges instead of two. The third right-angle working face or faces might, however, be omitted although thereby decreasing much the utility and value of the tool. Yet it would with the two parallel faced stock make a valuable tool as a folding square, a plumb, a level, or a bevel protractor and a pitch to the foot indicator. While with the additional right-angle face the supplementary angle of pitch or degree in relation to the parallel face of the stock and blade will be shown and may be laid out without mental calculation. Therefore I wish to make my claims to cover my improved tool, carrying with it either

the two parallel working faces only or with the three working faces as described.

The graduations of the turret are in degrees on one side and to show pitch to the foot on the other.

In the drawings,—Figure 1 is a side view with the blade in square position. Fig. 2 is a reverse side view with blade in parallel position. Fig. 3 is a section on line 3—3 of Fig. 1.

The stock 5 is of sufficient width to receive near one end the revolving turret 6 and also preferably to form the working face 7. Spirit levels 8 and 9 set opposite to each other permit the use of either face 10 or 11 on under side or on top of work to show level or pitch, depending on the nature of the work. The angles between the faces 7 and 11 and 7 and 10 are both preferably right angles.

The turret 6 is graduated on opposite sides, one side being graduated to indicate pitch to foot in half inch graduations, and the other side being graduated to indicate in degrees the angle between the straight edge 13 and either edge 10 or 7. The scale is reversed so that the turret will read both the angle and the complement thereof. The pitch scale shown in Fig. 1 is graduated to denote the number of half inches rise to one foot of run. It is, therefore, graduated from zero to twenty-four, instead of from zero to twelve, as would be the case if it indicated the rise in inches.

The faces 7 and 10 are deeply slotted as at 12 Fig. 3 to receive the blade 13 and the bottoms of said slots are at right angles. The blade is provided with the usual groove 14 which coöperates with screw 15 as described in my previous patent. Screw studs 16 and 17 are adjustably mounted in these grooves and serve to accurately seat the blade 13 when in either extreme position.

The turret 6 is rotatable about the center of an imaginary circle to which the bottoms of the slots 12 are tangent and of a larger imaginary circle to which all three external working faces 7, 10 and 11 are tangent.

Should blade 13 be set at any intermediate angle, the amounts of both angles to the two faces 7 and 10, which are complementary, are read on the graduations shown in Fig. 2. At the same time, the angle supplementary to the one made by blade 13

and face 10 is given by the third working face 11 and said blade, an advantage peculiar to this tool and of considerable importance in practice.

5 It is obvious that a third level tube could be mounted cross-wise near the end of stock 5 which is opposite turret 6 for use in laying off angles from the vertical, if desired.

What I, therefore, claim and desire to 10 secure by Letters Patent, is:

1. A tool of the class described, comprising a head-stock having a pair of parallel working side faces, a level for each of said faces and a third working face at one end 15 and at right angles to both of said parallel faces, said head-stock being opened for a hand grasp between its ends, a ring mounted in one end of said head-stock and rotatable about a center equidistant from each of said 20 working faces, a straight edge or measuring blade and means for adjustably clamping said blade to said ring, means for clamping the ring to the stock, said ring having a scale for indicating the rise per foot expressed in half inches, and a second scale indicating in degrees the angles and the complementary angles formed by said straight edge and said parallel and right angle working faces of the stock.

30 2. A tool of the class described, comprising a head-stock having a pair of parallel working side faces, a level for each of said faces and a third working face at one end and at right angles to both of said parallel 35 faces, said head-stock having a guide slot in one of said parallel faces and a guide slot in said third face, the bottoms of said slots forming blade seats therein, a ring mounted in one end of said head-stock and rotatable 40 about a center equidistant from each of said working faces and equidistant from the bottoms of the slots, a straight edge or measuring blade and means for adjustably clamping said blade in said ring and means for 45 clamping the ring to said head-stock.

3. A tool of the class described, comprising a head-stock having a pair of parallel working side faces, a level for each of said faces and a third working face at one end

and at right angles to both of said parallel 50 faces, a guide slot in one of said parallel faces, and a corresponding slot in said third face, a straight edge or measuring blade, means for adjustably holding said blade in said guide slots and means operative 55 at right angles to each other to adjust said blade in said slots.

4. A tool of the class described, comprising a head-stock having a pair of parallel working side faces, a level for each of said 60 faces, a ring mounted in one end of said head-stock and rotatable about a center equidistant from each of said working faces, a straight edge or measuring blade, means for adjustably clamping said blade to said ring, 65 said ring having a pair of reversed scales for indicating the complementary angles formed by said straight edge and said parallel working faces.

5. A tool of the class described, comprising 70 a head-stock having a pair of parallel working faces, a level for each of said faces, and having a guide slot in one of said parallel faces, and a guide slot in said third face, the bottoms of said slots forming blade seats 75 therein, a ring mounted in one end of said head-stock and rotatable about a center equidistant from each of said working faces and equidistant from the bottoms of the slots, a straight edge of greater width than the 80 depth of said slots and means for adjustably clamping said blade in said ring about said head-stock.

6. A tool of the class described, comprising 85 a head-stock having a pair of parallel working side faces, a level for each of said faces, an intersecting straight edge, means for holding said straight edge adjustable relative to said parallel working faces and means for indicating the two exterior complementary angles formed thereby. 90

In testimony whereof, I have affixed my signature in presence of two witnesses.

LAROY S. STARRETT.

Witnesses:

FRANK E. WING,

WILLARD G. NIMS.