

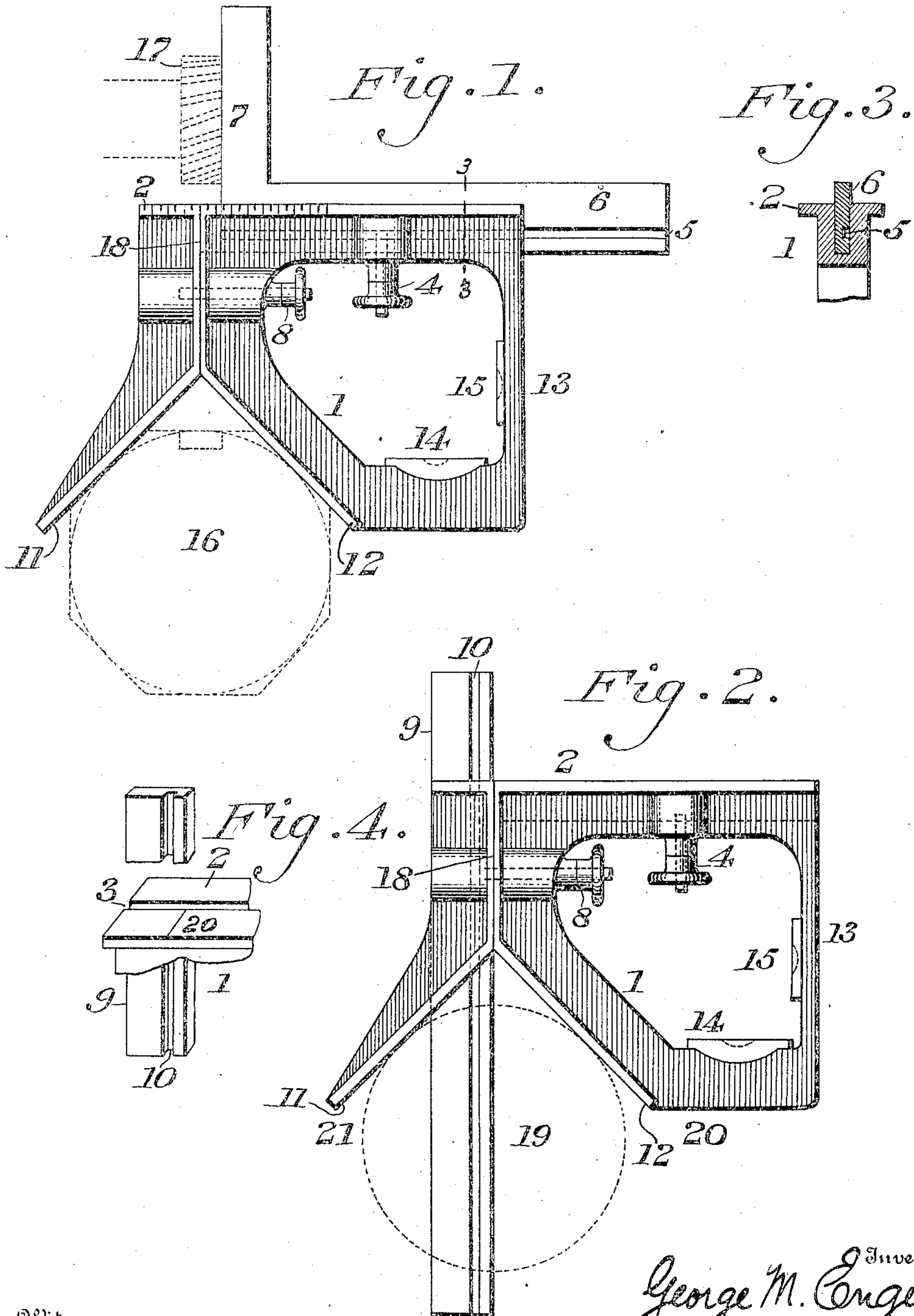
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G. M. ENGEL.  
COMBINED CENTER OR OTHER SQUARE.

APPLICATION FILED OCT. 27, 1903.

NO MODEL.



Witnesses  
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# UNITED STATES PATENT OFFICE.

GEORGE M. ENGEL, OF PHILADELPHIA, PENNSYLVANIA.

## COMBINED CENTER OR OTHER SQUARE.

SPECIFICATION forming part of Letters Patent No. 769,992, dated September 13, 1904.

Application filed October 27, 1903. Serial No. 178,671. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE M. ENGEL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in a Combined Center or other Square, of which the following is a specification.

My invention relates to a combination square and center-gage.

It comprises in one tool squares of different forms, a center-gage, and a device for setting a piece to be operated on, as a shaft, in correct relation to a milling-cutter or the like.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

Figures 1 and 2 are elevations of my device, showing its adaptation to different forms of work, one of the parts being changed for this purpose. Fig. 3 is a section through the line 3 3, Fig. 1. Fig. 4 is a fragmentary perspective view of a portion of the upper left corner, Fig. 2.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates the body of my device formed with a planed or true surface 2, longitudinally of which is cut a slot 3, coöperating with which is the usual set-screw 4, adapted to engage in the slot 5 of a square-blade 6 shown as having the member 7 at a right angle therewith. 8 is a second set-screw adapted to engage the blade 6, or preferably a similar blade 9, which is provided with the slot 10. Opposite the plane surface 2 of the device are plane surfaces 11 and 12 at right angles with each other and each at an angle of one hundred and thirty-five degrees with the surface 2. The side 13 of the body 1 is at an angle of ninety degrees with said surface 2. Spirit-levels 14 and 15 are parallel, respectively, with the surfaces 2 and 13.

The operation is as follows: Assuming that it is desired to mill a key-seat in a piece of shaft 16, (represented in dotted lines, Fig. 1,) the surfaces 11 and 12 are applied thereto, the square 6 7 being first loosely secured in the slot 3. It is obvious that either the blade

6 or the surface 2 may be graduated in fractions of an inch or in millimeters, as desired. In the first case the line 20 (shown in Fig. 4 of the drawings) and in the other case the edge of the blade 7 may serve as an index to coact with such graduations. If the milling-cutter 17 is five-sixteenths of an inch in width, it is evidently necessary to set the blade 7 of the square five thirty-seconds of an inch from the line 18, (shown on the body 1,) which line bisects the right angle formed by the surfaces 11 and 12. If the screw 4 is then set and the shaft 16 adjusted until the blade 7 of the square is in true contact with the face of the cutter 17, it is clear that when the shaft and cutter are brought together the key-seat will be milled with its sides exactly parallel with that radius of the shaft which coincides with the prolongation of the line 18 bisecting the angle between the sides 11 and 12. By a second series of dotted lines, Fig. 1, I have shown that my device may be used with bars of polygonal form.

To prick a center in the end of a shaft, as 19, (shown in Fig. 2 of the drawings,) the blade 9 is inserted in the slot at the side of the body 1 so that its inner edge is in alignment with the line 18. It is clear that a diameter of the circle may be marked thereon and that by rotating either the shaft or the tool the center may be found in the usual manner.

To use the device as a square, it is evident that either blade may be placed in the position shown and extended longitudinally as far as its length will permit. By means of the spirit-levels 14 and 15, in connection with either of the blades 6 and 9 or without either of these, the device may be used to ascertain a level or plumb line. For this purpose it is desirable that the side 20 and point 21 of the body 1 be in alinement and parallel with the plane surface 2.

It is evident that various changes may be made by those skilled in the art which will come within the scope of my invention, and I do not, therefore, desire to be limited in every instance to the exact construction herein shown and described.

Having thus described my invention, what



I claim as new, and desire to secure by Letters Patent, is—

1. A tool of the character described comprising a part having plane surfaces at an angle with each other and a plane surface at a right angle with the line bisecting the angle between said first-named surfaces and extending to said line, a square, means adjacent said last-named surface for supporting said square with one of its members extending at a right angle therefrom, and means for adjustably engaging said square whereby said member is retained at any desired distance from said line.

2. A tool of the character described comprising a part having plane surfaces at an angle with each other and a plane surface at a right angle with the line bisecting the angle between said first-named surfaces and intersecting said line, a square, means adjacent said last-named surface for supporting said square with one of its members extending at a right angle therefrom, and means for ad-

justably engaging said square whereby said member is retained at any desired distance from said line.

3. A tool of the character described comprising a part having plane surfaces at an angle with each other and a plane surface at a right angle with the line bisecting the angle between said first-named surfaces and extending to said line, a square, means adjacent said last-named surface for supporting said square with one of its members extending at a right angle therefrom, means for adjustably engaging said square whereby said member is retained at any desired distance from said line and graduations and an index respectively on said square and on the surface adjacent thereto.

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Witnesses:

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