Oct. 27, 1931. W. GROZI 1,828,930

COMBINATION SQUARE AND PROTRACTOR

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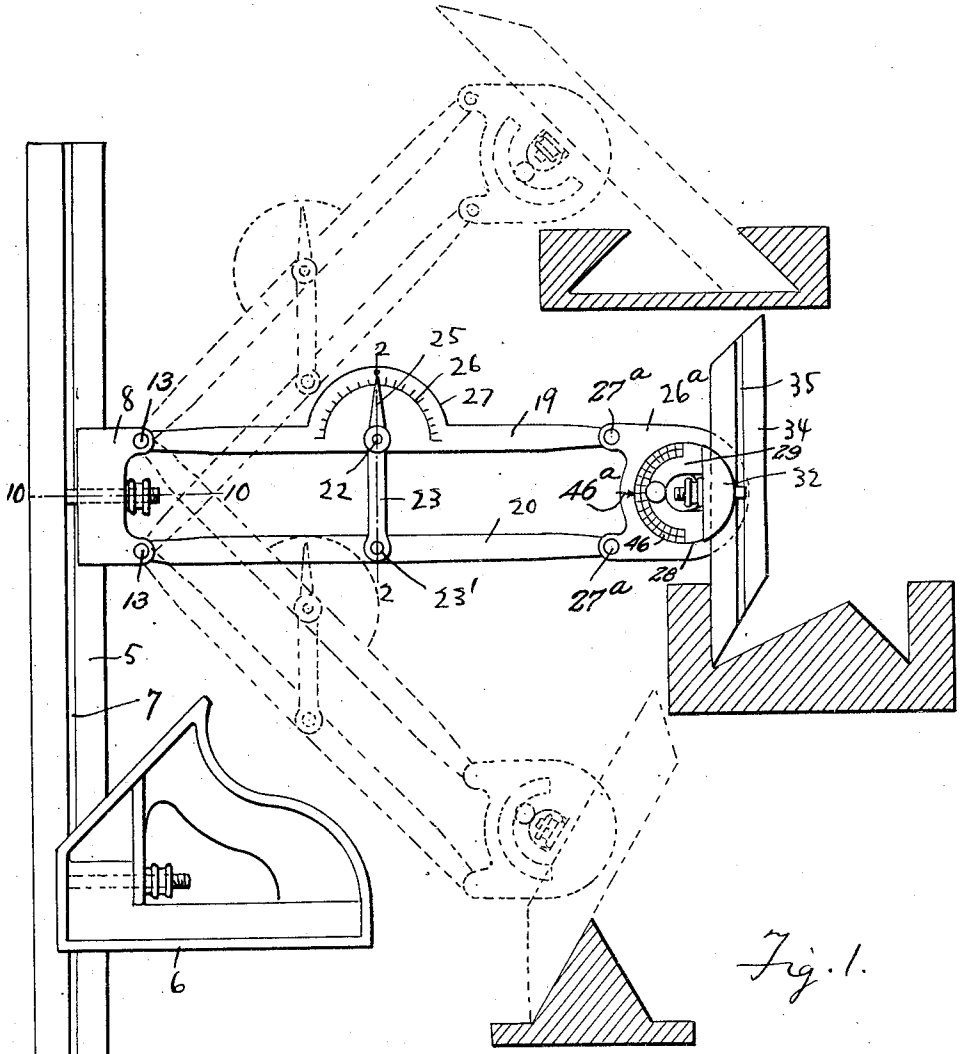


Fig. 1.

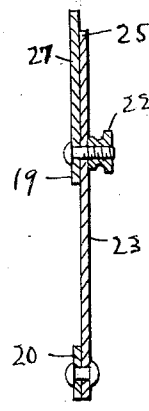


Fig. 2.

Inventor

Wesely Grozi

By Clarence A. O'Brien

Attorney

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Fig. 4.

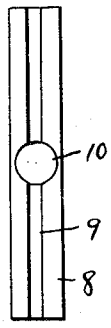


Fig. 5.

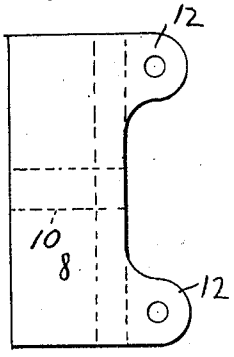
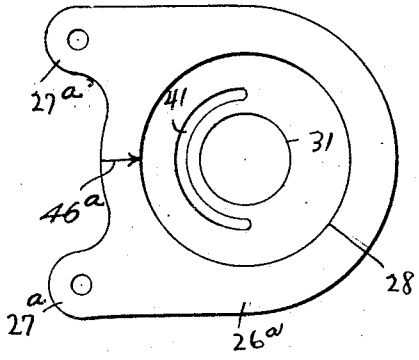


Fig. 7.



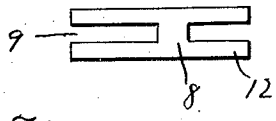


Fig. 6.

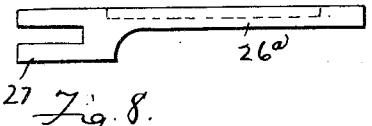


Fig. 8.

Fig. 10.

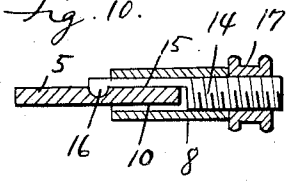


Fig. 3.

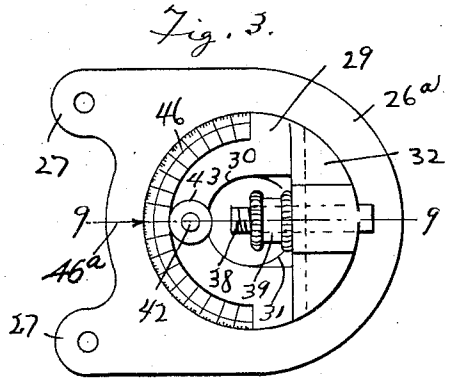
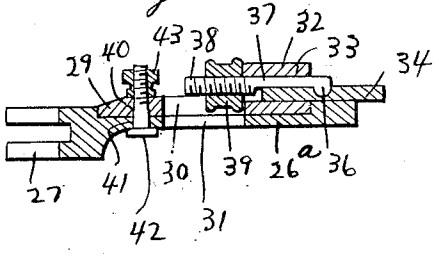


Fig. 9.



Inventor

Wesely Grozi

By Clarence A. O'Brien

Attorney

Patented Oct. 27, 1931 1,828,930

UNITED STATES PATENT OFFICE

WESELY GROZI, OF INDIANAPOLIS, INDIANA

COMBINATION SQUARE AND PROTRACTOR

Application filed February 24, 1928. Serial No. 256,641.

The present invention relates generally to a tool combining the features of an ordinary square with a protractor and has for its prime object to provide a device of this nature which is useful whenever there is any work to be set up or checked, especially when the work is on parallels and cannot be reached very handily with a square or a protractor.

Another very important object of the invention is to provide a tool of this nature which is particularly useful to machinists, pattern makers and shop foremen.

A still further very important object of the invention resides in the provision of a device of this nature which is exceedingly simple in its construction, easy to manipulate, inexpensive to manufacture, convenient, and thoroughly efficient and reliable in use.

With the above and numerous other objects in view as will appear as the description proceeds, the invention resides in certain novel features of construction and in the combination and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawings:

Figure 1 is an elevation of the device showing the same in various positions for operation,

Figure 2 is a detailed enlarged sectional view taken substantially on the line 2—2 of Figure 1,

Figure 3 is an elevation of the protractor head,

Figure 4 is an edge elevation of a slide,

Figure 5 is a side elevation thereof,

Figure 6 is an end elevation thereof,

Figure 7 is a plan view of one section of the head,

Figure 8 is an edge elevation thereof,

Figure 9 is a detail section taken substantially on the line 9—9 of Figure 3, and

Figure 10 is a section taken substantially on the line 10—10 of Figure 1.

Referring to the drawings in detail it will be seen that the numeral 5 denotes the blade and the numeral 6 the slide member of an ordinary square well known in the art. The blade 5 is provided on one face with a longitudinally extending groove 7 in the usual well known manner. The numeral 8 denotes a slide member having extending inwardly from one longitudinal edge a longitudinally extending recess 9 for receiving the blade similar to the slide member 6. Intermediate the ends thereof, the slide 8 is provided with a bore 10 opening at one end into said recess 9, and at its opposite end opening outwardly of the slide.

Two pairs of apertured ears 12 are provided on the slide member 8, one pair at each corner of the slide at the free longitudinal edge of the slide. The bolt 14 is provided with a relatively thin shank projection 15 having a lateral enlargement at its terminal indicated at 16 for reception in the groove 7, the bolt 14 extending through the bore 11. A nut 17 is threaded on the bolt so that the slide may be tightened on the blade 5 in different adjusted positions as will be apparent. A pair of arms 19 and 20 are pivotally engaged with the ears 12 as indicated at 13. A pointer 23 is pivoted intermediate the ends of the arms 19 and 20 as at 22 and 23 respectively and has a pointed end extension 25 for cooperating with indicia 26 provided on the plate 27 formed integrally on an intermediate portion of the arm 19. The distance between pivots 22 and 23′ is equal to the distance between pivots 13 so that the arms always swing together and retain their parallelism in respect to each other. A head 26*a* is provided with ears 27*a* pivoted to the extremities of the arms 19 and 20. This head is provided with an annular recess 28 in which is rockable a member 29. The member 29 and the head 26 are provided with registering apertures 30 and 31 respectively. An enlargement 32 is formed on the member 29 and has a slot 33 for receiving blade 34 formed with straight longitudinal parallel edges and beveled end edges. This blade 34 has a longitudinally extending groove 35 in which the lateral projection 36 on the shank 37 of bolt 38 may fit. A nut 39 is provided on the bolt so that the blade 34 may be tightened in the member 29 and held in different adjusted positions. The member 29 and the head 26*a*

are provided with registering arcuate slots 40 and 41 respectively through which extends a bolt 42 on which may be tightened a nut 43 for holding the member 20 in adjusted positions in respect to the head 26*a* thus thereby holding the blade 34 at a desired angle with respect to the head.

Suitable indicia 46 is provided on the member 29 so that the angle of the blade to the head may be readily ascertained, a pointer 46*a* being provided on head 26*a*, and against which the graduations or indicia 46 may be read for this purpose.

From the above detailed description it will be seen that the combination tool may be used in various different ways such as the three different ways illustrated in Figure 1 for testing the accuracy of the angularity of various machine done work.

It is thought that the construction, operation, utility and advantages of the invention will now be quite apparent to those skilled in this art without a more detailed description thereof. The present embodiment of the invention has been disclosed in detail merely by way of example since in actual practice it attains the features of advantage enumerated as desirable in the statement of the invention and the above description.

It will be apparent that changes in the details of construction, and in the combination and arrangement of parts may be resorted to without departing from the spirit or scope of the invention as hereinafter claimed or sacrificing any of its advantages.

Having thus described my invention, what I claim as new is:

1. In a device of the class described, a slide member, a pair of spaced parallel arms of equal length pivoted at one end to said slide member, a head member pivoted to the free ends of said arms, the distance between the pivots of the respective pairs of pivots being equal, one of said arms being provided with an arcuate series of graduations, a pointer pivoted to said arms and adapted to be read against said graduations, a member rockably mounted on said head and provided with a slot, a blade operable in said slot, means for retaining said blade in a predetermined adjusted position in said slot and for movement with said member for angular adjustment relative to said head.

2. In a device of the character described, the combination of a square including a blade, a slide mounted on said blade for adjustment relative thereto, a pair of spaced parallel arms pivoted at one end to said slide, a plate integral with one of said arms and having a scale formed thereon, a pointer pivoted to said arms and adapted to be read against the graduations of the scale, a head pivoted to the free ends of said arms and provided with a recess, a member rotatably mounted in said recess and provided with an enlargement having a slot, a blade shiftable in the slot, means for retaining said blade in a predetermined adjusted position in said slot, means for retaining said member in a predetermined rotative position, and said member being provided with a scale, and said head being provided with a fixed pointer adapted to be read against the scale of said member.

3. In a device of the character described, a pair of spaced parallel arms of equal length, one of said arms being provided with a plate integral therewith intermediate the ends of said one arm, a scale having its graduations arranged in an arcuate series provided on said plate, a pointer pivotally connected to said arms and adapted to be read against the graduations of said scale, a slide pivoted to said arms at one end of the latter, the distance between the pivots of the respective pairs of pivots being equal whereby said arms will maintain their parallel relation relative to one another when said arms are swung about their pivots relative to said slide, a head pivotally connected to the free ends of said arms, a member rotatably mounted on said head, means for retaining said member in a predetermined rotative position relative to said head, a blade having straight parallel edges and bevelled end edges, and means for adjustably securing said blade on said member for rotation with said member for varying the angular relation between said blade and said arms.

In testimony whereof I affix my signature.

WESELY GROZI.