

No. 706,095.

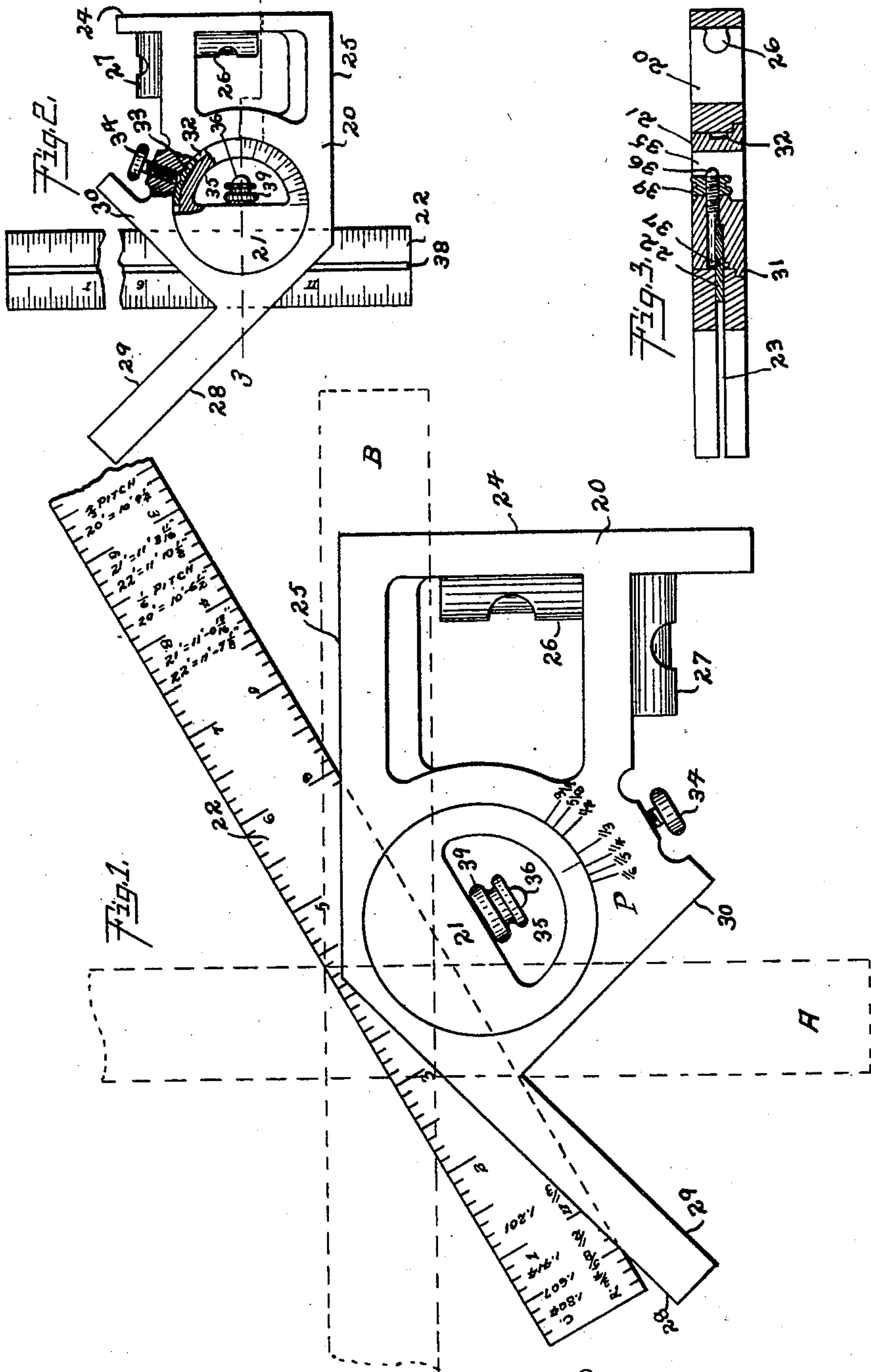
Patented Aug. 5, 1902.

E. OHRLE.

COMBINATION SQUARE AND PROTRACTOR.

(Application filed Oct. 21, 1901.)

(No Model.)



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## COMBINATION SQUARE AND PROTRACTOR.

SPECIFICATION forming part of Letters Patent No. 706,095, dated August 5, 1902.

Application filed October 21, 1901. Serial No. 79,458. (No model.)

*To all whom it may concern:*

Be it known that I, EMANUEL OEHRLE, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Combination Squares and Protractors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in combination squares and protractors; and it consists in a square having a body portion or head, a straight-edge, and means for pivotally securing the straight-edge in the said head, whereby the straight-edge may be set and held at various angles with respect to the different edges of the head.

It further consists in certain novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is an elevation of one side of the combination-square, the blade or straight-edge being shown as set at an angle, while the extreme adjustments of the said straight-edge are indicated in dotted lines. Fig. 2 is an elevation of the opposite side of the square. Fig. 3 is a transverse cross-section taken upon the line 3 3 of Fig. 2.

It is the purpose of the present invention to provide a convenient and comparatively inexpensive combination-square suitable for machinists, pattern-makers, carpenters, and the like, the one instrument being capable of serving as a level, miter, bevel, center square, and protractor, and in addition to these being capable of certain special uses, as will be hereinafter fully described.

The instrument is made up principally of three parts—namely, a main body portion or head 20, a rotatable graduated disk 21, and a straight-edge or scale 22—to which are added certain other parts, as will be hereinafter set forth. The head 20 is preferably made substantially as illustrated in the drawings, being formed with straight edges or bearing-surfaces 24 and 25, arranged at right angles to each other. Small spirit-levels 26 and 27 are mounted upon the head 20, arranged parallel,

respectively, with the surfaces 24 and 25, so that any thing or object to which these surfaces are applied may be properly leveled. These levels 26 and 27 are preferably made no wider than the thickness of the material composing the head 20 and are arranged upon the edges of inner cut-out or open portions of the head, so as to be entirely out of the way and well protected against accidental injury. The head is formed also with a projecting arm formed with a surface 28, which is arranged at an angle of forty-five degrees to the surface 25. A surface 29 is also formed on this arm parallel with the surface 28. Another surface 30 is also formed upon the head 20, which extends at right angles to the surface 29, forming therewith an interior right angle. This interior angle is so arranged that when the straight-edge 22 is brought to the position indicated at A in Fig. 1 it forms, with the said surfaces, a center square of the ordinary type. It may be noted at this point that when the straight-edge 22 is set at any other position than that shown at A it may be used for determining lines on a circular surface other than those which are radially arranged—as, for example, where laying off a ratchet or other toothed wheel.

The blade 22 is adjustably secured to the disk 21, so as to be carried thereby and held in various positions. The head 20 is kerfed or slotted centrally through the edges which carry the surfaces 25 28 29 and a part of 24 and 30. The position of the kerf 23 with respect to the cross-section of the head 20 will be apparent from Fig. 3, while the extent of the kerf is indicated by the extreme dotted positions of the straight-edge, as shown in Fig. 1. Since the blade is thus arranged centrally in the various surfaces of the head, the square may be reversed and either side be applied to work in hand with equal facility. Thus corresponding angles may be obtained with the instrument without changing the position of the straight-edge 22.

The disk 21 is preferably formed of a thickness equal to that of the head 20 and engages a circular opening in the same. The disk 21 is formed upon one side with a lip or shoulder 31, which fits a corresponding counter-sunk annular recess in the body of the head 20, as will appear upon examining Fig. 3.



On the periphery of the disk 21 is formed an annular groove 32, which is adapted to receive a curved sliding brake piece or shoe 33. A set-screw 34 extends through a portion of the head 20, engaging screw-threads therein, its inner end or point engaging a recess or socket formed in the shoe 33. This screw thus engaging the shoe prevents the same from moving from its position when the disk 21 is turned in its bearing. The screw, with the shoe, also serves the purpose of locking the disk in place, so as not to move laterally from its bearing, and also serves the purpose when the screw is tightened of preventing the disk from turning in its socket when the straight-edge carried thereby has been properly set. The disk 21 is also kerfed, its kerf coinciding with that in the head 20. The dotted line in Fig. 2, indicating the inner edge of the blade or straight-edge 22, shows the depth which the kerf reaches in the disk 21. The straight-edge 22 is secured to the disk 21 by means of a pin 36, which is formed at its outer end with a head turned at right angles to the pin and formed so as to engage and project into a groove or slot 38, formed in one face of the blade or straight-edge 22. The inner end of the pin 36 is screw-threaded, so as to receive a milled nut by which the pin can be drawn inwardly for clamping the straight-edge tightly against the disk 21. The disk is provided with a central segmental opening to accommodate the nut 39 upon the end of the pin 36 and permit the same to be easily reached and operated by the fingers of any person using the instrument. By loosening the nut 39, so as to relieve the pressure of the screw 36 upon the straight-edge, the said straight-edge can be moved longitudinally with respect to the disk 21, so as to assume any new position desired and so that the straight-edge may be made to project suitable distances upon either side of the head 20. When the desired adjustment has been attained, the milled nut 39 is tightened for clamping the straight-edge to the disk. After this the straight-edge is ready to be adjusted to any suitable angle by loosening the pin 34 and turning the disk 21 till the desired angle is attained, after which the set-screw 34 is tightened again.

As shown in Fig. 2 of the drawings, one side of the disk 21 is preferably provided with graduations covering a quarter of its circumference, dividing the same into degrees, such as appear ordinarily upon protractors for indicating the angle to which the blade is to be turned between the extreme positions indicated at A and B in Fig. 1. On the opposite side of the disk, as shown in Fig. 1, a single line or indication is placed in position to be brought into correspondence with the marks of a scale P on the head 20. This scale is an especial adaptation of this instrument to enable carpenters or others to determine the correct angles for cutting the ends of rafters in roofs of various pitches. Fractional num-

bers, as " $\frac{1}{6}$ ," " $\frac{1}{4}$ ," " $\frac{1}{3}$ ," &c., indicate the pitches of roofs in common use. When the line on the disk 21 is set opposite the number indicating the required pitch of roof, the correct angle is formed between the surface 24 and either edge of the blade 22. It is obvious that the sum of the angles at A and B is equal to ninety degrees or a right angle, so that the proper angle for cutting the bottom end of the rafters is formed between the surface 25 and either edge of the blade, the setting of the instrument remaining the same for both ends of the rafters of any given pitch. In addition to the fractional graduations for obtaining the angles of different-pitch rafters I provide on one end of the straight-edge 22 a table of contents, which when multiplied by half the width of the roof gives the length of the rafters for the various pitches in common use. As a further convenience in determining the length of rafters I provide on the opposite end of the blade 22 a table showing the lengths of rafters for the different pitches for the more common widths of buildings.

It is obvious from the above description that my combination-square, although exceedingly simple in structure, is capable of use in a number of ways. Of course it will be understood that I can vary the parts for securing the same ends without departing from the spirit of the invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A square, comprising a head having a countersunk recess formed therein, a flanged disk finding a bearing in said recess, said disk having a groove in its periphery, a shoe loosely resting in said groove, a set-screw carried by the head and bearing upon the said shoe whereby the disk may be held in its bearing and may be clamped at any point in its revolution, and a straight-edge carried by the said disk, substantially as described.

2. A combination-square comprising a head portion a disk having a flange on one side engaging a countersunk bearing in the said head, separate levels arranged at right angles to each other, upon the said head, a straight-edge carried by the said disk, and means traveling in a groove on the periphery of the disk for holding the same in position in connection with the flange of said disk, said means also clamping the disk in its adjusted positions, substantially as described.

3. A combination-tool comprising a head formed with a circular opening, a disk having a groove in its periphery, said disk lying in the opening in said head, a lip or shoulder on said disk engaging one face of said head for preventing lateral movement of said disk in one direction, means carried by said head engaging said peripheral groove for preventing lateral movement of said disk in an opposite direction, and ruling means carried by said disk, substantially as described.

4. A combination-tool comprising a head



formed with a circular opening, a disk having  
an annular groove, said disk lying in the open-  
ing in said head, an annular shoulder engag-  
ing one face of said head, a set-screw passed  
5 through a portion of said head and into said  
annular groove, and ruling means carried by  
said disk, substantially as described.

In testimony whereof I hereunto affix my  
signature in presence of two witnesses.

EMANUEL OEHRLE.

Witnesses:

D. O. BARNELL,

H. J. COWGILL.