No. 798,695. PATENTED SEPT. 5, 1905.

E. OEHRLE.

COMBINATION SQUARE AND PROTRACTOR.

APPLICATION FILED APR. 14, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

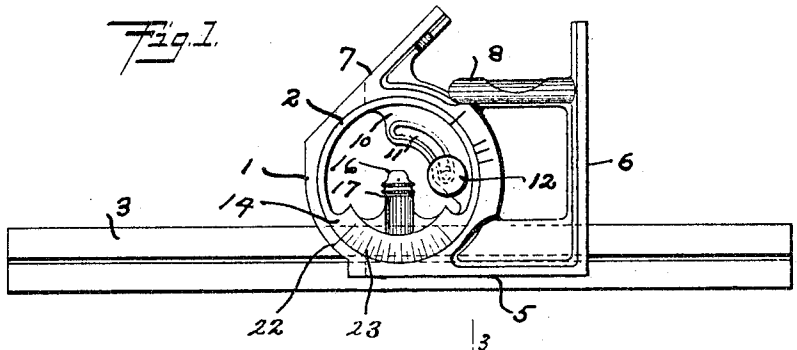


Fig. 3.

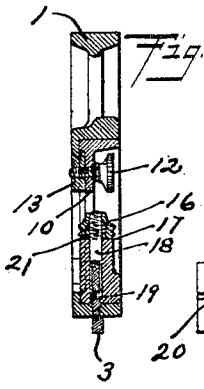


Fig. 2.

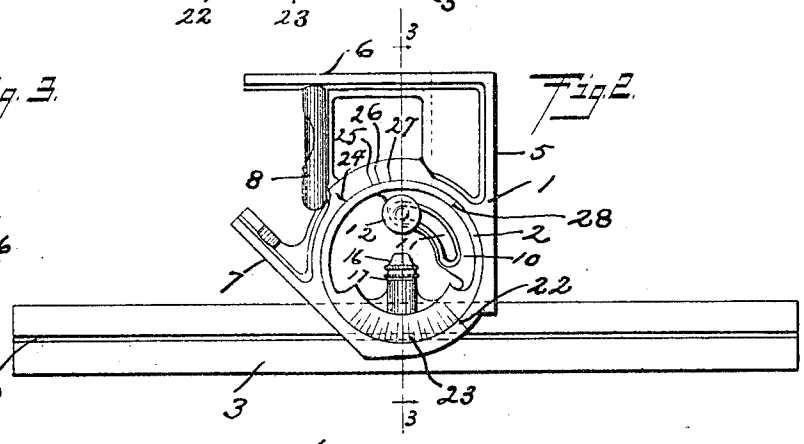
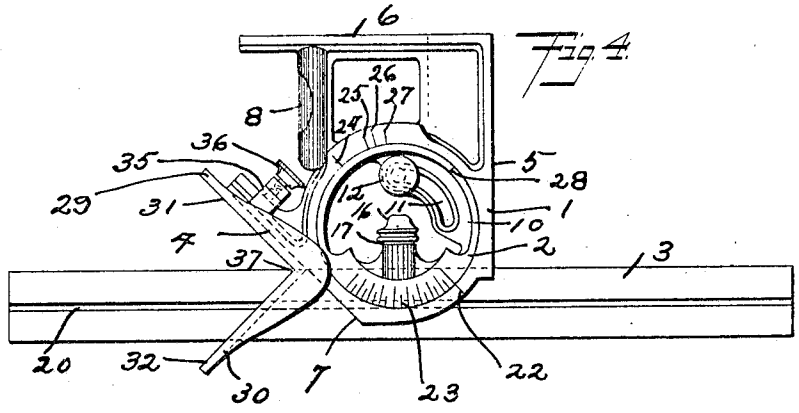


Fig. 4.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 5.

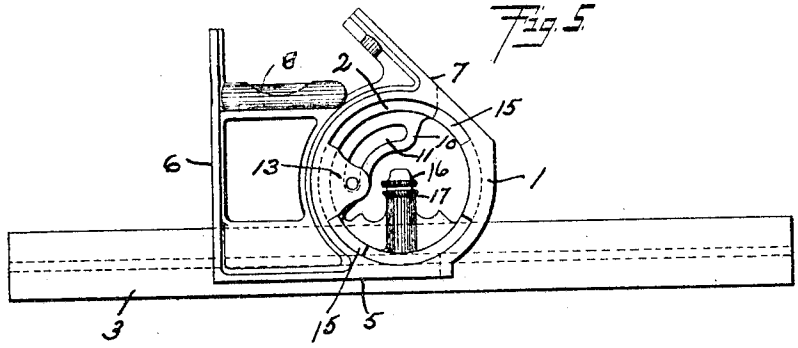


Fig. 7.

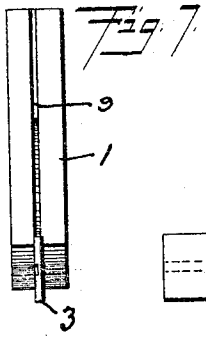
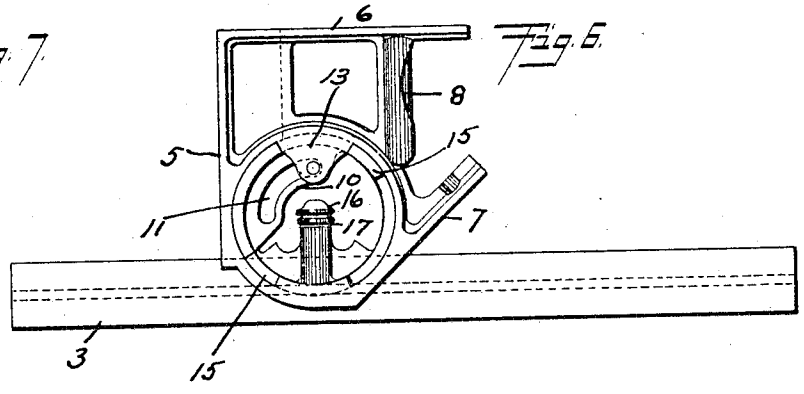


Fig. 6.



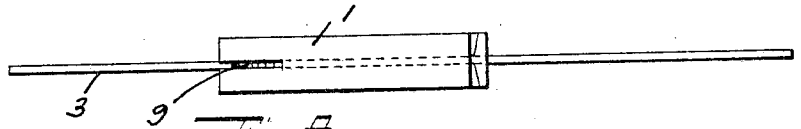


Fig. 8.

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No. 798,695. PATENTED SEPT. 5, 1905.

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3 SHEETS—SHEET 3.

Fig. 13.

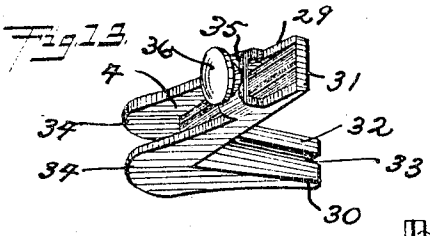


Fig. 9.

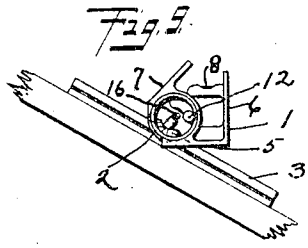


Fig. 10.

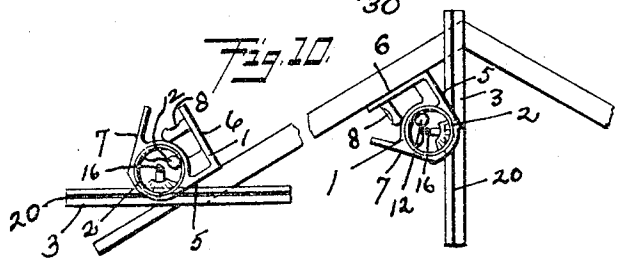


Fig. 12.

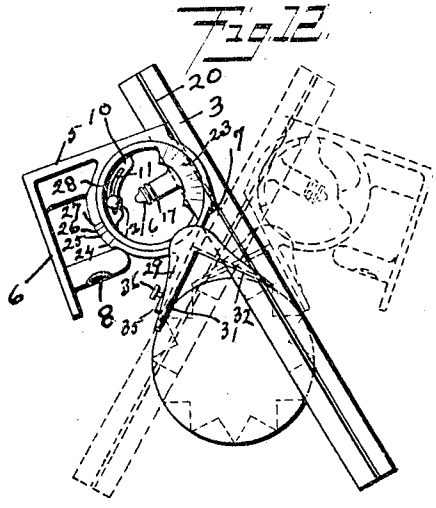
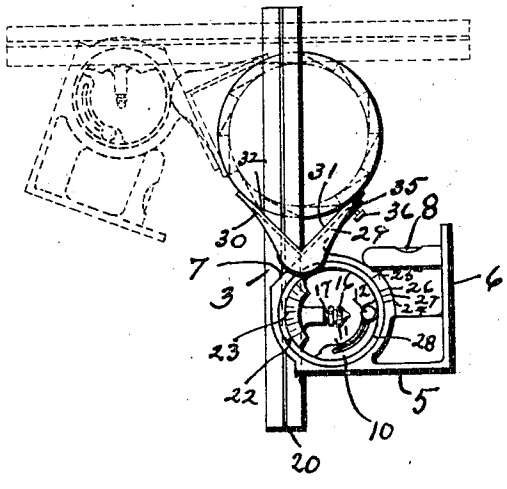


Fig. 11.



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UNITED STATES PATENT OFFICE.

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COMBINATION SQUARE AND PROTRACTOR.

No. 798,695. Specification of Letters Patent. Patented Sept. 5, 1905.

Application filed April 14, 1904. Serial No. 203,212.

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.

My invention relates to improvements in combination squares and protractors; and it is the object thereof to provide a convenient and comparatively inexpensive combination-square adaptable to the use of machinists, pattern-makers, carpenters, and the like, one instrument serving as a level, a miter, a bevel, a center-square, and protractor and in addition to these being adaptable to certain special uses, as will be hereinafter fully described.

My invention consists in the novel constructions, combinations, and arrangement of parts, as will be hereinafter 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 set so as that it may be used as a square or a level. Fig. 2 is an elevation of the same side of the combination-square, showing the blade in position so that the combination-square may be used as a square, a miter, and a plumb. Fig. 3 is a cross-section on line 3 3 of Fig. 2. Fig. 4 is the same elevation as Fig. 2 with the addition of the center-square attachment. Fig. 5 is an elevation of the other side of the combination-square in the same position as shown in Fig. 1. Fig. 6 is an elevation reverse of Fig. 2. Fig. 7 is an end elevation of Fig. 6. Fig. 8 is a plan view of Fig. 6. Fig. 9 shows the combination-square set in position to adjust timbers or the like at any desired angle with a horizontal line. Fig. 10 shows the square in a position to mark the plumb cut of roof-rafters and also the reverse position of the square to mark the level cut or that part of the rafters which sets on the studding. Fig. 11 shows the combination-square in position to be used as a center-square. The dotted lines show it set at any desired angle for marking off ratchet-teeth. Fig. 12 shows the square as used for marking off star-wheel teeth. Fig. 13 is a perspective of the center-square attachment.

The instrument comprises four parts—namely, a main body portion or head 1, a rotatable graduated disk 2, a straight-edge 3, and the center-square attachment 4. The head 1 is made substantially as illustrated in the drawings, being formed with straight edges or bearing-surfaces 5 and 6, arranged at right angles to each other and the face 7 at an angle of forty-five degrees to the faces 5 and 6. The small spirit-level 8 is mounted upon the head 1 parallel with the surface 5, so that an object to which the surface 5 is placed may be properly leveled. The level 8 is suitably placed with respect to the rest of the combination, so as to be entirely out of the way.

The blade 3 is adjustably secured to the rotatable graduated disk 2, so as to be carried thereby and held in various positions. The head 1 is slotted centrally, and the position of the slot 9 with respect to the cross-section of the head 1 is shown in Fig. 7, while the extent of the slot is indicated by the positions of the blades and the dotted lines in Figs. 1 and 2. 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 the work with equal facility. Thus corresponding angles may be obtained with the instrument without changing the position of the straight-edge 3. The rotatable graduated disk 2 has a slot which fits over the blade and coincides with the slot 9 in the head 1. The disk 2 has the projections 10 on the inside thereof, and in the projection 10 is the circular slot 11. The said rotatable graduated disk 2 may be securely held in any desired position by the thumb-screw 12, passing through the circular slot 11 and screwed into the lug 13 on the head 1. (Shown in Figs. 5 and 6.) One side of the disk, as 14, is flush with the surface of the head 1, while the other side is slightly below the surface of the head, except at the stops 15. (Shown in Figs. 5 and 6.) The said stops 15 are adapted to engage corresponding stops 13 on the head and limit the rotary movement of the head to ninety degrees or a quarter-circle.

The blade 3 is secured to the graduated disk 2 by turning the bur 16, bearing on the face 17 of the disk 2, which pulls the rod 18, hav-

ing the shoe 19 on the end thereof, fitting into the groove 20 of the blade 3. This operation binds the edge of the blade 3 against the bottom of the slot in the graduated disk 2. Under the bur 16 is placed a small spring 21, which is for the purpose of keeping a slight tension on the rod 18 when the bur 16 is slightly slacked.

On the head 1 is a graduation 22, which represents the zero-mark, and on the rotatable disk 2 are suitable graduations 23. If it is desired to secure certain angle, the thumb-screw is released, the disk revolved in the body 1 so that the desired graduation comes opposite the graduation 22 on the body, and the thumb-screw 10 is tightened, thus holding the blade 3 at the desired angle with the face 5. On the body 1 are the graduations 24, 25, 26, and 27, and on the rotatable disk 2 is the graduation 28. These graduations are for getting the pitch and in use for cutting rafters of any desired pitch.

The center-square attachment 4 comprises the arms 29 and 30, having the faces 31 and 32, respectively, at right angles to each other. The arm 30 has the slot 33, which extends to the face 31. The arm 29 has the side guides 34 34, the loop 35, and the thumb-screw 36, passing through the loop 35. When desired to use the center-square, the head 1 is passed between the side guides 34 34 and under the loop 35 of the arm 29, the attachment is pushed down until the blade 3 comes in contact with the end of the slot 29 and the arm 30, as shown at 37 in Fig. 4, and the thumb-screw 36 is then tightened, holding the attachment in place. On account of the adjustability of the blade through the slot in the center-square attachment the same may be used to draw lines on a circle through the points other than the center thereof, thus making it possible to use the square to lay out a ratchet or star wheel, as shown in Figs. 11 and 12. By means of the graduations 24, 25, 26, and 27 the square may be used in cutting rafters, as shown in Fig. 10. By placing the face 6 against the timber in marking the plumb cut and placing the face 5 against the timber marking the horizontal or lower cut both of said cuts may be marked with one setting of the instrument.

By setting the blade 3 at any desired angle the instrument may be used to place timbers at any desired angle with a horizontal line by placing the blade on the timber and adjusting the same to bring the level 8 horizontal, as shown in Fig. 9.

It will be noted that as the stops 15, limiting the movement of the disk, makes an abutting rather than a sliding contact on the limiting-stops 13 there will be no wear on the abutting faces of the stops and when the same are once accurately adjusted will remain so indefinitely. The screw 12 for fixedly holding the disk in any position overcomes the inaccuracy in instruments of this character employing screws bearing on the face of the disk, resulting after the disk is worn in pushing the same to a position eccentric to the opening in the head in which the disk is placed.

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

1. A combination square and protractor comprising a head having the flat base-surface, a vertical surface extending at right angles from the said base-surface, a miter-surface at an angle of forty-five degrees to both the vertical surface and the base-surface, a circular opening within said head, a projection on the inside thereof, a graduated disk revolubly held within said opening, said graduated disk being partially slotted, aforesaid base-surface being slotted, aforesaid vertical surface being slotted, aforesaid miter-face being slotted, aforesaid graduated disk having stop-lugs thereon, a straight-edge slidably held within the said graduated disk and working within said slotted head so that said straight-edge is stopped in one position at right angles to aforesaid flat base-surface and at forty-five degrees to the aforesaid miter-surface, and in its remaining stop position at right angles to said vertical surface, a threaded holder extending from said graduated disk to engage the said straight-edge, a thumb-nut engaging said threaded holder to adjustably secure aforesaid straight-edge to said graduated disk, a projection extending on the inside of the graduated disk having a circular slot therein, a thumb-screw passing through the circular slot into the projection on the aforesaid head thereby securing the aforesaid graduated disk in any desired position as described, and for the purpose set forth.

2. In an instrument of a class described, a slotted head, a base-surface on said head, a surface perpendicular to said base-surface, a miter-surface arranged at an angle of forty-five degrees to both the said base-surface and the perpendicular surface, an annular recess within the head, a disk revolubly held within said recess, and coinciding slots in said disk and head adapted to permit the passage through the same of a blade, said slot intersecting the three aforesaid surfaces on the head, a body removably secured to the miter-surface, said body having the two arms forming an interior angle, one of the said arms being slotted to allow the passage of the aforesaid blade, substantially as described.

3. In an instrument of the class described, a slotted head, a base-surface on the said head, the surface perpendicular to the base-surface, a miter-surface arranged at an angle of forty-five degrees to both the said base-surface and the said perpendicular surface, an annular recess within the head, a stop on the slotted body extending into the annular recess, a disk

revolubly held within said recess, stops on said disk to limit the revolution of the said disk, a slot in said disk adapted to permit the passage through the same of a blade, said slot intersecting the three aforesaid surfaces on the head, substantially as described.

4. In an instrument of the class described, a slotted head, a base-surface on the said head, a surface perpendicular to said base-surface, a miter-surface arranged at an angle of forty-five degrees to both the said base-surface and said perpendicular surface, an annular recess within the head, a lug on the head extending into the said recess, a disk revolubly held within said recess, stops on said disk coming in contact with the aforesaid lug on the head thereby limiting the revolution of the said revolubly-held disk, and coinciding slots in said disk and head adapted to permit the passage through the same of a blade, said slot intersecting the three aforesaid surfaces on the head, means for securing the blade to the revolubly-held disk, and means for holding the said disk in any desired position, substantially as described.

5. In an instrument of the class described, a slotted head, a base-surface on the said head, a surface perpendicular to the said base-surface, a miter-surface arranged at an angle of forty-five degrees to both the said base-surface and the perpendicular surface, an annular recess within the head, a lug on the head extending into the said recess, a disk revolubly held within said recess, stops on said disk coming in contact with aforesaid lugs on the head thereby limiting the revolution of the said revolubly-held disk, and coinciding slots in said disk and head adapted to permit the passage through the same of a blade, said slot intersecting the three aforesaid surfaces on the head, means for securing the blade to the revolubly-held disk and means for holding the disk in any desired position, a body removably secured to the miter-surface, said body having two arms forming an interior angle, one of the said arms being slotted to allow the passage of the aforesaid blade, substantially as described.

6. In an instrument of the class described, a slotted head, a base-surface on the said head, a surface perpendicular to the said base-surface, a miter-surface arranged at an angle of forty-five degrees to both the said base-surface and perpendicular surface, a spirit-level arranged parallel to the aforesaid base-surface, an annular recess within the head, abutments on the head, a disk revolubly held within said recess, abutments on the disk adapted to engage with the aforesaid abutments on the head, thereby limiting the revolution of the said disk, and coinciding slots in the said disk and head adapted to permit the passage through the same of a blade, said slot intersecting the three aforesaid surfaces on the head, a body removably secured to the miter-surface, said body having two arms forming an interior angle, one of the said arms being slotted to allow the passage of the aforesaid blade, means for securing the blade to the revolubly-held disk and means for holding the disk in any desired position, substantially as described.

7. A tool of the class described comprising a head having a base-surface at one edge thereof, a miter-surface arranged at an angle of forty-five degrees with said base-surface, the said surfaces and their prolongation to a point of intersection forming an acute angle, a disk revolubly held within said head and between said surfaces, and a blade carried by said disk, said blade passing through a slot intersecting the said base and miter surfaces, the extent of said slot being such that the blade may be turned from a position perpendicular to the base-surface to a position parallel therewith, in each of said positions the blade extending beyond the head at both sides, and the form of the head being such that for all positions of the blade one edge thereof will extend beyond the head along its entire length.

8. A tool of the class described comprising a head having a base-surface at one edge thereof, a miter-surface arranged at an angle of forty-five degrees with said base-surface, a protractor-disk revolubly held within said head, a blade carried by said protractor-disk and passing through a slot in the head arranged centrally to the sides thereof, a body removably secured to the miter-surface of the head, said body having faces arranged at a suitable angle, the said faces together with the aforesaid blade being adapted to form a center-square, and a slot in one of the said faces to permit the blade to be turned to a position other than the one at which it bisects the angle formed by the faces.

9. A tool of the class described comprising a head having a base-surface at one edge thereof, a surface perpendicular to said base-surface, a protractor-disk revolubly held within the head, means by which the said disk may be held at a fixed position relative to the head, said holding means being adapted to clamp the disk against a portion of the head in a direction parallel to the axis of rotation of the disk, a blade carried by the disk, said blade passing through a slot intersecting the said base and perpendicular surfaces, abutments on the head, and abutments carried by the disk adapted to engage the abutments on the head to limit the possible movement of the disk so that at one extreme the blade will be parallel with the base-surface and at the other extreme parallel with the perpendicular surface.

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

EMANUEL OEHRLE.

Witnesses:
D. O. BARNELL,
HOWARD J. COWGILL.