No. 700,326. Patented May 20, 1902.

N. D. HAMEL.

COMBINED BEVEL, PROTRACTOR, SQUARE, AND PITCH BOARD.

(Application filed Dec. 26, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

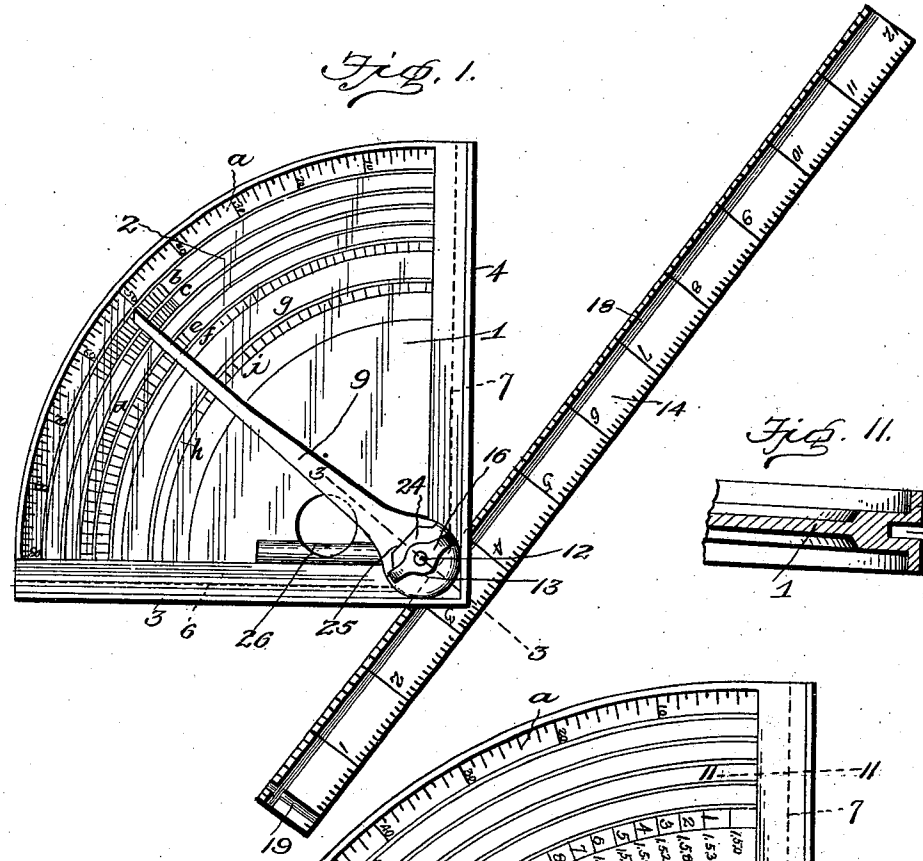
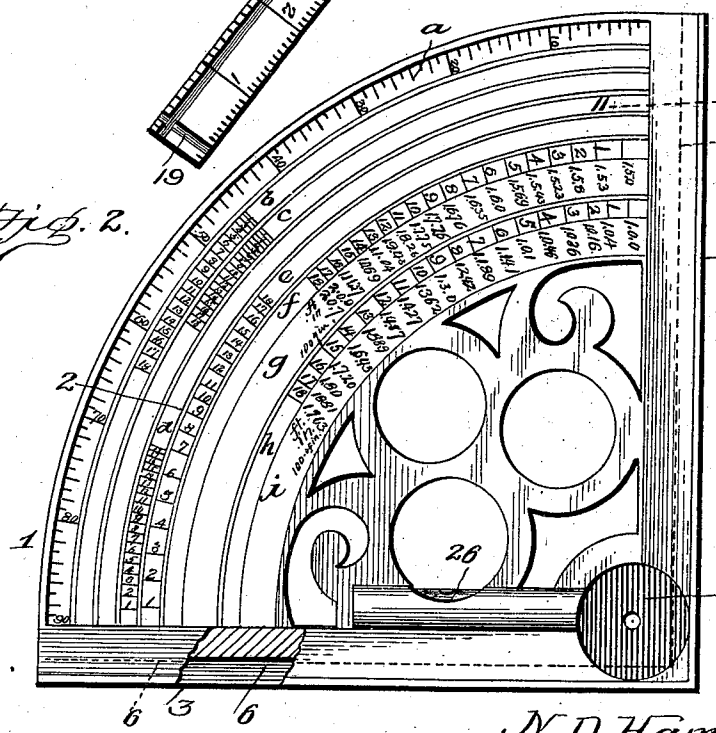


Fig. 11.

Fig. 2.



Witnesses

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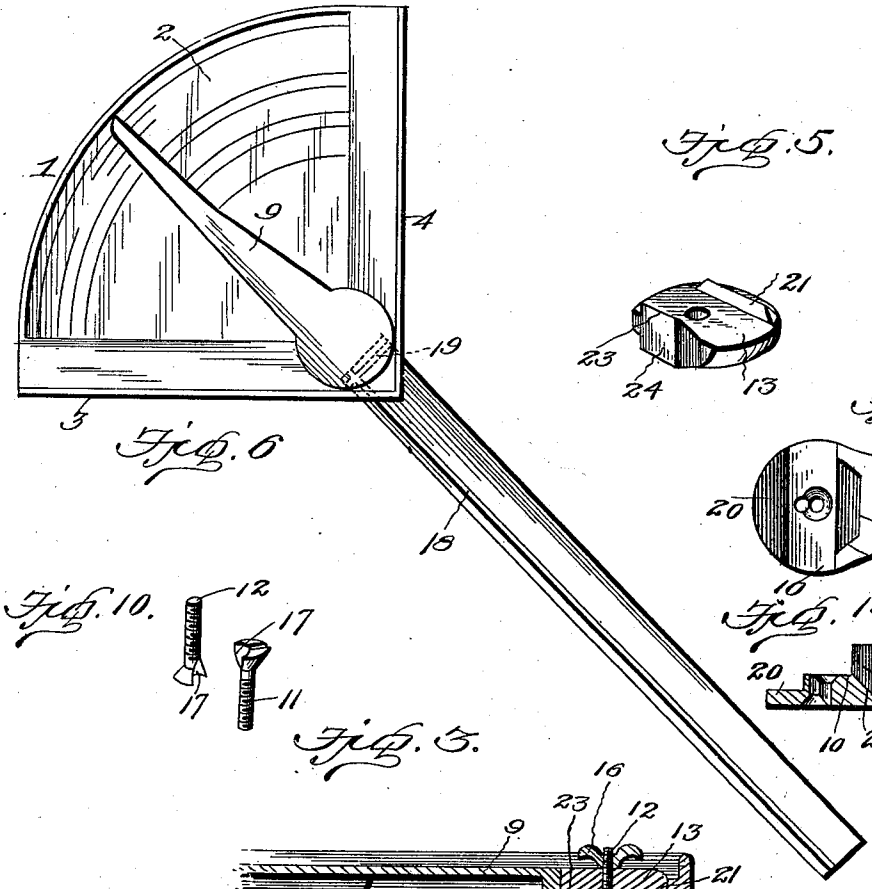


Fig. 6

Fig. 5.

Fig. 12.

Fig. 10.

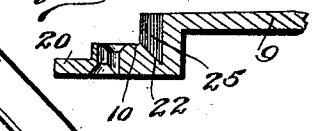
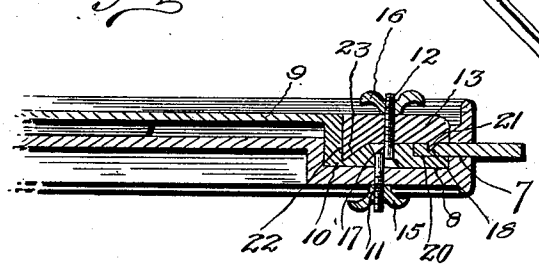


Fig. 13.

Fig. 3.



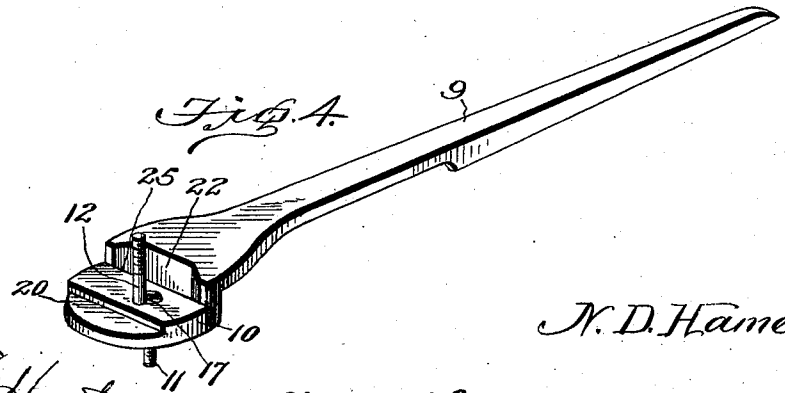


Fig. 4.

Witnesses

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(Application filed Dec. 26, 1901.)

(No Model.) 3 Sheets—Sheet 3.

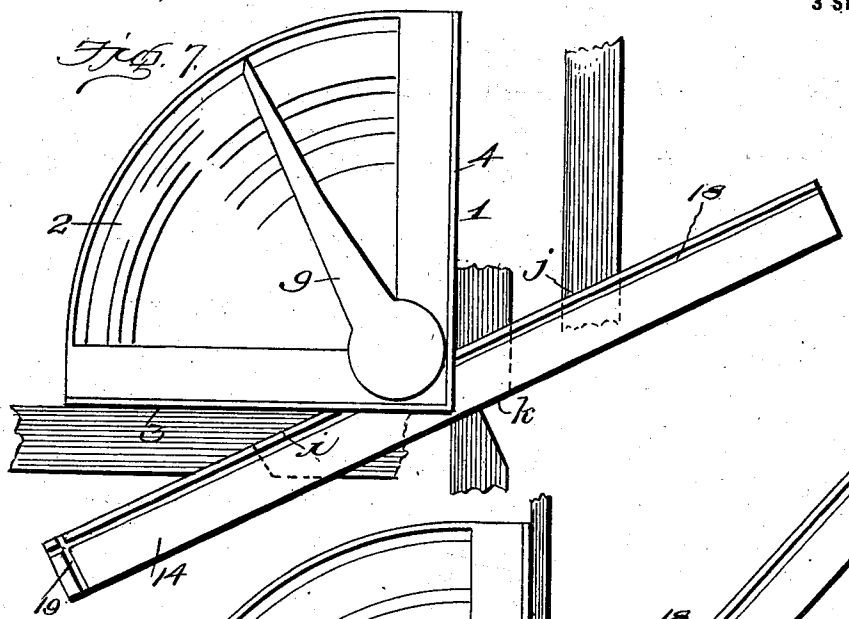


Fig. 7.

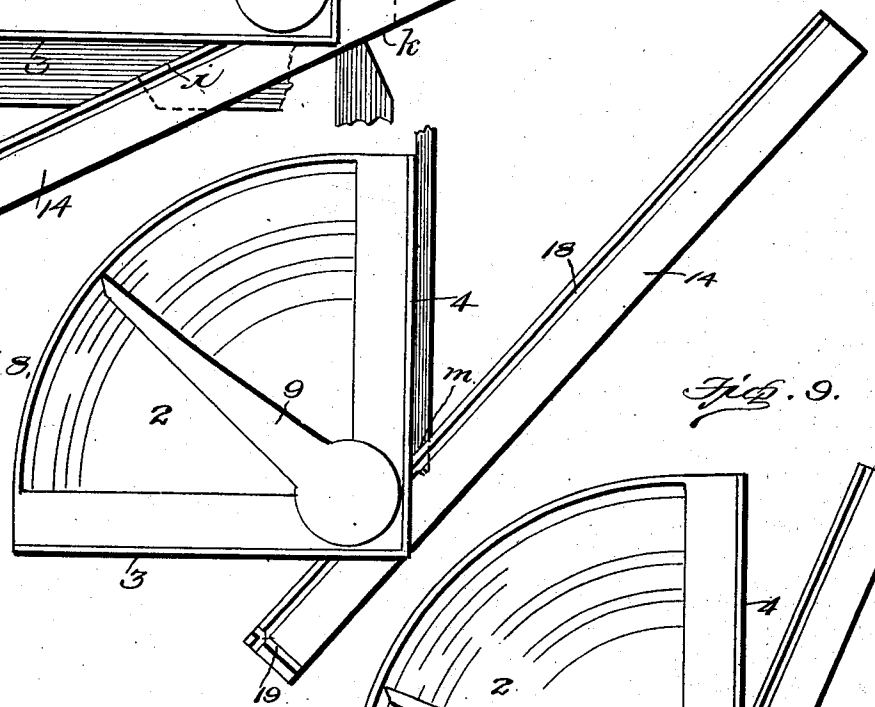
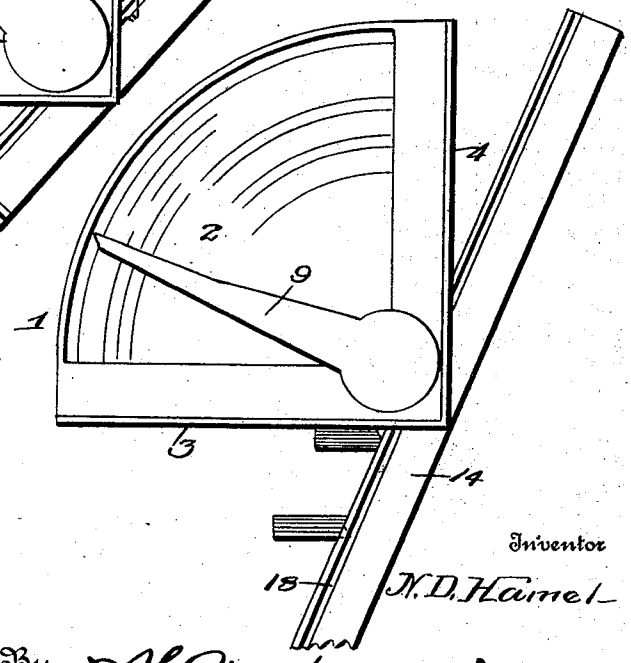


Fig. 8.

Fig. 9.



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UNITED STATES PATENT OFFICE.

NORBERT D. HAMEL, OF WEST GARDNER, MASSACHUSETTS.

COMBINED BEVEL-PROTRACTOR, SQUARE, AND PITCH-BOARD.

SPECIFICATION forming part of Letters Patent No. 700,326, dated May 20, 1902.

Application filed December 26, 1901. Serial No. 87,194. (No model.)

To all whom it may concern:

Be it known that I, NORBERT D. HAMEL, a citizen of the United States, residing at West Gardner, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in a Combined Bevel-Protractor, Square, and Pitch-Board; and I do 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.

This invention relates to a combined bevel-protractor, square, and pitch-board.

The object of the invention is to provide a device of this character which shall be comparatively simple of construction and inexpensive of production, durable in use, and easily operated, and by means of which a variety of adjustments may be obtained to adapt the device for a number of different useful purposes.

With these and other objects in view, which will appear as the nature of the invention is better understood, the same consists in certain details of construction, combination, and arrangement of parts, as will be hereinafter more fully described, defined in the appended claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of a measuring instrument embodying my invention. Fig. 2 is an enlarged detail view of the scale-plate thereof. Fig. 3 is a detail sectional view on line 3 3 of Fig. 1. Fig. 4 is a detail perspective view of the pointer or index-arm. Fig. 5 is an inverted perspective view of the clamp. Fig. 6 is a detail view showing the blade set to use the transverse groove, and Figs. 7, 8, and 9 are diagrammatic views showing some of the different uses for which the device is adapted. Fig. 10 is a detail view of the screws. Fig. 11 is a detail section on line 11 11 of Fig. 2. Fig. 12 is a detail view, in top plan, of the pivoted end of the pointer. Fig. 13 is a longitudinal section of the same.

Referring now more particularly to the drawings, the numeral 1 represents the segmental or triangular part of the instrument, which forms the scale-plate 2 and the working edges 3 and 4. These edges 3 and 4 are formed with longitudinal grooves 6 and 7, which at the vertex portion of the triangular part intersect and open into a circular socket or depression 8, formed in the plate 2.

The pointer or index-arm 9, which sweeps across the face of the scale-plate 2, is formed at its pivoted end with a circular boss 10, which seats and turns within the said recess or socket and has passed therethrough a screw 11, which projects down through the bottom wall of the socket and forms the pivot on which the pointer turns, and a screw 12, which passes up through an opening in the clamping-block 13, which secures the blade 14 in adjusted position. These screws are provided, respectively, with the securing-nuts 15 and 16, and their heads are formed with notches 17, the shank of one screw seating within the notch in the head of the other screw, whereby the screws mutually coact to prevent each other from turning.

The blade or ruler 14 is formed near one of its side edges with a longitudinal groove 18 and near one of its end edges with a transverse groove 19. The boss 10 is formed at a point diametrically opposite the arm 9 with a recess or cut-away portion 20 of sufficient depth and width to receive the grooved edge of the blade, and a corresponding portion of the clamping-block has a tongue 21 to enter either groove 18 or 19. A recess 22 is further provided in the boss to receive a detent 23, formed upon the clamping-block, which detent is carried by an angular portion 24 of said block, which is adapted to occupy an angular notch 25 in the contiguous end of the indicator-arm 9, whereby the block 13 is held from twisting or turning independent of the boss 10. The nut 15 is adapted to hold the boss 10 seated in the socket 8, while the nut 16 is adapted to hold the clamping-block from upward movement and maintain it in clamping engagement with the blade 14.

On the face of the plate are the following scales: A general protractor-scale *a*, a scale *b* for measuring and determining the side bevels of jack-rafters, a scale *c* for measuring the side bevels of hip or valley rafters, a scale *d* for measuring the angle at which the end of a hip or valley rafter is to be cut off to correspond to the square cut on the foot of a common rafter, a scale *e* for making measurements in "backing off" hip or valley rafters, a scale *f* for determining the "rise" of a hip-

rafter in inches, a scale *g* for determining the length of a hip or valley rafter in feet, inches, and fractions of an inch to correspond with a common rafter, a scale *h* for determining the rise of a common rafter in inches, and a scale *i* for determining the length of a rafter to one foot run in feet, inches, and a fractional part of an inch. These scales while designed for the specific uses stated may of course be employed for any and all analogous purposes.

A level 26 may be used upon the device, if desired, for an obvious purpose.

By reference to Fig. 1 of the drawings it will be seen that the blade 14 may be set to slide in either of the grooves 6 or 7 and adjusted parallel with either of the working edges 3 and 4 and held in adjusted position by simply tightening the thumb-nut 16, and it will be apparent that the device may be used as a square, leveler, or bevel-protractor, as desired. The adjustment of the rule or blade for right-angle or triangle measurement by the mode of application of the blade shown in Fig. 1 will be obvious, and Fig. 6 shows the manner of setting the blade differently for similar purposes. In either mode of adjustment the pointer or index-arm when clamped to the blade by the action of the nut 16 will swing across the face of the scale-plate as the blade is adjusted.

Fig. 7 represents the device as used in gaging the angles in forming the cuts in hip and valley rafters, the side 4 giving the top cut at *j* and also the cut at *k*, while the side 3 gives the angle of the cut at *i*, representing the lower end of the hip or valley, *j k* are the plumb cuts, and *i* the level cut.

Fig. 8 represents gaging the side bevel of a hip. The side 4 is placed against the timber and the blade will indicate that the cut is to be made at *m*, the pointer showing the angle on the scale-plate.

Fig. 9 represents how a hip or valley may be backed. Place the pointer at the proper point on the scale *c* and the edge 3 to the timber, when the blade will give the cut.

The foregoing illustrate some of the uses for which the device is adapted, while the general mode of use of the device will be apparent to those versed in the art.

Changes in the form, proportion, and minor details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

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

1. In a device of the character described, the combination with the segmental part having a scale and working edges, of an index-arm having a boss pivoted at the vertex portion of said part and formed with a recess, a blade having a groove and adapted to seat in said recess, a clamping-block mounted upon the boss and having a tongue to engage said groove, means for holding the block against turning, and means for securing the block in clamping position to fix the blade to the arm, substantially as described.

2. In a device of the character described, the combination with the segmental part having a scale and working edges; of an index-arm having a boss pivoted at the vertex portion of said part and formed with a recess, a blade having a groove and adapted to seat in said recess, a clamping-block mounted upon the boss and having a tongue to engage said groove, a screw passing downwardly through the boss and segmental part and carrying a clamping-nut, and a second screw passing upwardly through the boss and clamping-block, said screws having an interfitting engagement to prevent rotation thereof, substantially as specified.

3. In a device of the character described, the combination of the segmental part provided at its vertex portion with a socket or depression and in its working edges with grooves communicating with said depression, an index-arm having a boss pivoted to turn in the socket or depression, a blade adapted to fit and slide in either of the aforesaid grooves in the working edges, and means for clamping the blade to the boss of the index-arm, substantially as set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

NORBERT D. HAMEL.

Witnesses:
THEOPHILE T. JAILLET,
CHARLES HAMEL.