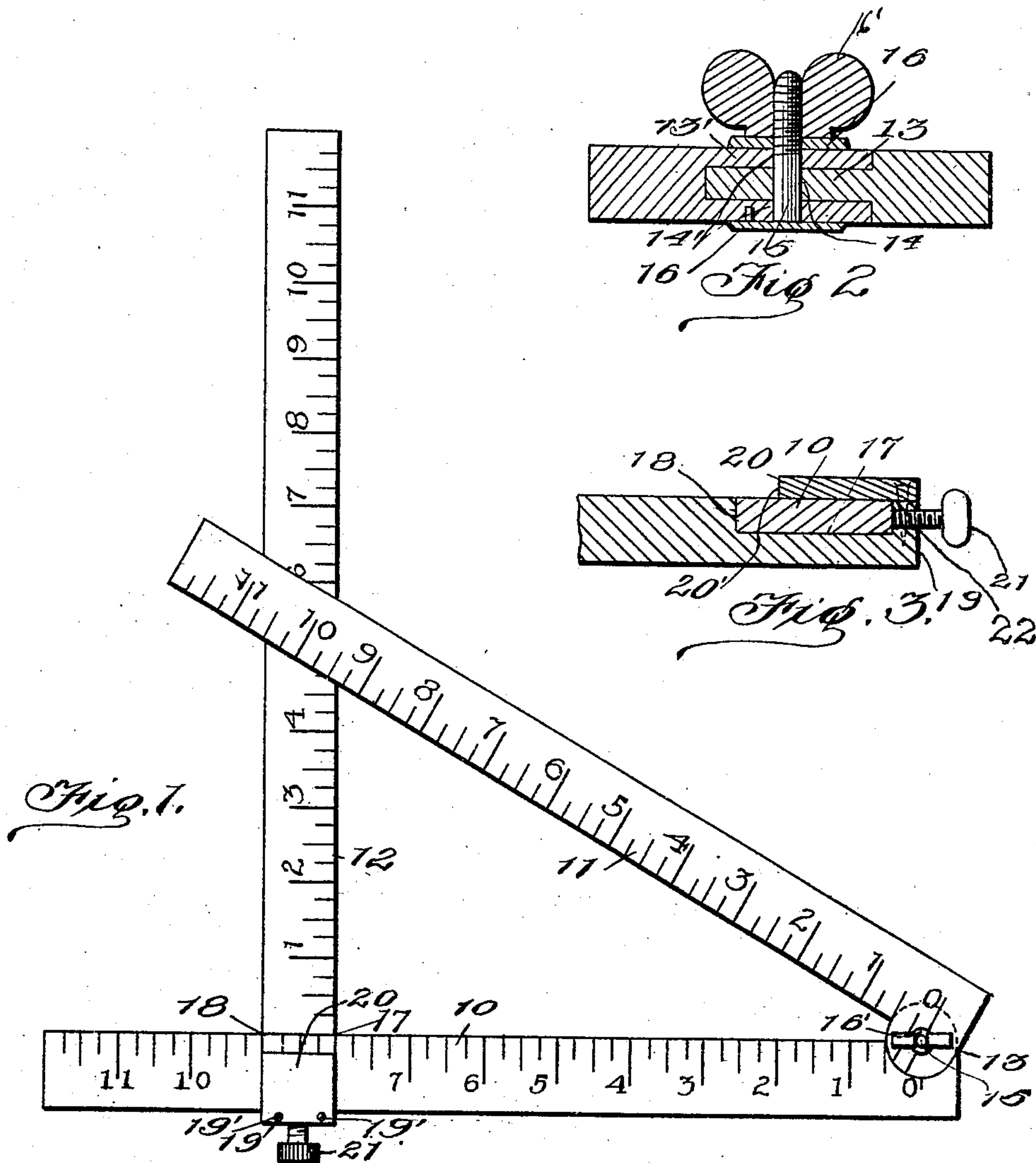


J. MINOR.
PROJECTOR.

APPLICATION FILED DEC. 5, 1907.

907,517.

Patented Dec. 22, 1908.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN MINOR, OF LEXINGTON, KENTUCKY.

PROJECTOR.

No. 907,517.

Specification of Letters Patent.

Patented Dec. 22, 1908.

Application filed December 5, 1907. Serial No. 405,243.

To all whom it may concern:

Be it known that I, JOHN MINOR, a citizen of the United States, residing at Lexington, in the county of Fayette and State of Kentucky, have invented certain new and useful Improvements in Projectors, of which the following is a specification.

This invention relates to measuring instruments, and has for its object to provide a protractor of simple design, for use by carpenters, builders, architects, in schools, etc.

Another object is to provide such an article which will simplify the operation of discovering the proper length for certain timbers and the angle at which they should be cut, in the construction of roofs, bridges, etc.

Another object is to provide an attachment which may be fitted to carpenters' rules of the pivoted type to convert them into protractors.

Another object is to provide such an article which will be low in cost and easy to manufacture.

Other objects and advantages will be apparent from the accompanying description, and it will be understood that changes in the specific form shown and described may be made within the scope of the claims without departing from the spirit of the invention.

In the drawings forming a part of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a plan view of the instrument, Fig. 2 is a sectional view horizontally, showing the pivotal engagement of the horizontal and hypotenuse sections, and Fig. 3 is a similar view, showing the means for engaging the vertical section on the horizontal section.

Referring now to the drawings, there is shown a protractor made of metal, wood, or other suitable material, having a horizontal section 10, a hypotenuse section 11 pivoted thereon, and a vertical section 12 slidably engaged on the horizontal section. Each of the sections named has marked thereon a suitable series of scales for indicating units of length.

The horizontal section 10 comprises a straight-edge, or rule, having a semicircular knob 13 extending laterally therefrom at one end, in which there is a perforation 14, for a purpose to be indicated. The hypotenuse section 11 is formed similarly to the section 10, having a knob 13' and a perforation 14', and is secured pivotally upon the section 10

by means of a threaded bolt 15 engaged through the perforations 14 and 14' and a washer 16. A wing-nut 16' is engaged over the projecting end of the bolt 15 and is arranged to engage against the washer to hold the sections 10 and 11 rigidly against movement when they have been adjusted at the desired angle.

The vertical section 12 comprises a straight ruler, provided with a laterally extending recess 17 at its lower end having a shoulder 18 at its inner side and a wall 19 at its outer side, and having an inwardly extending arm-piece 20 secured upon the wall 19 by means of screws 19' with its end edge 20' in spaced relation with the shoulder 18, for a purpose to be indicated. The horizontal section 10 is engaged slidably in the recess 17 beneath the arm 20, the figures of the scale on the horizontal section being observable in the space between the shoulder 18 and the edge 20' of the arm 20. A thumb-screw 21 is engaged through a threaded opening 22 in the wall 19 of the recess 17, being arranged to bear against the horizontal section 10 to hold the vertical section adjustably at any point in the length of the horizontal section.

In use, for planning and constructing the wooden framework for a roof, it is only necessary to determine the pitch which the roof shall have and set the hypotenuse section 11 at a corresponding angle to the horizontal section 10, then move the vertical section 12 to the proper point on the horizontal section, when the proper length for certain timbers required will be indicated to scale at the junction of the sections. The angle at which the ends of the timbers should be cut is also indicated, and by placing the instrument upon one of such timbers it will serve as a guide for marking the line on which it should be cut. In order to obtain the pitch of the roof, it is necessary to determine the total rise to be given any portion of the roof, and the distance from the eaves at which the apex shall be, and setting the vertical and hypotenuse sections in corresponding adjustment. Thereafter, if the roofs shall have L extensions or other extensions, the length of necessary beams may be obtained by adjustment of the vertical section alone, retaining the hypotenuse section at the angle originally presented. The use of this protractor for other work in building construction, bridge work, etc., is similar to the application above described,

When not in use, the vertical section 12 may be disengaged from the horizontal section 10 and the hypotenuse section 11 folded to lie adjacently parallel to the horizontal section, and
5 the parts disposed in the pocket, or otherwise, conveniently for carrying. It will be seen that by means of the recess 17 and thumb-screw 21, the vertical section 12 may be attached to ordinary rulers to form right-
10 angle squares, and to rulers of the folding type to form protractors, similar to applicant's complete invention.

What is claimed is:

1. In a measuring device, the combination with straight edged sections connected
15 pivotally, and having scales marked thereon at one edge, of a straight edged member having a transverse recess therein at one end, opening through the opposite edges of
20 the member, and a retaining arm secured to the member outwardly of the recess and projecting inwardly thereover, the inner end of the arm being disposed in spaced relation with the inner edge of the recess, said recess
25 having one of said first named sections

engaged slidably therein with said scale disposed to view beyond the inner edge of said arm.

2. As an article of manufacture, a measuring instrument comprising straight edged
30 member having a transverse recess formed therein adjacent to one end, and a retaining member secured to the outer end of the first member and extending inwardly over the
35 recess to lie with its inner edge in spaced relation with the inner edge of said recess, said recess being adapted to receive a ruler slidably therein having a scale marked upon
one edge thereof, to expose said scale to
view inwardly of the retaining member,
40 and a headed screw engaged through the outer end portion of the first named member and adapted to impinge against a ruler carried within the recess.

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

JOHN MINOR.

Witnesses:

TOM McMEEKIN,
E. WHITSON.