No. 703,235. Patented June 24, 1902.

# B. H. CAMDEN.

## PROTRACTING RULER.

(Application filed Dec. 3, 1901.)

(No Model.)

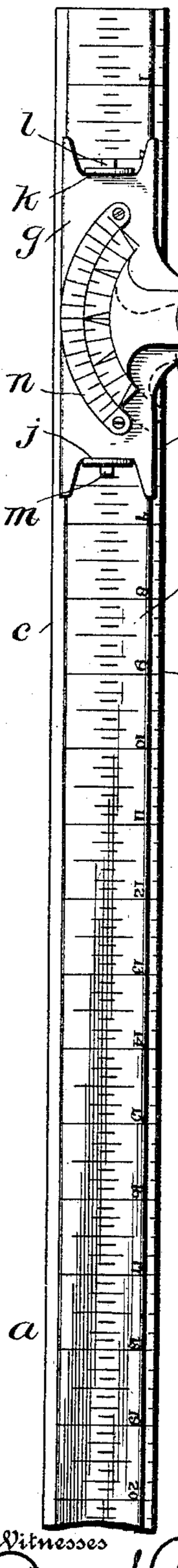



Fig. 1.

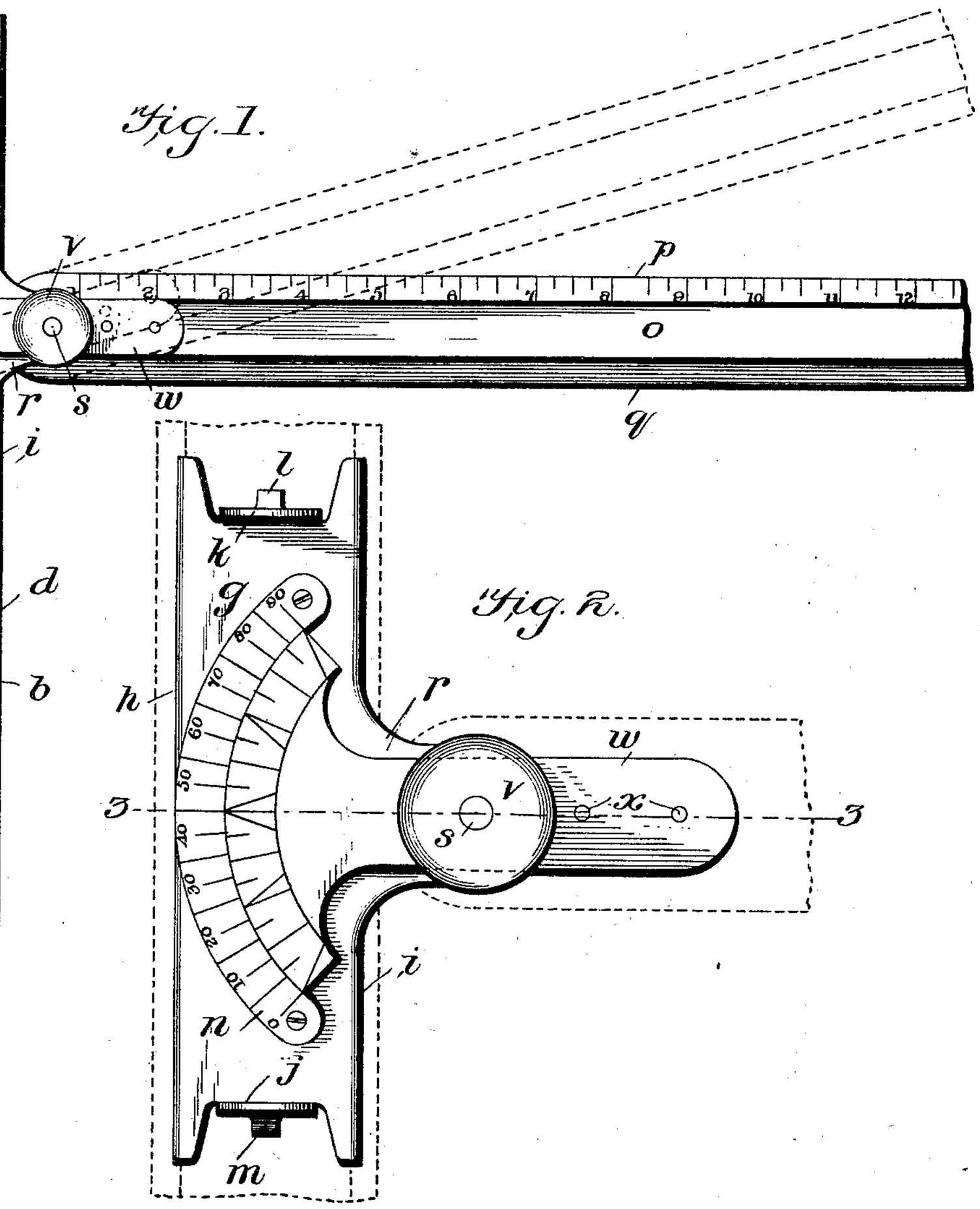
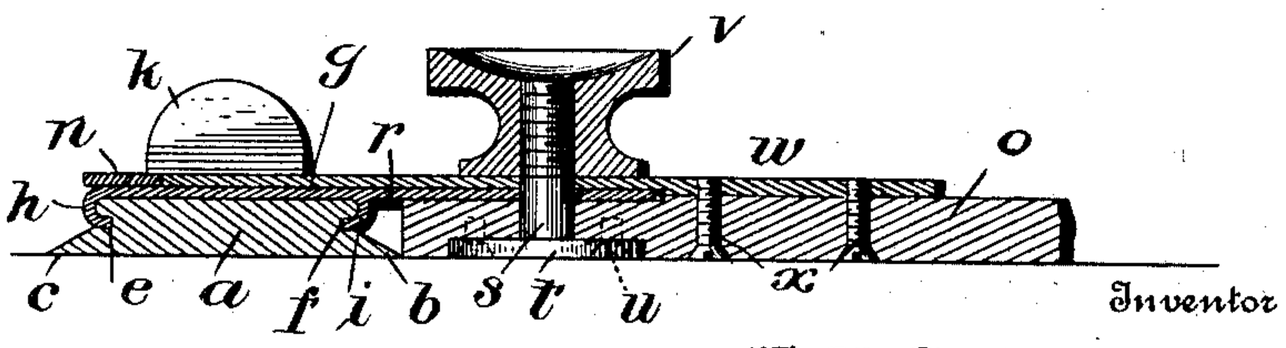



Fig. 2.




Fig. 3.




Witnesses

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# UNITED STATES PATENT OFFICE.

BERNARD H. CAMDEN, OF THE UNITED STATES REVENUE MARINE.

## PROTRACTING-RULER.

SPECIFICATION forming part of Letters Patent No. 703,235, dated June 24, 1902.

Application filed December 3, 1901. Serial No. 84,536. (No model.)

*To all whom it may concern:*

Be it known that I, BERNARD H. CAMDEN, lieutenant United States Revenue Marine, stationed at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Protracting-Rulers; 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 protracting-rulers; and the object of my invention is to provide a simple, economical, and efficient ruler designed especially to be used instead of the ordinary parallel-ruler in making section-lines, laying off angles, and for use in connection with laying a course on board ships.

With this object in view my invention consists in the construction and combination of parts, as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of my improved ruler. Fig. 2 is a plan view of the slide and protractor carried thereby; and Fig. 3 is a cross-section of my improved ruler, taken on the line 3 3 of Fig. 2.

*a* represents a ruler provided with two beveled edges *b c*. The edge *b* is preferably divided off to furnish a scale, as is also the top *d*, which scale on the top is used especially in section-lining. Near the top *d* the ruler is undercut, as shown at *e* and *f* in Fig. 3, for the reception of the slide *g*. This slide is provided with two inwardly-curved portions *h* and *i*, fitting in the recessed portions *e* and *f* of the body of the rule. The slide is also provided with thumb-pieces *j* and *k* for convenience in moving the same and with pointers *l* and *m*, one at each end thereof, centrally placed over the top of the ruler. The slide *g* is also provided with a curved protractor *n*, fastened to the top thereof and divided off into degrees, as is usual. *o* represents another ruler, pivoted to the slide *g*. This, too, is provided with tapered edges *p* and *q*, the edge *p* being preferably divided off to form a scale. The slide *g* is provided with an extension *r*, centrally located with relation to the slide and extending some little distance to one side thereof. This slide is perforated for the passage of a pivot-pin *s*, which pin is provided on its lower end with a head *t*, which head is fastened by means of the screws *u* to the ruler *o*. A set-screw *v* engages the top of the pivot-pin and serves to hold the parts friction-bound in any desired position. A quadrant *w*, the left-hand end of which is concentric with the protractor *n*, is also pivoted on the pin *s* and is attached to the ruler *o* by screws *x*. The quadrant is graduated, so as to show the points of the compass and also half and quarter points. The parts are so arranged and the graduation of the quadrant and protractor are so related that when the part *o* is brought up so as to be parallel with or touching the part *a* the edge of the quadrant will be at zero degrees on the protractor.

In using my invention as a parallel-ruler the part *o* is set in any desired position, and then the slide *g*, carrying with it the protractor, the quadrant, and the part *o*, may be moved back and forth over the ruler *a* to any desired position. Of course angles may be laid off by moving the part *o* into any desired relation with the ruler *a*. For section-lining after the part *o* has been set in position the slide may be moved back and forth over the ruler *a*, taking care that either of the pointers *l* or *m* should just reach one of the divisions on the top of the ruler *a*.

In laying down a course on a chart the ruler *a* may be set on any desired meridian, and the course determined between any two points by movement of the part *o*, or any desired course may be laid off from any given point.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a protracting-ruler, the combination of a base or main part, a slide movable longitudinally thereon, pointers adapted to register with graduations upon said base or main part, a protractor upon said slide, a swinging member, a perforated extension upon said slide adapted to lap upon the end of said swinging member, a quadrant secured to said swinging member, having a perforation adapted to register with the perforation upon the said extension, said quadrant being provided with a curved edge concentric with said pro-

tractor, and a screw passing through the perforations in said quadrant and the extension upon said slide.

2. In a protracting-ruler, the combination of a base or main part, a slide movable longitudinally thereon, pointers carried by said slide adapted to register with graduations upon said base portion, a segmental plate raised upon the top of said slide having concentric inner and outer edges, a swinging member, a perforated extension upon said slide adapted to be pivoted to said member, a perforated quadrant secured to said member, and having a graduated curved edge concentric with and adapted to slide upon the inner edge of said protractor, and a screw passing through said perforations to secure the same to said swinging member.

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

BERNARD H. CAMDEN.

Witnesses:

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