

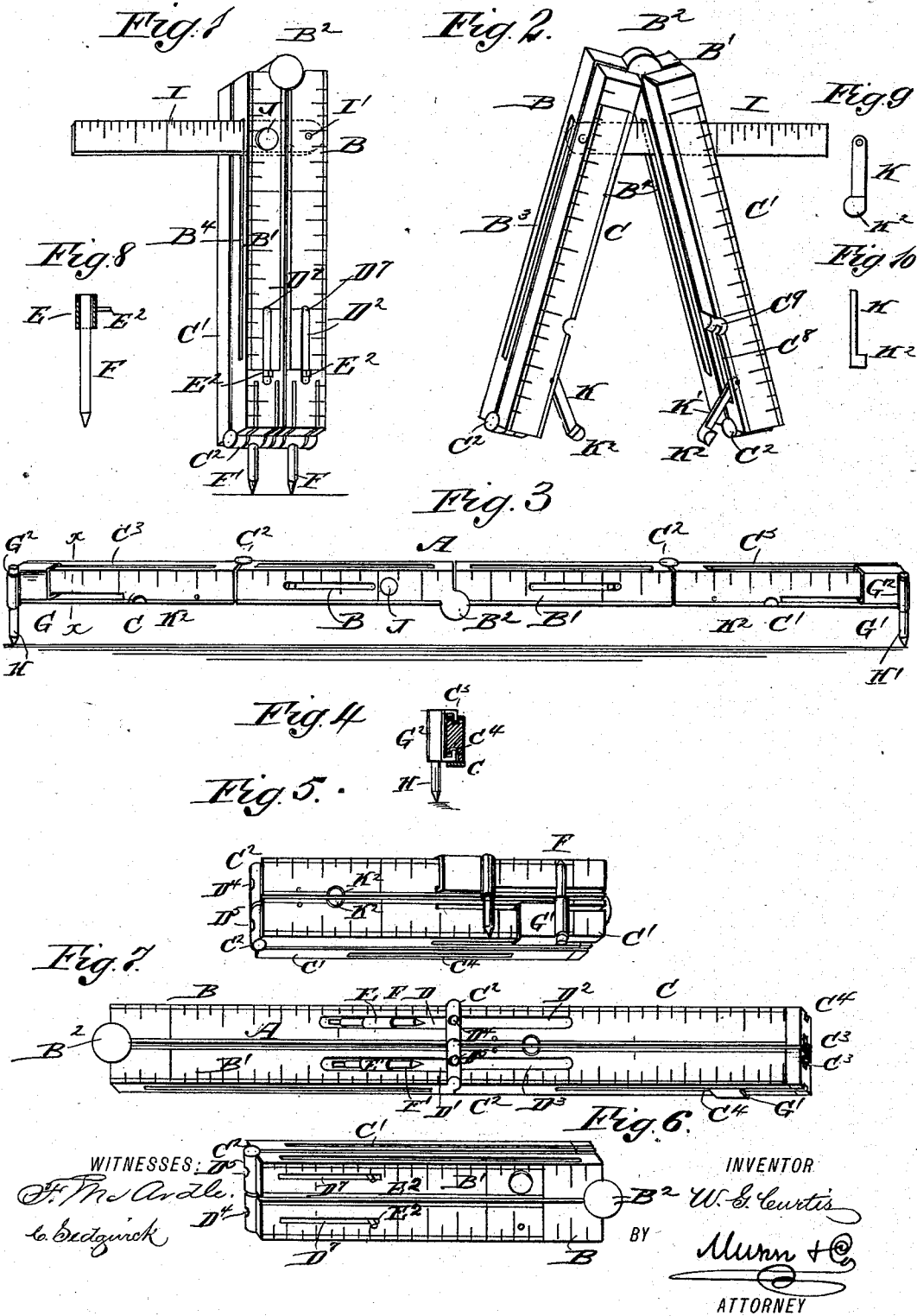
(No Model.)

W. G. CURTIS.

COMBINED DRAWING AND MEASURING INSTRUMENT.

No. 416,719.

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WITNESSES:  
*J. Mc Ardle.*  
*L. Sedgwick*

INVENTOR  
*W. G. Curtis*  
 BY  
*Munn & Co.*  
 ATTORNEY

# UNITED STATES PATENT OFFICE.

WILLIAM G. CURTIS, OF PHILADELPHIA, PENNSYLVANIA.

## COMBINED DRAWING AND MEASURING INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 416,719, dated December 10, 1889.

Application filed March 16, 1889. Serial No. 303,612. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM G. CURTIS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Combined Drawing and Measuring Instrument, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved drawing and measuring instrument which combines a rule, dividers, calipers, beam-compasses, squares, &c.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of the improvement as adapted for use as a square and dividers. Fig. 2 is a like view of the same as adapted for use as a pair of compasses. Fig. 3 is a like view of the same as adapted for use as beam-compasses. Fig. 4 is a transverse section of the same on the line  $xx$  of Fig. 3. Fig. 5 is a perspective view of the improvement as folded up. Fig. 6 is a like view of the same, showing the reverse side. Fig. 7 is a similar view of the improvement as adapted for use as a rule. Fig. 8 is a side elevation of one of the divider-points with parts in section. Fig. 9 is a side elevation of one of the clamp-arms, and Fig. 10 is a front view of the same.

The improvement is provided with a rule A, having the usual sections B and B', connected by a hinge B<sup>2</sup>, and the sections C and C', connected with the sections B and B' by hinges C<sup>2</sup>, as is plainly illustrated in Fig. 3. On one side of each section B and B' is formed a groove D or D', and in the section C and C' are formed corresponding grooves D<sup>2</sup> and D<sup>3</sup>. The grooves D and D<sup>2</sup> and the grooves D' and D<sup>3</sup> are in line with each other when the several sections of the rule A are placed in the position shown in Fig. 7.

In the grooves D and D' are mounted to slide the casings E and E', respectively, carrying the divider-points F and F', respectively, adapted to pass through apertures D<sup>4</sup> and D<sup>5</sup>, formed in the hinges C<sup>2</sup>, when the several

sections of the rule are folded up into the position shown in Figs. 5 and 6. From each of the casings E and E' projects a pin E<sup>2</sup> through slots D<sup>7</sup>, formed in the opposite sides of the sections B and B' and in line with the grooves D and D'. The pins E<sup>2</sup> project to the outside, and the operator can conveniently move said pins up and down in the slots D<sup>7</sup>, thereby shifting the divider-points F and F' so as to pass outward into the position shown in Fig. 1, whereby the instrument can be used as a pair of compasses. When the pins E<sup>2</sup> are moved to their uppermost position, then the divider-points F and F' are disengaged from the apertures in the hinges C<sup>2</sup>, and consequently do not project to the outside. When the sections C and C' are folded onto the sections B and B', the said divider-points are entirely closed up and cannot be seen at all from the outside. The grooves D D' and D<sup>2</sup> D<sup>3</sup> are usually made semicircular, so that the points are firmly increased when the sections are closed.

On the sections C and C' of the rule A are mounted to slide forward and backward the heads G and G', carrying the compass-points H and H', respectively, to form beam-compasses. Each of the heads G G' is preferably made of a plate extending over one side of the respective sections C or C', being bent over at the top to form a downwardly-extending flange fitting into the grooves C<sup>3</sup> formed in the top of the said sections C and C', as is plainly shown in Fig. 4. The lower ends of the heads G G' are provided with inwardly-extending flanges fitting into a groove C<sup>4</sup>, formed in the sides of the sections C and C', respectively. On each of the plates G G' is formed an eye G<sup>2</sup>, into which is fitted the respective points H or H'. As the heads G and G' can be moved forward and backward on the sections C and C', the distance between the points H and H' can be increased or diminished, according to the desired circle to be drawn. It will be understood that the heads G and G' are used only when the rule is in an extended position, as shown in Fig. 3.

In the section B of the rule A is pivoted, at I', a graduated arm I, extending through a slot B<sup>3</sup> in the said section, and through a slot B<sup>4</sup> in the section B' of the rule A, as is

plainly shown in Figs. 1 and 2. A set-screw J screws in the section B' against the said graduated arm I, so as to hold the same in position when the instrument is to be used

5 1. When the sections C and C' are folded onto the sections B and B' and are swung in and out with them, as shown in Fig. 2, then the graduated arm I in connection with the sections B' and C' can be used as a bevel.

10 On the inner ends of the sections C and C' are pivotally secured the caliper-arms K and K', each of which is provided at its free end with an offset K<sup>2</sup>. (See Figs. 2, 9, and 15 10.) Each arm K or K' is adapted to fold into a recess C<sup>3</sup>, formed in the respective section C or C', and the offset K<sup>2</sup> fits into a transverse groove C<sup>9</sup>, also formed in the respective section C or C', as is plainly shown in the drawings.

20 When the caliper-arms K and K' are to be used, they are swung out into the position shown in Fig. 2, and then the folded-up sections B C and B' C' are swung toward or 25 from each other until the desired distance between the offsets K<sup>2</sup> of the arms K and K' is reached. The sections can then be locked in place by means of the graduated arm I and the set-screw J. When the graduated 30 arm I is folded up in the slot B<sup>3</sup> of the section B and the caliper-arms K and K' are folded up in their respective grooves C<sup>3</sup> in the sections C and C', and the compass-points F and F' are in their innermost position, as 35 previously described, then the rule can easily be folded up into the position shown in Figs. 5 and 6. At the same time the rule can also be used as an ordinary rule in the usual manner.

40 Having thus fully described my invention, I claim as new and desire to secure by Letters Patent--

1. As a new article of manufacture, a drawing and measuring instrument consisting in a folding rule having calipers K K' hinged in 45 recesses on the adjacent faces of its inner sections, beam-compass heads G G', adjustable on its outer sections and provided with compass-points H H', a straight bar or arm I, hinged to one inner section near the hinge- 50 joint of the opposite section and passing through a slot therein to form a try-square when the rule is folded, and a set-screw J for the bar, substantially as set forth.

2. As a new article of manufacture, a combined 55 measuring and drawing instrument comprising a folding pocket-rule A, having its inner members B B' slotted longitudinally, as at B<sup>3</sup> B<sup>4</sup>, from their inner to their outer 60 edges, a straight bar I, pivoted at the inner end of one slot near the joint and of a length to be inclosed in said slot or projected through the opposite slot at right angles to the folded 65 rule, and a set-screw J for binding the straight arm or bar, substantially as set forth.

3. In a drawing and measuring instrument, the combination, with a rule formed with 70 hinged sections, of compass-points mounted to slide on the hinged sections and adapted to pass through one set of the hinges, substantially as shown and described.

4. In a drawing and measuring instrument, the combination, with a rule formed with 75 hinged sections, of compass-points mounted to slide on the hinged sections and adapted to pass through one set of the hinges, and means, substantially as described, for moving said compass-points in and out of the respective sections, as set forth.

WILLIAM G. CURTIS.

Witnesses:

EDWARD A. OETZEL,  
WILLIAM HARR.