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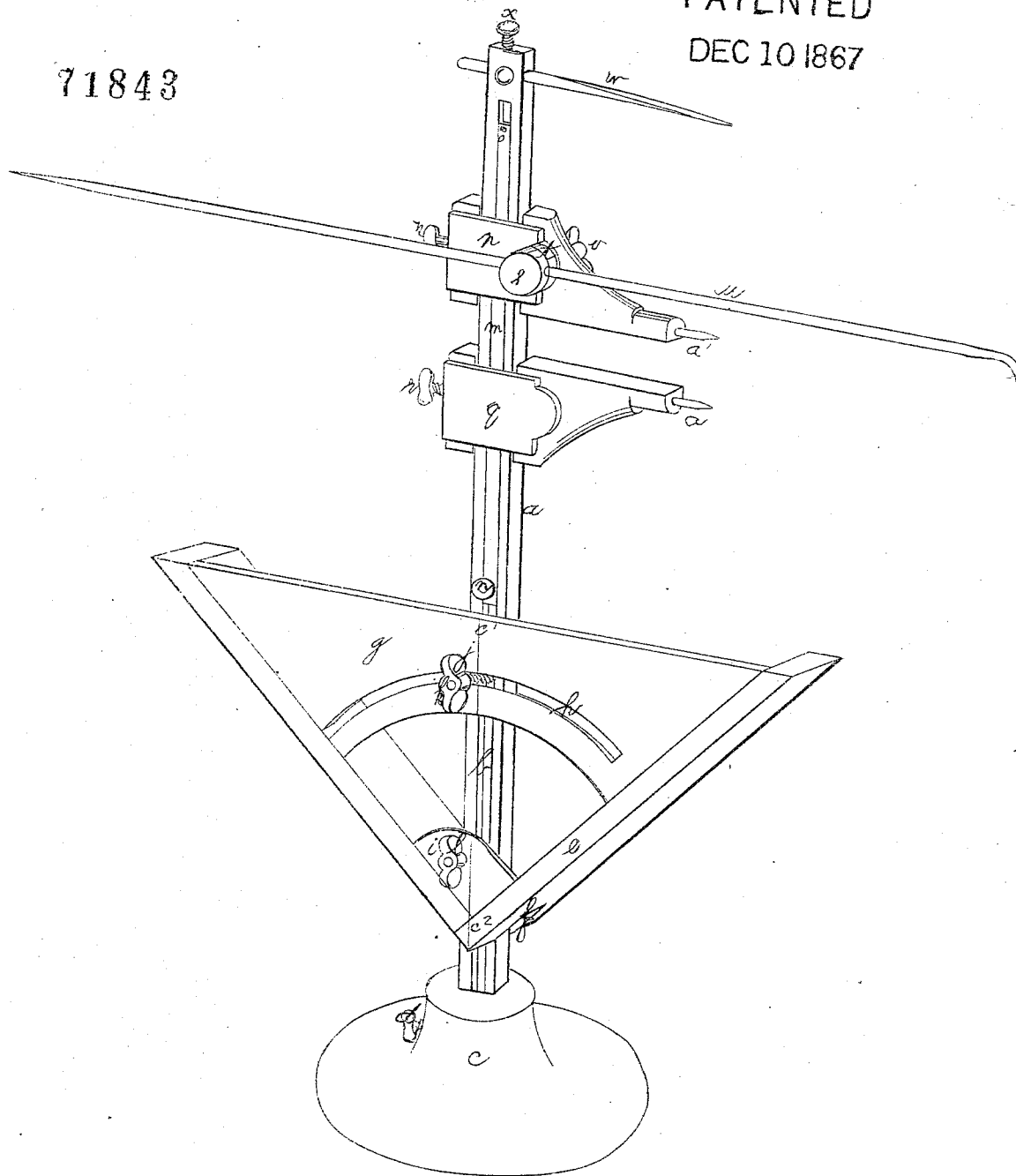
Combined calipers & T square.

Figure 1

PATENTED

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JOSEPH BENNOR, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN CALIPERS AND T-SQUARES.

Specification forming part of Letters Patent No. 71,843, dated December 10, 1867.

To all whom it may concern:

Be it known that I, JOSEPH BENNOR, of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Combination-Tools; and I do hereby declare that the following is a full and exact description of the construction and operation of the same; reference being had to the annexed drawings, forming part hereof, and to the letters marked thereon.

This combination-tool comprises, in a portable and convenient form, various mechanical implements—viz., a circumference-square, circumference angle-square, T-square, device for squaring up polygonal nuts, a spirit-level, surface-gage, mortise-gage, trammel for cutting circles, trammel and outside and inside calipers, and a scribe-block.

In the drawings, Figure 1 is a perspective view of the combination; Fig. 2, a similar view of the try-square; Fig. 3, a similar view of the mortise and surface gage.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and mode of operation.

In Fig. 1, *a* is a nine (9) inch rule, which is intended to be divided and subdivided by surface-marks into spaces of an inch and fractions of an inch in length, in the ordinary manner, as desired. This rule contains a dovetailed groove, *b*, and is secured to a stand, *c*, by a set-screw, *d*.

e is a square, having a slot, *f*, in its projecting rim, and having a face-plate, *g*, which is slotted with a curved slot, *h*.

i and *j* are bolts, the heads of which play in the groove *b*.

k and *l* are thumb-nuts, screwed on the projecting ends of the bolts *i* and *j*.

m is a dovetailed slide, moving in groove *b*. This slide is provided with a set-screw, *n*, to hold it in the desired position, and it also has a sharp point or scriber, *o*.

p and *q* are the two legs of a pair of straight-legged calipers. These legs are mortised, and they slide upon rule *a*. Set-screws *r* secure these legs in the desired positions.

A bolt that passes through an aperture in the leg *p* has on one end of it a head, *s*, and a washer, *t*.

A perforation is made through the bolt between head *s* and washer *t*. The marker *u* is passed through this perforation, and a thumb-nut, *v*, is employed to secure the marker *u* in any desired position.

w is a removable cutter, fastened in place by a set-screw, *x*.

I make the several parts of the combination, excepting the spirit-level, of steel. The spirit-level I make of brass.

In place of the nine-inch rule represented in the drawings, the rule may be twelve or fifteen inches in length, the proportions of the other parts being correspondingly varied.

When it is desired to use the rule *a* as a measure, it may be divested of all appendages.

The rule *a*, stand *c*, leg *p*, with its described parts, and the marker *u*, together constitute a scribe-block, which is employed for laying out lines on the several sides of any solid body at any required height, measuring from the same horizontal line.

The rule *a* and legs *p* and *q* together constitute straight-legged calipers, and these parts, with the points *a'* of the legs *p* and *q*, (said points being removable at pleasure, they being screwed into the ends of the legs,) form a trammel for laying out circles, ellipses, &c.

The rule *a*, leg *q*, and cutter *w* together constitute a cutting-trammel for cutting circular work of different kinds, such as washers of gum or leather.

The rule *a* and the square *e*, arranged as shown in Fig. 2, form a try-square, and said rule may be turned on the bolt, by which it is attached to square *e* as a center, and thus form a circumference-square, a T-square, an angle-square, or an implement for laying out polygonal nuts, as one or another of these tools may be required.

The rule *a*, slide *m*, stand *c* constitute a surface-gage and a mortise-gage.

The square *e* is marked with a line, *c'* *c''*, Fig. 1, bisecting the angle and edge line of the face-plate *g* of the square. This line facilitates the setting of the rule *a* square with the edge of the face-plate *g*.

The curved slot *h* is to be marked by lines and numbers to indicate fractional divisions

of a quadrant, measuring from bolt *i* as a center.

Having thus described my invention, I claim and desire to secure by Letters Patent—

The rule *a*, stand *c*, slide *m*, legs *p* and *q*, marker *u*, cutter *w*, with their several described appendages, all combined in the man-

ner and for the purpose substantially as shown and described.

JOSEPH BENNOR.

Witnesses:

JOHN P. ADAMS,
GEO. E. BUCKLEY.