

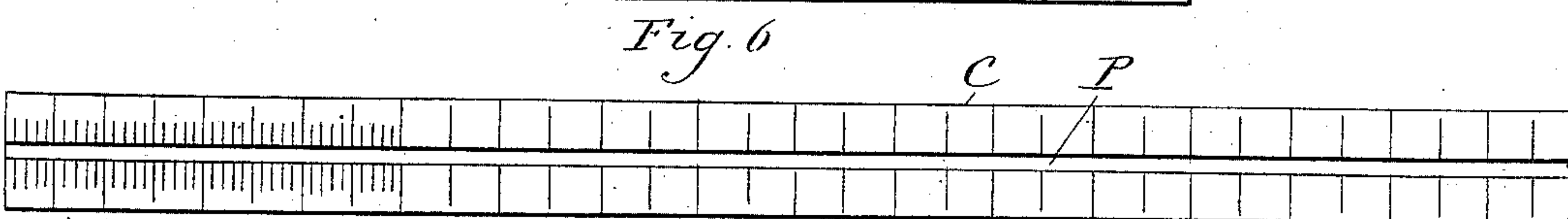
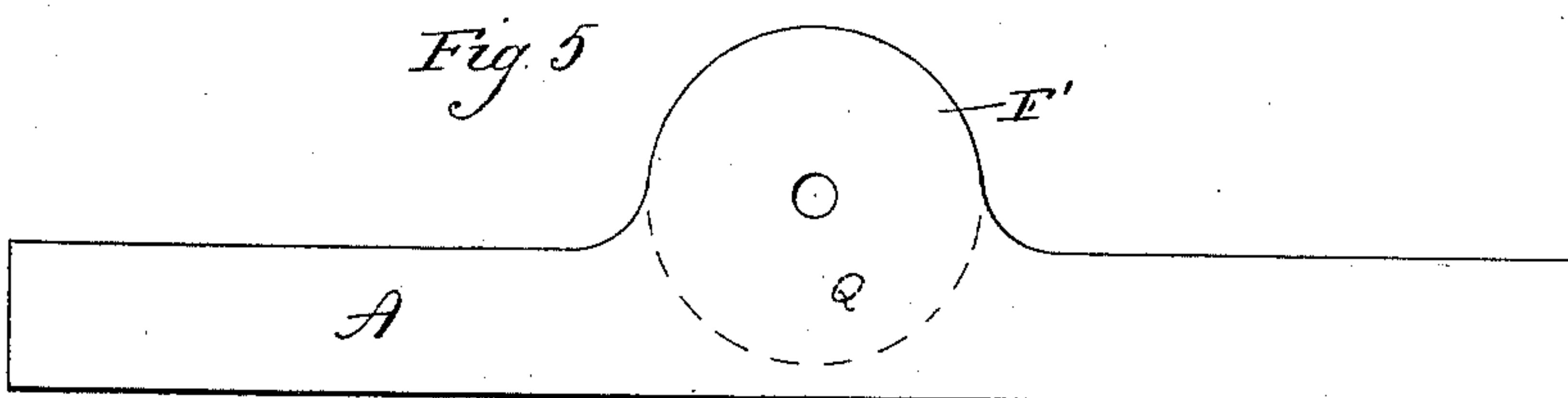
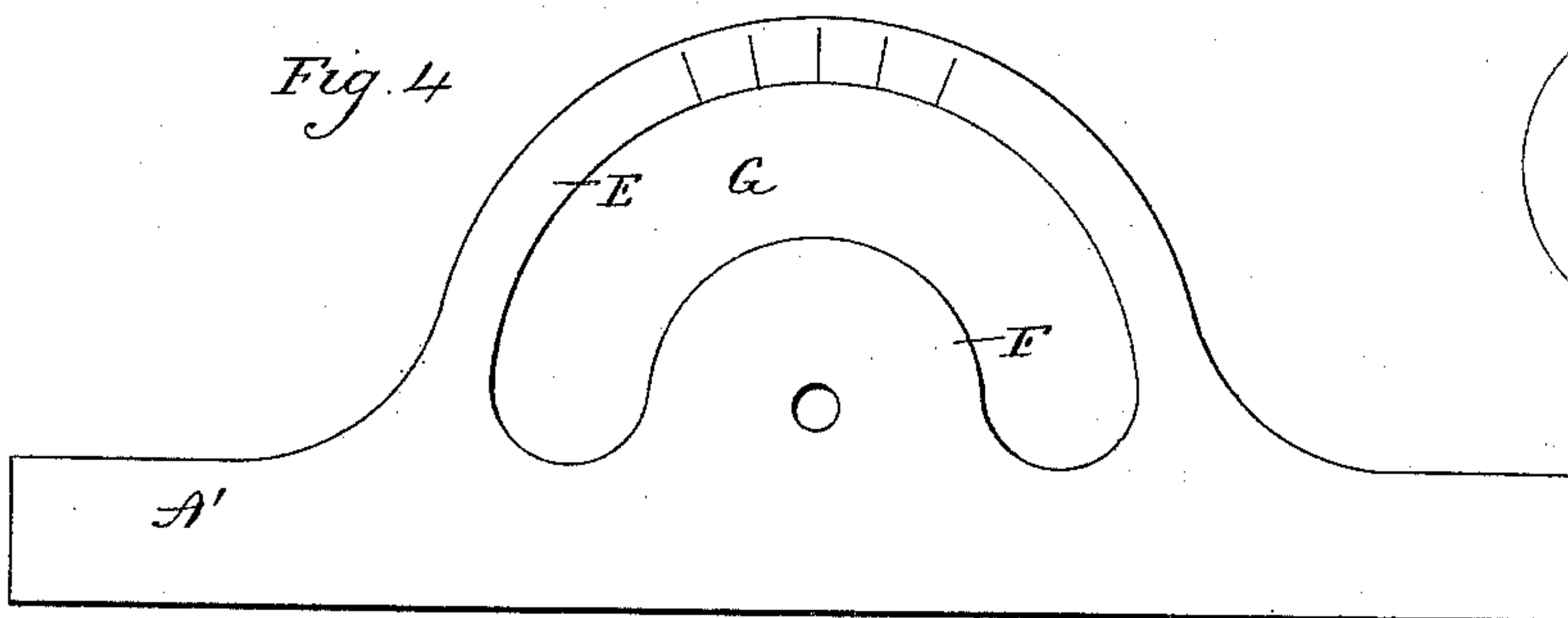
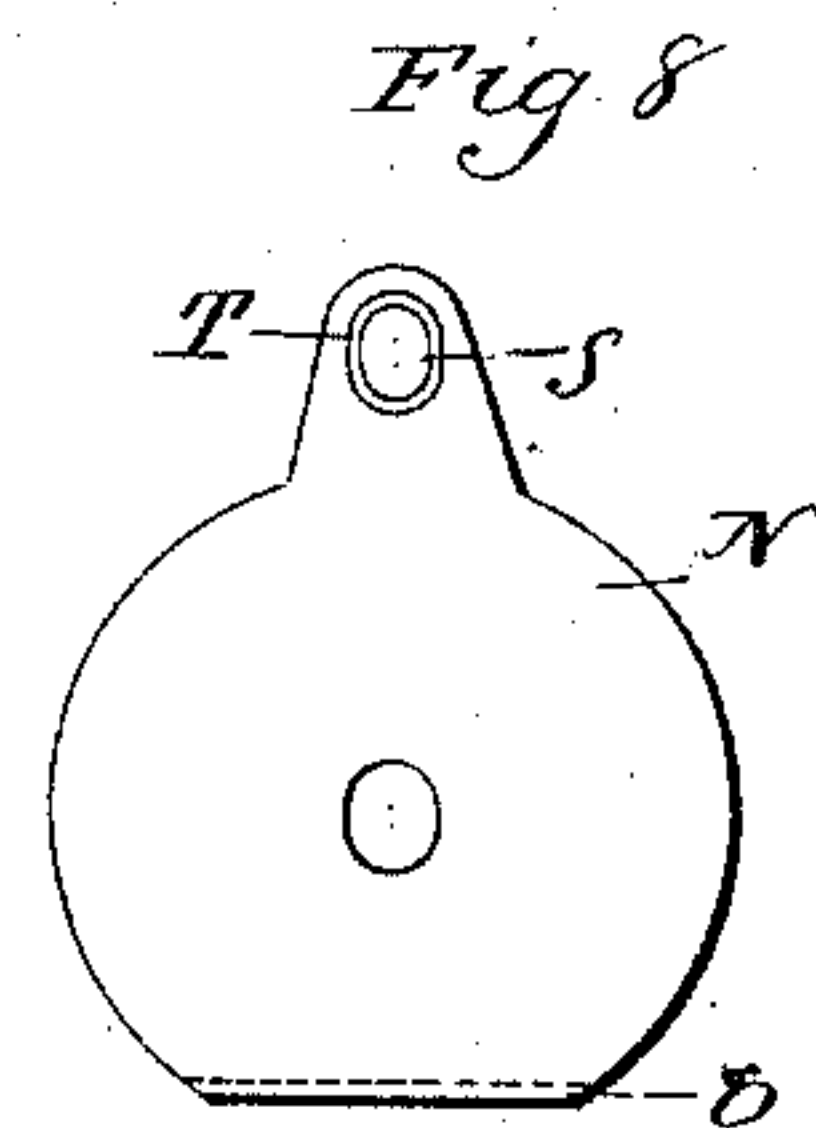
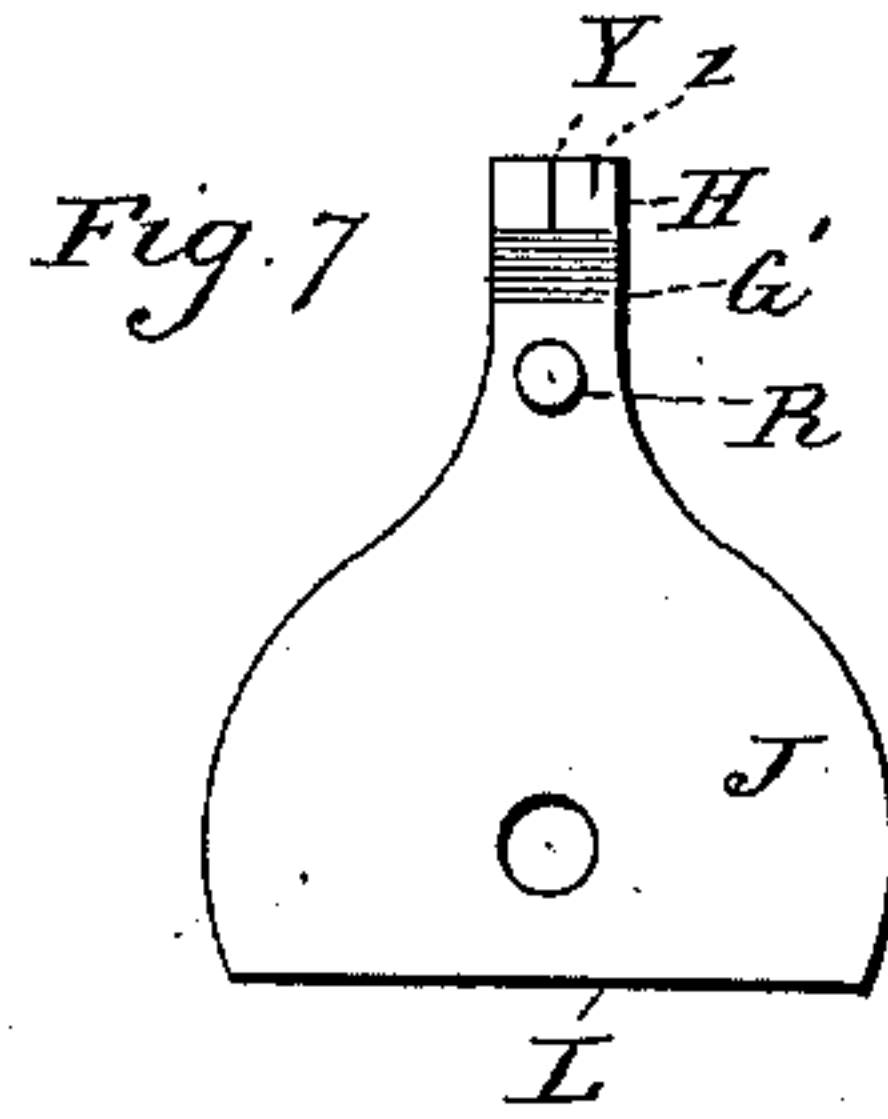
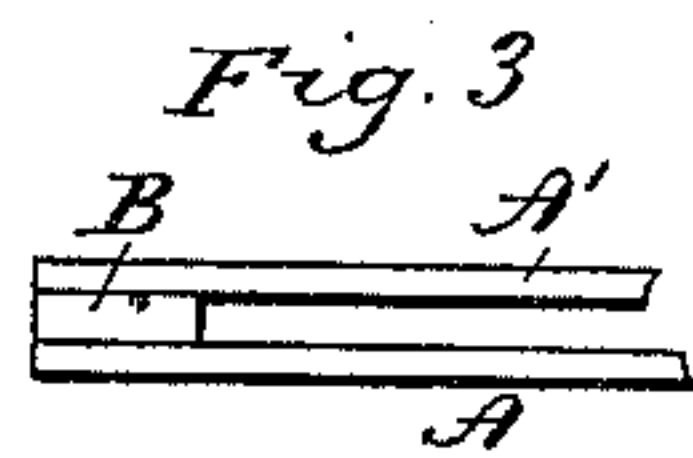
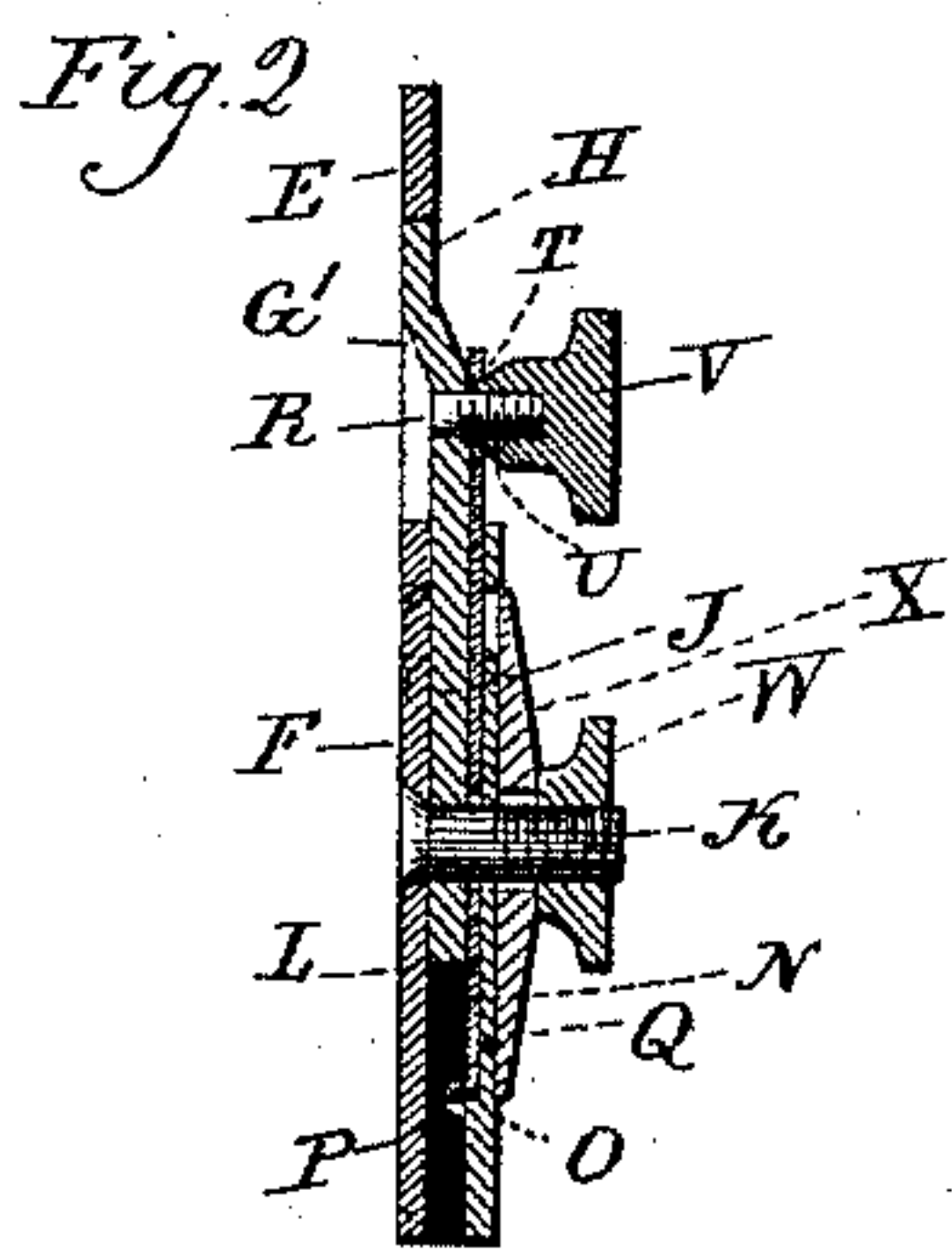
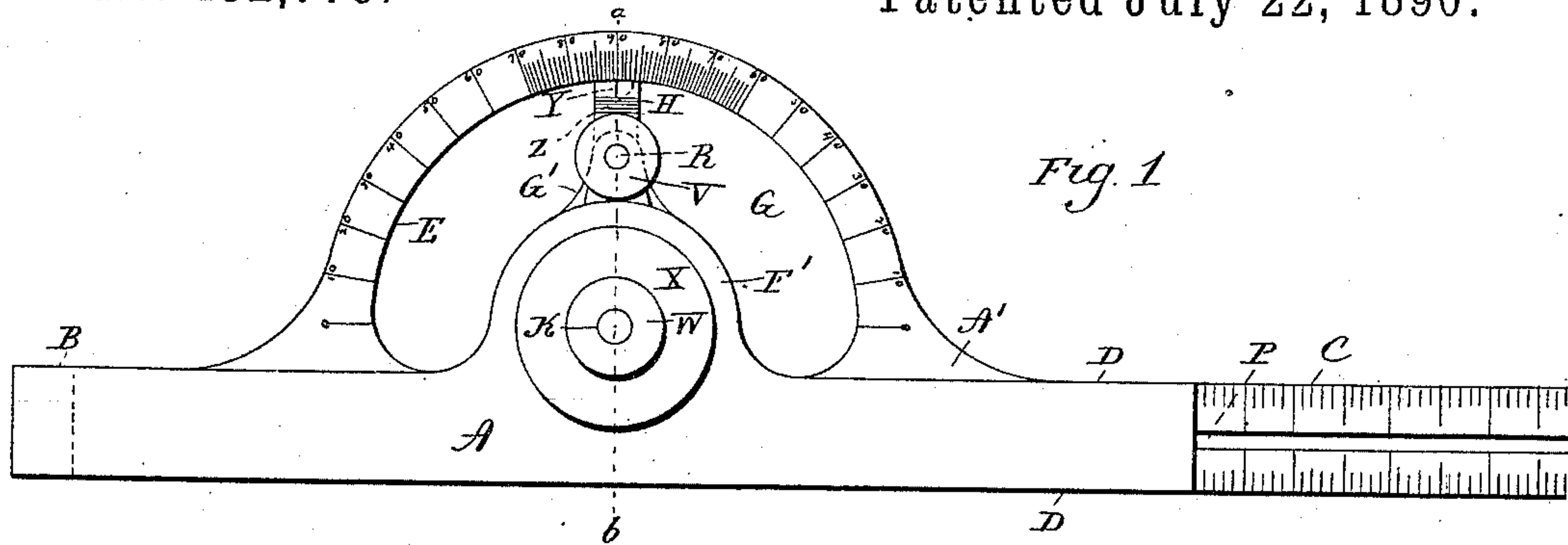
(No Model.)

2 Sheets—Sheet 1.

J. P. B. WELLS.
PROTRACTOR.

No. 432,779.

Patented July 22, 1890.



Witnesses:
J. H. Shumway.
Lillian D. Healy.

John P. B. Wells.
Inventor
By Atty.
Charles Seymour

(No Model.)

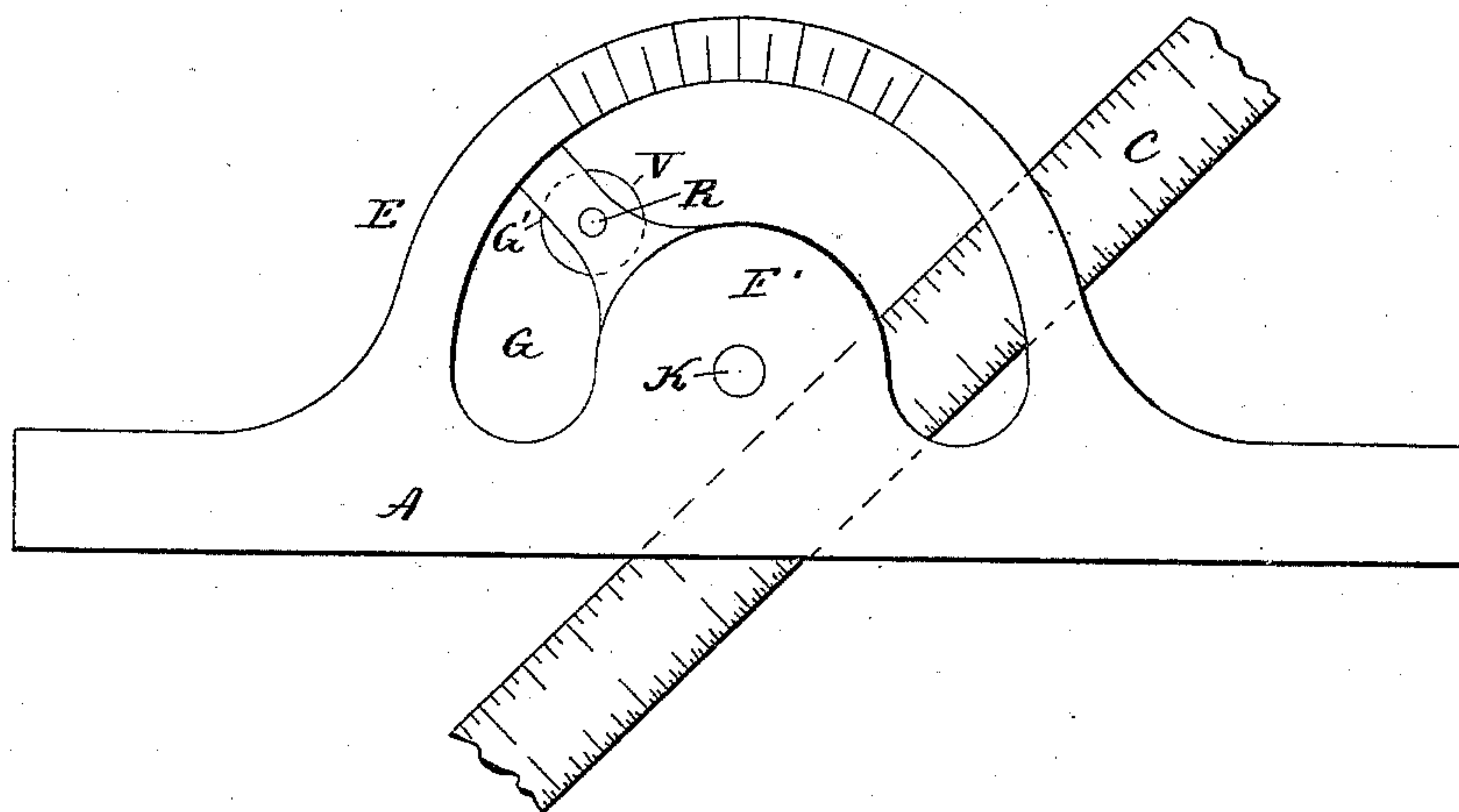
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Fig 9



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UNITED STATES PATENT OFFICE.

JOHN P. B. WELLS, OF ATHOL, MASSACHUSETTS.

PROTRACTOR.

SPECIFICATION forming part of Letters Patent No. 432,779, dated July 22, 1890.

Application filed April 4, 1890. Serial No. 346,545. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. B. WELLS, of Athol, in the county of Worcester and State of Massachusetts, have invented a new Improvement in Bevel-Protractors; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1 a plan view of an instrument embodying my invention; Fig. 2, a view thereof in transverse section on line *a b* of Fig. 1; Fig. 3, a broken edge view showing the mode of securing the two frame-plates of the tool together; Fig. 4, a detached plan view of the lower frame-plate; Fig. 5, a similar view of the upper frame-plate; Fig. 6, a similar view of the grooved ruler; Fig. 7, a similar view of the indicating-arm and the carrier of which it forms a part; Fig. 8, a similar view of the coupler, which is provided for connecting the ruler with the carrier and indicating-arm. Fig. 9 is a reverse view of the instrument, showing the graduations upon the under faces of the ruler and extension.

My invention relates to an improvement in bevel-protractors, the object being to produce a simple, durable, convenient, and accurate instrument.

With these ends in view my invention consists in a bevel-protractor having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

As herein shown, the device is provided with a frame composed of an upper frame-plate *A* and a lower frame-plate *A'*, attached together at one end, with a block *B* between them to secure a space to receive the graduated ruler *C*, with which their parallel straight edges *D* co-operate, the said plates being adapted in width to completely inclose the ruler as far as it is embraced between them when it is brought into line with their straight edges. The lower plate *A'* is provided with a graduated semicircular extension *E* and a centrally-perforated bearing *F* separated from the same by a semicircular opening *G*, the said extension being graduated from ninety degrees

to zero on each side of its central point. As herein shown, both the upper and lower faces of the ruler and extension are graduated. This is preferably done, as it facilitates the use of the instrument to adapt it to be read from both sides. The upper plate *A* is provided with a centrally-perforated bearing *F'*, corresponding to the bearing *F*, before mentioned. An indicating-arm *G'*, having its outer end bent to form a finger abutting against the inner edge of the extension *E*, is formed at the outer end of a centrally-perforated carrier *J*, interposed between the bearings *F* and *F'*, and rotatable between them upon a pivot *K*, passing through their central perforations and its perforation.

The inner end of the carrier is provided with a straight edge *L*, forming a right angle with the said indicating-arm *G'*, and the ruler is held against this edge by means of a coupler *N*, having one edge turned down to form a hook *O*, entering the longitudinal groove *P* formed in the ruler, the said coupler being interposed between the bearings *F* and *F'* and the former being cut away, as at *Q*, to accommodate it, as is made necessary by making the coupler to correspond in thickness to the ruler, which has only enough clearance between the plates to move freely between them in either direction. The said coupler is connected to the carrier and indicating-arm by means of a screw-stud *R* mounted therein, and of a slotted ear *S* formed at its outer end, the forward end of the slot in the ear having a bevel *T* co-operating with a bevel *U*, formed at the lower end of a nut *V*, threaded upon the said stud. When the said nut is turned down, the coupler is drawn over the carrier and the edge of the ruler clamped so firmly against the edges of the carrier that the ruler cannot be moved, but is rigidly held in a plane at a right angle to that in which the indicating-arm extends, the central perforation in the coupler being elongated, as shown, so as to permit it to be slid over the carrier, notwithstanding the pivot which passes through it. By turning the nut so as to separate the two bevels the tension on the ruler will be relieved so as to permit it to be freely moved longitudinally, or removed from the instrument altogether. If desired, the

bevels for clamping and relieving the ruler may be replaced by a cam or equivalent device. The said indicating-arm and ruler are held in any desired position of adjustment by clamping the carrier and coupler between the bearings F and F', which are thereto sprung together by means of a nut W and a spring-disk X, the former being mounted upon and the latter surrounding the pivot K, the headed lower end whereof enters a countersink formed in the lower face of the lower plate.

The indicating-arm is provided with a primary gaging-line Y and a secondary or vernier gaging-line Z, the former being placed so that when the ruler is exactly in line with the straight edges of the frame-plates it will coincide with the line intersecting ninety degrees on the semicircular extension, and the latter being placed so that it will stand exactly between two adjacent lines when the primary line coincides with any one of the lines on the extension.

The use of the secondary line arranged as described enables the ruler to be set to half degrees very readily and with perfect accuracy. If it is desired, for instance, to set the ruler to an angle of forty-five and one-half degrees with respect to the straight edges of the plates, the ruler will be turned in either direction until the primary gaging-line coincides exactly with one of the two lines indicating forty-five degrees on the extension. The ruler will then be further moved until the secondary gaging-line coincides with the degree-line 30 or the degree-line 41, according to the side of the circle on which the measuring is being done. In either case the ruler will then be exactly at an angle of forty-five and one-half degrees with the straight edges of the frame-plates. If desired, more than one secondary gaging or vernier line may be employed. In that case the same principle will be followed, and no two lines will ever at one time coincide with the lines on the extension.

My new bevel-contractor, consisting as it does of few and simple parts, is comparatively inexpensive of production and is durable and very convenient in use. Its manipulation in use involves very little wear of the parts, and it therefore retains for a long time its integrity as an instrument of precision. The ruler being readily removable, may be easily interchanged for rulers of different lengths, whereby the instrument may be used by draftsmen in making large or small drawings. In either case it operates with great precision. It will carry, if desired, a long thin wooden ruler, such as draftsmen use.

The adaptation of the device to be used either side up makes it very convenient to use, and particularly when it has both sides of its ruler and extension graduated, as herein shown.

By the use of the secondary or vernier lines the extension may be graduated so that each line will be two or four degrees apart, or suffi-

ciently far apart to be easily read and distinctly seen.

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

1. A bevel-protractor having two frame-plates secured together at one end with a space between them and one being provided between its ends with a graduated semicircular extension, a ruler located in the space between the plates, an independent indicating-arm arranged to sweep the said extension on a pivot located centrally thereto, and means for coupling the arm and ruler at a right angle to each other, substantially as described.

2. A bevel-protractor having two frame-plates secured together at one end with a space between them and both being provided with straight edges and bearings and one having a graduated semicircular extension toward which the bearings project, a longitudinally-grooved ruler located between the said plates, a carrier pivoted between the bearings and provided with an indicating-arm and with a straight edge, a coupler also located between the said bearings and having one end hooked to enter the groove in the ruler, which it holds against the straight edge of the carrier, and its other end connected with the carrier, and means for moving the coupler over the carrier, substantially as described.

3. A bevel-protractor having two frame-plates secured together at one end with a space between them and both being provided with straight edges and bearings, the inner face of one of which is recessed, and one frame-plate having a graduated semicircular extension toward which the bearings project, a longitudinally-grooved ruler located between the said plates, a carrier pivoted between the bearings and provided with an indicating-arm and a straight edge, a coupler also located between the bearings and entering the recess provided for it in one of them, and having one end hooked to enter the groove in the ruler, which it holds against the straight edge of the carrier, and its other end connected with the same, and means for moving the coupler over the carrier, substantially as described.

4. A bevel-protractor having two frame-plates secured together at one end with a space between them and both being provided with straight edges and bearings and one having a graduated semicircular extension toward which the bearings project, a ruler located in the space between the plates, an indicating-arm to sweep the graduated extension, a carrier for the arm, and a coupler for the ruler located between the said bearings, and means for springing the bearings to frictionally bind the carrier and coupler so as to hold the arm and ruler in any desired position, substantially as described.

5. A bevel-protractor having two frame-plates secured together at one end with a

space between them and both being provided
with straight edges and bearings and one
having a graduated semicircular extension
toward which the said bearings project, a lon-
5 gitudinally-grooved ruler located in the space
between the plates, an indicating-arm to sweep
the graduated extension, a carrier for the arm
having a straight edge at a right angle there-
with, a hooked coupler interposed between
10 the bearings for holding the inner edge of the
ruler against the straight edge of the carrier
and having a beveled slot formed in its for-

ward end, a screw-stud mounted in the car-
rier and passing through the said slot, and a
beveled nut mounted upon the stud and co- 15
operating with the bevel of the slot to slide
the coupler over the carrier and so clamp the
ruler, the coupler being centrally cut away to
clear the pivot on which the carrier works,
substantially as set forth.

JOHN P. B. WELLS.

Witnesses:

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