

J. O. HESS.
COMBINATION TOOL.

(Application filed Mar. 17, 1902.)

(No Model.)

2 Sheets—Sheet I.

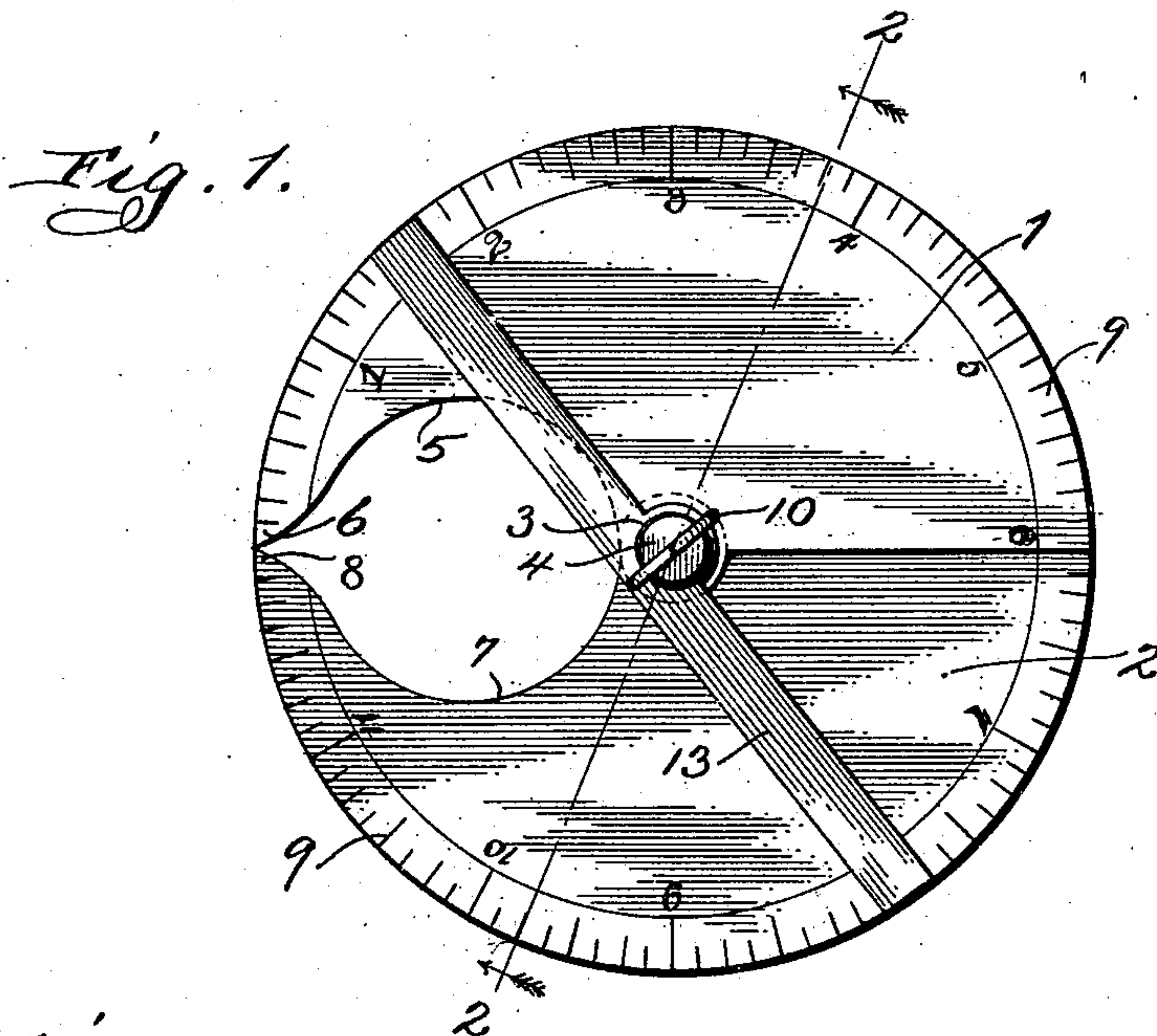


Fig. 2.

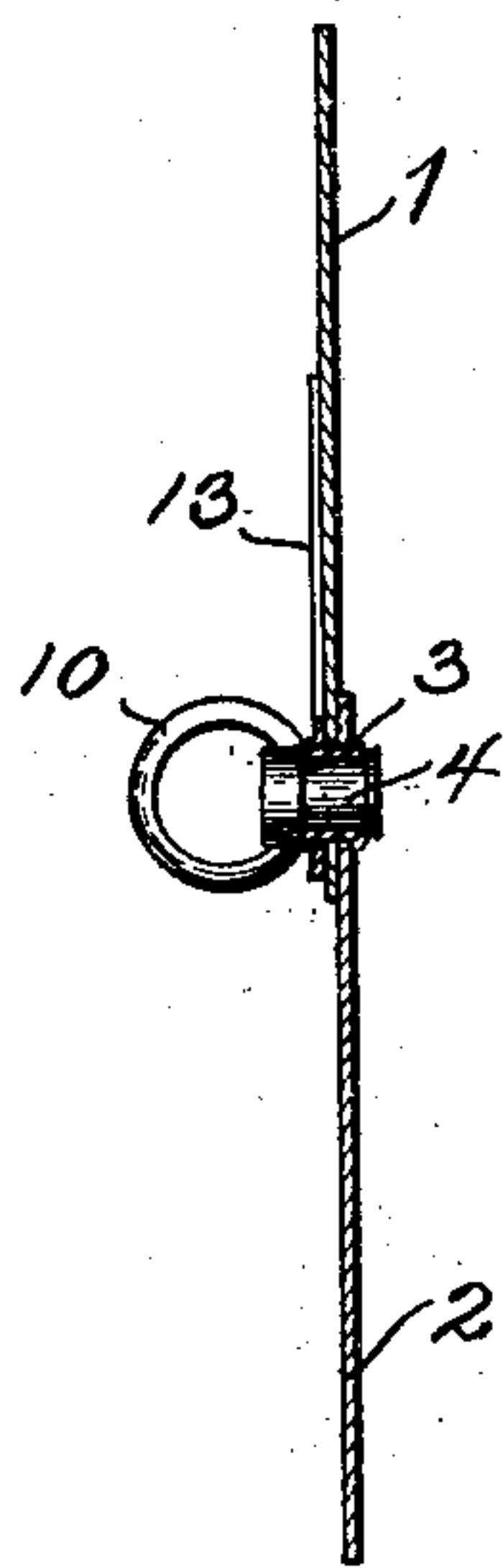
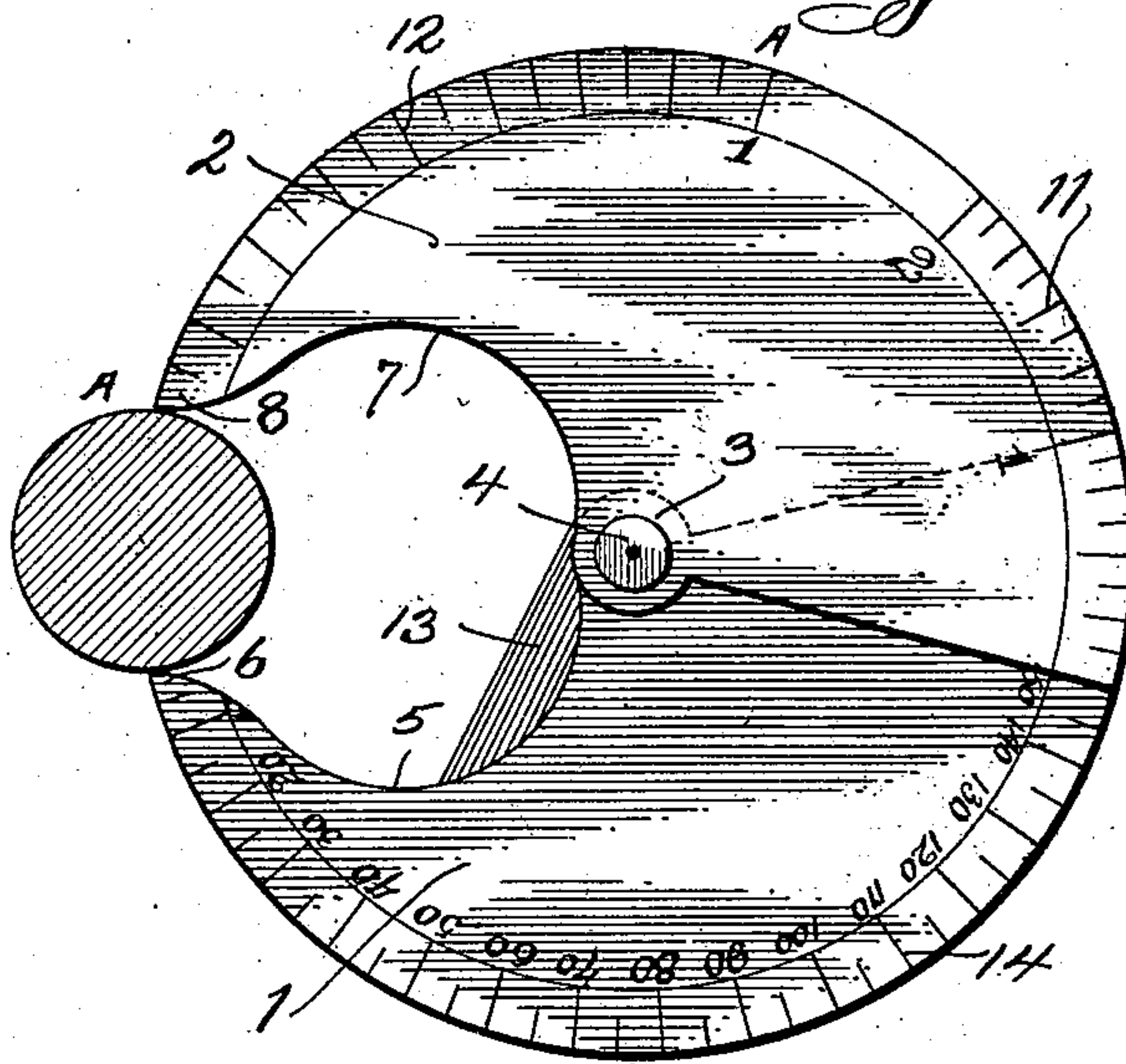


Fig. 3.



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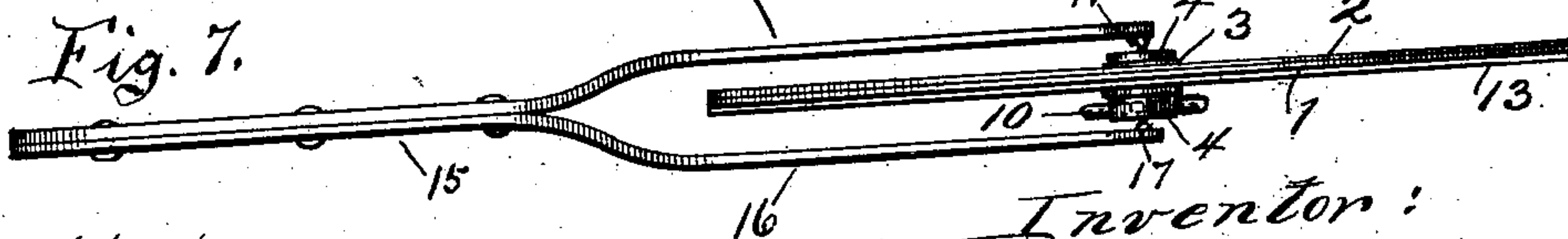
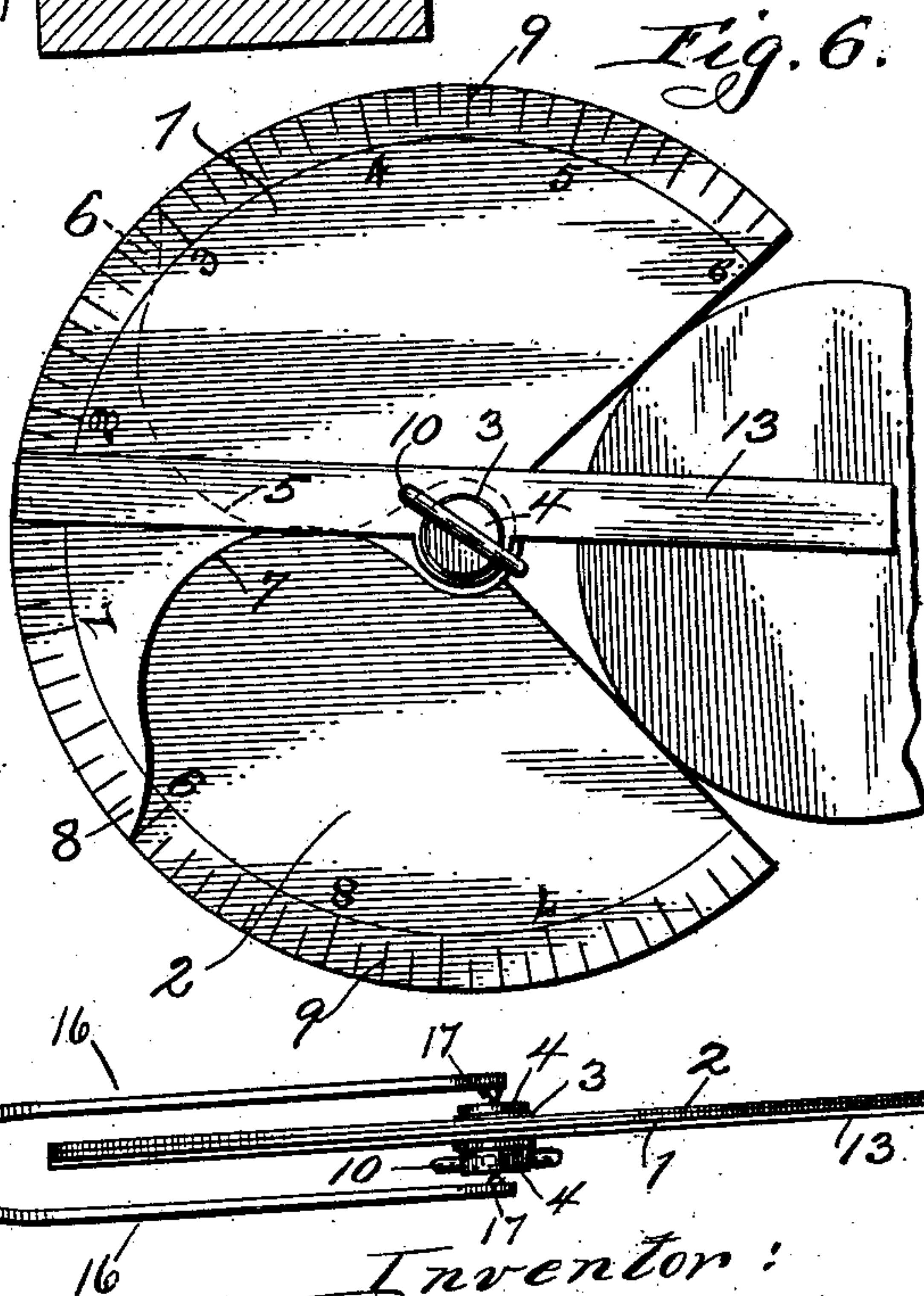
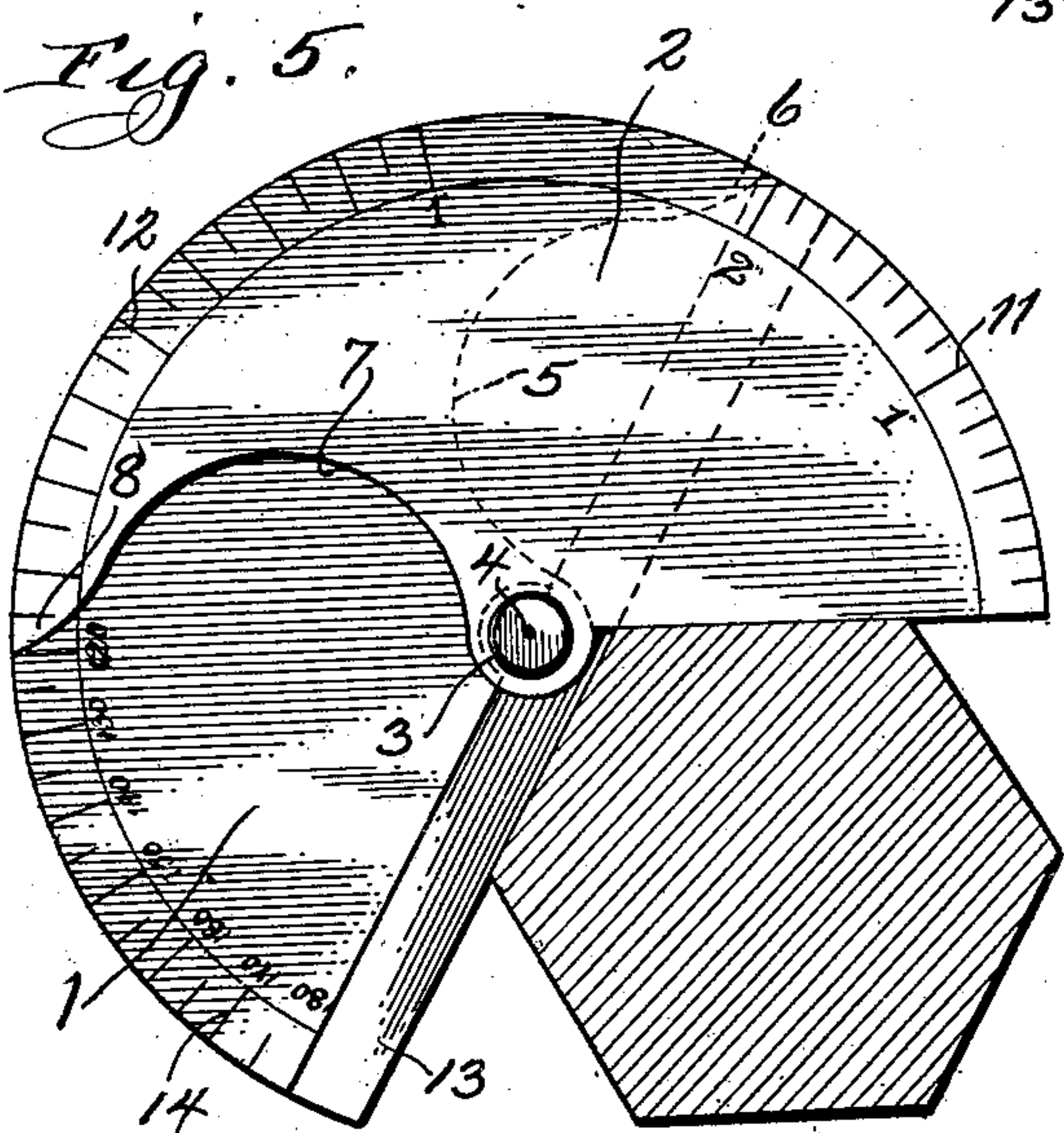
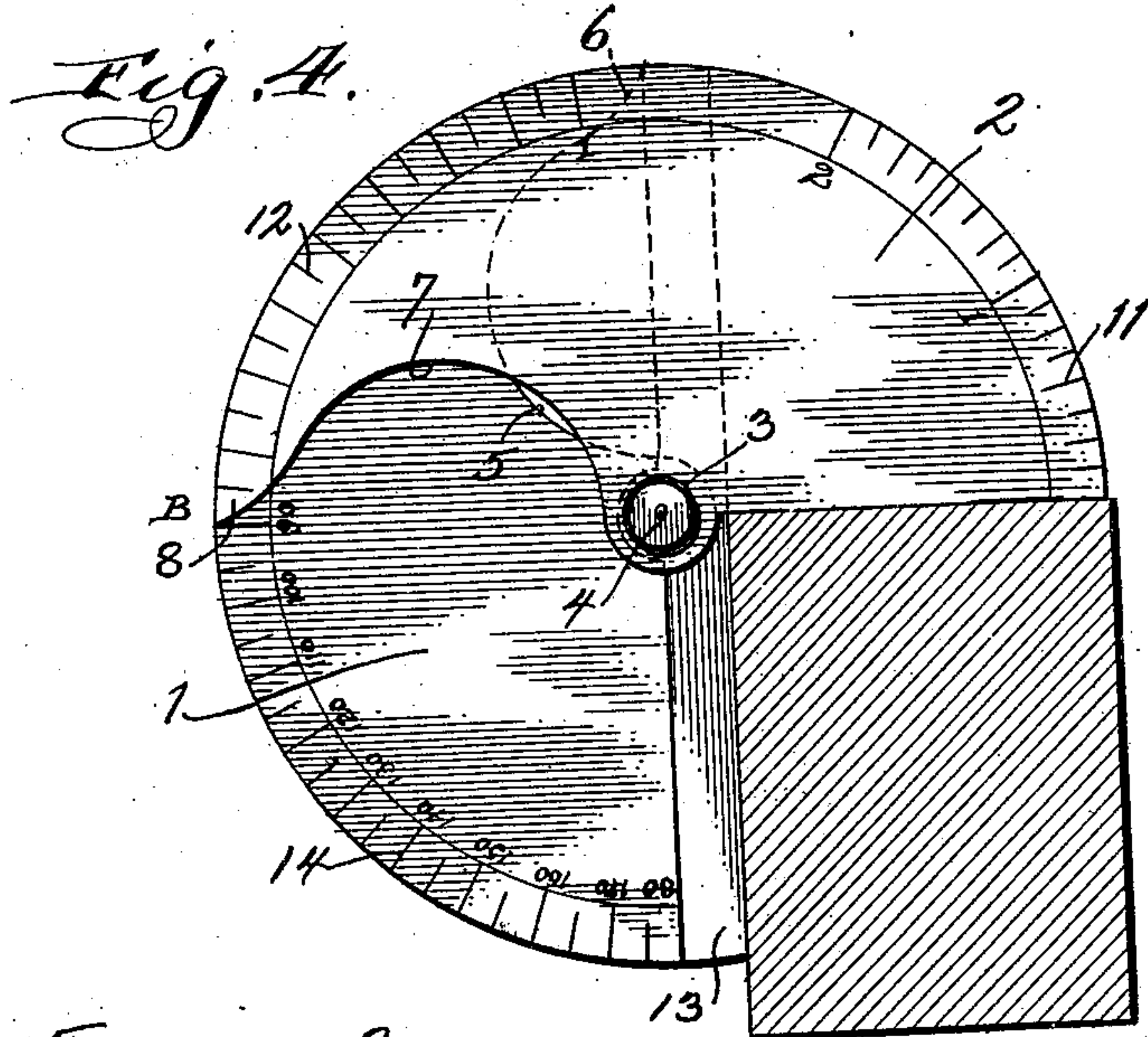
No. 713,096.

Patented Nov. 11, 1902.

J. O. HESS.
COMBINATION TOOL.
(Application filed Mar. 17, 1902.)

2 Sheets—Sheet 2.

(No Model.)



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UNITED STATES PATENT OFFICE.

JOSEPH OTTO HESS, OF ORAN, MISSOURI.

COMBINATION-TOOL.

SPECIFICATION forming part of Letters Patent No. 713,096, dated November 11, 1902.

Application filed March 17, 1902. Serial No. 98,466. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH OTTO HESS, a citizen of the United States, residing at Oran, in the county of Scott and State of Missouri, have invented certain new and useful Improvements in Combination-Tools; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to a combination-tool, being specially designed for use by mechanics in measuring the outer or inner surfaces of tires, bands, and similar parts, or surfaces of eccentric form which cannot be measured with an ordinary straight-edge rule.

My device is also used for determining the diameter of shafting, bars, or similar objects and can be employed as a try-square, as a bevel-square or protractor, or as a centering-square.

There are several other uses to which the tool can be put which will more fully appear in the following specification.

In the drawings, Figure 1 is a plan view of my device. Fig. 2 is a vertical cross-section in the line 2 2 of Fig. 1. Fig. 3 is a reverse plan view of my invention, showing the tool in position when used as calipers. Fig. 4 is a reverse plan view showing the tool in use as a protractor. Fig. 5 is a similar view thereof. Fig. 6 is a plan view similar to Fig. 1, showing the tool in use as a centering-square. Fig. 7 shows my device in elevation with handle attachment.

Similar numbers refer to similar parts throughout the several views.

My invention consists, primarily, of two segmental plates or leaves 1 and 2, having two of their faces contiguous and pivotally secured to each other centrally of their circumference by means of a hollow rivet 3, through which passes a bolt 4, which serves as an axis for the tool to revolve upon. The leaves 1 and 2 are clamped together by the rivet 3, so that the friction between the inner faces of such plates is sufficient to prevent the movement of such plates upon their

center without the application of a slight amount of force.

In one edge of the plate 1 is a semicircular recess 5, whereby one end of the plate 1 is formed into a finger or pointer 6. A similar recess 7 in the edge of the plate 2 forms a similar finger 8 on the end of such plate 2 adjacent to the pointer 6, as shown in Fig. 1. When the ends of the pointers 6 and 8 are in close proximity to one another, as in Fig. 1, the outer edges of the plates 1 and 2 form a complete circle, the circumference thereof being equal to some well-known denomination of lineal measurement.

As shown in the drawings and as preferred for convenient use, the circumference of the tool is one foot, and the plates 1 and 2 are provided near such circumference with a scale 9, dividing such measurement into inches and desired parts of an inch. In this form the tool is of value in measuring irregular surfaces or objects and forms an endless rule for measuring tires and bands of various kinds. For this purpose the ends of the bolt 4 are grasped between the thumb and finger of the operator and the tool caused to rotate, the edge thereof following the surface to be measured. As it is difficult or impossible to use the hand in all cases on account of want of space, I provide a loop 10, which is pivotally attached to the bolt 4 and is closed against the tool when not in use. On the opposite face of the leaf 2 from the scale 9 is a scale 11, Fig. 2, indicating a measurement of two inches and graduations thereof. As the fingers 6 and 8 are separated the distance between them is indicated on the scale 11 by that edge of the plate 1 immediately in rear thereof, such measurement being limited, however, to the two inches. It is apparent that by this arrangement the fingers 6 and 8 can be used as self-registering calipers. On the same side of the plate 2 as the scale 11 is a graduated scale 12, the total measurement indicated thereon being equal to the circumference of a circular object having a diameter of one inch. The scale 12 is preferably divided into sixteenths, so that the measurement of a circular object thereby would indicate the diameter of such object in inches and sixteenths of an inch. Where the diameter of the object to be measured exceeds one inch, the use

of the scale 12 is repeated the necessary number of times to complete the measurement of the circumference of such object, and the diameter of the object thus measured will be as many times one inch as the number of times that the scale 12 is made use of in making such measurement.

In Fig. 1 is shown a bar or blade 13, pivotally secured to the bolt 4, one edge of such blade being in line with the central pivotal point of the tool and the other edge thereof being adapted to form any desired angle with the straight edge of the plate 2. On the face of the plate 1 opposite to the scale 9 is a protractor-scale 14, having indicated thereon one-half the degrees of a circle. When that edge of the blade 13 which is in line with the center of the tool is adjacent to the straight edge of the plate 1, as shown in Figs. 3 and 4, and the other edge of such blade is at any given angle to the straight edge of the plate 2, such angle is indicated on the scale 14 by the pointer 8. As indicated in Fig. 4, the angle is a right angle and the object being measured is square. This position of the tool is used in many cases where the small square cannot be used to advantage, as in locating hinges and locks for doors, and in similar uses.

Fig. 5 shows the tool in use for measuring a hexagonal object, one hundred and twenty degrees being indicated by the protractor. The tool is not only useful in measuring irregular objects of this kind, but can also be employed for laying off figures and designs with lines having desired angles. It can also be used in determining the proper angle for plane-bits, countersinks, and drills when the same are being ground.

Fig. 6 shows a method of determining the center of a circular figure or object. The plates 1 and 2 are turned until the straight edges thereof form such an angle with each other as will suitably embrace the object being measured. The blade 13 is then set, so that the edge thereof which is in line with the center of the tool will be equidistant from each of said edges, whereupon such edge of the blade will pass over the center of the object being measured.

If desired, the blade 13 can be replaced by one having greater length for use in larger work, the range of the tool when employed as a square being thus greatly increased.

For greater convenience in continuous measuring I provide a handle 15, having arms 16, adapted to embrace the tool by means of the inwardly-extending pins 17 engaging the bolt 4 by means of slight depressions in the ends thereof.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In a combination-tool, a pair of segmen-

tal plates, pivotally secured to one another at a central point, and adapted to form a circular disk, the periphery of which forms an endless rule; such disk being provided on one face near its periphery with a lineal scale; two contiguous ends of said plates being further formed into a pair of fingers, adapted to be used as calipers; a scale on one of said plates whereby the dimension of the object measured by such calipers is indicated; and means for supporting such disk centrally, so as to permit a rotation thereof upon its center, substantially as set forth.

2. In a combination-tool a pair of segmental plates pivotally secured to one another at a central point, and adapted to form a circular disk to be used as an endless rule; and a blade, also pivoted at such central point, adapted to cooperate with one of said plates so as to form an angle with the other of said plates; and a protractor-scale whereby such angle may be indicated by one of such plates upon the other one thereof, substantially as shown and set forth.

3. In a combination-tool a pair of segmental plates, pivotally united, and adapted to form a disk, the periphery of which constitutes an endless rule; a lineal scale for such endless rule on one of the faces of such disk; a pair of fingers formed upon two contiguous ends of such plates, adapted to be used as calipers; means for indicating on said plates the distance between said fingers, when separated; and a blade, pivotally secured at the point of connection of said plates, one edge of said blade being in line with such central pivotal point, substantially as shown and set forth.

4. In a combination-tool, a pair of segmental plates, pivotally united, and adapted to form a disk, the periphery of which constitutes an endless rule; a lineal scale for such endless rule on one of the faces of such disk; a pair of fingers formed upon two contiguous ends of such plates, adapted to be used as calipers; the other ends of said plates being provided with straight edges which are radii of said periphery; means for indicating on one of said plates the distance between such fingers, when separated; a blade, adapted to coincide at one edge with a straight edge of one of said plates, and form with its other edge a desired angle with the straight edge of the other of such plates; and means for indicating such angle on one of said plates by the finger formed on the end of the other one thereof, substantially as set forth.

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

JOSEPH OTTO HESS.

Witnesses:

JACOB STILAR,
J. L. HALE.