A. D. IDE.

DEVICE FOR DIVIDING CIRCLES OR ARCS OF CIRCLES.

APPLICATION FILED JUNE 12, 1908.

948,172. Patented Feb. 1, 1910.

3 SHEETS—SHEET 1.

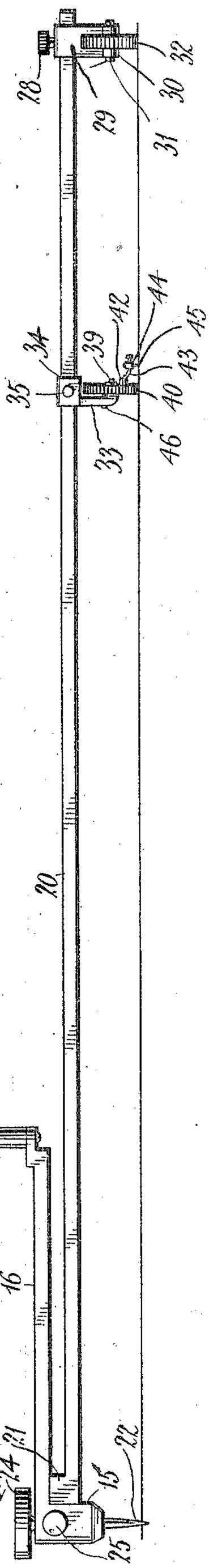


FIG. 1

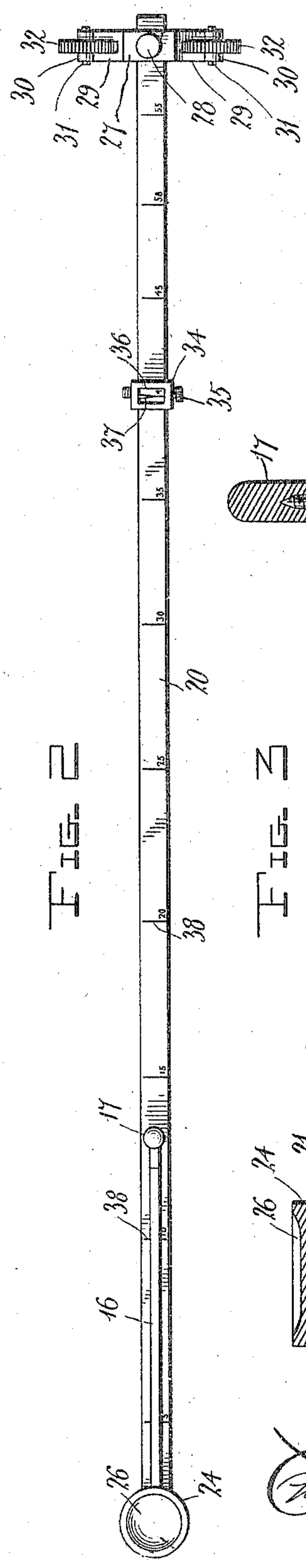


FIG. 2

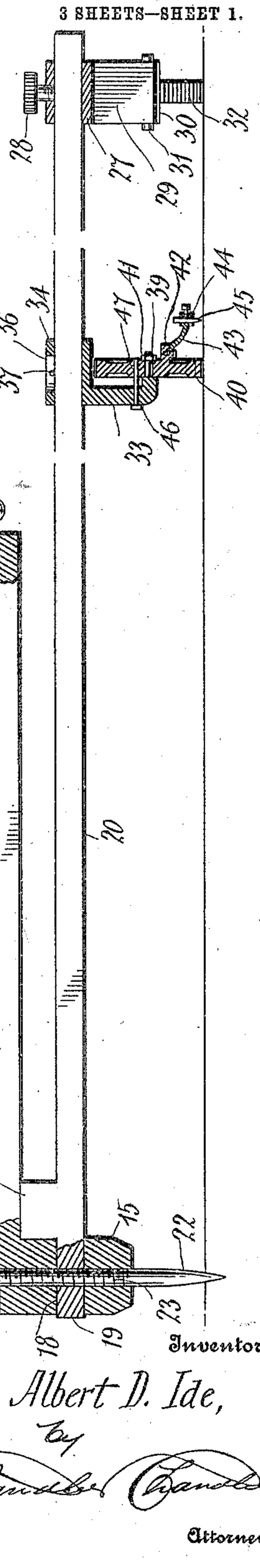


FIG. 3

Witnesses

J. L. Jonkins

M. J. Miller

Inventor

Albert D. Ide,

by

Attorneys

A. D. IDE.

DEVICE FOR DIVIDING CIRCLES OR ARCS OF CIRCLES.

APPLICATION FILED JUNE 12, 1908.

948,172.

Patented Feb. 1, 1910.

3 SHEETS--SHEET 2.

FIG. 5

FIG. 6

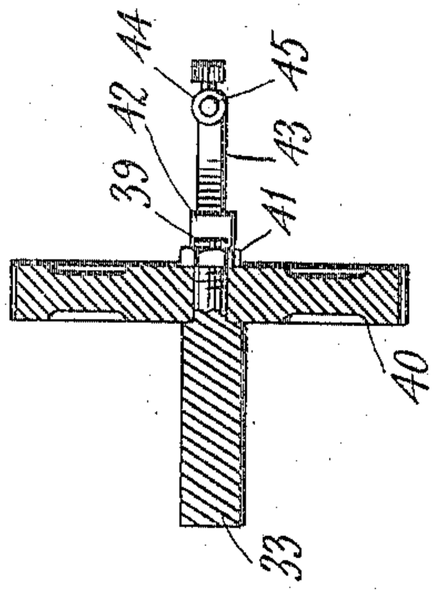


FIG. 10

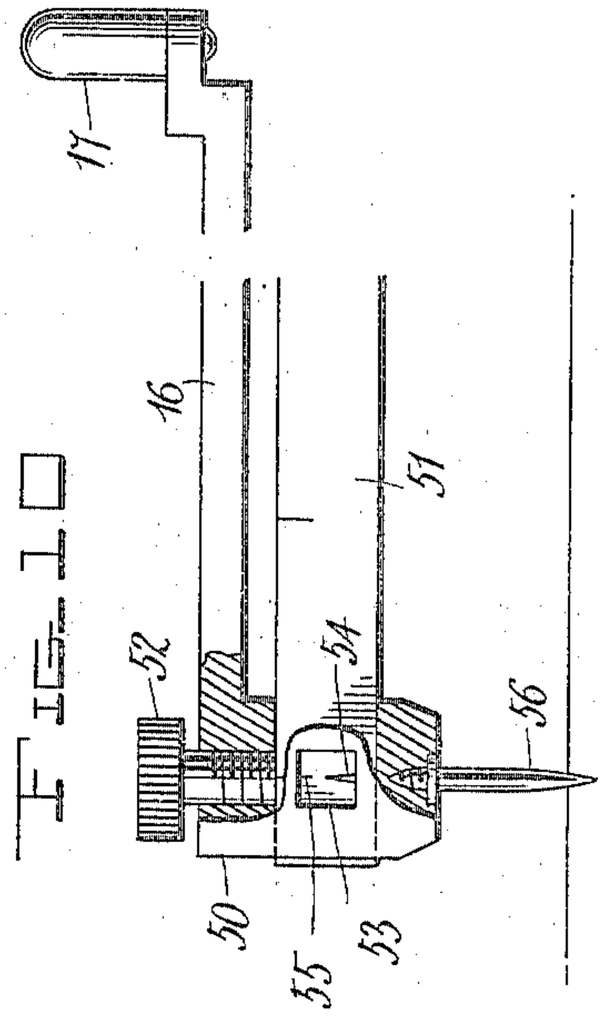
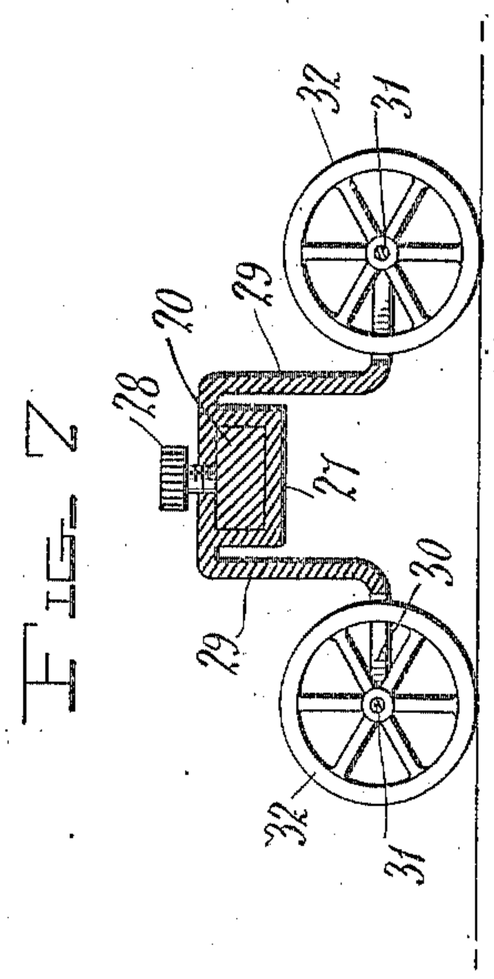


FIG. 4

FIG. 7



Witnesses

J. L. Bonsall

M. J. Miller

Inventor

Albert D. Ide

By Chandlee & Chandlee

Attorneys

A. D. IDE.

DEVICE FOR DIVIDING CIRCLES OR ARCS OF CIRCLES.

APPLICATION FILED JUNE 12, 1908.

948,172.

Patented Feb. 1, 1910.

3 SHEETS—SHEET 3.

FIG. 9

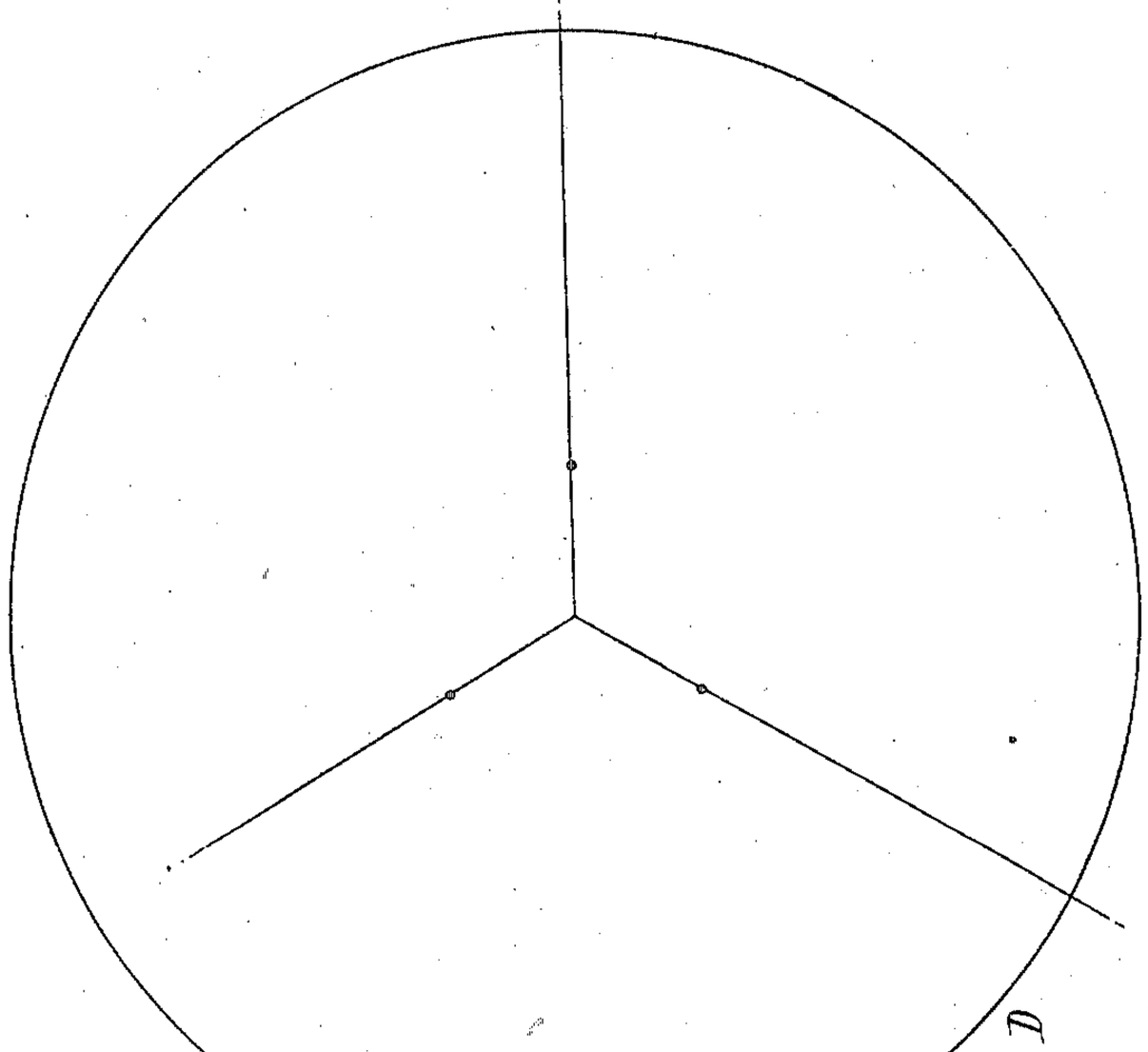
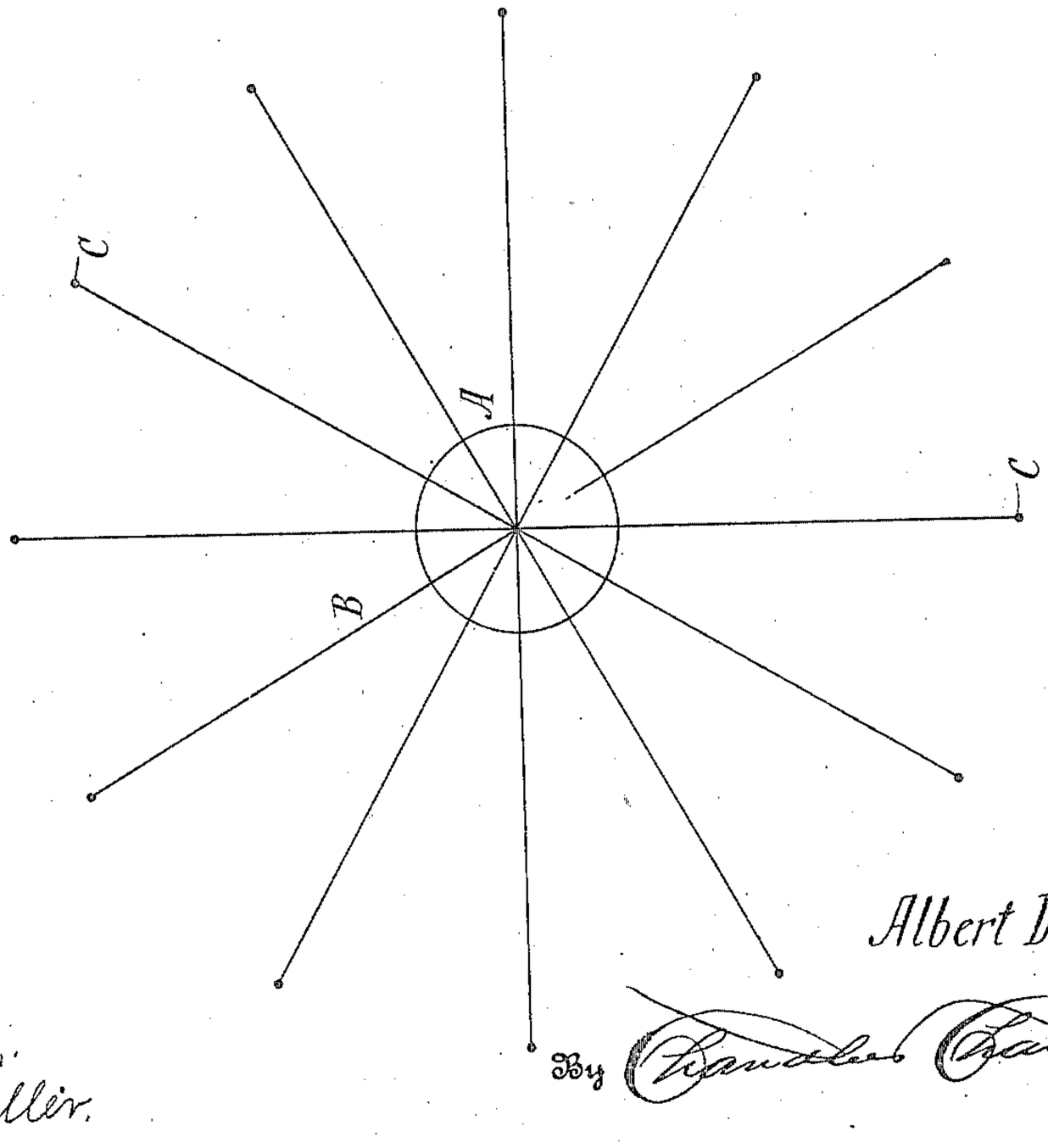


FIG. 10



Witnesses

D. L. Brown.

M. F. Miller.

Inventor

Albert D. Ide

By Chandlee & Chandlee

Attorneys

UNITED STATES PATENT OFFICE.

ALBERT D. IDE, OF CHICAGO, ILLINOIS.

DEVICE FOR DIVIDING CIRCLES OR ARCS OF CIRCLES.

948,172. Specification of Letters Patent. Patented Feb. 1, 1910.

Application filed June 12, 1908. Serial No. 438,241.

To all whom it may concern:

Be it known that I, ALBERT D. IDE, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Devices for Dividing Circles or Arcs of Circles; 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.

This invention is a device designed for use in dividing circles or arcs of circles into any desired number of divisions.

More specifically, the invention resides in the provision of a marker which is adapted to be moved about a center and is adjustable to and from the center so that the number of its functions may be varied with respect to a given angular movement.

More specifically, I provide, in carrying out my invention, a marker which is adapted for movement about a center and is adjustable with respect to the center so that the number of its functions with respect to a given angular movement may be increased or diminished in ratio to the radii of the circles or arcs described thereby, adjustment of the marker away from the center serving to increase the number of its functions in the given angular movement and, vice versa, adjustment of the marker toward the center serving to diminish the number of its functions in the given angular movement, the desired number of divisions being in this manner secured.

In the accompanying drawings, Figure 1 is a side elevation of the instrument embodied in the invention, Fig. 2 is a top plan view thereof, Fig. 3 is a vertical longitudinal sectional view therethrough, Fig. 4 is a vertical transverse sectional view taken in a plane with the end upon which the instrument swings, Fig. 5 is a similar view taken in a plane through the marker, Fig. 6 is a horizontal sectional view taken in a plane also through the marker and with the axis of the wheel thereof, Fig. 7 is a vertical transverse sectional view taken to one side of the supporting device for the outer end of the beam of the instrument, Fig. 8 is a diagrammatic view showing the manner of dividing a small circle into a number of parts, Fig. 9 is a similar view showing the manner of dividing a larger circle into a number of parts, and, Fig. 10 is a detail side elevation partly in section of a slightly modified form of the invention.

In the drawings, the instrument embodying the invention is shown as comprising a head 15 from the upper end of which there projects laterally a handle 16 which at its outer end or extremity has swiveled to it a finger grip 17 the function of which will be presently stated. The head 15 is formed with a rectangular socket 18 and fitted in this socket is a correspondingly shaped stud 19 formed at the inner end of a beam 20 which may be of any desired length and which is enlarged at its said inner end as at 21 the enlargement abutting at its upper end against the underside of the handle 16, the beam being in this manner held securely in position. A pin 22 at its lower end pointed as is clearly shown in the drawings and formed throughout the greater portion of its length with screw-threads 23 said pin being provided at its upper end with a milled head 24 is threaded through the head 15 and the stud 19 at the inner end of the beam it being understood that the pin may be adjusted so that its lower pointed end will project to the proper distance below the under side of the head 15. A set screw 25 is threaded into the head 15 and bears against the pin 22 to prevent rotation of the same after it has been properly adjusted. The upper face of the head 24 of the pin 22 is concaved as indicated by the numeral 26 and it will be understood from the foregoing that by placing the tip of the forefinger of one hand upon the concaved head 26 of the pin and grasping the finger piece or grip 17 of the handle 16 and moving the said finger piece or handle around with a circular motion, the pin having been previously stuck into the surface to be marked, the beam 20 will be correspondingly swung and the function of this operation will presently be made clear.

It is desirable that some means be provided for supporting the extremity of the beam so that the entire beam may be level or may travel parallel to the surface being marked and this means will now be described.

A squared collar 27 is fitted upon the end of the beam 20 and is held securely in place thereon by means of a set-screw 28 which is threaded through the collar and bears against the upper side of the said beam. The collar is formed at each side with an

integral lateral extension 29 and at their ends, these extensions are formed each with a pair of bearings 30 in which is journaled the spindle 31 of a small wheel 32 the two wheels supported by the device having their spindles parallel and having flat peripheries which travel over the surface to be marked it being understood the extensions 29 are bent down or otherwise so formed that the beam 20 will be held parallel to the paper or other surface to be marked.

I will now describe the marker embodied in the invention.

The marker just mentioned is comprised of a standard 33 at the upper end of which is formed a head 34 which is of hollow construction and is slidably engaged upon the beam 20 it being held at various adjustments thereon by means of a set-screw 35 which is threaded through one side of the said head and bears against the corresponding side of the beam. An opening 36 is formed through the top of the head 34 and fixed at one edge of the opening and projecting part of the way across the same is a pointer or indicator pin 37 which registers with scale marks 38 upon the upper side of the beam 20 these marks being numbered to indicate the number of divisions to be marked in one rotation of the beam 20 around its axis 22 as will be presently more fully explained. It will be understood of course from the foregoing that the standard or stem 33 extends downwardly at right-angles with respect to the beam 20 and the lower end of said standard is turned laterally to extend beneath the beam and in a line therewith and is reduced as indicated by the numeral 39, there being a wheel 40 journaled upon the said reduced portion of the standard and a nut 41 engaged upon the said reduced portions directly outwardly of the wheel to hold the same thereon. The periphery of the wheel is preferably roughened as clearly shown in the drawings so as to insure of its rotation while traveling over the surface to be marked and formed integral with the wheel upon one face thereof is a lug 42 to which is secured the upper end of a leaf spring 43 the said spring extending downwardly and outwardly at an angle from the lug and having fixed to its lower outer end a head 44 which carries a marking point preferably of pencil lead.

From the foregoing description of the invention, it will be understood that as the beam 20 is swung around upon its axis 22, the wheel 40 will rotate and at each revolution, the marking point 45 will make a single dot upon the surface being marked the circumference of the wheel and the scale mark 38 upon the beam 20 being of course accurately proportioned so that when the pointer 37 upon the head 34 registers with one of the marks, say that indicating 20 divisions, the wheel 40 will rotate twenty times in one revolution of the beam 20 about its axis 22, twenty dots being made upon the surface over which the instrument travels. It is preferable that the marker wheel 40 may be held stationary when the first dot is made and that it be released before the beam 20 is swung around its axis and in order to attain this result I provide a pin 46 which is removably engaged through the standard 33 of the marker device and an opening 47 formed at the proper point through the wheel 40 the marker point and the opening through which it projects being so relatively located that when the pin is engaged through the opening, the marker point 45 will rest upon the surface to be marked.

The manner of using the instrument will now be fully explained, reference being had to the two diagrammatic views of the drawings. In the first diagrammatic view there is illustrated the method of procedure in dividing a small circle into a number of parts and we will suppose, in this instance that the circle to be divided is three inches in circumference and that it is to be divided into five equal parts. The pin 22 constituting the axis around which the beam 20 swings, is inserted or stuck in the paper upon which the circle is drawn the said circle being indicated by the reference character A at the center thereof, and the marker is adjusted so that the point 37 carried by the head 34 will register with the numeral 5 of the scale on the beam 20, the marker wheel being held stationary until the first dot is made and then being released and the beam 20 swung around the axis 22 in a complete circle. As the beam swings around five dots are made upon the paper in a circular series surrounding the circle A and the instrument is then removed from the paper. Lines are then drawn from the center of the circle which is indicated by the reference character B, to each of the five dots these dots being indicated by C, the circle A being in this manner divided in five equal parts or divisions. Should it be desired to divide the circle into twenty or thirty equal parts it will be understood of course that the marker is to be set at the corresponding number of the scale 38 upon the beam 20 and the same operation is performed. We will now suppose that it is desired to divide a circle which is 18 inches in circumference into three equal parts. The marker is set at the number 3 on the scale 38 and the instrument placed in position as in the first instance above described it then being turned about its axis 22. As will be observed from Fig. 9 of the drawings, the circle in which the dots are described is inside of the circle to be divided and is much smaller than the said circle so that in order to divide the larger

circle, a line must be drawn through the center of the circle and intersecting each dot and the circle which is to be divided and which is indicated by the reference character B, the points of intersection of the three lines with the circle B being exactly six inches apart.

Another use to which the instrument embodying my invention may be put and which renders it extremely desirable for use will now be stated. We will suppose the marker wheel 40 is one inch in circumference and consequently the scale mark 38 will indicate successively from the inner to the outer end of the beam the number of revolutions the marker wheel will make when adjusted to any special mark of the scale, in describing a complete circle so that if it is desired to draw a circle ten inches in circumference, the marker wheel may be set at 10 and the point 22 inserted in the paper upon which the circle is to be drawn and the beam 20 is swung until one dot is made upon the paper. After this has been done, the compass point is placed in the small opening made by the point 22 and the marking point of the compass is brought to register with the dot made by the marker of the instrument the desired radius being in this manner secured after which the circle may be described in the usual way.

In the form of my invention illustrated in Fig. 10 of the drawings, the instrument is shown as comprising a head 50 provided with an opening through which the marker beam, in this figure indicated by the numeral 51, passes the marker beam being held at various adjustments with respect to the said head by means of a set-screw 52 threaded through the upper end of the head. In one side, the head is provided with an opening 53 having a pin or pointer 54 at one edge thereof and extending partly across the opening as this pointer registers with the scale mark 55 upon the corresponding side of the beam 51, there being a needle point or pin 56 formed integral with or secured in the lower end of the said head 50 and corresponding to the point 22. In this form of the invention, the marker is fixed upon the beam at one end thereof and to one side of the head 50 and the supporting device for the other end of the beam is fixed upon the said end in the same manner as in the first seven figures of the drawings, the marker and the supporting device being identical with the marker and supporting device shown in the said first seven figures.

It will be understood of course that in using the form illustrated in Fig. 10, the same method of procedure is carried out and the same results are attained.

It is to be understood that I am not to be limited to either of the forms illustrated in the drawings and that I am not to be limited either to the exact form of supporting device nor the exact form of marker inasmuch as the marker may be constructed in various ways and the same results finally attained and with equal accuracy, the same being the case with the supporting device and also with the needle point or pin which should constitute the axis for the beam of the instrument. In other words I am to be limited only by the scope of the claims which follow. It will further be understood that changes in the character and construction of any and all of the several elements of the instrument may be made as found expedient without departing from the spirit of the invention. It will further be understood from the foregoing description of my invention that if it is desired to use the instrument as a compass, or in other words for describing circles, the wheel 40 may be held stationary by means of the pin 46 and the head 34 may be properly adjusted upon the beam 20 to describe a circle of the desired diameter, and the said beam then swung about the center.

What is claimed is:

1. In a device of the kind described, a bar arranged to swing around a circle, and a carriage mounted to slide on said bar, a wheel rotatably supported from said carriage, an arm projecting laterally from said wheel and a marker carried by said arm.

2. In a device of the kind described, a bar arranged to swing around a circle, a carriage mounted to slide thereon, a wheel rotatably supported from said carriage, an arm projecting laterally from said wheel and provided with a perforation through its outer end, a marker slidably adjustable in said perforation, and a set screw extended through said arm to hold said marker in adjusted position.

3. In a device of the kind described, a bar arranged to swing around a circle, a carriage mounted to slide on said bar, a wheel rotatably supported from said carriage, an arm projecting laterally from said wheel to carry a marker, and means to prevent the tilting of said bar.

4. In a device of the kind described, a bar arranged to swing around a circle, a carriage mounted to slide thereon, a wheel rotatably supported from said carriage, an arm projecting laterally from said wheel and provided with a perforation through its outer end, a marker slidable in said perforation, and means to prevent tilting of said bar.

5. In a device of the kind described, a bar arranged to swing around a circle, a carriage mounted to slide on said bar, a wheel rotatably supported from said carriage, an arm projecting laterally from said wheel to carry a marker, and means to prevent the tilting of said bar comprising a sleeve sup-

ported on said bar and a pair of spaced rollers supported from the sleeve and adapted to rest on a surface.

6. In a device of the kind described, a bar arranged to swing around a circle, a carriage mounted to slide thereon, a wheel rotatably supported from said carriage, an arm projecting laterally from said wheel and provided with a perforation through its outer end, a marker slidable in said perforation, a set screw to hold said marker in position, and means to prevent tilting of said bar comprising a sleeve supported on said bar and a pair of spaced arms supported from the sleeve and adapted to rest on a surface on opposite sides of the bar.

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

ALBERT D. IDE.

Witnesses:

WILLIAM A. BARNES,

FRANK P. LEFFINGWELL.