

R. C. COXHEAD.
 MATHEMATICAL INSTRUMENT.
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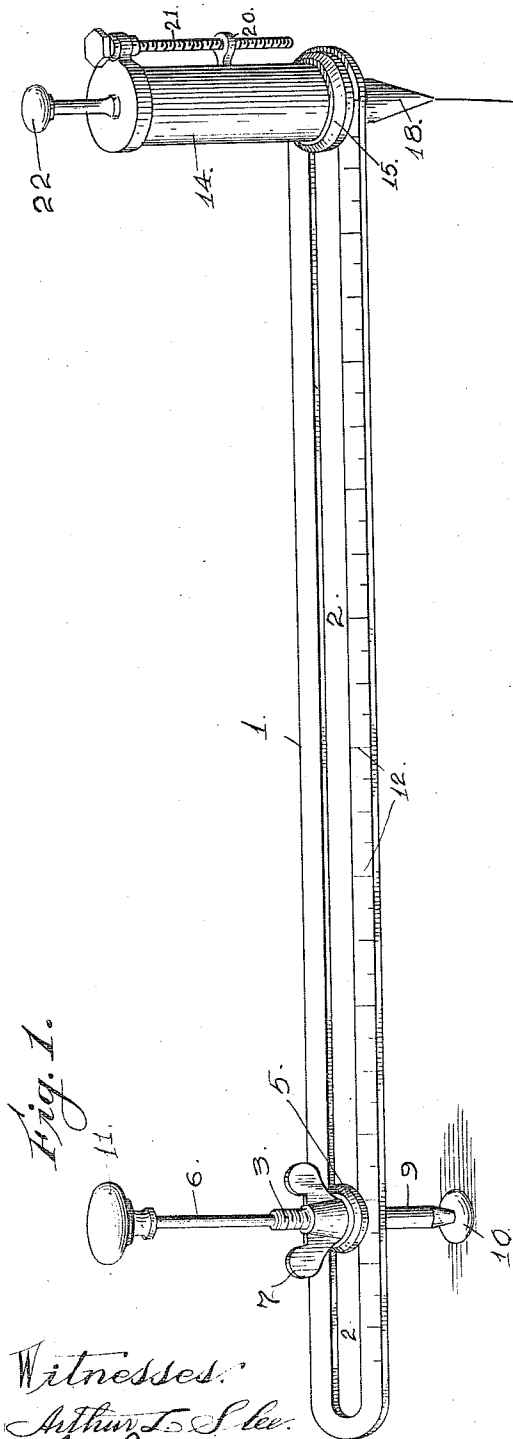


Fig. 1.

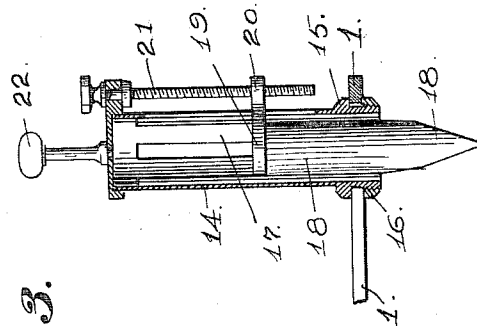


Fig. 3.

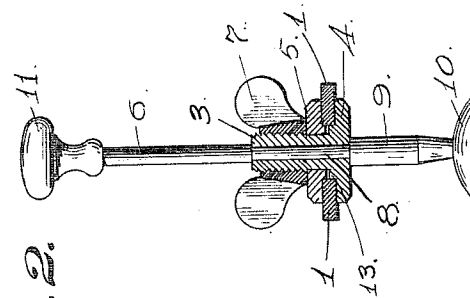


Fig. 2.

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UNITED STATES PATENT OFFICE.

RALPH C. COXHEAD, OF OAKLAND, CALIFORNIA.

MATHEMATICAL INSTRUMENT.

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Specification of Letters Patent.

Patented Mar. 7, 1911.

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To all whom it may concern:

Be it known that I, RALPH C. COXHEAD, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Mathematical Instruments, of which the following is a specification.

The hereinafter described invention is designed for use in the drawing of circles and circular lines generally, and more particularly for use in connection with class rooms for describing circular lines on the black board in the working out of geometrical problems; the object being to provide a simple and effective device for accurately describing circular lines on the black board without injury to the surface thereof, the instrument embracing adjustable means for positioning the same for the drawing of circles of varying diameter, the said adjustable means being of such construction as to hold onto the surface of the black board to prevent slippage of the instrument while drawing circles and circular or curved lines.

To comprehend the invention reference should be had to the accompanying sheet of drawings, wherein—

Figure 1 is a perspective view of the instrument positioned for the drawing of circles or circular lines. Fig. 2 is a detail sectional view of the adjusting and holding means. Fig. 3 is a similar view of the chalk holding thimble, illustrating the spring clamp therein for engaging the chalk and the adjusting screw and follower for moving the stick of chalk outwardly.

In the drawings, the numeral 1 is used to designate a base plate, constructed of any suitable material, which, in the present case, is formed with a longitudinally disposed central slot 2. Within this slotted portion of the base plate is slidably held the screw-threaded stud 3, the same carrying an enlarged head 4, which bears against the under face of the base plate 1, and, in conjunction with the circular plate 5, acts as a clamp for the post 6. The plate 5 fits over the screw threaded stud 3 and bears onto the upper face of the base plate, being held clamped thereto by means of the wing nut 7, which works on the screw-threaded stud 3. Through the said stud 3 loosely extends the reduced end 8 of the post 6, the same screwing into the stem 9, carrying a suction disk 10. To the upper end of the post 6 is

secured a finger knob 11, so that the operator may readily hold the same.

On the upper face of the base plate 1 and to one side of the longitudinally disposed slot 2, is formed a graduated scale 12, preferably in inches, ranging from one to twelve inches, so that the post 6 may be set at any desired point and there clamped to the base plate by screwing tight the wing nut 7, which causes the plates 4 and 5 to firmly clamp onto the base plate. For instance, if a circle twelve inches in diameter is to be drawn, the post 6 will be set to the point designating six inches, the position of the post being varied in accordance with the distance of the line, from the center from which it is to be struck. The screw stud 3 is held against rotation within the slotted portion of the base plate, by reason of the flattened faces 13 thereof bearing against the walls of the slotted portion 2.

At the outer end of the base plate is held a chalk container, thimble or shell 14, the lower end of which is fitted within an enlarged open portion of the base plate 1 until its shouldered portion 15 bears onto the upper face of the base plate, there being screwed onto the projecting end thereof a securing washer 16. Within the container, thimble or shell 14 is located a spring clamp holder 17, which receives and clamps a stick 18 of chalk. The inner end of the stick of chalk bears against a follower 19, movable within the spring clamp holder, the extension 20 of which projects through a vertical slot formed in the wall of the container, thimble or shell 14, and the said extension 20 is engaged by an adjusting screw 21, and by means of which the follower 19 is lowered to force outwardly the stick 18 of chalk to compensate for the wear thereof. To the head of the container, thimble or shell 14 is secured a finger knob 22, which, preferably, is free to turn as the instrument is swung around. The chalk is thus held out of contact with the fingers of the operator, thereby maintaining the same clean while using the instrument.

In operation, the post 6 is first adjusted on the base plate to the diameter of the circle to be described, and the sucker disk 10 then pressed onto a point on the black board previously determined as the center of the circle to be described, the suction of said disk being substantially sufficient to support the weight of the instrument. The

operator with one hand grasps the knob 11 and with the other the knob 22, exerting slight pressure onto the post 6 and by the hold on knob 22 swinging the base plate 1 to describe the desired circle, or arc of a circle, the chalk pencil 18, which is in contact with the surface of the board producing the circle line. During this movement, the clamp plates 4 and 5 turn freely on the post 6, the said clamp plates serving as a pivot joint for the base plate to swing on.

The described instrument is designed to take the place of the string and chalk commonly employed in class-rooms for describing circles and circular lines in the working out of geometrical problems. Inasmuch as the disk 10 holds to the surface of the black-board by suction, there is no disfigurement to the surface of the board by the use thereof, which follows from the use of such devices as employ centering studs which cut into the surface of the board.

While preference is given to the use of a suction disk as a bearing head for holding the instrument centered, still, any form of a base disk which will prevent slippage of the base plate may be employed as a centering head.

The described instrument will readily appeal to instructors in mathematics, inasmuch as it insures the pupils producing on the surface of the board perfectly drawn circular lines.

Having thus described the invention what is claimed as new and desired to be protected by Letters Patent is:—

1. An instrument for the described purpose, the same comprising a slotted base plate having its upper surface provided with a scale of measure, a suction disk slidably held to said base plate, adjustable means for clamping the said disk and holding the same in locked position relative to the base plate, a holder for a chalk stick secured to the outer end of the base plate, and means within the holder for feeding outwardly the stick of chalk held therein.

2. In an instrument for the described purpose, the combination with a slotted base plate provided on one face thereof with an indicating scale, a stud slidably mounted within said base plate, a post extended through and rotatably held within the slidable stud, a suction disk secured to the lower end of the said post, and means for clamping the slide stud in adjusted position relative to the base plate.

3. In an instrument for the described purpose, the same comprising a swinging base plate, a suction disk for holding the same to a board, slidable clamping means for adjusting the suction disk and holding the same in locked position, a chalk container secured to the outer end of the slotted swinging base plate, a spring holder within the container, and means for feeding downwardly the chalk.

4. In an instrument for the described purpose, the combination with a slotted swinging base plate, of a chalk container secured to the outer end thereof, a spring clamp holder within the container, a follower therein, and means outside of the container for forcing downwardly the follower to regulate the position of the chalk stick, and adjustable suction means for holding the base plate to the surface of a board.

5. In an instrument for the described purpose, the combination with a longitudinally slotted swinging base plate, of adjustable clamping means slidably mounted within the slotted portion of the base plate, a suction disk for frictionally holding the base plate to the surface of a black-board, rotatable connection between the suction disk and the slidable clamping means for permitting free swinging movement of the base plate, a chalk holder carried at the outer end of the swinging base plate, and means therein for feeding downwardly a stick of chalk held within the said holder.

6. In an instrument for the described purpose, the combination with a swinging base plate, a suction disk carried thereby for frictionally holding the same to the surface of a board, adjustable clamping means for regulating the position of the suction disk relative to the base plate, a loose connection between the suction disk and the clamping means for permitting free swinging movement of the base plate, a chalk holder carried at the outer end of the base plate, and means within the chalk holder for regulating the outward feed of the chalk contained therein.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RALPH C. COXHEAD.

Witnesses:

EZRA W. DECOTO,
N. A. ACKER.