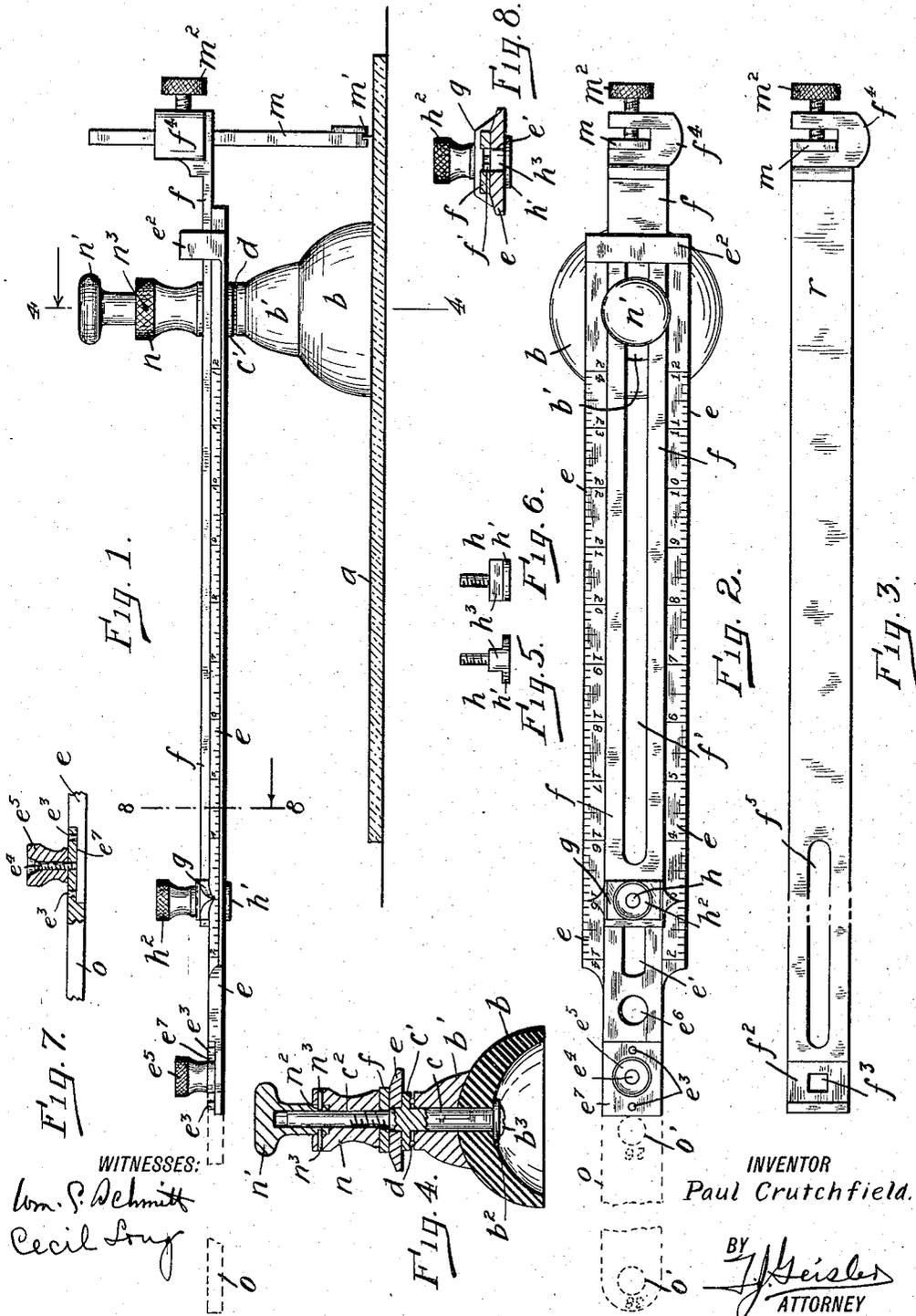


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 SUCTION BASE CIRCLE MARKING AND CUTTING INSTRUMENT.  
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# UNITED STATES PATENT OFFICE.

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SUCTION-BASE CIRCLE MARKING AND CUTTING INSTRUMENT.

1,166,889.

Specification of Letters Patent.

Patented Jan. 4, 1916.

Application filed March 4, 1914. Serial No. 822,534.

To all whom it may concern:

Be it known that I, PAUL CRUTCHFIELD, a citizen of the United States, and a resident of the city of Portland, county of Multnomah, State of Oregon, have invented a new and useful Improvement in Suction-Base Circle Marking and Cutting Instruments, of which the following is a specification.

My invention relates to devices for cutting a circular portion out of a flat piece of material, such as glass for example, or for merely marking a circle on the surface of the material. In either case the standard pivotally supporting the cutting or marking instrument must be supported in place; and to provide a device adapted for being readily secured in place on the surface by a mere suction hold of the base of the standard of my device is one of the main objects of my invention.

It is also my object to so construct my device that it may be conveniently used for cutting and marking circles of diameters varying from 2 to 48 inches.

To this end my invention consists of a standard provided with a suction base, a post journaled in such standard, a graduated beam, with a slide bar, pivoted on the post, and providing one end of the slide bar with means for holding a marking or cutting instrument.

The other details of construction, and the operation of my device are hereinafter fully described.

In the accompanying drawings: Figure 1 is a side elevation of my device as arranged for being used for cutting or marking circles having a diameter of from 2 to 12 inches inclusive; Fig. 2 is a top view of my device as shown in Fig. 1; the dotted portion shown in the left-hand end of Figs. 1 and 2 representing an auxiliary extension bar which is used only when circles of larger diameter are to be produced; Fig. 3 is a top view of a substitute slide bar which is used when it is desired to cut or mark very large circles; Fig. 4 is a transverse section of the pivot post and its suction base, the section being taken on line 4-4 of Fig. 1; Figs. 5 and 6 are details of a stud screw; Fig. 7 is a longitudinal section showing the means for fastening the auxiliary extension bar to the slide bar; and Fig. 8 is a section on line 8-8 of Fig. 1.

*a* represents a sheet of glass out of which

a circular portion is to be cut. The standard of my device comprises a hemispherical rubber shell or suction base, *b*, which is affixed to the sheet of glass by causing a partial vacuum in the suction base. On the latter is mounted a metallic standard *b'* made with a concave bottom surface. The post *c* is journaled in the member *b'* and is made with a circular flange *c'*. Ball-bearing elements *d* are interposed between the top surface of the standard *b'* and the lower surface of the flange *c'* of the post, *c*, to facilitate the rotary motion of the latter. The longitudinal displacement of the post, *c*, is prevented by the washer *b<sup>2</sup>* and screw *b<sup>3</sup>*, threaded into the bottom of the post. The upper end *c<sup>2</sup>* of the post *c* is threaded and has a nut *n*. The upper end of this nut is made with a cavity and a partially cored-out cap *n'* fits in said cavity. The cap *n'* is provided with a peripheral groove *n<sup>2</sup>*. Pins, *n<sup>3</sup>*, inserted through the top of the nut *n*, as shown in Fig. 4, bear in said peripheral groove and thus permit the nut *n* to be rotated independently of the cap *n'*. The cored-out cap *n'* serves as an inclosure for the upper end *c<sup>2</sup>* of the post *c*, and as a hold for one hand while the other hand is rotating the nut, *n*, in the act of clamping or releasing the slide-bar *f*.

The graduated beam, *e*, has a longitudinal slot *e'* and its forward end *e<sup>2</sup>* is turned upward and slotted so as to form a guide-bearing for a slide-bar *f*.

The slide-bar *f* is made with a longitudinal slot *f'* and its left end (having reference to the positions of the parts in the drawings) is provided with a recessed portion *f<sup>2</sup>* made with a centrally located square hole *f<sup>3</sup>*, which constitutes a seat for the pointer *g*. The latter is secured in place by a screw, *h*, having its head *h'* made with a shoulder *h<sup>3</sup>* and inserted upwardly through the slot *e'* of the beam *e*, the hole *f<sup>3</sup>* of the slide bar *f*, and a hole in the pointer *g*; and on the extremity of the screw *h* is threaded a nut *h<sup>2</sup>*. The shoulder *h<sup>3</sup>* of the screw head *h'* prevents the screw *h* from turning. By loosening the nut *h<sup>2</sup>* the bar *f* may be longitudinally moved until the pointer *g* comes into alignment with any predetermined graduation of the beam *e*. The right end of the slide bar *f* is made with a holder *f<sup>4</sup>* for the marking or cutting instrument, *m*, which is clamped by the set-screw *m<sup>2</sup>*. The instrument illustrated is a glass cutter, as shown by *m'*.

My device, as thus far described, is adapted for cutting circles having a diameter varying from 2 to 12 inches. For cutting circles having a diameter varying from 12 to 22 inches, I provide a substitute slide bar  $r$ , shown in Fig. 3, and which is to be used in place of the slide bar  $f$ . As will be noted by comparing Figs. 2 and 3, the substitute slide bar  $r$  is like the bar  $f$ , except that it is longer. The slot  $f^5$  of the slide bar  $r$  has the same length as the slot  $f'$  of the bar  $f$ . When said substitution is to be made the nuts  $h^2$  and  $n$  are removed and replaced after the substitution has been made. When the bar  $r$  is used ten inches will be added to the lower and upper scales shown on the beam  $e$ ; thus when the pointer  $g$  is placed to register 3 inches on the lower scale of the beam  $e$ , the instrument would mark or cut a circle of 3 inches plus 10 inches, equaling 13 inches.

In order to adapt my device for describing circles having a diameter varying from 34 inches to 48 inches, I provide an extension bar  $o$ , which is fastened to the left end  $e^7$  of the beam  $e$ . The bar  $o$  is made with a plurality of holes  $o'$  spaced one inch apart. The bar  $o$  is necessarily made detachable so that it may be removed and not render my device unhandy when to be used for describing circles of smaller diameter. The left end  $e^7$  of the beam  $e$  is made with a sunken surface and is provided with two stud pins  $e^3$ , and a stud screw  $e^4$ , on which screws a nut  $e^5$ ; and the related end of the bar  $o$  is also made with a sunken surface and holes to receive the stud pins  $e^3$  and screw  $e^4$ . See Fig. 7.

My device, as shown in the drawings, is adapted to cut circles whose diameter varies from 2 to 48 inches. The measurements used represent those merely suggesting themselves as convenient, and as evident other measurements may be employed, and the sizes of the parts of my device relatively changed to adapt the same for describing circles of other diameters.

In operation my device is used as follows: To describe a circle having a diameter of 3 inches the standard  $c$  is arranged under the right end of the slot  $e'$  of the beam  $e$  (as shown in Figs. 1 and 2) and the slide-bar  $f$  is adjusted to bring the pointer  $g$  to read 3 on the lower scale of the beam. See Fig. 2. The nuts  $h^2$  and  $n$  are then tightened and the instrument  $m$  is revolved about on the post  $c$ . And to describe any other circle of a diameter varying from 2 to 12 inches inclusive, the slide bar  $f$  is so adjusted that the pointer  $g$  will indicate the corresponding graduation on the lower scale of the beam  $e$ . To describe a circle having a diameter varying from 12 to 22 inches the substitute slide bar  $r$  must be used in place of the slide bar  $f$ , and by which 10 will be added to the measurement indicated by the pointer  $g$ ;

thus when the pointer  $g$  indicates 2 inches on the lower scale of the beam  $e$ , the circle described will be 12 inches in diameter, and when the pointer  $g$  indicates 12 inches on the lower scale the diameter of the circle will be 22 inches.

To describe a circle having a diameter varying from 14 to 24 inches inclusive, the nut  $n$  must be removed from the top  $c^2$  of the post  $c$  and said post inserted through the hole  $e^6$  of the beam  $e$ , and the upper scale of the beam  $e$  read in connection with the adjustment of the slide bar  $f$ . To describe circles varying in diameter from 24 to 34 inches inclusive, the substitute slide-bar  $r$  is used in place of the slide bar  $f$ , and the adjustment of the substitute slide bar is made with respect to the upper scale of the beam  $e$ , to which 10 must be added, as above mentioned. The top of the post  $c$  is inserted through the hole  $e^6$  of the beam  $e$ , the substitute slide bar  $r$  used in place of the slide bar  $f$ , and the adjustment of the pointer  $g$  is made on the upper scale of the beam  $e$ , 10 being added to the measurement indicated, as above described. In describing circles of a diameter varying from 24 to 38 inches the extension bar  $o$  must be affixed to the left end of the beam  $e$ . The bar  $o$ , as mentioned, has a plurality of holes  $o'$  one inch apart, and the post  $c$  must be inserted through one or the other of these holes in order to attain the measurement desired. For example, to describe a circle of 26 inches in diameter the post  $c$  is inserted in the hole  $o'$  marked 26 and the slide bar is moved until the pointer  $g$  registers with the graduation 24. To describe a circle 25 inches in diameter the slide bar  $f$  is moved until the pointer  $g$  registers with the graduation 23, thus 2 inches must be added to each reading of the upper scale of the beam  $e$ . To describe circles varying in diameter from 24 to 48 inches inclusive, the bar  $o'$  must be used, and the substitute slide bar  $r$  must replace the bar  $f$ . For example: to describe a circle of 48 inches in diameter the post  $c$  would be inserted in the hole  $o'$  marked 38 of the bar  $o$  (see Fig. 2) and the substitute slide bar  $r$  moved outward its full length. To adjust my device, when arranged as last mentioned, so as to describe a circle of smaller diameter, for example say 47 inches, the substitute slide bar  $r$  would be moved inward one inch on the scale of the beam  $e$ .

I claim:

1. In a device of the character described, a pivot element comprising a suction base, a standard thereon mounted, a post journaled in the standard, a nut threaded on the upper end of the post, and a piece providing a hand-hold rotatably secured on the nut.
2. In a device of the character described, a pivot element comprising a suction base, a standard thereon mounted, a post journaled

in the standard, said post made with a peripheral flange, ball-bearings between such flange and the top of the standard, a nut threaded on the upper end of the post, and a piece providing a hand-hold rotatably secured on the nut.

3. In a device of the character described, a pivot element comprising a hemispheric cup-like resilient base, a standard thereon mounted, a post journaled in the standard, a nut threaded on the upper end of the post, and a piece providing a hand-hold rotatably secured on the nut.

4. In a device of the character described, a pivot element comprising a hemispheric cup-like resilient base, a standard thereon mounted, a post journaled in the standard, said post made with a peripheral flange, ball-bearings between such flange and the top of the standard, and a cap providing a hand-hold rotatably secured on the nut and inclosing the upper end of the post.

5. In a device of the character described, the combination of a standard, a beam adjustably supported by the standard, a slide bar longitudinally adjustable on the beam, said bar provided on one end with a cutting

or marking instrument, and means for locking the bar and beam in any position to which they have been adjusted.

6. In a device of the character described, the combination of a standard, provided with a suction base, a graduated beam supported by the standard and longitudinally adjustable with respect to the latter, a slide bar longitudinally adjustable on the beam, said bar provided on one end with a marking instrument and means for locking the bar and beam in any position to which they have been adjusted.

7. In a device of the character described, the combination of a standard, provided with a suction base, a graduated beam supported by the standard and longitudinally adjustable with respect to the latter, a slide bar longitudinally adjustable on the beam, said bar provided on one end with a marking instrument and a clamping device for locking the bar and beam in any position to which they have been adjusted.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."