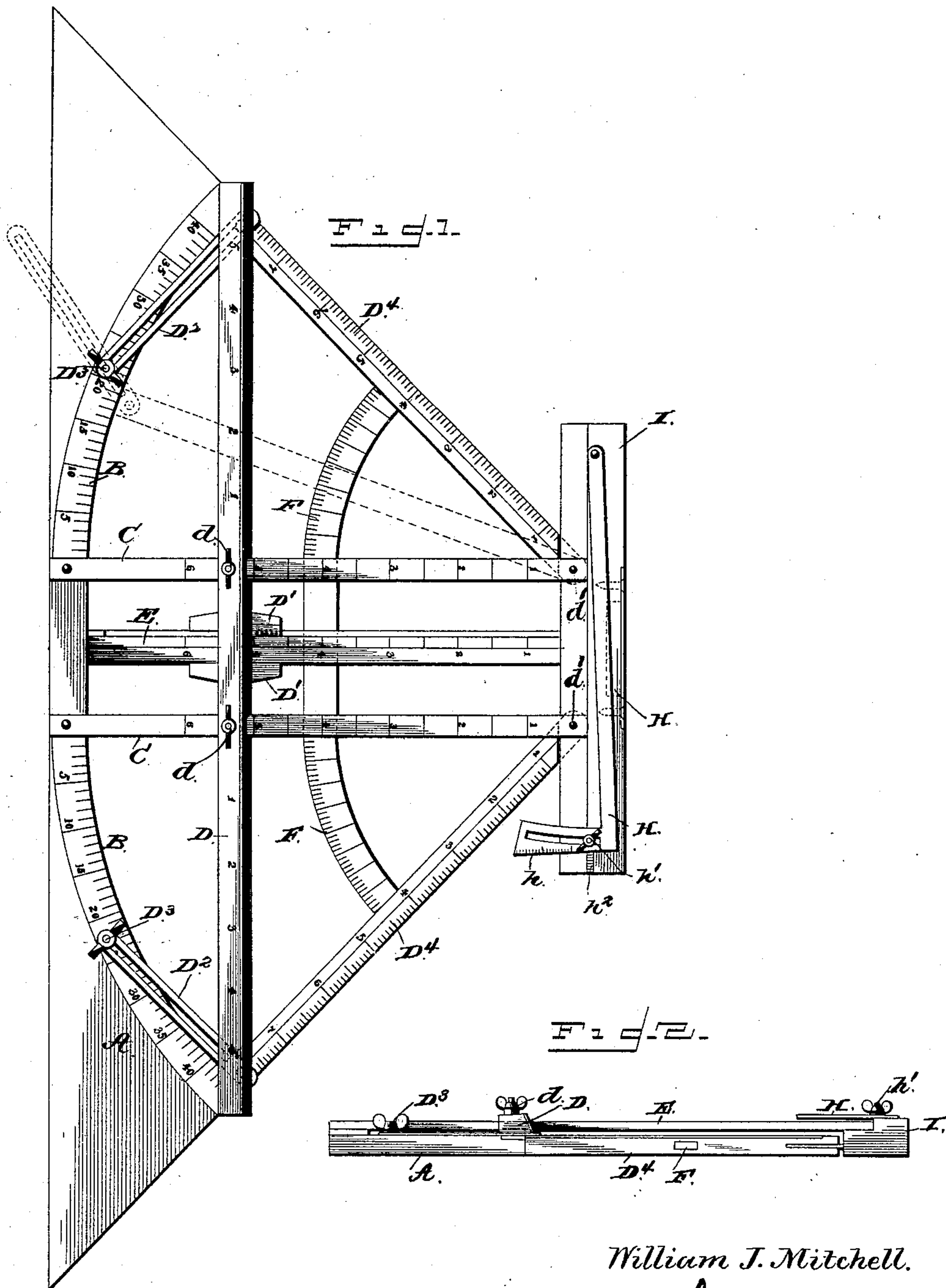


(No Model.)

W. J. MITCHELL.
PLOTTER AND PROTRACTOR.

No. 376,332.

Patented Jan. 10, 1888.



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PLOTTER AND PROTRACTOR.

SPECIFICATION forming part of Letters Patent No. 376,332, dated January 10, 1888

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To all whom it may concern:

Be it known that I, WILLIAM J. MITCHELL, a citizen of the United States of America, residing at Princeton, in the county of Caldwell and State of Kentucky, have invented a certain new and useful Improvement in Measuring Devices; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in measuring-instruments; and it consists in the novel construction and arrangement of the parts thereof, which will be more fully hereinafter described, and particularly pointed out in the claims.

The primary object of my invention is to provide a device for measuring angles, framing buildings, building ordinary and railroad bridges and trestle-works, and for any other purpose where straight and angular measurement is required.

The secondary object of my invention is to provide a simply-constructed measuring device which can be used and employed by persons untutored in mathematical principles and problems with understanding, accuracy, and certainty, the said device requiring but slight instruction in the use and resultant computation thereof to render it comprehensive to the most illiterate.

The accompanying drawings illustrate my preferred form of construction, like letters of reference being used to designate similar parts in the several views, and in which—

Figure 1 is a top plan view of my improved device. Fig. 2 is a side elevation thereof.

A indicates the base-strip, which is angularly constructed and forms the base and lower corner-angles for the measurement of angles. To the central part of the base-strip A one end of a central bar, E, is secured, and at the opposite end thereof a cross-strip, I, is attached. Secured to the said cross-strip I and base-strip A on each side and slightly above the central bar, E, a pair of parallel bars, C C, are mounted, which are adapted to be traversed by a transversely-arranged extended slide-bar, D,

mounted thereover. The bars C are fitted in mortises formed in the lower side of the bar D, suitable set-screws, *d d*, being used to clamp the said bar D to the bars C in adjusting the former bar. To the under side of the bar D two slide blocks, *D' D'*, are secured and which engage with the central bar, E, and guide the movement of the bar D relatively with the bar E.

The upper part of the angular base-strip A has curved metallic guide scales B B secured to each side thereof on the outside of the parallel bars C. These guide-scales are graduated to represent degrees, and having longer degree-lines for each five degrees formed thereon, with subdivisions between each longer line. Inside the guide-scales B, and passing through mortises in the parallel bars C and central bar, E, another segmental scale, F, is mounted, which also passes through side arms *D¹*, and act as guides therefor, to steady the movement thereof. The scale-marks on the segmental arms F are converging continuations of the scale-marks on the segments B on the strip A. The marks on the upper segment B and upper segment F converge to pivot of upper arm *D¹*, and marks on the lower segment B and lower segment F converge to pivot of the lower arm *D¹*. The said arms *D¹* are pivoted at *d'* to the strip I, and at their opposite ends have slotted arms *D²*, which arms are secured at their other ends to the segments B on the strip A by screw-threaded pins passing through the slots thereof, and secured in an adjusted position, as shown in dotted lines, by clamping winged nut *D³*.

The upper side of the strip I is provided with a spirit-level, *H'*, and to one side thereof an arm, H, is pivoted, which is formed with a depending arm, *h*, having a segmental slot therein, through which a stud secured to the strip I passes and is engaged by a clamping-nut, *h'*. The edge of the arm *h* is formed with a scale, and the strip I, adjacent thereto, is also formed with a scale, *h²*, to indicate the angle of position of the arm *h*. Using the strip A as a base and observing the bead in the spirit-level, the level of a beam may be readily ascertained. If it is found that the beam is not true, the arm H is adjusted to indicate the amount of deflection, and a calculation made from the scales on the said arm H and the strip I.

The central strip, E, and parallel strips C are divided into inches, as is also the cross-bar D. The segmental bars B and F have degree-scales thereon, as hereinbefore described, and the bars D¹ with inch-scales, having subdivisions of twelfths of an inch. The bars D¹ act as protractors, and, with the segments B and F, will indicate the angle of inclination, and also form and show the hypotenuse use of the angle measured, while the strip D forms the base and the bars C the altitude or perpendicular. As shown in the drawings, right and left angles of forty-five degrees are formed, and by the scales on the several parts the angle can be measured at all points, as will be obviously apparent.

To illustrate the practicability of my device, I will describe the use thereof in measuring a brace. Taking the bar D as a base, it is moved to 6 on the central bar, E, and one of the pivoted bars D¹ is moved to 1 on the said cross-bar D, when the length of your brace is six feet one inch. The movable side bars D¹ are then moved in line with the edge of the timber, when it will be found by verification that the length of brace is six feet one inch. The instrument may then be laid upon the timber to form the other end and reversed, when a right and left hand brace will be formed.

The advantage of my improved device is that any person who has a knowledge of the figures 1, 2, 3, &c., can readily use the instrument with accuracy, without understanding square and cube root, and without a drawing or sketch.

The convenience afforded by the use of my improved device renders it indispensable in the mechanical arts, and its general utility and usefulness being obviously apparent, it is unnecessary to further enlarge upon the same herein.

Having thus described my invention, what I claim as new is—

1. In a measuring device, the combination of the base-strip, the central bar, the two parallel bars on each side of the central bar, the cross-bar mounted in connection with the said parallel bars and sliding thereon, the outer pivoted bars, and the segmental arms, substantially as described.

2. The combination of the base strip, the central bar, the parallel bars on each side thereof, the sliding cross bar having slide-blocks secured thereto and engaging with the central bar, the outer pivoted bars, the segmental arms, and the top cross-strip having a spirit-level therein, substantially as described.

3. The combination of the base-strip carrying the curved arms or segments, the central bar, the parallel bars on each side of the central bar, the cross-bar sliding on said parallel bars, the outer pivoted bars having slotted arms adapted to be clamped to the base-strip, the segmental arms, the top cross-strip carrying a spirit-level, and the arm secured to the side of the cross-strip and constructed as and for the purposes set forth, substantially as described.

4. The combination of the base-strip, the central bar, the parallel bars on each side of the central bar, the cross-bar adapted to be clamped to the parallel bars, the segmental arms, the outer pivoted arms having lower slotted arms secured thereto, which are clamped to the base-strip when the said arms are adjusted, the said parts having inch, foot, and degree scale marks thereon, the top cross-strip having a spirit-level therein and a scale, h^2 , on one side thereof, and the arm H', having the depending end h provided with a scale and formed with a segmental slot through which a stud secured to the top cross-strip passes and is engaged by a clamping-nut, substantially as described.

5. The combination of the base-strip carrying segmental graduated arms, the central bar having a scale thereon, the parallel bars on each side of the central bar, having scales thereon, the sliding cross-bar having a scale thereon, and sliding blocks engaging with the central bar and adapted to be guided by the parallel bars, which pass through mortises in said cross-bar, and to be clamped thereto by suitable set-screws, the upper segmental arms secured to the central bar, the outer pivoted protracting arms having a scale thereon and formed with slots through which the upper segmental arms pass, the slotted arms on the lower end of the said protracting arms, which are adapted to be clamped to the base-strip and hold the arms in adjustment thereby, the top cross-strip carrying a spirit-level, and the arm secured to the side of the cross strip and having the angular slotted projection at one end thereof, substantially as described.

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

W. J. MITCHELL.

Witnesses:

R. GARRETT,
J. T. MITCHELL.