

(No Model.)

J. D. BROWN.
DEVICE FOR PROTRACTING LAND SURVEYS.

No. 604,517.

Patented May 24, 1898.

Fig. 1.

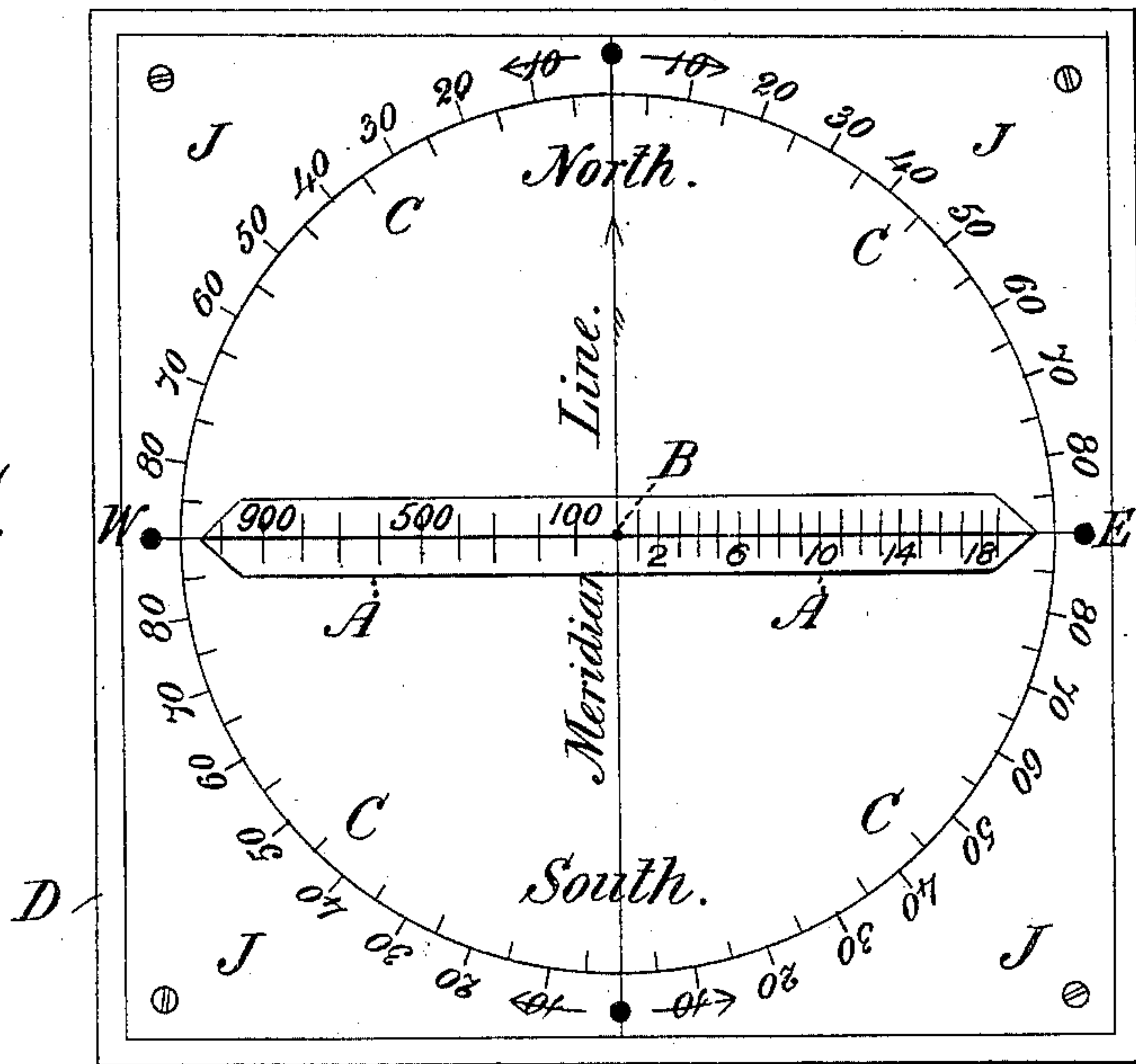


Fig. 2.

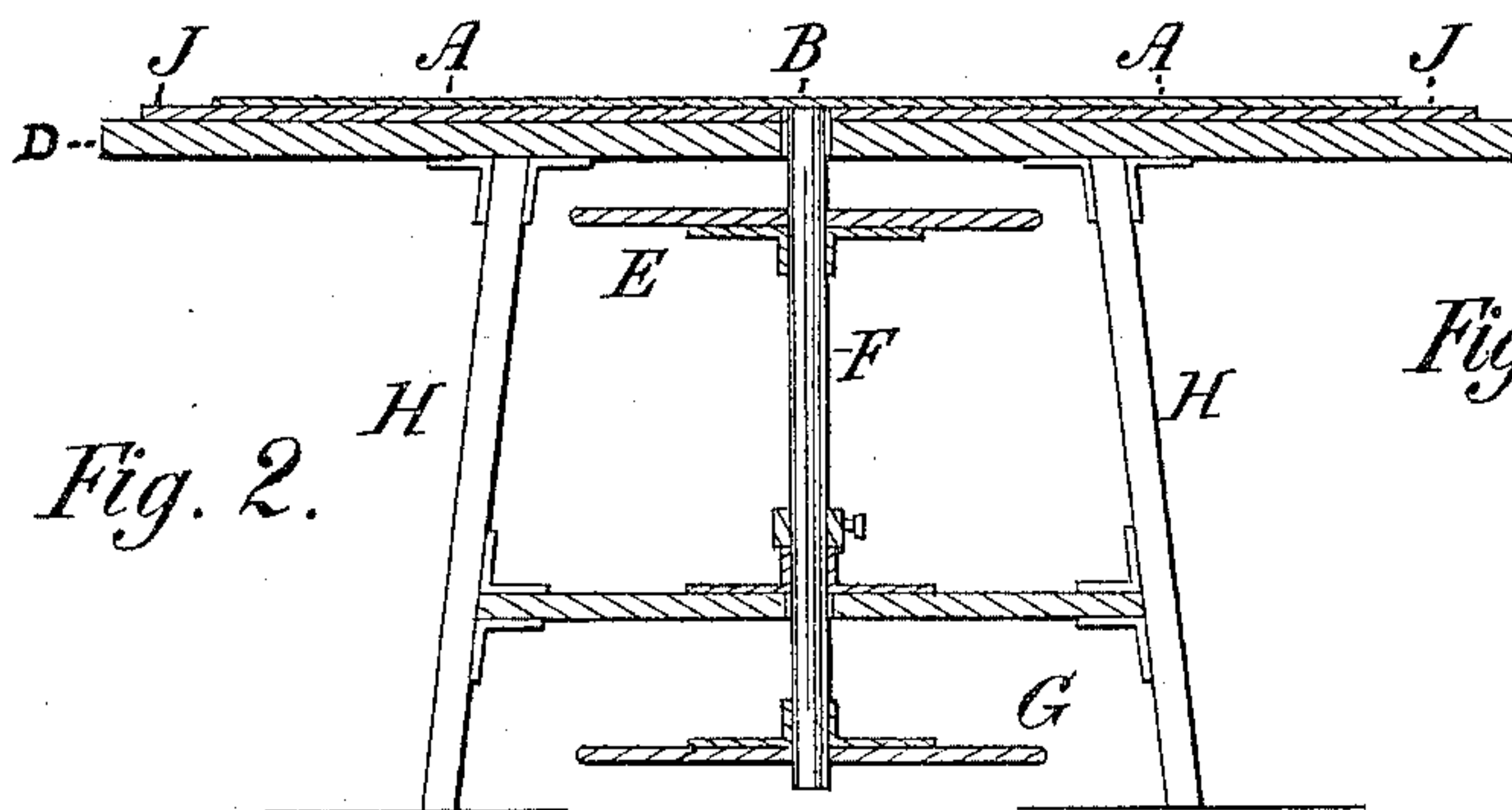
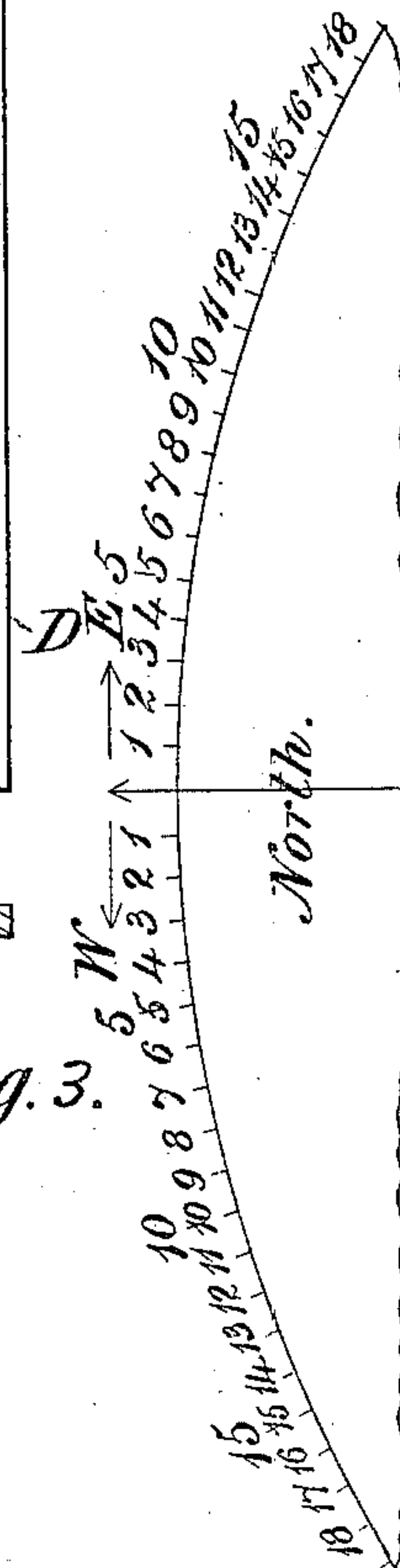


Fig. 3.



WITNESSES.

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DEVICE FOR PROTRACTING LAND SURVEYS.

SPECIFICATION forming part of Letters Patent No. 604,517, dated May 24, 1898.

Application filed June 25, 1897. Serial No. 642,313. (No model.)

To all whom it may concern:

Be it known that I, JOHN DUNWELL BROWN, a citizen of the United States, residing at Richmond, Staten Island, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Methods of and Devices for Protracting Land Surveys; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to use the same.

The methods heretofore in use for the above purpose have been either to use a half-circle metal or horn protractor and move the same to the delineations to be made on the drawing-paper or to place a large full-circle protractor on the side or corner of drawing-board, from which the courses are transferred to the drawing by means of a rule and triangle. Either of the above methods are slow and require considerable care in that the protractor in the first instance and the rule and triangle in the second are liable to slip in their movements over the drawing-paper, and also in the first case above mentioned the radius of the protractor must necessarily be quite small, so that in its travel over the drawing it will not overlap the same, it being well understood that the smaller the radius the less accurate the protractions, and in the second case where a large stationary protractor is used the triangle must be of such a size as to be cumbersome and not easily manipulated and requiring also a very large table or drafting-board especially constructed therefor.

The object of my invention is to avoid the transfer of protractor and the transfer of lines or directions by rule and triangle, as above mentioned, and to procure the advantages of a large radius within the smallest possible space by drawing a properly-degreed circle on a plain surface and at the exact center thereof attaching or holding a flat rotary indicator pointing to the several degrees on the circumference of such circle. The several directions to which such indicator is set are copied directly upon a sheet of vellum or other transparent substance placed over the same, and the protraction being thus delineated can be transferred by carbon-paper in the usual manner to any surface required.

Referring to the accompanying drawings, which are made a part of this specification and on which similar letters of reference indicate similar parts, Figure 1 represents a plan view of the circle C above described drawn upon a cardboard J, attached to the drawing-board D and showing a flat rotary indicator A in position for rotating from the common center shown on the indicator by a small dot at B. Fig. 2 represents a central cross-section of Fig. 1, showing cardboard J, drawing-board D as attached to or forming the top of the stand H, also the indicator A, fastened to the end of the rod F, the latter having the pulleys E and G attached thereto for the purpose of rotating the said indicator. Fig. 3, represents a detached broken section, on an enlarged scale, of the upper portion of the circle E in Fig. 1, showing the divisions of same as commencing to number from both sides of the meridian.

As all descriptions of surveys are given as deflections from a north and south line or meridian, I have drawn the circle C to conform thereto by dividing the same into four equal parts, having the degrees marked thereon as commencing from the terminals of such north and south lines and continuing in numerical order on both sides thereof to ninety degrees or to the terminal of east and west lines. The indicator is thus readily rotated to the exact direction required, and for the purposes of this invention I denominate such circle a "degreed" circle.

The indicator-plate A is made of a length equal to the diameter of the circle C, and a line is drawn entirely through the center of its length as a pointer or indicator to any degree of the circle that may be called for in any survey. The circle C is drawn upon or attached to the board D or to any suitable plane surface sufficiently strong to hold or to connect with any pin or rod that may be used for the purpose of allowing the indicator-plate A to rotate from or around the center of such circle. The lines and figures comprising such circle, as well as all lines and figures drawn on the indicator-plate, are made on a white surface and in very black ink, and the whole is varnished, so as to be easily kept clean and bright, to secure at all times a good view thereof through the tracing-linen or

other transparent material which is necessary to be placed over the same for receiving the delineation of the survey by the method herein described, as follows: Placing such tracing material over the circle and indicator a dot is made thereon over the center B as a starting-point for the survey. The indicator A is then rotated to the direction on the circle called for in the survey by means of the pulley E, Fig. 2, and starting from such central point the line on the indicator is copied for the proper distance required and the first course and distance is completed on the tracing. While the indicator is still in the same position I move the vellum backward, so that the line drawn thereon will exactly cover the line on the other side of the center, with the terminal resting directly over such center. Then holding the vellum in that position I rotate the indicator to the next direction demanded in the survey, and starting from the terminal of first line, which covers the center of rotation at B, I copy the indicator-line for any distance required, and I have the second course and distance of the survey connected to first course and distance, with the indicator still in its last position. I again move the vellum, so that the second line drawn thereon will exactly cover the line on the other side of the center, with its terminal resting over such center, and holding the vellum in that position, I rotate the indicator to the third direction called for in the survey, and so on, as above described, for all the directions demanded by the survey until the protraction is completed. If the distance given in the survey by reason of its length is greater than can be obtained from the scale in one measurement, then such distance can be divided on such scale, the first division, when drawn, being made to cover the line on the opposite side of the center, as if completed, and the second division continued on the same line to make up the distance called for in the survey. A due north or south or arrowed line, which should accompany every protraction, can be drawn upon the vellum at any time when the indicator is in position by copying a portion of such line shown on the circle C. Having thus completed the protraction on the tracing, I transfer the same with its arrowed line to any surface required by the use of carbon or leaded paper in the usual manner. If the lines drawn on the tracing are pencil-lines, they may be erased after transfer by the use of rubber or, better still, by some suitable fabric saturated with turpentine, when the same tracing may be used for any number of protractions. The process of transfer is much simplified by making the protractions in reverse—that is, reversing all the deflections from the north and south line, but not the directions given directly on such line, and laying off the same on the tracing in the manner above described, in which case, if taken in pencil, the tracing can afterward be turned face downward on

any surface and the back of same rubbed with an ordinary table-knife, when there will be given out on such surface the outlines of the survey as correctly as if made as first described, with the advantage that four or five copies can be rubbed off, if desired, from the same protraction.

In the method above described the measurements mentioned can be taken in the usual manner by compass and scale; but in order to avoid that trouble I have drawn a scale directly upon the indicator-plate, the lines of such scale being connected with the indicator-line and the measurements commencing at the center of such indicator and running in numerical order in the direction of the circumference of the circle. By this adjustment of the scale the line drawn on the tracing in the direction of the course wanted can come to a full stop when the proper distance is reached, and the exact terminal of the line is thus so clearly defined that there is no difficulty in placing such terminal over the center of the indicator at B, as above described, preparatory to forming the line for the subsequent course and distance.

As it is necessary that the line on the indicator-plate should be of a greater length than the radius of the circle, so that the line formed on the transparency can be adjusted to a continuation of the radial line, as heretofore described, preparatory to resetting such indicator, I have taken advantage thereof by making the length of such indicator line equal on both sides of the center and can thus be provided with two scales—one, say, in feet and the other in chains or rods—and they may be drawn so that one chain on one side will be equal in length to what is represented as sixty-six feet on the other, or one rod on one side equal to what is represented as sixteen and one-half feet on the other.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device for protracting land surveys the degreed circle C as herein described provided with a flat rotary indicator-plate A, of a length equal to the diameter of the circle C; such plate having a line drawn through the center of its length and made rotatable at the point B by means of a rod, spindle or shaft F attached thereto and passing through the material on which such circle is drawn or fastened substantially as and for the uses and purposes herein fully described and set forth.

2. In a device for protracting land surveys the degreed circle C as herein described provided with a flat rotary indicator-plate A having a scale of measurements drawn thereon commencing to number from the point of rotation B and a length equal to the diameter of the circle C; such plate having a line drawn through the center of its length and made rotatable at the point B by means of a rod, spindle or shaft F attached thereto and

passing through the material on which such circle is drawn or fastened substantially as and for the uses and purposes herein fully described.

uses and purposes herein fully described and set forth.

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

JOHN DUNWELL BROWN.

Witnesses:

WILLIAM HOWLAND, Jr.,
MARY A. CURRY.

5 3. In a device for protracting land surveys the degreed circle C—indicator-plate A—rod, spindle or shaft F in combination with the wheel or pulley E substantially as and for the