

(Model.)

J. H. DOLMAN.

SURVEYOR'S INSTRUMENT.

No. 313,659.

Patented Mar. 10, 1885.

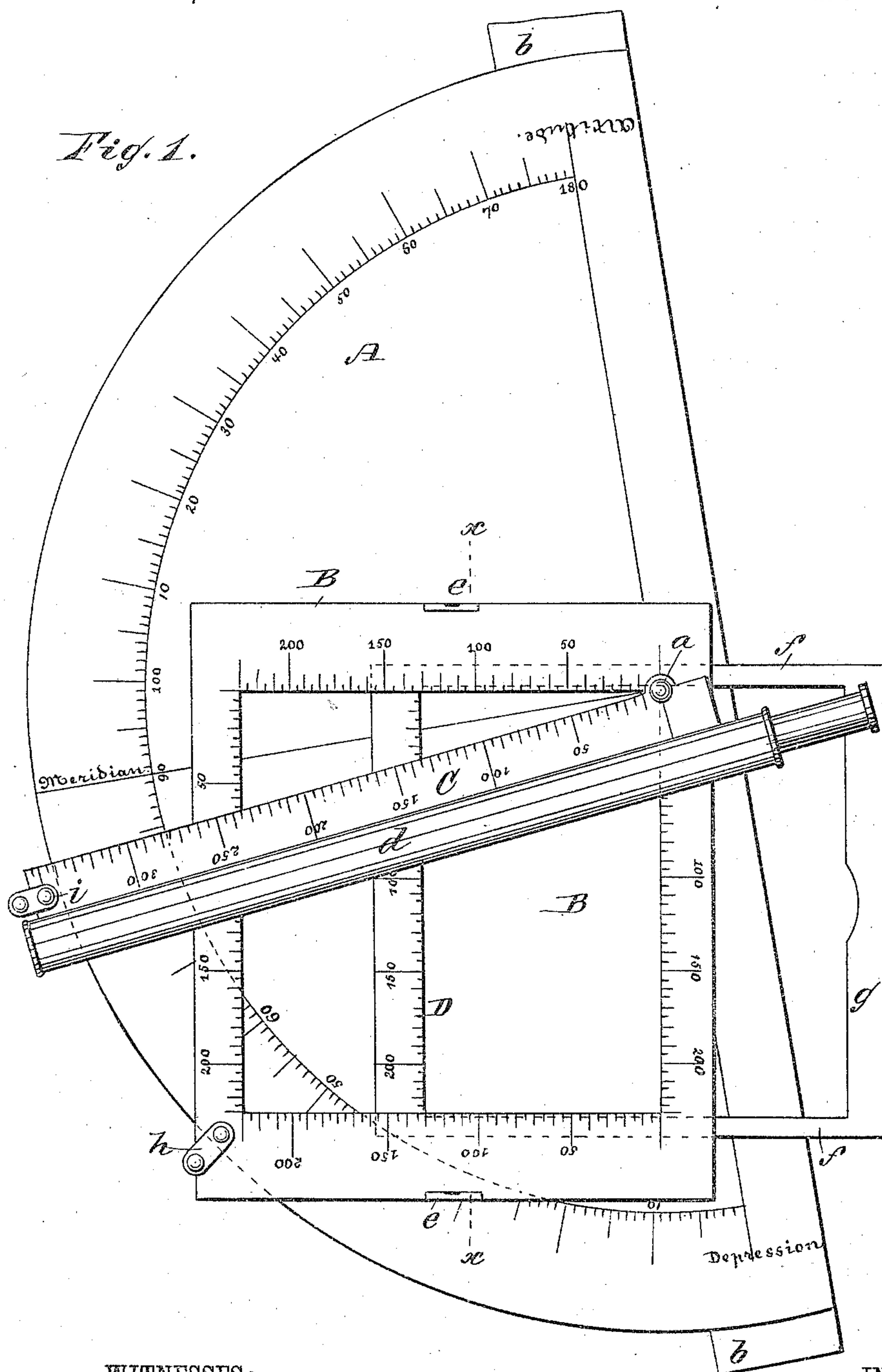


Fig. 2.



WITNESSES:

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SURVEYOR'S INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 313,659, dated March 10, 1885.

Application filed June 6, 1884. (Model.)

To all whom it may concern:

Be it known that I, JOHN H. DOLMAN, of Albany, in the county of Shackelford and State of Texas, have invented a new and useful Improvement in Instruments for the Use of Surveyors and Others, of which the following is a full, clear, and exact description.

My invention consists in an instrument for the measurement of angles for use in surveying and for plotting, constructed as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a face view of the instrument, and Fig. 2 is a detail section on line *x x*.

The parts composing the instrument are a protractor, A, secured by a pivot or set-screw, *a*, at the intersection of its pole and meridian lines, to a bar, *b*, a leveling-piece, B, and a sight-piece, C, carrying a telescope, *d*, both parts B and C being hung on pin *a*, as represented; and a piece, D, is fitted to slide on piece B. The piece B is of open square form, and in the edges of its upper and lower sides are levels *e*, so as to allow its use either side up. The inside edges of the four sides are spaced and numbered alike, the numbers running from 1 to 200 on each. The sight-piece C is spaced and numbered to correspond with the piece B, the numbers commencing at pivot *a* and running up to 360, and the telescope *d* is parallel to the marked edge. The top and bottom sides of piece B are grooved to receive the ends of piece D, and there are side arms, *f*, on the latter that fit the grooves, so as to retain the piece D always at right angles to the top and bottom of the level B, and the arms are connected by a cross-piece, *g*, which serves for use in sliding the piece back and forth. The edge of this sliding piece is marked and numbered to correspond with the sides of level B.

On the end of the sighting-piece C is a clamp, *i*, taking over the edge of the protractor A, for holding the piece C in place, and a similar clamp at *h* serves for clamping the piece B. The bar *b* will have a clamping-screw at its mid-length for securing it to a tripod or staff, with the protractor in a vertical plane.

In using this instrument, the inside edges of the top and bottom of piece B always represent the base-line for a right-angled triangle. The other two sides of level B and the sliding piece D represent the perpendicular, and the sighting-piece C the hypotenuse of the triangle.

To use the instrument for plotting, paper is placed on the face of the protractor and beneath level B. Base-lines are then drawn along the edge of the piece B to any distance, representing feet, inches, or poles. Slide D is then moved to the end of the base-line to obtain the perpendicular, and then the piece C is moved to any number on piece D, and the scale on piece C indicates the length of the hypotenuse by the number at the intersection. From this a square or a parallelogram or other shaped figure can be drawn by using a separate rule similar to piece D.

For taking altitude and depression and horizontal lines to same, or to correct measured lines on hilly grounds, the operation is as follows: The instrument is placed at the top of the hill, and fastened to the stand with the meridian line of protractor A pointing to a staff at foot of hill. The piece B is then to be leveled and clamped to the protractor, the telescope sighted on the staff at a point the same distance from the ground as the pivot of the instrument, and piece C then clamped. Supposing the measured line to be ten poles, slide D is to be moved until its edge coincides with 10 on piece C, and the end of the slide at the top bar of piece B will be at 8, which will be the length of the horizontal line.

For obtaining the length of the true line at a rise, the instrument is to be set on the stand with the protractor reversed, so as to bring the bottom bar of level B at the top. The method is the same as before; and the instrument is also adapted for other purposes of the same character, which it is not necessary to describe. It is to be observed that the piece B furnishes two radial lines and right-angled lines thereto, while piece C gives another radial line, adjustable with reference to the first, so that at any part of the protractor right angles can be had and right-angled triangles formed with the length of any side indicated. The four angles of piece B may

also represent the cardinal points of the compass, so that by placing the sides of piece B on the line of the protractor indicating the desired degree, and moving the slide D, parallels of latitude and longitude at any given point can be had.

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

1. The instrument for surveying and analogous purposes, consisting of protractor A, right-angled piece B, and piece C, the two latter pivoted to move independently on the protractor, substantially as described, for use in the manner specified.

2. The combination, with the protractor A, of the rectangular piece B, pivoted at one corner to the protractor, as shown at *a*, and straight piece C, also pivoted at *a*, and provided on its under edge with a telescope, *d*, substantially as set forth.

3. The combination, with the protractor A,

of the rectangular frame B, pivoted at *a*, and the sliding frame D *g f* within the frame B, substantially as set forth.

4. The combination, with the protractor A, of the rectangular frame B, pivoted at one corner to the protractor at *a*, levels *e* on the upper and lower edges of said frame, and piece C, pivoted at one end to the protractor at *a*, substantially as set forth.

5. A surveying or analogous instrument consisting of the protractor A, rectangular open frame B, sliding frame D within frame B, levels *e* on opposite edges of frame B, and piece C, pivoted to the protractor at *a*, and provided with a telescope, *d*, along one longitudinal edge, substantially as set forth.

JOHN H. DOLMAN.

Witnesses:

SAML. SPEARS,

JNO. H. McLEAN.