(No Model.)

J. M. TÉBAR.

SURVEYOR'S LEVELING ROD.

No. 284,513. Patented Sept. 4, 1883.

Fig. 1.

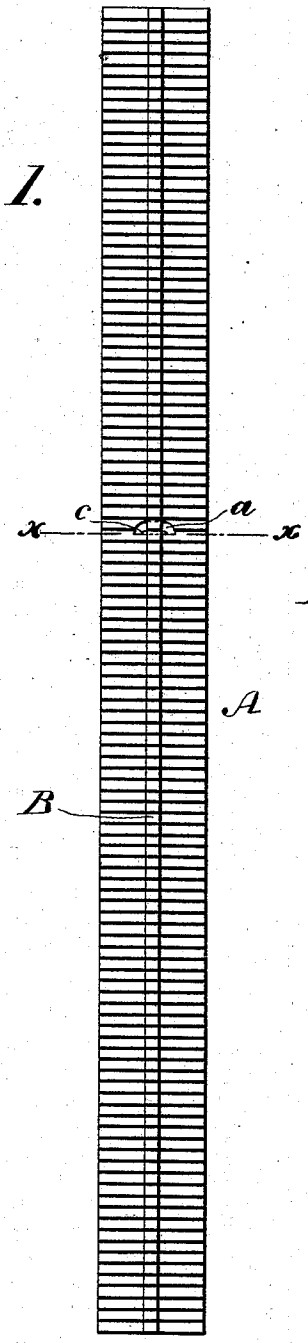


Fig. 3.

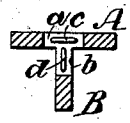
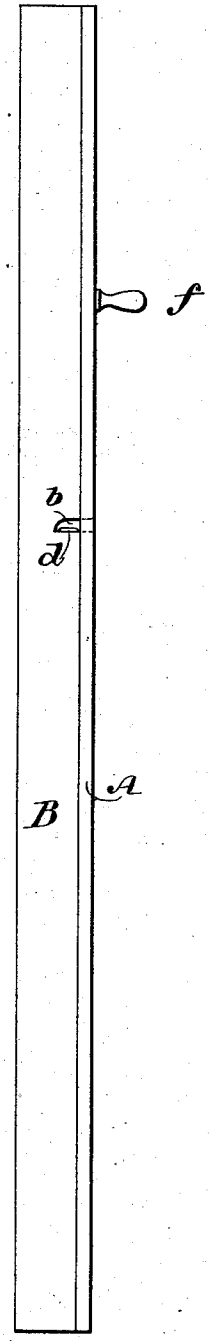


Fig. 2.



WITNESSES:

John H. Deemer

S. Sedgwick

INVENTOR:

BY J. M. Tébar

Munn & Co

ATTORNEYS.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JESUS MUÑOZ TÉBAR, OF CARÁCAS, VENEZUELA.

SURVEYOR'S LEVELING-ROD.

SPECIFICATION forming part of Letters Patent No. 284,513, dated September 4, 1883.

Application filed May 21, 1883. (No model.)

To all whom it may concern:

Be it known that I, JESUS MUÑOZ TÉBAR, of Carácas, Venezuela, have invented a new and Improved Surveyor's Leveling-Rod, of which the following is a full, clear, and exact description.

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

Figure 1 is a front elevation of my new and improved leveling-rod. Fig. 2 is a side elevation of the same, and Fig. 3 is a transverse sectional elevation taken on the line *x x* of Fig. 1.

This new and improved leveling-rod is composed of the board A, which is graduated in the ordinary manner, and the board B, which is placed on the central longitudinal line of the board A and held at right angles to the sides of the board A, as will be understood from Fig. 3. The outer edge of the board B is graduated to correspond exactly with the graduations of the board A, as illustrated in Fig. 1. At a convenient height, so that the rod-man can see them, are placed in the holes *a b*, made, respectively, in the boards A B, the bulb-levels *c d*, by means of which the rod may be easily held in a vertical position, avoiding in this manner a considerable error in actual elevations for want of exact verticality in the position of the rod; and at a convenient height, and somewhat above the bulbs *c d*, is attached to the back of the board A the handle *f*, by which the rod-man may handle the rod and hold it straight when in use; and by means of the graduation-marks on the boards A B the leveler may also discover, when using level at each observation, whether or not the rod is held in a vertical position by the rod-man, since the horizontal plane marked by the horizontal hair which passes at the height of the leveler's eye must pass along one of the divisions of the central board, B, which, if the rod is vertical, must form a single straight line with the corresponding lines or divisions on the board A upon both sides of the board B, and all lines or divisions of the boards running up or down from that which is in the horizontal plane of the eye will appear on the board A as broken lines with the marks on the board B, and thus enable the leveler to detect any deflection of the rod out of perpendicular. When there is a certainty that the rod-man keeps the rod in an exact vertical position by means of the bulbs *c d* and the handle *f*, elevations can be made at sight in explorations, or aided by a spy-glass or telescope without the use of a reticule, because the coincidence of the divisions of the boards A B into one single line, as mentioned above, takes the place of the horizontal hair of the reticules.

This new rod is very light and convenient to use, and may be constructed in two or more pieces of the length that may be convenient, and the graduations may be made upon any desired system.

With this new rod the delicate and dear instrument called "level" is not necessary. Consequently it can be modified, leaving it reduced to the telescope only, without level and without reticule, moving in a horizontal and in a vertical plane.

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

1. The leveling-rod herein shown and described, consisting of the graduated board A and the board B, having its edge graduated to correspond with the graduations of the board A, substantially as and for the purposes set forth.

2. In a surveyor's leveling-rod, the board A, having the leveling-bulb *c*, in combination with the board B, having the leveling-bulb *d*, substantially as and for the purposes set forth.

3. The leveling-rod herein shown and described, consisting of the graduated board A, having leveling-bulb *c* and handle *f*, in combination with the board B, having the leveling-bulb *d*, and having its edge graduated to correspond with the graduations of the board A, substantially as and for the purposes set forth.

JESUS MUÑOZ TÉBAR.

Witnesses:

J. HURTADO MANRIQUE,

AGN. AVELEDO.