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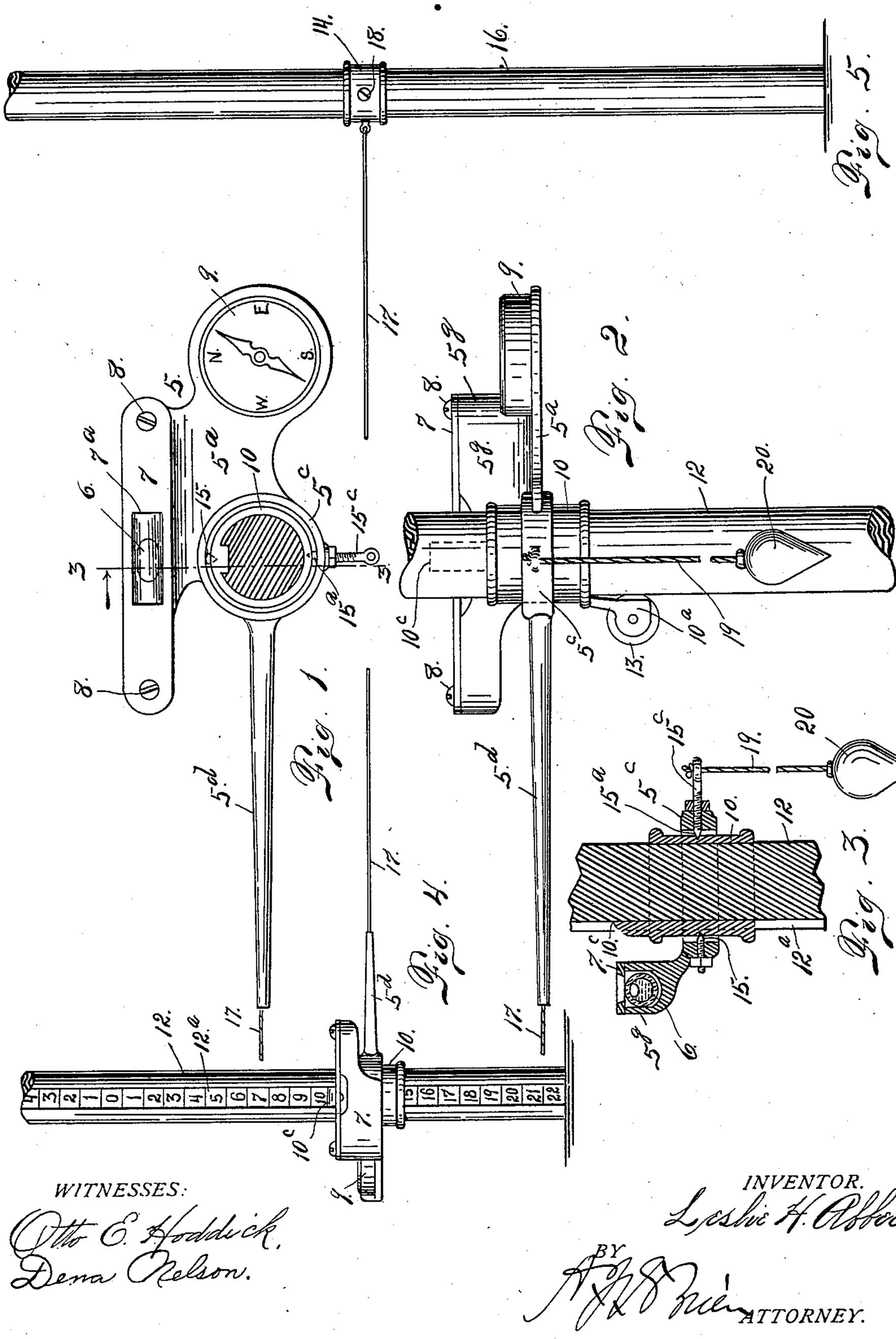
L. H. ABBEE.

TRANSIT.

APPLICATION FILED AUG. 2, 1902.

NO MODEL.



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TRANSIT.

SPECIFICATION forming part of Letters Patent No. 723,351, dated March 24, 1903.

Application filed August 2, 1902. Serial No. 118,139. (No model.)

To all whom it may concern:

Be it known that I, LESLIE H. ABBEE, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Transits; and I do 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 the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in transits, my object being to provide a device of this class which shall be exceedingly simple in construction, economical in cost, reliable, durable, and efficient in use; and to these ends the invention consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a top or plan view of the transit, its supporting pole or standard being shown in horizontal section. Fig. 2 is a side elevation of the same. Fig. 3 is a section taken on the line 3 3, Fig. 1, viewed in the direction of the arrow. Fig. 4 shows the transit-supporting standard viewed from the side opposite that shown in Fig. 2 and shown on a smaller scale. Fig. 5 shows a pole employed in connection with the transit-standard and provided with an adjustable sleeve or collar, which when the instrument is in use is connected with an arm of the transit by a cord or other suitable flexible device. The constructions shown in Figs. 4 and 5 are arranged in coöperative relation, the connecting-cord being broken in the middle.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a bracket which, as shown in the drawings, consists of an integral casting comprising a platform 5^a, a ring 5^c, an arm 5^d, leading outwardly from the ring, and an elongated part 5^g, forming a receptacle for the spirit-level tube 6. The top of the part 5^g is covered by a plate 7, which is held in place by screws 8. This cover 7 is provided with an opening 7^a, through which the tube 6 may be observed. On one end of the platform 5^a is mounted a compass 9. Within the ring 5^c is trunnioned a sleeve 10 by means of pivots 15 and 15^a. The sleeve is considerably smaller in diameter than the ring to allow the bracket to tilt or turn freely on the sleeve-trunnions within certain limits when the supporting-standard 12, which passes through the sleeve 10, is in a perpendicular position. The standard 12 is provided with a groove or channel 12^a, which is engaged by a projection 10^c, formed on the sleeve, and which projects above the latter, forming a guide for the sleeve and a pointer at the same time, since the bottom of the groove is provided with numerals or other distance-indices. The sleeve 10 is also provided with a depending part 10^a, in which is journaled a small roller 13, preferably composed of rubber. This roller engages the surface of the standard and normally supports the bracket in any desired position of adjustment, but permits it to be moved up and down at will. This may be accomplished by turning the roller, and the latter may be easily operated by applying the thumb to its periphery. The groove 12^a of the standard is provided with numerals increasing consecutively from the zero-mark in both directions—that is to say, both upwardly and downwardly. The zero-mark is located at a suitable predetermined distance above the foot of the standard 12. The standard 12 fits the sleeve nicely; but the latter may be moved therein freely. By virtue of the trunnioned connection between the sleeve 10 and the bracket 5 the latter is allowed to turn freely on the pivots 15 and 15^a within certain limits. The arm 5^d, which is rigid with the bracket, is connected with a collar 14, mounted on a pole 16, by a cord or other suitable flexible device 17. The collar 14 is adjustable on the pole 16 and may be secured in the desired position of adjustment by a set-screw 18.

When the device is in use, the collar 14 is adjusted on its pole to occupy a position above its foot or lower extremity exactly equal to the distance of the zero-mark above the foot of the standard 12. The foot of the pole 16, which it will be assumed occupies a vertical position, is then placed at a suitable

point and the foot of the standard 12 at another point, either above or below or of greater or less elevation than that occupied by the foot of the pole 16. If the foot of the standard occupies a higher point than the foot of the pole, as shown in the drawings, the bracket 5 is then moved downwardly from the zero-mark until the bracket of the standard is at the same level as the collar of the pole, as indicated by the bubble of the spirit-level. It must be assumed that the cord 17 is kept taut, and this may be accomplished, if necessary, by pulling the knot 17^a through the arm extremity as may be required. As shown in the drawings, (see dotted lines in Fig. 2,) the extremity of the arm 5^d is provided with an angular opening through which the cord is passed and then knotted. This angular opening will cause sufficient friction to retain the cord in place when adjusted. The distance of the downward movement of the bracket 5 below the zero-mark is indicated by the figures in the groove 12^a, in order to bring the bracket to a level that the collar 14, as indicated by the bubble of the spirit-level, will show the difference in height or elevation between the two points which the pole and standard respectively occupy. If the foot of the standard 12 occupies a position below the pole 16, the bracket 5 must be raised above the zero-mark, and the distance of its movement required to bring the bracket and the collar 14 to the same level will indicate the difference in elevation between the two points, the only difference being that in this case the standard occupies a lower position, while in the previous case it occupies a higher position.

The pivot 15^a, as shown in the drawings, consists of the point of a screw 15^c, to whose outer extremity is attached a cord 19, provided with a weight 20, forming a plumb-bob to aid in determining the perpendicular position of the standard.

Having thus described my invention, what I claim is—

1. In a transit, the combination with a supporting-standard, of a bracket provided with a bubble-tube, a sleeve trunnioned on the bracket through which sleeve the standard passes, the sleeve being vertically adjustable on the standard which is provided with distance-indices extending from a zero-mark both up and down, substantially as described.

2. In a transit, the combination of a supporting-standard provided with distance-indices increasing upwardly and downwardly from a zero-point, a sleeve through which the standard passes, a bracket pivotally connected with the sleeve and allowed a tilting movement within suitable limits, a bubble-tube mounted on the bracket, and a plumb-bob connected with the latter, substantially as described.

3. The combination of a supporting-standard provided with distance-indices, increasing upwardly and downwardly from a given point, a sleeve through which the standard passes and in which it is vertically adjustable, a bracket pivotally mounted on the sleeve, a bubble-tube mounted on the bracket, a compass also mounted on the bracket, and a plumb-bob connected with the bracket, substantially as described.

4. In a transit, the combination of a standard provided with a longitudinal groove, a sleeve through which the standard passes, said sleeve being provided with a roller engaging the standard, and also provided with a projection engaging the groove of the sleeve, and a bracket pivotally connected with the standard and provided with a suitable level-indicating device, substantially as described.

5. In a transit, the combination of a standard, a sleeve adjustable thereon, a bracket pivotally mounted on the sleeve and provided with a suitable level-indicating device, a pole, a collar mounted thereon at a predetermined distance from its foot, a flexible connection between the collar and the bracket, the standard having a zero-mark located above its foot, a distance equal to the height of the collar above the foot of the pole, the standard being provided with numerals increasing from the zero-mark both upwardly and downwardly, substantially as described.

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

LESLIE H. ABBEE.

Witnesses:

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IDA E. O'BRIEN.