

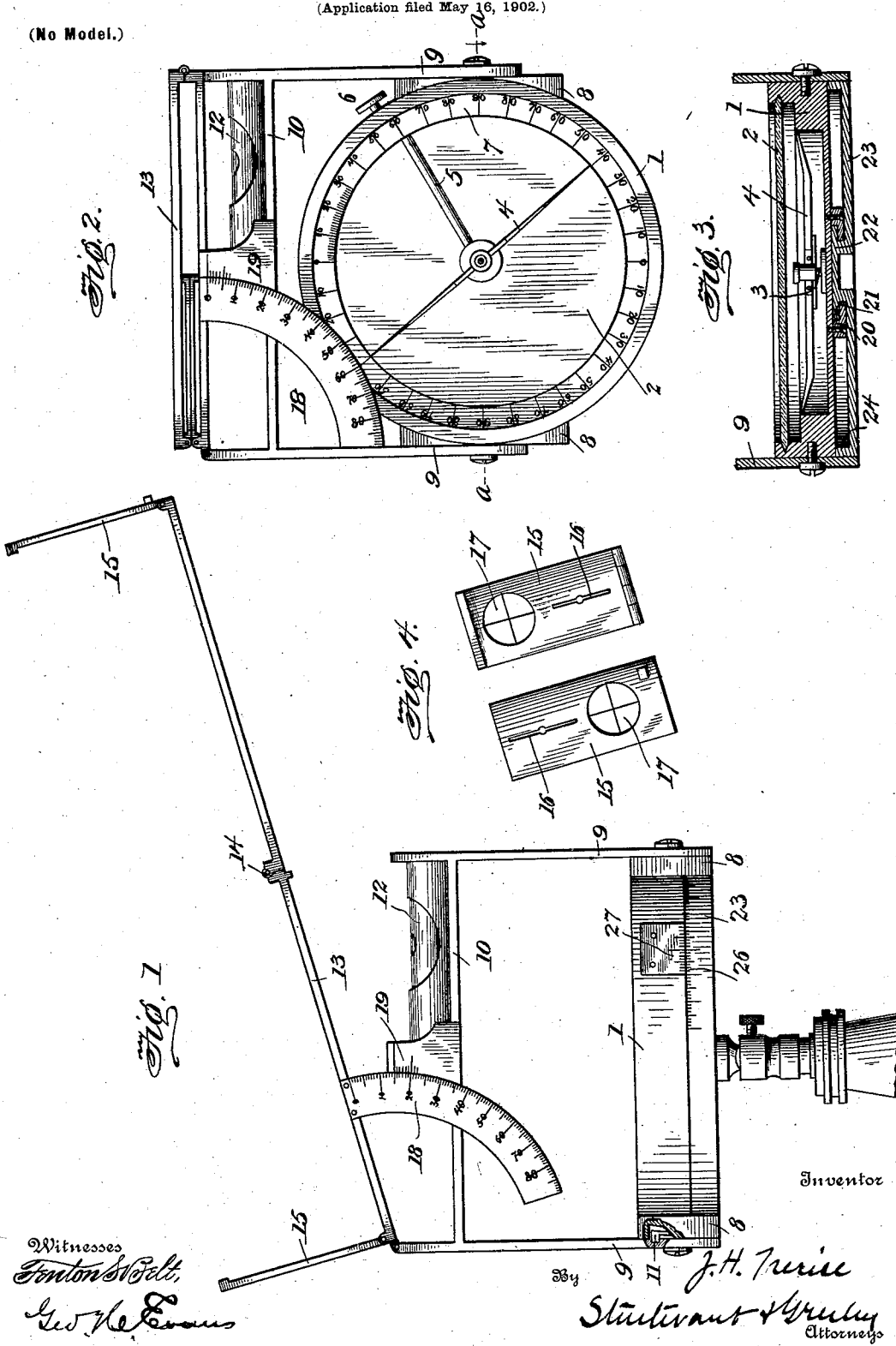
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Patented Nov. 4, 1902.

J. H. TRERISE.
MINER'S POCKET TRANSIT.

(Application filed May 16, 1902.)

(No Model.)



UNITED STATES PATENT OFFICE.

JOSIAH H. TRERISE, OF BUTTE, MONTANA.

MINER'S POCKET-TRANSIT.

SPECIFICATION forming part of Letters Patent No. 712,869, dated November 4, 1902.

Application filed May 16, 1902. Serial No. 107,679. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH H. TRERISE, a citizen of the United States, residing at Butte, in the county of Silverbow, State of Montana, have invented certain new and useful Improvements in Miners' Pocket-Transits, of which the following is a description, reference being had to the accompanying drawings and to the figures of reference marked thereon.

My invention relates to surveying instruments, particularly that class of surveying instruments which are adapted for use in mines; and it is the object of my invention to provide an instrument superior to and more reliable than any known to myself, by which any person skilled in surveying may measure any angle on, above, or below the horizontal, and may obtain simultaneously a compass-reading, the instrument being compact and inexpensive and of such size as to be capable of being carried in the pocket.

With this object in view my invention consists in the construction and combination of elements hereinafter described, and particularly pointed out in the claims.

So far as I am aware no small instrument capable of being carried in the pocket, adapted for taking both horizontal and vertical angles with simultaneous reading of the compass, has hitherto been produced. Instruments for taking vertical angles and clinometer-readings are in general use, but, so far as I am aware, no successful attempt has been made heretofore to combine such instruments with a compass, by which the course of any sight between a vertical and horizontal can be read simultaneously.

In the device herein described, which I term a "miners' pocket-transit," I have provided means for taking both horizontal and vertical angles and obtaining clinometer-readings, and have made the instrument of such size as to be readily carried in the pocket and capable of use either with or without a "Jacob's staff."

Referring to the drawings, Figure 1 is an elevation of the instrument in unfolded position, ready for use. Fig. 2 is a plan view showing the instrument folded for transportation. Fig. 3 is a cross-sectional view on line *a a* of Fig. 2, and Fig. 4 shows the folding sights.

Referring to the drawings in detail, 1 is the casing, provided with a cover 2 of transparent material and having at its center a pivot 3, on which the magnetic needle 4 swings. A locking-lever 5 of usual construction, operated by a thumb-screw 6, serves to lift the needle from its pivot and clamp it against the cover 2 when the instrument is not in use. 7 is the degree circle, suitably divided, preferably to one degree.

To the casing 1 are secured oppositely-arranged blocks 8, having their inner faces curved to fit the casing and having their outer faces parallel. To these blocks 8, at diametrically opposite points, are pivoted arms 9 9, which are rigidly connected by cross-bar 10. One of the blocks 8 is provided with a spring-catch 11, arranged to engage the arm 9 when in raised position to hold it perpendicular to the plane of the casing 1.

On the cross-bar 10 is located a spirit-level 12 of usual construction.

To the end of one of the arms 9 is hinged a sighting-arm 13, made in two parts, jointed at 14. At each end the sighting-arm is provided with folding sights 15, consisting of arms hinged to the sighting-arm and each provided with sight-openings 16 and 17, so arranged that sights may be taken in either direction. To the sighting-arm, near the point at which it is hinged to the arm 9, is secured a vertical limb 18, suitably graduated, as shown, and to the cross-bar 10 is secured a vernier 19.

Concentric with the pivot of the compass-needle the casing 1 is provided on its under side with a ring 20, having recess 21 in its inner face. A circular plate 22 is arranged against the bottom of the casing with its edge lying in the recess 21, and to this plate 22 is secured a disk 23, having its flange 24 in contact with the under face of the bottom of the casing. The periphery of this disk 23 is in contact with the inner faces of the blocks 8, which, as shown, are extended below the bottom of the casing 1. The disk 23 is provided centrally with a screw-threaded opening 24' to receive the screw-threaded end of a Jacob's staff 25, when desired. The connection of the disk 23 with the casing, as above described, permits the free rotation of the casing and disk relative to each other, when

desired, and the casing and disk are provided on their outer edges, respectively, one with graduations 26 and the other with vernier 27. The width of the arms 9 is preferably equal 5 to the depth of the casing 1 and disk 23, so that when folded for transportation the vertical limb 18 will rest on the top of the casing, as shown.

In folding the instrument for transportation 10 the folding sights 15 are turned on their hinges to rest on the sighting-arm, and this sighting-arm is then folded on the joint 14 and turned on the hinge which connects it with the arm 9 so that its free end will rest 15 on the opposite arm 9. The spring-catch 11 is then pressed inward and the arms 9 are turned on their pivots until they are parallel with the top and bottom of the casing, as shown in Fig. 1. When so folded, the instrument 20 may be readily carried in the pocket, either with or without an inclosing case.

In order to use the instrument as a compass, it is not necessary to raise the arm 9, as practically the full face of the compass is exposed. 25 When the instrument is fully unfolded and leveled by the aid of a Jacob's staff or otherwise, clinometer-readings may be made on the vertical limb 18, assisted by the vernier 19, and the course of the horizontal angle may be taken simultaneously. 30 The sighting-arm 13 being hinged at its end to the arm 9, the course of a nearly-vertical sight may be taken.

Having thus described my invention, what 35 I claim, and desire to secure by Letters Patent, is—

1. In a surveying instrument, the combination of a compass-casing, a pair of arms having their lower ends pivotally connected to the casing at diametrically opposite points and 40 having their upper ends rigidly connected, and a sighting-arm hinged to one of said arms on a line at right angles to the diameter joining the points at which the arms are pivotally connected to the casing; substantially as described. 45

2. In a surveying instrument, the combination of a compass-casing, a pair of arms having their lower ends pivotally connected to the casing at diametrically opposite points 50 and having their upper ends rigidly connected, and a sighting-arm hinged to one of said arms on a line at right angles to the diameter joining the points at which the arms are 55 pivotally connected to the casing, and a spirit-level carried by said arms; substantially as described.

3. In a surveying instrument, the combination of a compass-casing, a pair of arms having their lower ends pivotally connected to the casing at diametrically opposite points 60

and having their upper ends rigidly connected, and a sighting-arm hinged to one of said arms on a line at right angles to the diameter joining the points at which the arms are 65 pivotally connected to the casing, and a spirit-level carried by said arms, the sighting-arm being provided at each end with a hinged sight; substantially as described.

4. In a surveying instrument, the combination of a compass-casing, a pair of arms having their lower ends pivotally connected to the casing at diametrically opposite points and having their upper ends rigidly connected, and a sighting-arm hinged to one of said 70 arms on a line at right angles to the diameter joining the points at which the arms are pivotally connected to the casing, the sighting-arm being provided midway of its length with a hinge-joint; substantially as described. 75 80

5. In a surveying instrument, the combination of a compass-casing, a pair of arms having their lower ends pivotally connected to the casing at diametrically opposite points, a cross-bar rigidly connecting the arms near 85 their outer ends, a sighting-arm so hinged to one of the arms as to be movable in the plane of the cross-bar, a vertical limb carried by the sighting-arm and a vernier carried by the cross-bar; substantially as described. 90

6. In a surveying instrument, the combination of a compass-casing, a pair of arms pivotally connected at their lower ends to the casing at diametrically opposite points and adapted to be brought into the plane of the casing, a cross-bar rigidly connecting the arms near their outer ends, a sighting-arm 95 hinged to the end of one of said arms and adapted to lie against the end of the other arm when in folded position, the sighting-arm 100 being provided at its ends with inwardly-folding sights; substantially as described.

7. In a surveying instrument, the combination of a compass-casing, a pair of arms pivotally connected at their lower ends to the casing at diametrically opposite points and adapted to be brought into the plane of the casing, a cross-bar rigidly connecting the arms near their outer ends, a sighting-arm 105 hinged to the end of one of said arms and adapted to lie against the end of the other arm when in folded position, the sighting-arm being provided midway of its length with a hinge-joint and being provided at its ends with inwardly-folding sights; substantially as 110 115 described.

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

JOSIAH H. TRERISE.

Witnesses:

J. M. KENNEDY,
JAS. M. DENNY.