

935,807.

Patented Oct. 5, 1909.

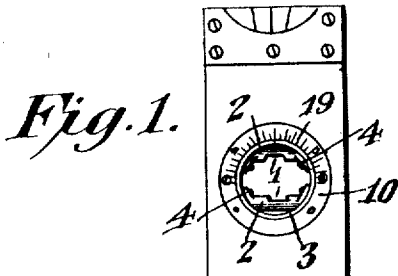


Fig. 3.

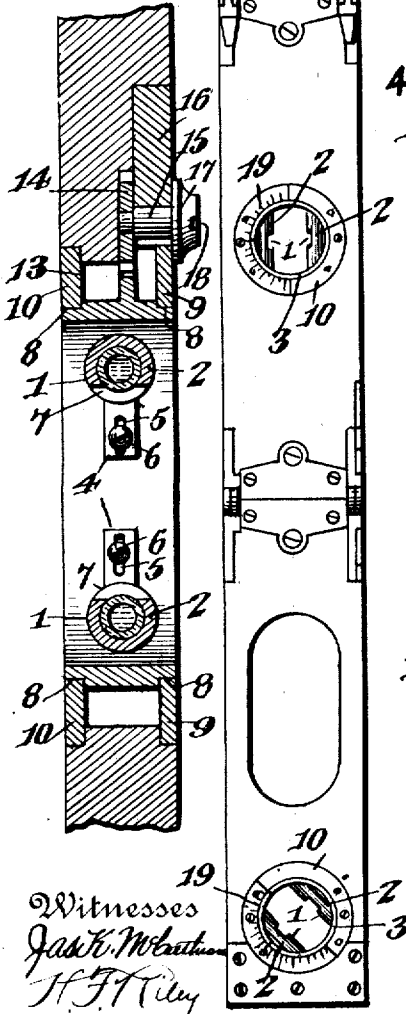


Fig. 2.

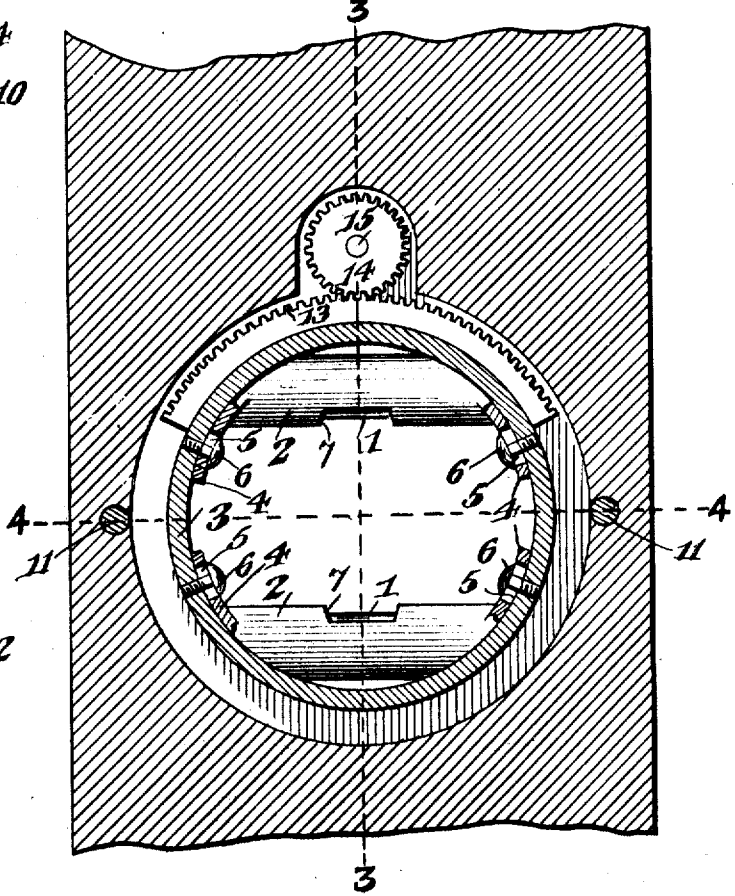
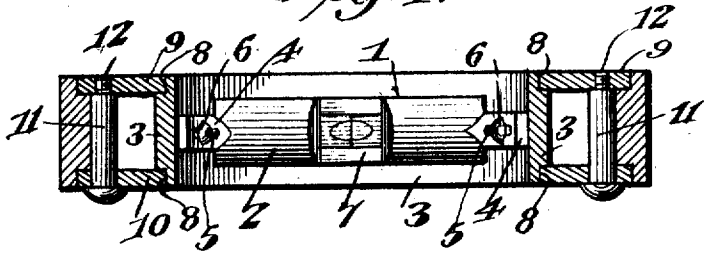


Fig. 4.



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SPIRIT-LEVEL ATTACHMENT.

935,807.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed May 1, 1908. Serial No. 430,299.

To all whom it may concern:

Be it known that I, WILLIAM C. OSWALD, a citizen of the United States, residing at Olean, in the county of Cattaraugus and State of New York, have invented a new and useful Spirit-Level Attachment, of which the following is a specification.

The invention relates to improvements in spirit level attachments.

The object of the present invention is to improve the construction of spirit level attachments, and to provide a simple, inexpensive and efficient device of this character capable of ready adjustment to arrange the bubble tubes in proper position with relation to the instrument, and adapted to permit a bubble tube to be readily removed and replaced by a new tube, should the bubble tube be broken or otherwise impaired through rough handling of the instrument.

A further object of the invention is to provide a spirit level attachment having a plurality of bubble tubes, adapted to increase the efficiency of the instrument to which the attachment is applied and capable of affording a test of the accuracy of the use of the instrument.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawing, and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing:—Figure 1 is an elevation of a combined level and plumb provided with level attachments, constructed in accordance with this invention. Fig. 2 is an enlarged sectional view, illustrating the construction of the level attachment. Fig. 3 is a sectional view on the line 3—3 of Fig. 2. Fig. 4 is a similar view on the line 4—4 of Fig. 2.

Like numerals of reference designate corresponding parts in all the figures of the drawing.

The spirit level attachment includes a pair of parallel bubble tubes 1, mounted in holders 2 consisting of tubular members or sleeves and arranged within a rotary supporting ring 3. The tubular holders have beveled or rounded ends to conform to the configura-

tion of the supporting ring, and are provided with terminal lugs 4, curved to fit the ring and having slots 5 for the reception of screws 6, or other suitable fastening devices for adjustably securing the holders within the supporting ring. By this construction the holders may be readily adjusted to arrange the bubble tubes in proper position with relation to the supporting ring. The holders are also provided at their inner opposite portions with central openings 7 for exposing the central portions of the bubble tubes.

The supporting ring is provided at its side edges with circumferential recesses 8, forming outer bearing portions, which fit in circular openings of side plates 9 and 10. The sections of the instrument are provided with circular openings for the reception of the level attachment, and the side plates 9 and 10 are fitted in side recesses and have their outer faces in flush relation with the side faces of the sections, as clearly illustrated in Figs. 3 and 4 of the drawing. The side plates are connected by screws 11, piercing the side plates 10 and having reduced threaded terminals 12, which engage threaded perforations of the side plates 9. The reduction of the threaded ends of the screws 11 form shoulders, which engage the inner faces of the plates 9.

The rotary ring is equipped with an arcuate rack 13, consisting of a segment of a gear and meshing with a pinion 14, mounted on a shaft or spindle 15. The shaft or spindle 15, which is journaled in a suitable bearing of a plate 16, has its inner end reduced and secured in a central opening of the pinion 14. The outer end of the shaft or spindle 15 is provided with a head 17, having a groove 18, which is adapted to be engaged by the blade of a trowel, or other tool for rotating the shaft or spindle to adjust the supporting ring or member 3. When the shaft or spindle 15 is rotated, it carries with it the pinion 14, which in turning imparts a rotary movement to the ring or member 3 through the arcuate rack 13. The arcuate rack, which is rigid with the supporting ring or member 3, may be applied to the same by any suitable means.

The side plates 9 and 10 are provided with suitable graduations 19, and the supporting ring or member has indicator marks, which are movable over the graduated portions of the side plates, whereby the spirit level at-

tachment may be accurately set as a plumb or level, or for indicating an angle or inclination.

The duplication of the spirit level or bubble tubes and the arrangement of the same in parallelism will enable either edge or end of a combined level and plumb to be fitted against the work, and they afford a test of the accuracy of the instrument, as the work must be true and accurate when both of the bubble or spirit level tubes show the work to be true. If either of the spirit tubes should be out of true with the other or with the straight edges of the level, both will not indicate the same result on the same piece of work.

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

1. A spirit level attachment including a supporting ring, opposite spirit tube holders located within the ring and having curved faces fitting against the same, said holders being capable of arcuate adjustment, and means for securing the spirit tube holders in their adjustment.

2. A spirit level attachment including a rotary supporting ring, a spirit tube holder arranged within and having curved terminal faces fitted against the ring, said holder being capable of an arcuate adjustment within the ring, means for securing the holder in such adjustment, and means for rotating the ring to adjust the same.

3. A spirit level attachment including a

supporting ring, a bubble tube, and a holder arranged within the ring and carrying the bubble tube and having terminal means fitted against the ring and adjustably secured to the same at each end of the holder.

4. A spirit level attachment including a supporting ring, a bubble tube, and a holder carrying the bubble tube and provided with curved terminal lugs adjustably secured to the supporting ring.

5. A spirit level attachment including a supporting ring, a bubble tube, a holder carrying the bubble tube and provided with curved terminal lugs having slots, and fastening devices operating in the slots and adjustably securing the holder to the supporting ring.

6. A spirit level attachment including a rotary supporting ring, means for adjusting the same, spirit tube holders arranged within the ring at opposite sides of the center thereof, complete spirit tubes carried by the holders, and means for securing the holders to the ring and for providing an arcuate adjustment of the spirit tubes independent of the rotary adjustment of the ring.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM C. OSWALD.

Witnesses:

GEORGE B. CARTER,
S. A. REYNOLDS.