

W. G. ENTWISTLE.

TRAVERSING AND LEVELING HEAD FOR THEODOLITES.

No. 561,876.

Patented June 9, 1896.

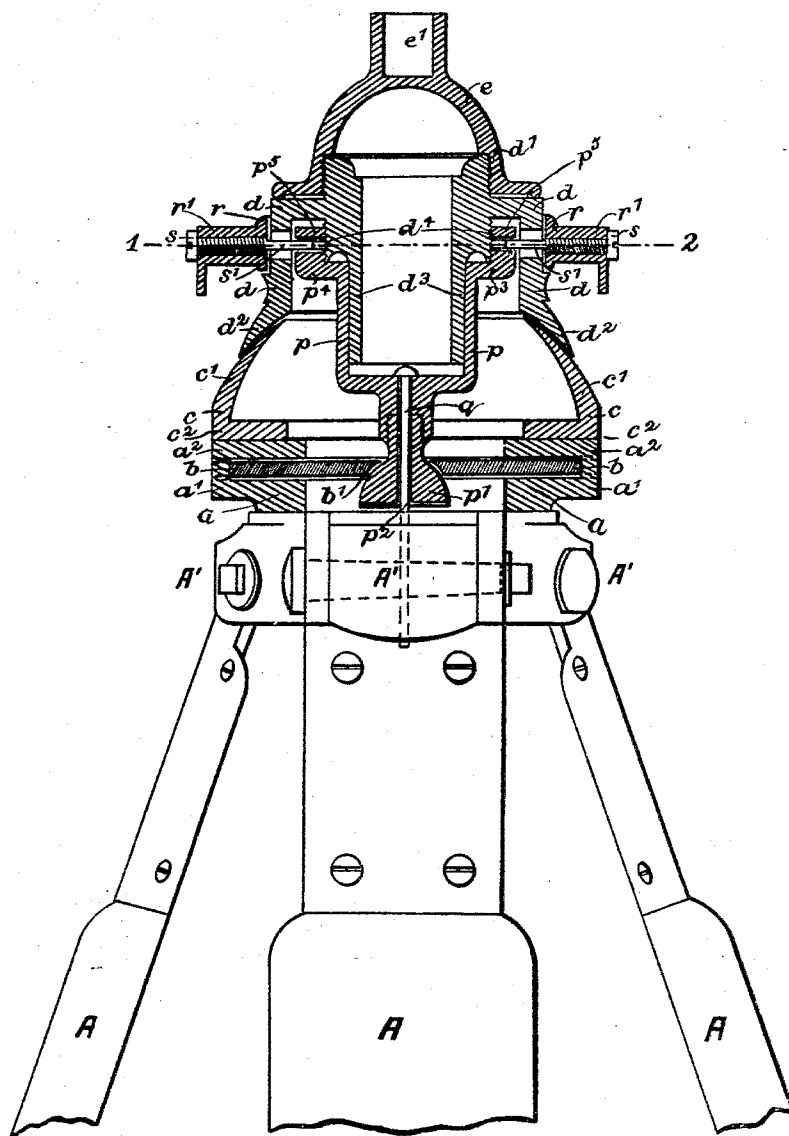


Fig. 1.

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

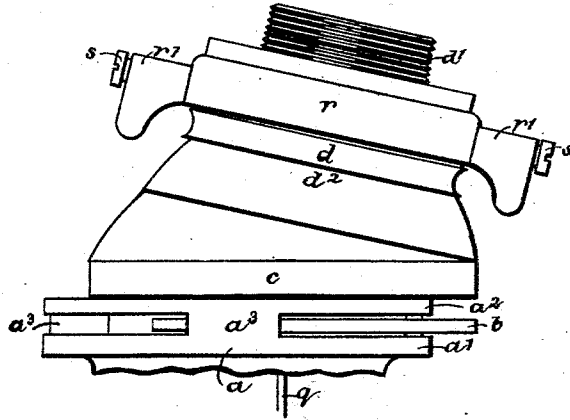


Fig. 3.

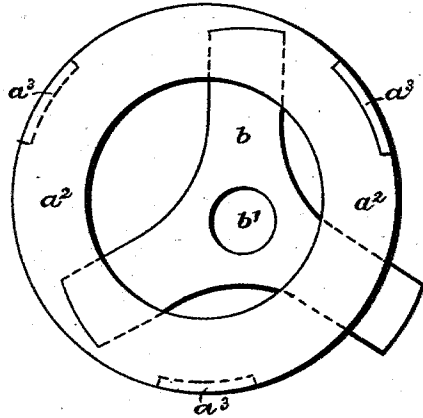
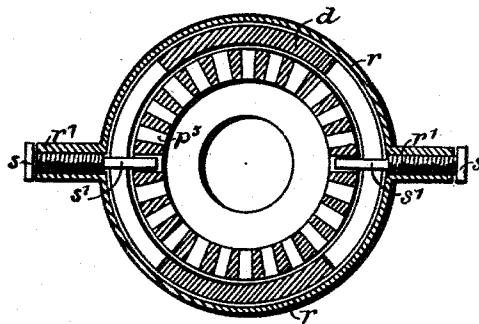


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM GEORGE ENTWISTLE, OF BROOKLYN, NEW ZEALAND, ASSIGNOR
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TRAVERSING AND LEVELING HEAD FOR THEODOLITES.

SPECIFICATION forming part of Letters Patent No. 561,876, dated June 9, 1896.

Application filed January 25, 1896. Serial No. 576,871. (No model.) Patented in New Zealand June 11, 1895, No. 7,665.

To all whom it may concern:

Be it known that I, WILLIAM GEORGE ENTWISTLE, a subject of the Queen of Great Britain, residing at Brooklyn, in the provincial district of Wellington, in the Colony of New Zealand, have invented certain new and useful Improvements in Traversing and Leveling Heads for Theodolites or other Instruments, (for which Letters Patent have been granted to me in New Zealand, No. 7,665, under date of June 11, 1895;) and I do hereby declare that the following is a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to provide a new and simple method of combining and clamping together the traversing and leveling parts of a theodolite or similar instrument after the machine has been set and of readily releasing the same for another operation.

My invention is illustrated on the accompanying sheet of drawings, on which—

Figure 1 is a sectional view of my improved head as used for theodolites and similar instruments. Fig. 2 is an elevation of part of the same when set to an angle and moved on the traverse-plate to its full extent. Fig. 3 is a plan showing the traversing plate, and Fig. 4 is a sectional view through the line 1 2 on Fig. 1.

Similar letters indicate like parts in all the figures.

A are the ordinary legs or supports, which are joined to the cap-piece *a* by pins *A'*. This cap-piece *a* is formed with a lower flange *a'* and an upper flange *a''*, joined together by distance-pieces *a'''*, so as to leave a free space in which the traversing plate *b* may move freely in all directions horizontally.

c is the traversing head, having a spherical upper surface *c'* and flat base *c''*, so that it can be traversed horizontally by the hand when desired simultaneously with the plate *b*.

d is the leveling-head, fitted with the ordinary screw *d'* for receiving the theodolite, which screw is covered by a cap *e* when the instrument is not in use. This leveling-head *d* has a base *d''*, hollowed out internally in the form of a sphere, so as to fit and move freely

upon the spherical surface *c'* of the traversing head, and also has a projection-piece *d'''*, fitted with a left-handed screw *d''''*, for a purpose to be hereinafter described. The cap *e* is fitted with a square recess *e'*, which forms a wrench for turning the joint-screws *A'*.

By this description of the parts it will be seen that an instrument screwed on at *d'* can be made to slide in any direction horizontally upon the base *c''* and can be set to a horizontal position or to an angle by being adjusted on the spherical surface *c'*. Such motions have been applied to theodolites and similar instruments, and I lay no claim to the means which allow of such movements, my invention consisting of the improved method of clamping the whole of the parts together, and which I will now proceed to describe.

p is the clamping-piece, having at its lower end a semispherical projection *p'*, bored accurately to receive the plumb-line *q*, the center of the semisphere being at *p''*, which center is also the center from which is described the spherical surface *c'*. This projection *p'* works accurately in a spherical hollow *b'* formed in the traversing plate *b* to receive it.

The upper end of the clamping-piece *p* is formed in the shape of the capstan-head *p''*, having an internal thread *p'''* screwing onto the thread *d''''* of the leveling-head *d*, and around this capstan-head are holes *p''''*.

r is a ring fitting loosely around the leveling-head *d* and fitted with two projections *r'*, which have internal threads to receive the screws *s*, the ends of which *s'* project into the holes *p''''* of the capstan-head and serve to turn the said capstan-head when the ring *r* is turned.

It will be seen from this description of the several parts and by reference to the drawings that the ring *r* being turned from left to right the capstan-head *p* is also turned, and by this action, *d''''* being a left-handed screw, the leveling-head *d* is drawn down tight upon the traversing head *c* and the traversing plate *b* is drawn up against the plate or flange *a''*, so that both leveling-head and traversing head are firmly fixed by one action of the hand acting on the projecting pieces *r'*, and this takes place in whatever position the lev-

eling-head or traversing head may have assumed. Of course, on moving the ring r back from right to left the whole is again loosened ready for resetting. The point p^2 being the
 5 center of the spherical traversing head c , the plumb-line q is not materially affected by the movement of the traversing head, but only by the horizontal movement of the plate a' .

I claim as my invention—

- 10 1. In a traversing and leveling head for theodolites and other similar instruments a clamping-piece p having a capstan-head p^3 acting upon the leveling-head d by means of the screw d^4 , and having a tailpiece p' carry-
 15 ing the plumb-line q and oscillating or revolving in a traversing plate b as and for the

purposes substantially as described herein and illustrated.

2. In a traversing and leveling head for theodolites and other instruments a clamping- 20 piece p having a capstan-head p^3 acting upon the leveling-head d by means of the screw d^4 actuated by the revolution of a ring r carrying screws or pins s as and for the purposes substantially as described herein and illus- 25 trated.

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

WILLIAM GEORGE ENTWISTLE.

Witnesses:

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 HORACE W. LLOYD.