

# PATENT SPECIFICATION



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184,728

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## COMPLETE SPECIFICATION.

### Improvements in Devices for Facilitating the Reading of Sextants and other like Instruments.

I, GEORGE ANDREW HEATH, of New Eltham Scientific Instrument Works, Southwood Road, New Eltham, London, S.E. 9, British subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to devices for facilitating the reading of sextants and other like instruments and more particularly to what is usually known as the "greatest angle clamp" which is in common use in connection with sextants and the construction and operation of which and of the improvements therein in accordance with my invention will be more readily understood by reference to the accompanying drawing in which:—

Figures 1 and 2 represent an elevation and plan respectively of this known device

Figures 3 and 4 are similar views of the improved construction of the same according to the present invention and

Figure 5 is a front view of a sextant shewing this improvement applied thereto,

Figures 6 and 7 are sections to a larger scale on lines A—B and C—D respectively of Figure 5.

Similar reference characters refer to like parts in all the figures of the drawing.

Referring to Figures 1 and 2 it will be appreciated that the known form of clamp comprises a plate *a* carrying a bow-spring *b* the outer ends of which are adapted to contact with the concave or inner edge of the arc on which the sectoral scale plate is mounted and thus form a resilient bearing for the plate at

points on either side of the same while the block *c* is cut away to form a shoulder *d* which abuts against the convex or outer edge of the said arc the device being clamped on the instrument by means of the screw *e* provided with the milled head *f*. This form of clamp is generally employed to mark the high angle the clamp *a* being moved along the arc until the forward edge or nose *g* thereof contacts with the radius or index bar and being clamped in that position by the screw *f*.

I have however found that a clamp of this description particularly when used on a sextant having an endless tangent screw such as described in the Specification of Patent No. 17,840 of 1909 or other types of sextant in which the tangent screw gears with teeth on the periphery of the arc is liable to give rise to an error in reading. For after the high angle is read and the nose of the clamp brought up against the index bar as described, the index is moved away along the arc to read the lower angle and in reading this it is necessary in order to obtain the fine adjustment to operate the tangent screw by which it is quite possible and has been found in practice to be frequently the case that the tangent screw and worm carried thereby are turned into such a position that when the index is moved back into contact with the clamp the worm of the tangent screw engages with the teeth on the underside of the arc which are nearest to the point of contact thus leaving a gap between the index and the nose of the clamp which may not be noticed. To obtain a correct reading it is necessary to rotate the tangent screw so as to bring the index into actual contact with the nose of the clamp otherwise

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there may be an error in the reading which may amount to as much as two to four minutes.

A further disadvantage of this known form of "greatest angle clamp" illustrated in Figures 1 and 2 of the drawing lies in the bow-shaped spring *b* the outer ends of which bear upon the concave edge of the arc for it is found in actual practice that when the device is clamped to mark the high angle the clamping action is liable to produce a slight pivotal movement of the plate *a* around the screw *e*. This also tends to cause a gap between the nose of the clamp and the index and thus gives rise to inaccurate readings.

The object of the present invention is to obviate these disadvantages by providing an improved construction of clamping device for marking the position of the high angle by the use of which the possibility of errors in reading referred to above are entirely eliminated for according to my improvement the clamp is provided with an indicator which shows the point of true contact and furthermore the clamp is so constructed that the top thereof bears resiliently on the concave edge of the arc only at one point and at one side of the clamp, there being a positive and solid contact at the other side of the clamp between the top of the clamp and the said concave edge.

But in order that the nature of my improvements may be more clearly understood I will more particularly describe the same with reference to Figures 3 and 4 of the drawing wherein as in the known form of clamp illustrated in Figures 1 and 2 *a* represents the plate thereof, *c* the clamping block with the shoulder *d*, *e* the clamping screw with milled head *f* and *g* the nose of the clamping plate.

*h* represents an indicator lever or pointer which is pivotably mounted at *i* on the forward end of the plate *a* adjacent the nose *g* thereof and is provided with the tail piece *j* which projects beyond the edge of the plate *a*. The indicator *h* is normally maintained in the position shewn in Figure 3 by the spring *k* one end of which bears against the under side thereof but when pressure is applied to the tail *j* the indicator *h* is moved downwardly within the limits permitted by the guide *l* so that its pointer *m* may indicate the position of true contact or zero marked by the arrow *n*. *o* represents a blade spring carried by the top of the plate *a* and projecting from one end thereof the outer curved end of which spring is adapted to bear on the concave or inner edge of the arc while

the other end of the top of the plate forms a stop *p* making a positive and solid contact between this part of the clamp and the said inner edge as shewn in Figure 5 wherein, and also in the sectional views Figures 6 and 7, is illustrated the application of my improved clamp to a sextant.

It will be appreciated from these figures and from the previous description that when the index *q*, after the lower angle has been read, is brought back again into contact with the nose *g* of the angle clamp if there is not a true contact between the index *q* and the clamp this will be immediately apparent from the position of the indicator relatively to the zero mark *n* the pointer *m* being above the said mark and in order to obtain a correct reading the tangent screw *r* must be turned slightly so as to cause the traverse screw *s* thereof to engage with the corresponding teeth *t* on the underside of the arc *u*, by which true contact will be obtained, shewn by the pointer *m* being coincident with the zero mark *n*. The sectional views illustrated in Figures 6 and 7 will make this quite clear for it will be obvious that if when the index *q* is brought back up against the angle clamp and the hinged plate released by the relaxation of pressure on the buttons *v* and *w* as described in the Specification of Patent No. 17,840 of 1909 referred to above, the worm *s* engages in teeth of the rack *t* which are nearest to the point of contact the effect will be to carry the index away from the clamp and true contact can only be obtained by rotation of the tangent screw *r* as explained above.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. A clamping device for facilitating the reading of sextants and other like instruments of the kind herein before referred to provided with an indicator for showing the point of true contact between the clamp and the index or radius bar substantially as and for the purpose described.

2. A clamping device for facilitating the reading of sextants and other like instruments of the kind hereinbefore referred to and as claimed in Claim 1, in which the clamp is so constructed that the top thereof bears resiliently on the concave edge of the arc of the sextant only at one point and at one side of the

clamp there being a positive and solid contact at the other side of the clamp between the top of the clamp and the said concave edge substantially as and for the purpose described.

5 3. A clamping device of the kind hereinbefore referred to constructed and having its parts arranged and operating

substantially as described and illustrated in Figures 3 to 7 of the accompanying drawings. 10

Dated this 4th day of November, 1921.

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115, Cannon Street, London, E.C. 4.

[This Drawing is a reproduction of the Original on a reduced scale.]

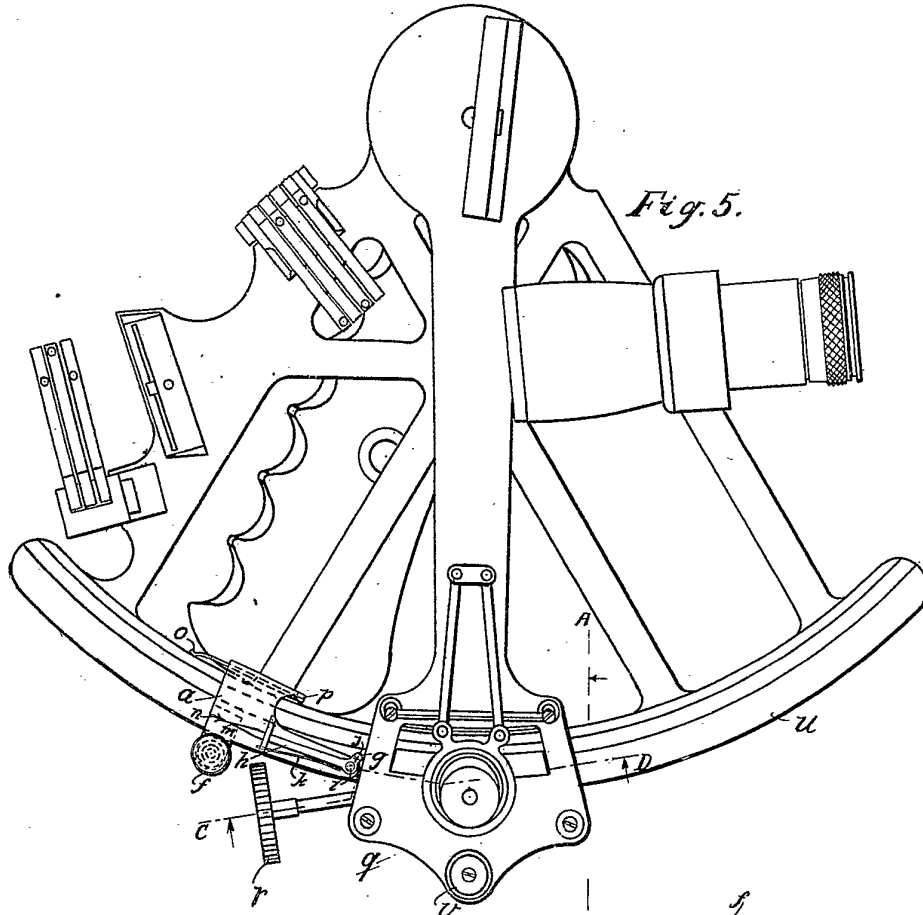


Fig. 5.

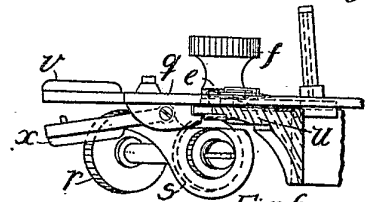


Fig. 6.

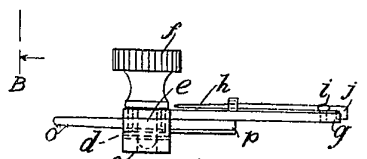


Fig. 4.

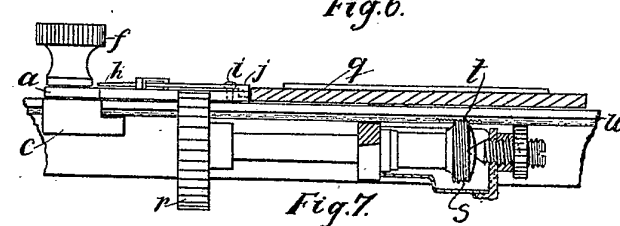


Fig. 7.

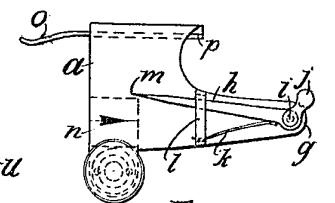


Fig. 3.

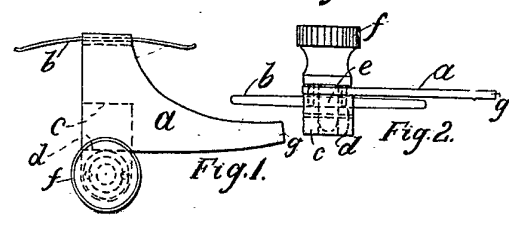


Fig. 1.

Fig. 2.