H. A. HUGHES AND T. Y. BAKER.

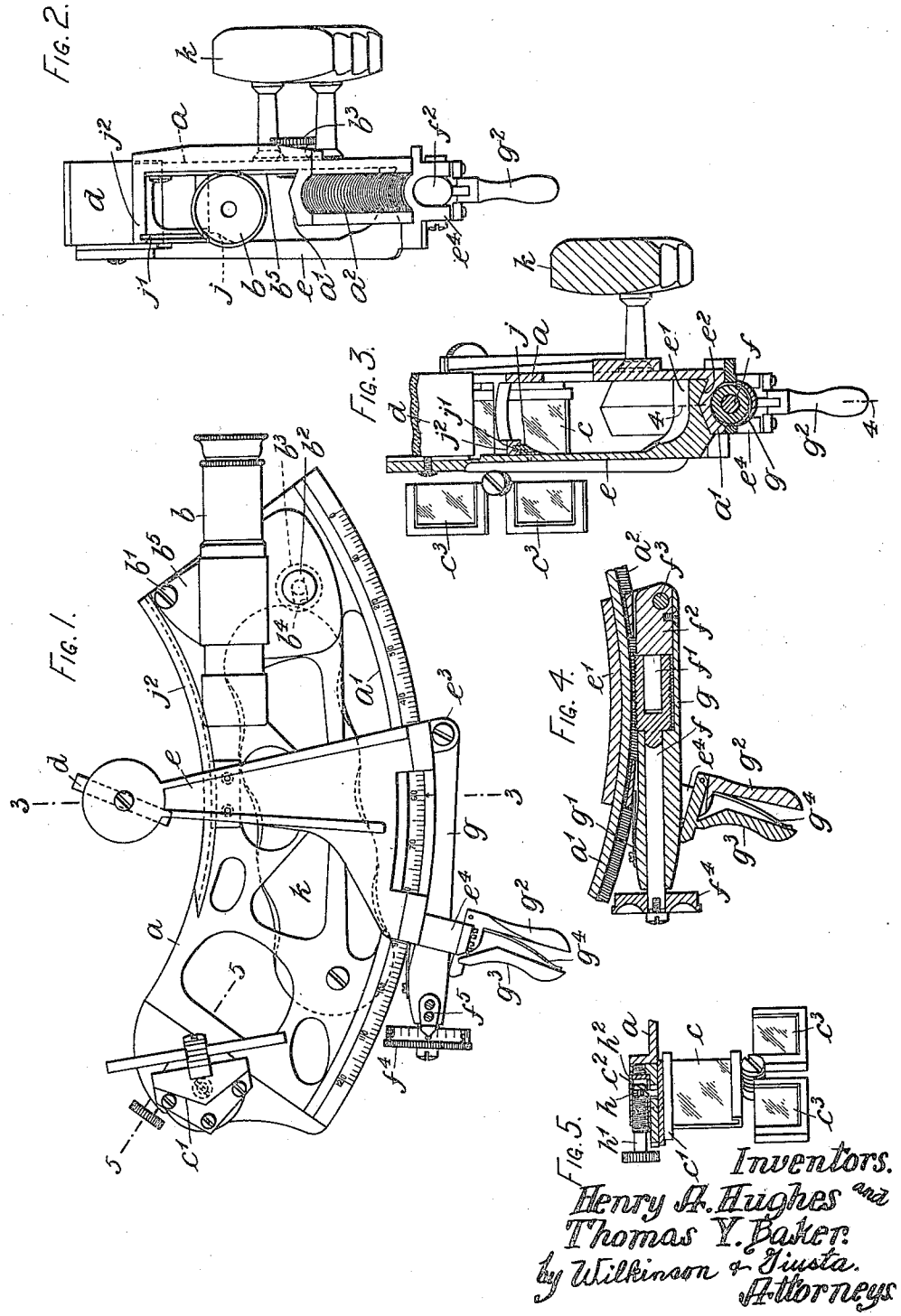
SEXTANT.

APPLICATION FILED APR. 27, 1920.

1,383,950.

Patented July 5, 1921.

2 SHEETS—SHEET 1.



Inventors.
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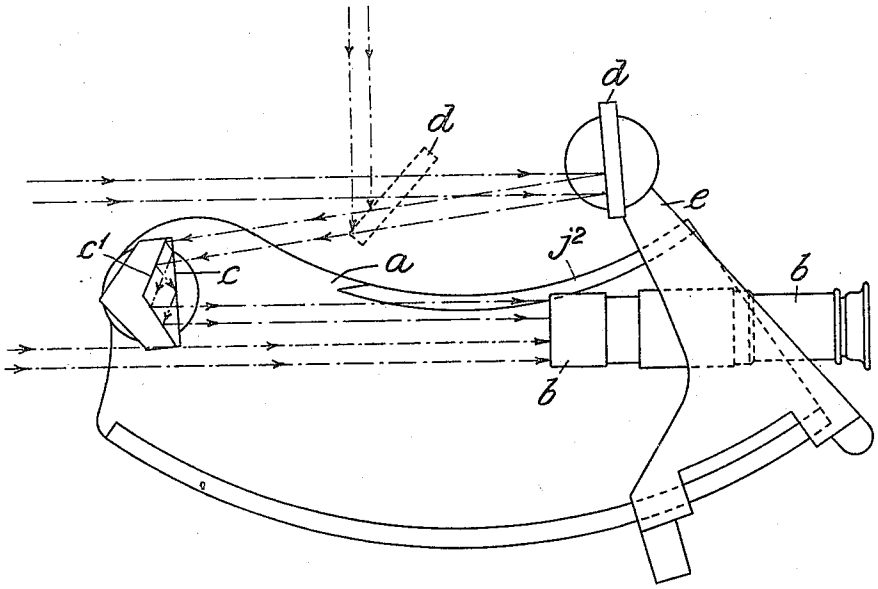
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2 SHEETS—SHEET 2.

FIG. 6.



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UNITED STATES PATENT OFFICE.

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SEXTANT.

1,383,950. Specification of Letters Patent. Patented July 5, 1921.

Application filed April 27, 1920. Serial No. 377,065.

To all whom it may concern:

Be it known that we, HENRY ALEXANDER HUGHES, of 59 Fenchurch street, in the city and county of London, England, and THOMAS YEOMANS BAKER, of Admiralty Compass Observatory, Slough, in the county of Buckingham, England, have invented new and useful Improvements in Sextants, of which the following is a specification.

This invention relates to sextants and consists in an improved mode of construction designed to reduce the size of the instrument while retaining the usual range of movement and reducing the cost of manufacture.

According to the present invention the limb of the instrument is in the form of a segment of a circle whereon the telescope is mounted while the index mirror is fixed to a carrier which is attached to the periphery of said limb and is adjustable thereon for reading the angle subtended by the object under observation.

The accompanying drawing is illustrative of a sextant constructed according to this invention,

Figure 1 being a view of the instrument in side elevation and

Fig. 2 a view of the front end.

Fig. 3 is a sectional view on the line 3—3 in Fig. 1.

Fig. 4 is a sectional view on the line 4—4 in Fig. 3,

Fig. 5 is a sectional view on the line 5—5 in Fig. 1, and

Fig. 6 is a diagram showing the operation of the device.

In the construction illustrated the limb a of the instrument is in the form of a segment of a circle and has mounted thereon the telescope b.

This telescope is by preference attached to the limb a at two points b' b^2 at one of which (b') it is pivoted while at the other point (b^2) the telescope is capable of angular adjustment by means of a clamping screw b^3 working through a slot b^4 in a plate b^5 whereon the telescope is mounted. The angular adjustment is for the purpose of correcting any error that may arise in the line of collimation. The outer end of the telescope b moves opposite to a prism c which is mounted on the limb a and which serves as the horizon mirror.

The index mirror d is mounted upon a carrier e formed or provided with an inwardly extending flange e' having a V-shaped recess e^2 which fits on to a correspondingly shaped projection formed upon a flange a' provided along the periphery of the limb a. The under side of this flange is concave and is formed with inclined grooves to receive a screw thread formed upon a spindle f. The inner end of this spindle is recessed to receive a supporting pin f' projecting from a block f^2 pivotally mounted upon a pin f^3 carried in a yoke e^3 provided at the right hand end of the lower side of the carriage e. The spindle f and the block f^2 are inclosed in a casing g which on the left hand end is provided with a leaf spring g'. The end of this spring bears against the under side of a yoke e^4 provided at the left hand end of the lower side of the carrier e. The yoke e^4 straddles the casing g and is provided with a fixed finger piece g^2 and with a thumb piece g^3 which is pivoted upon the finger piece and is pressed by a spring g^4 so that normally the thumb piece presses the casing g and overcomes the pressure of the spring g'. In this manner the screw threaded end of the spindle f is held in engagement with the underside of the flange a^2 of the limb. Disengagement for quick adjustment is effected by pressing the thumb piece g^3 thus relieving the pressure of the spring g^4 with the result that the spring g' moves the casing g together with the spindle f about the pivot f^3, and disengages the spindle f from the flange a'.

The carrier e may now be moved directly by hand for adjusting the position of the index mirror. For final adjustment the outer end of the spindle f is provided with a head f^4 whereby the spindle is turned to adjust the carrier e together with the mirror d along the flange a'.

The prism c is housed in a casing c' pivotally mounted upon the limb a and said casing is provided eccentrically with a pin c^2 which engages in a groove h formed at one end of an adjusting screw h'. This screw works in a casing h^2 mounted at the back of the limb a and by advancing or withdrawing the screw in its casing the prism c is moved about its pivot for the purpose of adjustment.

Pivotally mounted upon the casing c' are the tinted glasses c^3 usually employed as shades.

The carrier e on which the index mirror d

is fixed is held in position upon the limb a by a projection j on the inside of the carrier engaging a groove j' formed in a guide j^2 extending from the inner edge of the limb and at a right angle thereto. The guide j^2 is curved and concentric with the flange a' at the outer edge of the limb a. The carrier e is held on this flange by the V-shaped recess in the flange e' of the carrier engaging with the correspondingly shaped projection on the flange e^2 of the limb a.

For holding the instrument the limb a is provided with a handle k mounted on the side thereof.

The limb a is marked in degrees and half degrees of a circle along the flange a' on which the carrier e of the index mirror d works, said carrier being marked with an arrow-head for reading the angular adjustment of the carrier. The spindle f for adjusting the carrier e has by preference the screw threads thereon equal in pitch to 720th of the circumference of the circle of which the flange a' forms a segment.

In this manner one revolution of the spindle f moves the carrier half a degree along the limb a. To enable readings to be taken of less than half a degree the head f^4 of the spindle f is divided into 30 divisions which again may be subdivided so that readings of minutes and seconds can be taken from the head f^4 in conjunction with the pointer f^5 mounted on the casing g.

The telescope b is so arranged in relation to the prism c that light rays enter the telescope directly from underneath the prism c and by reflection from the prism. The telescope is adjusted about its pivot b' to allow more or less of the reflected light than the direct light to enter the telescope as desired. In adjusting the instrument the carrier e of the index mirror d is set to zero and an observation taken by the telescope on the object beneath the prism c. The prism c is now adjusted until an image of the object is reflected from the mirror d into the prism c and thence to the telescope, two superposed images of the object being then seen. The faces of the index mirror d and the prism c will now be parallel to each other, as shown in full lines in Fig. 6. To ascertain the angle subtended by an object relatively to another lower object or the horizon the lower object or the horizon is viewed directly through the telescope b and beneath the prism c. The index mirror d is now adjusted until the upper object is reflected from the mirror into the prism c and thence into the upper portion of the telescope, the angle subtended being then read on the scale of the sextant. The position of the mirror d shown in dotted lines represents an angle of 90° to the horizon.

What we claim as our invention and desire to secure by Letters Patent is:—

In a sextant, a limb in the form of a segment of an annulus, a carrier slidable bodily thereon in the arc of a circle whose center lies outside the sextant, means for adjusting the carrier on the limb, an index mirror on the carrier, a horizon prism mounted on said limb, and a telescope on the limb arranged relatively to the prism to receive direct rays of light from beneath the prism and reflected rays therefrom, substantially as described.

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