utilization of the airspace widely between different classes of aircraft, and, by so doing, has eased tremendously the air traffic control problem.

When one considers the vast research effort that has to go into the design and manufacture of only a single type of transport aircraft, in order to produce it at all, it does seem that the lack of major research effort, expressed either in terms of skilled man hours or of expenditure, on the air traffic control side presents a most unbalanced situation. It must also be remembered that the real commodity that the transport industry has to sell is speed, and it is hardly fair, therefore, to attack operators and constructors from being preoccupied with it.

If extra effort is to be devoted to solving our present air traffic control problems, I feel sure that real results will come more quickly and economically by directing this effort directly on to the problem of safe separation, rather than into the multifarious fields of aircraft design.

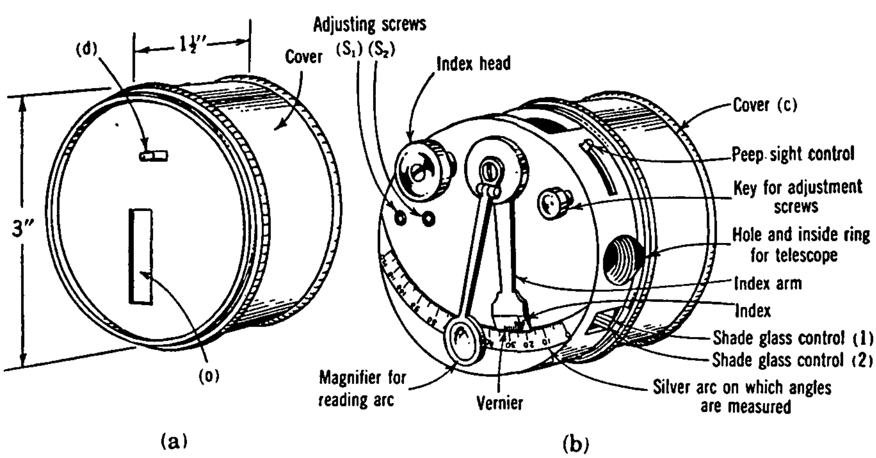
The 'Box' or Pocket Sextant

from Frances W. Wright

(*Harvard College Observatory*)

Last summer I sailed in R.M.S. *Newfoundland* from Boston to Liverpool and took the opportunity of keeping up a navigational plot using a minimum of charts and instruments. The sextant I used was a box sextant and it occurs to me that some description of this instrument may be of interest to navigators. Box sextants are lightweight and usually have a sling case which enables them to be carried or packed away easily. They are much less expensive than the standard sextant, and since they are precision-made instruments will last just as long. Good results can be obtained with them both in coastal navigation and offshore.

The instrument is made entirely of metal; it is only three inches in diameter and 1½ inches thick. It is shown, closed, in Fig. 1. The small opening (o) is



(a) (b)

Fig. 1. The box sextant closed (a); *opened* (b).

https://doi.org/10.1017/S0373463300016738 Published online by Cambridge University Press

similar to a sliding door. When (o) is closed, dust and moisture cannot penetrate the interior of the sextant; when (o) is opened, by the slide control (d), two small shade glasses may be pushed to the outside of the sextant. The cover (c) unscrews and screws back again on the other side, covering the sliding door and the shade glasses, and serving as a convenient handle in the measurement of angles. The horizon glass, mounted securely inside the sextant, has the left half (for a vertical position) silvered, and the other half transparent. The index mirror, also inside the sextant, moves with the index arm, which carries also the index; the position of the index mirror (and of the index arm) is changed by rotation of the index head (Fig. 2). The position of the index on the silver

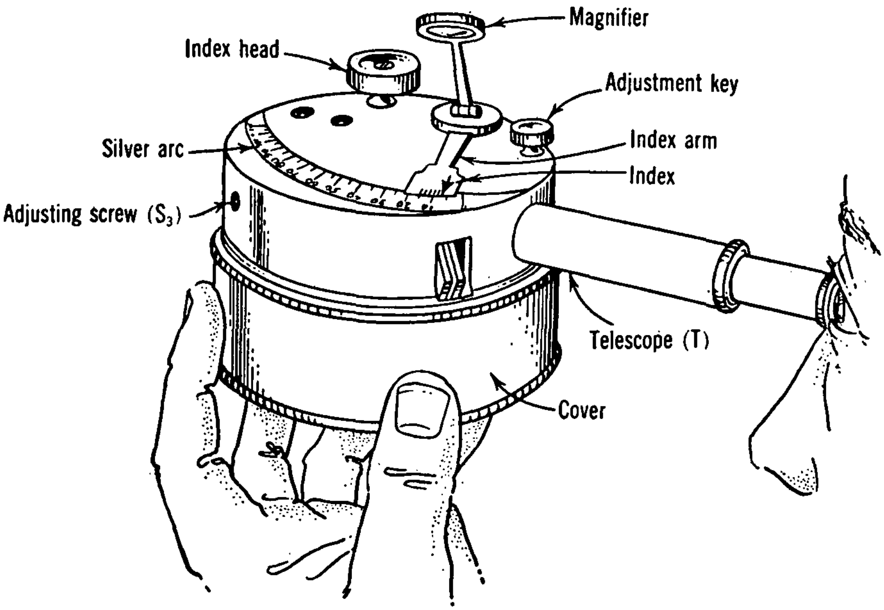


Fig. 2. The sextant in the horizontal position.

arc gives the measured angle, and the small attached magnifying glass makes the reading of the vernier very easy. The principle behind the arrangement of the horizon glass and the index mirror is exactly the same as for a standard sextant, and the index error is obtained in the same way. This index error should be measured before and after every sight or series of sights, since a change in temperature may quickly affect the adjustment of the sextant. Sometimes it is easier not to use the telescope which comes with most pocket sextants, and which magnifies about 2½ times. The navigator may simply look through the telescope hole for all his sights, or he may screw the telescope (erect image) in the inside ring of the telescope hole. In either case he may measure angles to within a minute of arc and as large as ninety degrees conveniently.

https://doi.org/10.1017/S0373463300016738 Published online by Cambridge University Press