

11. As, however, many vessels are not provided with a proper compass fitted with azimuth sights, it is a common practice to make use of a dumb compass as the standard of comparison—the card of the dumb compass being adjusted in reference to a well-defined mark, of which the correct bearing is known.

12. A distant mark—say not less than five or six miles off—is to be preferred for the standard of reference, provided it be distinct and well-defined; as in that case the parallax due to the change of position of the vessel while she is being swung may be safely neglected, as practically inappreciable, especially when she is made fast to a dolphin abreast of her standard compass; as in that case the amount of parallax will only be that due to the breadth of the vessel. If it be absolutely impossible to select a well-defined distant object, it will be necessary to erect a pair of near marks; but in that case, the vessel requires to be manœuvred by the head and stern lines, so as to keep the two marks always in one, as seen from the dumb compass—and this is troublesome and takes time.

When the situation is favourable and surrounded by easily distinguished objects, it is always convenient to ascertain the correct bearings of several from the swinging dolphin, so that a nearer or more distant mark may be selected as the standard of reference, according to the state of the atmosphere, &c.; and it is always well to erect a pair of near marks which may be reverted to in the event of the more distant objects being obscured by fog.

Compass Adjusters will, of course, understand that it is quite immaterial what the actual bearing of any object selected as a standard mark may be, provided it has been accurately ascertained; the mark being merely used to set the dumb compass by, so that it may always represent a correct magnetic compass card.

13. A dumb compass, adapted for swinging operations, should comprise the following essentials, though many differences of detail and style of finish will be found in the works of different makers:—A compass card or brass plate, not less than six inches diameter, accurately divided to points and quarters, or eighths, and truly centred, turning with moderate stiffness on a lower plate, on which a line (corresponding to the “lubber’s” point of an ordinary compass) is cut in such a manner as to read the divided card with accuracy: the lower plate, which represents the ordinary compass box or binnacle, should turn on an axis on a stout tripod stand of convenient height, and must be fitted with a clamp for holding it firmly in any required position. A pair of sight-vanes, like those of an azimuth compass, must be fitted to the divided card or plate of the dumb compass; they may either be jointed to a bar revolving on the common centre and capable of being clamped to the card in any position so as to move along with it, or they may be separate, and made to screw into holes tapped for them in the plate at each end of the bearing lines to the several standard marks. The correct bearings of all marks which are intended to be used as standards of reference should be laid down on the divided plate, the name of each object being engraved on the proper line, and, when there are several bearing lines, it is useful to cut an arrow-head on each, to show the direction in which the sight should be taken. If the sight-vanes are made to screw, holes must be drilled and tapped to fit them at each end of every bearing line. Though not essential, it is very convenient to have a ball and socket-joint on the axis of the lower plate of the instrument, as it greatly facilitates the operation of levelling the dumb card.

14. A dumb compass somewhat as described being provided, it is to be set up near the principal compass to be tested, sufficiently on one side of the keel line to allow of an unobstructed view fore and aft, and properly levelled; and the sight-vanes are to be screwed into the holes at each end of the bearing line corresponding to the most distant swinging mark which can be distinctly seen in the existing state of the weather. Then, to set the “lubber’s” point parallel to the keel line,—first, turn the dumb card till the “lubber’s” point coincide with the bearing line to which the sights are adjusted, so as to make the line of sight coincide in direction with the “lubber’s” line; then unclamp the lower plate and turn it (carrying the card and sights along with it) until the sights are in line with a boat-hook or pole, or similar object, which is to be held up (vertically) as far forward as possible, and exactly the same distance on the same side of the vessel from the centre or keel line as the centre of the dumb compass has been placed; when the pole is bisected, the centre of the dumb compass and its “lubber’s” point, or reading line, must be parallel to the keel line of the vessel, and the lower plate is to be clamped, and must not be shifted till the operation of swinging is completed.

The instrument is then in adjustment, and its “lubber’s” point will read the correct magnetic bearing of the ship’s head in any position, so long as the sight-vanes of the dumb card are kept in line with the proper bearing mark.

15. The dumb compass having been adjusted as described, the vessel may have her compasses tested with ease and expedition on either of the following systems:—

(a.) The dumb card being set so that the “lubber’s” point of the instrument exactly coincides with any point on the card, the vessel is to be warped round till the sight-vanes are in line with the proper swinging mark, and the actual reading of the compass or compasses under examination is to be noted after the vessel has been steadied on the proper line and the compass cards have come to rest; the dumb card being thus shifted a point or more, the vessel is to be again warped round, checked, and her compasses are to be read as before—and so on until the operation is completed. For the second series of observations the vessel should be warped round the reverse way, the operation being otherwise performed precisely as before; but only a few points need be examined on one of the rounds, as

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NOTE.—The theory and practice of compass adjustment have been so greatly improved since 1860 that it is now possible to determine the heeling error from observations made with the ship upright, and such observations are now a regular part of the complete series of magnetic observations made in the principal iron ships of Her Majesty’s navy. Her Majesty’s ships, however, present peculiar facilities for such observations from their standard compasses being all of the same pattern, and it would, besides, be unreasonable to expect such high scientific attainments in the Compass Adjusters in the Colonies as are possessed by the officers of the Admiralty Compass Department. The above quotation is still practically correct as regards merchant vessels in New Zealand, if not in England also, especially as the heeling error is seldom excessive except in iron-clads.