



The Fourteen Second Glass. Private collection.

A Timer



The top of the Fourteen Second Glass showing the concentric ring pattern and the number 14 inscribed on the outermost ring. Private collection.

At first glance this object might bring to mind one's grandmother's egg timer, but this glass has a much more interesting history.

TECHNOLOGY AND TERMINOLOGY: This week's object was integral to the nautical measurement of time and distance. The 360 degrees of latitude are each separated from one another by one degree. At the equator each degree is divided into 60 parts, and each part equals a nautical mile. To determine the length of a nautical mile the circumference of the earth at the equator must be known, and it was not until the 19th century that this was accurately defined.

In the 18th and 19th centuries ocean-going vessels determined their position by celestial observation of the sun, the moon, and the stars with the aid of sextants, compasses, and accurate chronometers. But when the weather was foul, as it might be for days on end, and the celestial bodies were obscured, positioning could only be estimated by dead reckoning—charting direction with compass and speed from the previous accurate celestial positioning—the compass gave direction; and a log line estimated the distance over time.

In the 18th century Capt. Cook utilized a log line to determine his speed and distance covered over each 24-hour period. A weighted wooden chip attached to a light line was tossed over the stern and simultaneously a 30 second glass was turned. The line was knotted every 45 feet. The weighted chip remained stationary just at the surface as the line paid out, and when the glass was empty the line was *nip*t or stopped and the number of knots paid out were counted. $4\frac{1}{2}$ knots paid out converted to a speed of $4\frac{1}{2}$ nautical miles per hour. In the 18th century this slightly overestimated the vessels' speed, but by the 19th century the length of a nautical mile had been refined to 6,070 feet (a mile equals 5,280 feet) and the corresponding ratios were refined such that a 28 second glass was utilized and the distance between knots in the line was 47 feet 3 inches. This worked well in the first half of the 19th century when maximum speed for a ship rarely exceeded 10 knots, or some 500 feet of line paid out, but with the advent of Clipper ships reaching speeds of 20 knots the 1,000 feet of line became cumbersome. The solution was to go to a 14 second glass and to double the count of knots paid out to give ship speed in nautical miles per hour. Knot has been adopted to designate speed in nautical miles per hour for a ship, the current, and the wind.

THE OBJECT: From the collection of Deb Richards, this 14 second log glass is a rare survivor that remains accurate to the second. Though possibly American, it is thought to be of English origin c. 1850. It was most likely utilized on a Clipper ship during the second half of the 19th century. The colorless glass is free-blown. The four turned posts holding the log glass are through-tenoned into the circular end-pieces, which have a shallow scratched expanding ring design with the number 14 incised and resting on the outermost ring.

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