From:
John Hamilton Moore.
The New Practical Navigator; being an epitome of navigation,... 11th edition.
London, 1795.

The log is a flat piece of wood like a flounder, or of the figure of a quarter of a circle, having its circular side loaded with lead suffcent to make it swim upright in the water. To this log is fastened a long line of about 150 fathoms, called the Log-line, which is divided into certain equal spaces, called Knots, each of which ought to bear the same proportion to a nautical mile (60 of which make a degree) that half a minute does to an hour, that being the time allowed for the experiment.

They are called Knots, because at the end of each of them there is a piece of twine with knots in it, reeved between the strands of the line; these pieces of twine shew how many knots run out in half a minute, and consequently the ship's rate of sailing per hour.

Mr. Norwood, and several other able mathematicians, have found that a degree of a great circle upon the earth contains about 367200 English feet, therefore a nautical mile being the 1/60 part of 367200 feet, that is, 6120 feet, and since half a minute is 1/120 part of an hour, the length of a knot on the log-line ought to be 1/120 part of 6120 feet, or 51 feet. But as for the most part the ship's way is found, by experience, to be really more than that given by the log, and as it is safer to have the reckoning before the ship than after it, therefore 50 feet may be taken as the proper length of each knot, and these knots subdivided into ten fathoms, each of 5 feet, which is certainly the best adapted for practice, and will correspond with all the tables and instruments used in navigation, as they are decimally divided, and consequently, the ship's run determined with greater ease and certainty. But

HALF MINUTE GLASS.

The Log
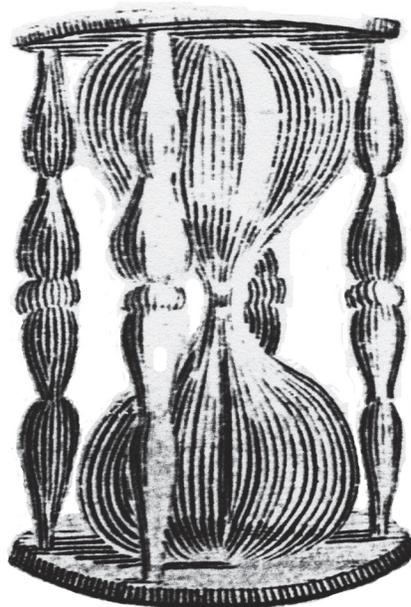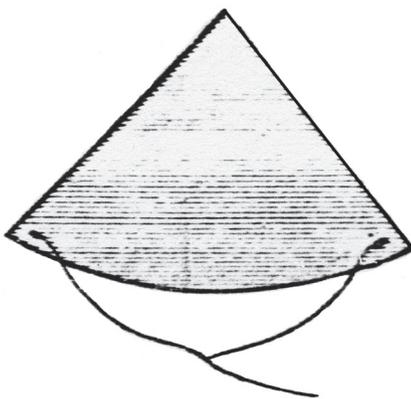
The Log in the Act of heaving
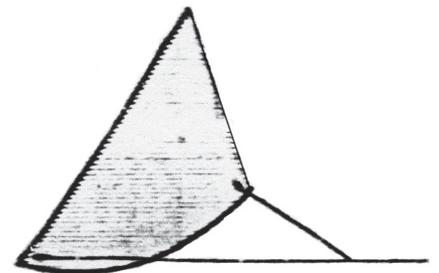
NB. There are many kinds of Logs, but the above is the most common.

some experienced commanders find, that the allowing 50 feet to a knot, generally makes a ship a-head of the reckoning; and to avoid danger mostly divide the log-line into knots of 7 or 7½ fathoms of 6 feet each, to correspond with a glass that runs 28 seconds. Others again, divide the seconds the glass runs by 4, and take the quotient for the distance in fathoms between the knots; which of these methods are best, I leave to every captain's own experience to determine; but certain it is, that whatever length the knots are, the most conveneient way is to divide them into tenths.

In hot or dry weather, the glass runs out faster than in moist or rainy weather: therefore care should be taken to try what number of seconds the glass runs.

The length of the log-line formerly used, was divided into knots of 42 feet, which way of dividing the same was founded on the supposition, that 60 miles, of about 5000 English feet, made a degree; whereas it is abundantly certain, that a degree contains about 73 such miles. It was therefore to be wished, that no line so divided were in use, but very often custom prevails over reason; and although mariners find by experience this length of the knots to be too short, yet some of them, rather than quit the old way, use glasses for half-minute ones that run but 24 or 25 seconds, which is but correcting one mistake by another.

The knots commonly begin to be counted at the distance of 10, 12, or 15 fathoms from the log, according to the largeness of the ship, that so the log may be out of the ship's wake when it is thrown overboard before they begin to count, lest the eddies should suck the log after the ship; and for the more ready discovery of this point of commencement, there is commonly fastened at it a piece of red rag; that part of the line between the red rag and the log is called the stray line.

The log and log-line being duly prepared and hove overboard from the poop, or lee-quarter, and the line veered out (by the help of a reel which turns easy, and about which it is wound) as fast as the log will carry it away, or rather as fast as the ship sails from it, will

shew how fast the ship has sailed in the given time, or rate of sailing per hour.

The experiment for finding the velocity of the ship is called heaving the log.

Care should be taken to veer out the line as fast as the log takes it, for if the log is left to turn the reel of itself, the log will come home, and deceive you in the reckoning.

In kings' ships, India ships, and some others, the log is hove every hour, but in coasters, and those using short voyages, every two hours.

Here the ship is supposed to move with equal velocity between the times of trying the experiment. But if the gale has not been the same during the whole hour, or time between heaving the log, or if there have been more sail set, or any handed, that so the ship has run more or less in any part of the hour that she did at the time of the experiment; or if it should fall little or more wind at that time, there must be allowance made for it according to the discretion of the artist: Sometimes too, when the ship is before the wind, and a great sea setting after her, it will bring home the log; in such cases it is customary to allow one mile in ten, and less in proportion, if the sea be not so great.

Care should also be taken to measure the log-line pretty often, lest it stretch and deceive you in the distance.

The like regard must be had, that the half-minute glass be just 30 seconds, otherwise no account of the ship's way can be kept; to prove which, if there be no stop-watch at hand, let a plummet, or any form or weight, be fastened to a silk string or thread, with a loop to hang on a small pin or nail fastened in   any place, so that the plummet may swing freely; let it be 39¼ inches from the end of the look to the middle of the plummet, and the plummet caused to swing; each of those swings will be a true second of time, always counting every time it passes the perpendicular let fall from the pin, and every time it passes from the perpendicular to the utmost swing will be half-a-second.