

towed at a good speed to keep the boards in position, and the vessel skilfully steered, so that the lines must necessarily be towed from the stern. It was found very difficult, however, to adopt this plan to our requirements, the chief drawback being that everything must be of the very strongest materials. Sir William Thomson long ago, when working at his sounding machine, discovered that the drums were easily burst, and the trawlers too have had similar experiences, in spite of their using drums of cast metal several inches thick.

The "Michael Sars" could not, of course, use such large appliances, for if in addition to overcoming the resistance of two ponderous otter boards, 6 feet by 10 feet, she had to tow a pair of wires each many thousands of metres long, she could obviously not have got over much ground; and besides, it would have been next to impossible to prevent such long lines from fouling one another. We were compelled therefore to trust to a smaller size of trawl, and to substitute a single warp, from the end of which we led a connecting line, 50 fathoms in length, to either otter board (see Fig. 26, line and bridle). A similar arrangement for small otter trawls had been already successfully tried by C. G. Joh. Petersen. During previous cruises of the "Michael Sars" we had operated a trawl with 50 feet of headrope at a depth of 1830 metres, and during our Atlantic expedition we succeeded in working the same appliance at a depth of 5160 metres. Our success must be ascribed to the solid construction of our gear. The drum of the winch which took the 9000 metres of wire was of the best cast steel, and the blocks were made as substantial as possible, though even then they had to be changed during the cruise, because the

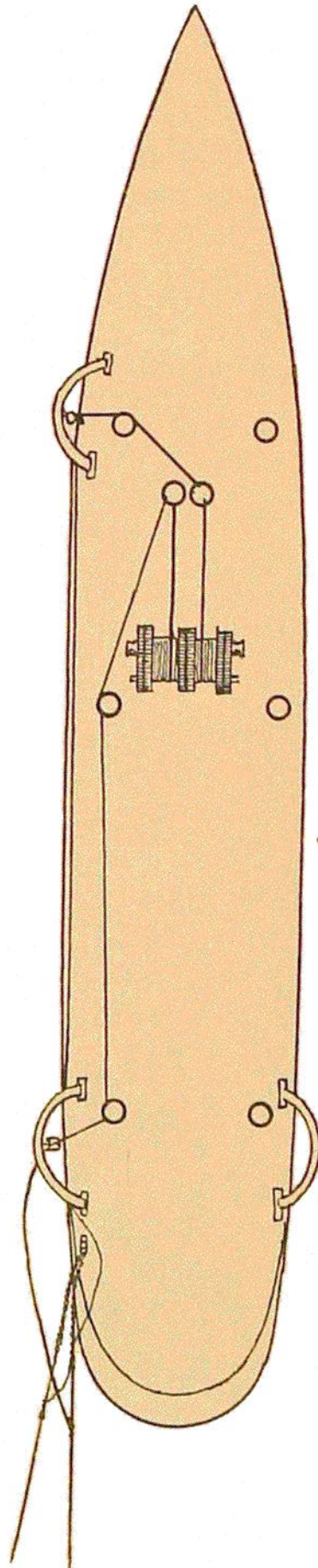


FIG. 25.—DECK ARRANGEMENTS OF A TRAWLER.