

speed when there was much line out and the weight was considerable.

Trawling.

For trawling, former expeditions employed the model designed by Sigsbee, 10 feet in breadth. This appliance, notwithstanding all its good points, is too small for catching large animals. Modern fishing steamers, which are quite small compared with the expedition ships of former days, mostly operate trawls 120 feet in length, having a span of about 60 to 80 feet, with a height at the entrance many times greater than that of the trawls employed for scientific purposes. Seeing then that a great many trials have been made in all oceans with the dredge and with Sigsbee's trawl, it was advisable to try whether a larger appliance would not yield different species and bigger catches, and it was natural to select as a model the appliance supposed to be best adapted for catching fish, namely, the

Otter trawl.

otter trawl in use among fishermen.

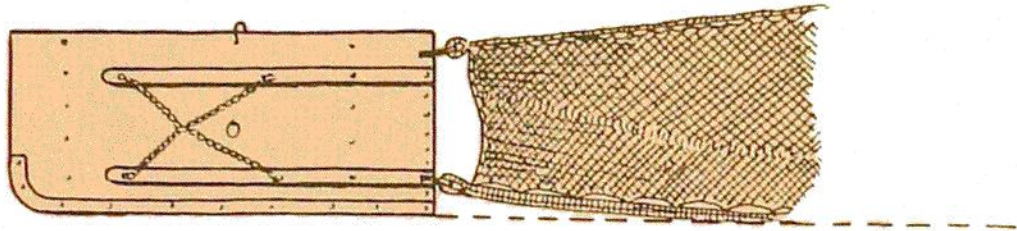


FIG. 24.—THE OTTER BOARD.

The difference between the otter trawl (Fig. 23) and the beam trawl (see the "Challenger" trawl, Fig. 11) is that in the case of the former the appliance is kept distended by means of otter boards, working on the principle of an otter for trout fishing or a kite in the air. The otter boards (Fig. 24) are attached to the line by bridles, and thus have a tendency to spread when towed along through the water. The regular trawlers use two steel lines of colossal dimensions, up to 3 inches in circumference and with a breaking strain of 20 tons; these are wound round two large drums that are keyed on to the slow axle of the trawl-winch (see Fig. 25), from which each line passes to its gallows and then astern, being carefully fastened with chains during the time that the vessel goes ahead towing the trawl after it. Sigsbee, it will be remembered, went astern when trawling, and he had one winch for winding the wire round the drum and another for the actual hauling in.

It is quite evident that the system adopted by the regular trawlers economises labour, for it is simple, and space is saved by using only one winch. The otter trawl, again, has to be