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SEA SCALLOP BOATS AND GEAR

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This leaflet is a revision of Fishery Leaflet 225, "Gear Used in the Sea Scallop Fishery", by William F. Royce, issued April 1947.

The sea scallop fishery is the most valuable of our North Atlantic offshore fisheries. During 1955, total United States landings of sea scallops were valued at 11.4 million dollars. In the same year, haddock landings were worth 8.1 million dollars and ocean perch 6.0 million dollars. Another 0.7 million dollars worth of sea scallops were landed in Canada. New Bedford, Massachusetts, the major sea scallop port, had landings of 13.9 million pounds worth 7.2 million dollars.

The animal which supports this fishery, the sea or giant scallop, (Placopecten magellanicus Gmelin), is a disk-shaped mollusk which may reach a diameter of 8 inches. The frontispiece shows the upper valve of a sea scallop about life-size. When this scallop was tagged it measured 4.65 inches from the hinge to the opposite margin; recovered 10 months later it had grown to 5.36 inches. Fifty years ago, fishermen reported 10-inch sea scallops but none of this size has been seen recently. Ninety-two percent of the 1955 catch were under 6 inches. The sea scallop has been dredged from the northern shores of the Gulf of St. Lawrence to Cape Hatteras, usually on gravel, sand or sand-mud bottoms. In the north, it is frequently found just below the low tide mark but south of Cape Cod it is restricted to the deeper, colder offshore waters.

Many sea scallop grounds are known and fished. Port au Port Bay, Newfoundland; Northumberland Strait, Prince Edward Island; the Digby and Grand Manan areas of the Bay of Fundy; the bays of the Maine coast; Stellwagen Bank and Cape Cod Bay; the Hudson Canyon area; and the Virginia Capes, all support small local fleets of sea scallopers. The total catch from all these areas, however, is small when compared to the crop which the New Bedford boats harvest from Georges Bank. About 60 percent of the total sea-scallop catch is landed at New Bedford and almost all of it comes from Georges Bank. Sea scallops caught on Georges Bank are also landed at Gloucester, Massachusetts; Rockland, Maine; and Lunenburg, Nova Scotia.

The greatest known sea scallop grounds are found between the 20- and the 50-fathom curves on Georges Bank. A dredge set almost anywhere in this area will bring up at least a few sea scallops. Within this general area, the Northern Edge, the Northeast Peak, the Southwest Part, and the South Channel grounds have been, for the past 10 years, the most consistent producers of sea-scallop crops. Many areas that are known to have concentrations of large sea scallops are not usually fished because the rough bottom damages the gear excessively.

The sea scallop, unlike many of the other commercial mollusks, cannot close its shell tightly and retain water within. As a result, it dies very quickly after it is caught and spoils unless it is iced. On all of the vessels fishing the offshore grounds, it is therefore necessary to shuck the scallops as soon as they are caught. In shucking, the single adductor muscle (usually called the "eye" or "meat"

by fishermen) is separated from the shell and viscera (called the "rim"). The meats are then washed in clean sea water and packed into new cotton bags holding about 4 gallons and weighing about 36 pounds when full. These bags are then iced down in the hold. After arrival at port, the dealer purchasing the catch generally barrels up the bagged scallops and stores them in a refrigerator until they are sold either fresh or quick-frozen. Some packers prepare sea scallops for sale by cutting them into small pieces and frying them in deep fat after which they are placed in consumer-size packages and frozen.

There are about 70 or 80 boats of the New Bedford fishing fleet now rigged for sea scalloping. They range from 60 to 100 feet long and are powered by Diesel engines up to 550 horsepower. All are equipped with depthfinders, Loran navigating sets, and ship-to-shore radiotelephones. Almost all of them are fairly new and extremely seaworthy craft. A winter gale on Georges Bank will soon seek out the weaknesses of any vessel. Construction and deck arrangement is very similar to the usual medium-sized New England dragger. Many of the boats change over from trawling to scalloping and back again to accommodate themselves to changing fishing and marketing conditions. Any well-found dragger can rig up for sea scalloping by removing the nets and otter-boards and taking aboard the shucking boxes, wash tank and the booms necessary for handling the dredges. The same double-drum fishing winch, wire rope, and forward gallows frames are used.

Figure 1 shows a modern dragger, the Edgartown, rigged for sea scalloping. This vessel is 79.1 feet registered length, 115 gross tons, and is powered by a 400 horsepower Diesel engine. She was built in 1955 at a reported cost of \$125,000 fully rigged and ready for sea. The pair of booms which can be seen rigged on the foremast is the characteristic which always identifies an offshore scalloper. Notice also the shucking boxes with lights over them just forward of the wheelhouse. A vessel of this size carries a captain, a mate or engineer, a cook, and 8 fishermen. At sea, she will fish 24 hours a day with the watch changing every 6 hours.

Some years ago, an agreement between the boatowners and the fishermen's union limited the length of each trip and the amount of the catch. These limits had been established ostensibly to conserve the stocks and ensure landing the scallops in a fresh condition. This agreement has since been abrogated by the courts as being in restraint of trade. Most of the New Bedford boats have been able to make a full fare, about 11,000 pounds, in 8 to 10 days at sea. In the summertime, trips are generally not longer than 7 days so that there is no chance of the catch spoiling because of premature melting of the ice in which it is packed. The boats make about 25 trips a year and land about 250,000 pounds of scallops worth roughly \$130,000.

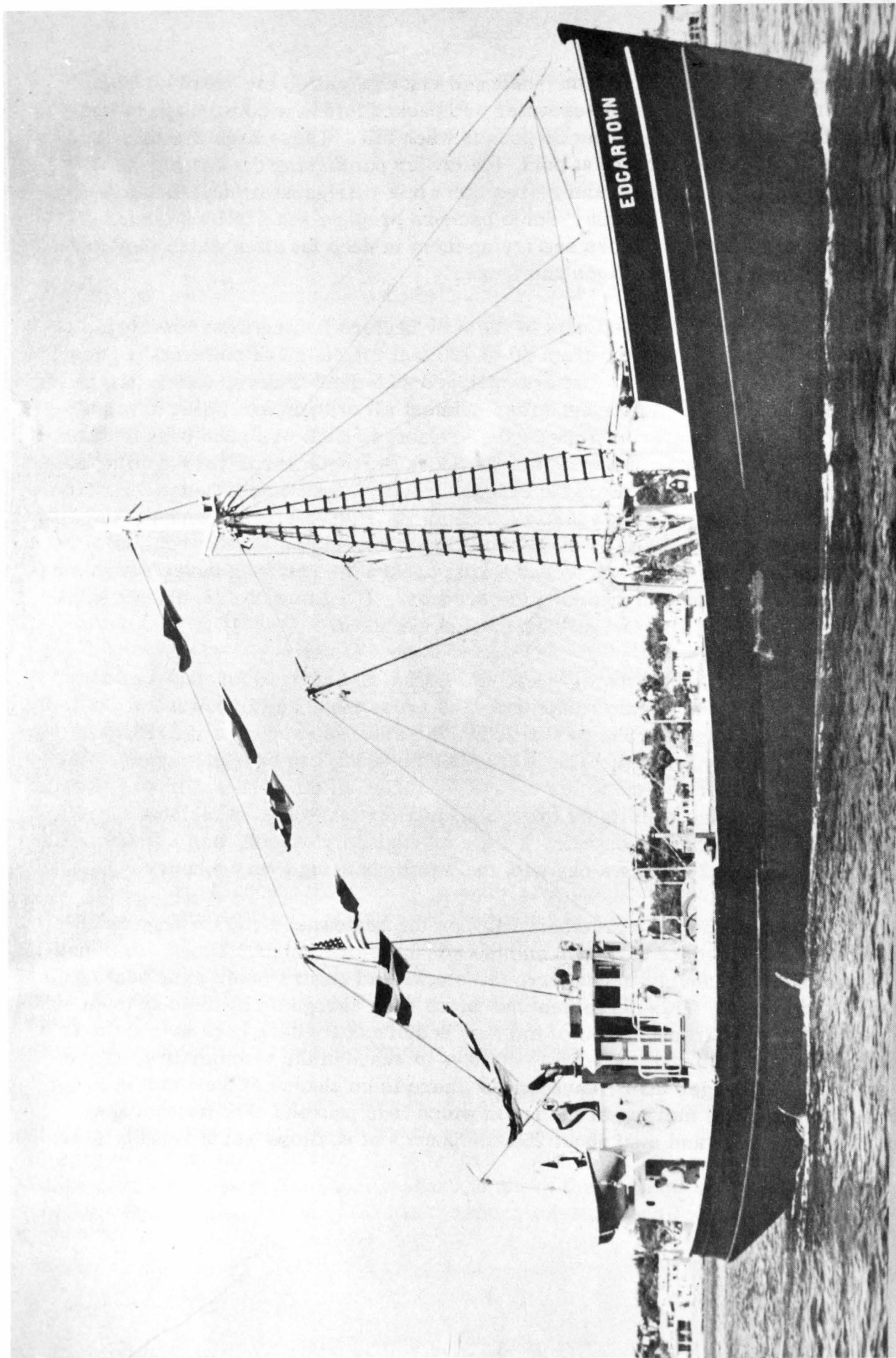


FIGURE 1. A MODERN SEA SCALLOPER FISHING OUT OF NEW BEDFORD, MASSACHUSETTS

Most of the vessels fishing out of New Bedford use two dredges, each 11 feet wide. They are towed together, one from each forward gallows frame, and brought up alternately to be dumped on deck. The dredges are very sturdy so that they will stand up under the rough use that they get. A complete 11-foot dredge with 3-inch rings weighs about 1,400 pounds when empty. Some of the smaller boats with less power use 8- or 10-foot dredges and 13-foot models have been tried on the larger boats but the 11-foot dredge is now fairly standard in the New Bedford fleet. There is really no standard design for a dredge; each fishing captain has his own ideas on what makes for efficient gear and modifies and alters the basic design to suit himself. The dredge illustrated in the drawing and photographs was made up by a fabricator of dredges as a typical offshore sea scallop dredge.

Figure 2 shows most of the details of construction. The holes for the links used in attaching the bag are spaced 4 inches apart around the frame. From the photographs, it will be seen that the links are fastened to the front edge of the top bar of the frame. This keeps them in a protected position if the dredge should turn over on its way to the bottom and be dragged along upside down. The side of the bail is designed so that the angle between the bail and mouth of the dredge may be changed to suit bottom conditions. When the bottom is soft, the forward holes are used so that the scraper blade will tend to ride up over the bottom and there will be less tendency for the dredge to become clogged with mud. On harder bottoms, the after hole is used and the dredge will tend to dig in somewhat and catch more of the scallops that are in its path. The bottom of the bag was formerly attached to the lower bar of the frame but most fishermen now use the chain footrope. They feel that the footrope hugs the bottom better than the bar and picks up more scallops.

The bottom, sides, and the after part of the top of the dredge bag are made up of steel rings connected by steel links. The forward part of the top of the bag is a section of webbing usually called the "twine back". The twine back is made up of 5/16-inch manila or braided cotton sash cord with the meshes formed with cord clips or hog rings. The webbing is made up on a board which has two parallel rows of nails on 1-inch centers about 5 feet apart; lines are drawn 3 inches apart parallel to and between the two rows of nails. The twine is wound around each nail, back and forth between the rows, and the meshes then formed with the cord clips along the lines. The finished webbing is thus 6-inch stretched mesh. It is made up 44 meshes wide and 10 meshes deep. A single row of rings is linked to one of the long edges so that it can then be attached to the upper bar of the mouth of the frame. The three other edges of the webbing are attached to the rings of the bag with links. The club maintains the shape of the bag while it is being towed and while it is being dumped.

MATERIALS LIST FOR 11-FOOT SEA SCALLOP DREDGE

FRAME

11 feet - 3-1/2" x 2-1/2" x 5/16"	angle hot rolled mild steel
21 feet - 2-1/2" x 1/2"	flat " " " "
5 feet - 2-1/2" x 3/4"	" " " " "
18 feet - 1-3/4"	round " " " "
14 feet - 1-1/8"	" " " " "
11 feet - 3-1/2" x 3/8"	flat spring steel
12 - 1/2" x 1"	rivets
18 - 3/4" x 2-1/2"	bolts
12 - 5/8" x 3"	bolts
1 - 1" x 4"	bolt

BAG

160 pounds - 5/16" x 3" I.D.	welded steel rings
130 pounds - 5/16" x 1-1/8"	open dredge links
10 pounds - 5/16"	cord clips
500 feet - 5/16"	braided cotton sash cord or nine-thread manila

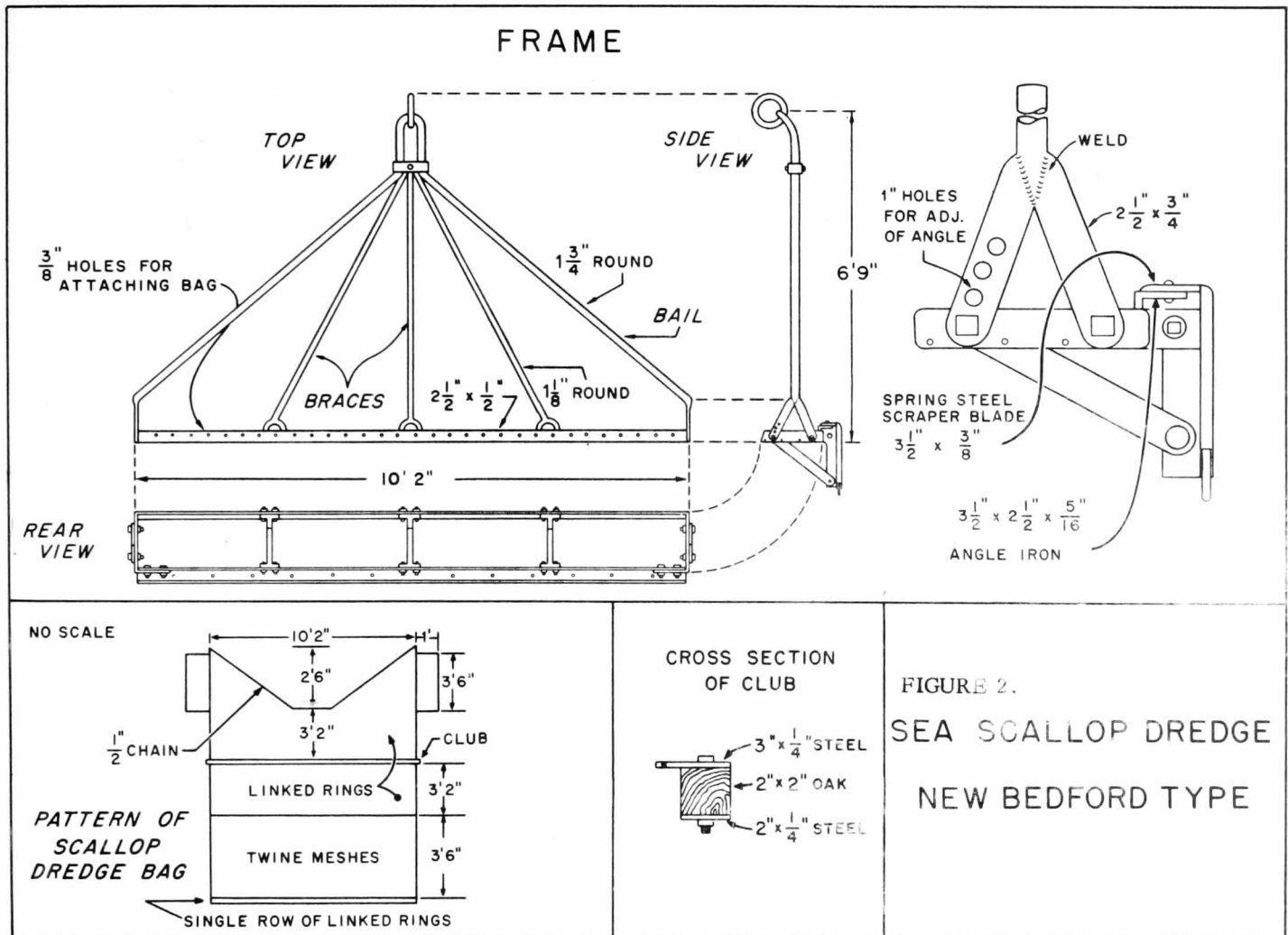
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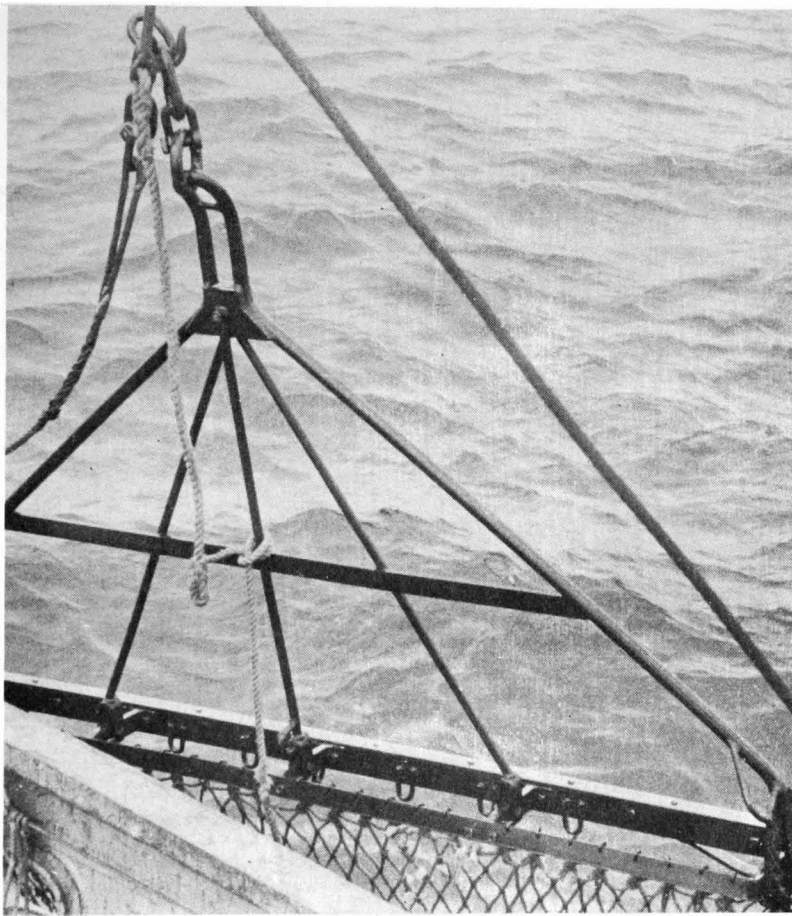
11 feet - 3" x 1/4"	flat hot rolled mild steel
11 feet - 2" x 1/4"	" " " " "
11 feet - 2" x 2"	oak
30 feet - 1/2"	chain

The list of materials represents the requirements for a single dredge, with some extra rings and links. The frame of the dredge may last for several seasons although it will need occasional repairs as certain parts wear or are damaged. The bag, however, will require constant repair with new links and rings as it is being fished and may have to be completely replaced after about three trips on rough bottom. Fishing on smooth bottom, fishermen report that a bag will last 6 or 8 trips. Accordingly, the materials listed for the bag should be increased several times to allow for repairs and replacement according to its anticipated use.

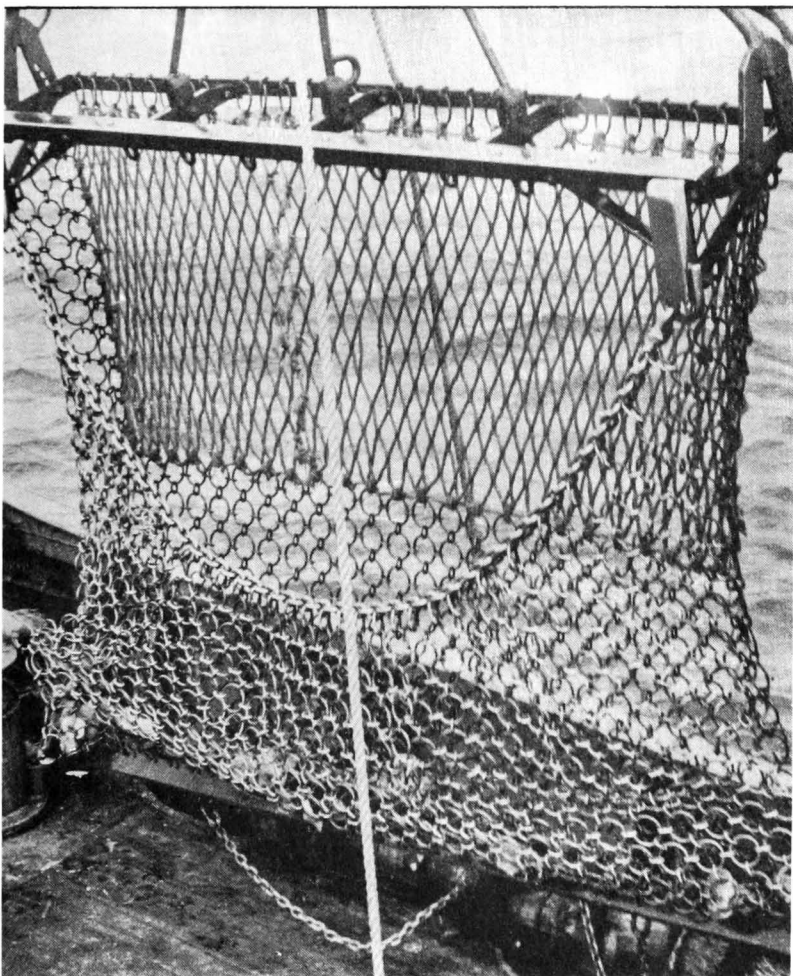
The weight of the gear is so great that almost all operations connected with bringing it aboard and resetting it are done with the aid of power. The dredge is brought aboard by hauling back on the wire cable until the bail of the dredge is at the block on the gallows frame. The boom tackle is hooked on the bail, the winch

brake is released, and the dredge is brought inboard on the boom tackle and dropped on the deck. The hook of the boom tackle is then transferred to the chain which is fastened to the club and the whole dredge is hoisted upside down to dump the catch on deck. The dredge is reset by reversing these steps. The live scallops are culled from the catch and the stones, shells, weed, and unsaleable animals are shoveled back over the side.

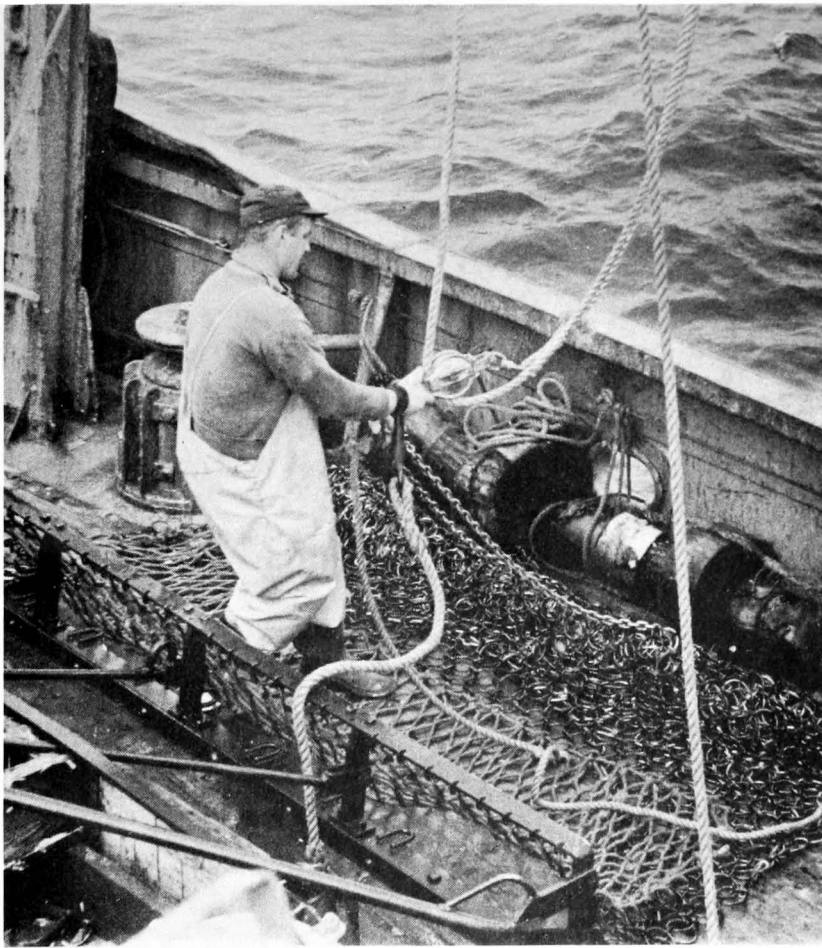




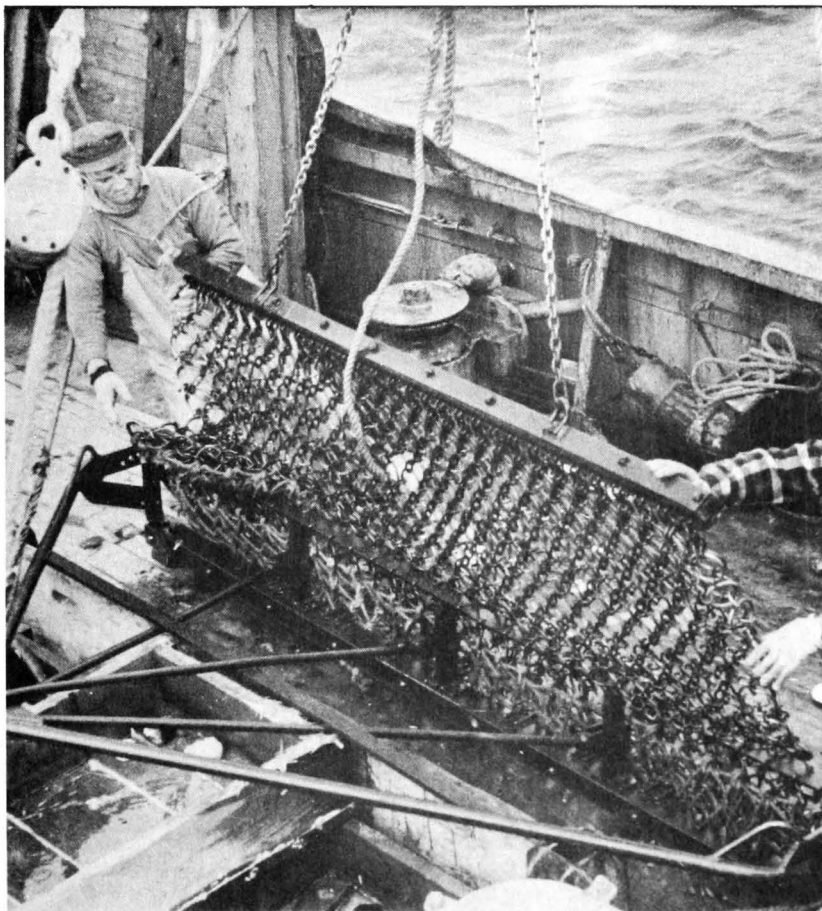
LIFTING WITH THE BOOM TACKLE



DREDGE INSIDE THE RAIL



THE BOOM TACKLE IS SHIFTED



CATCH DUMPED ON DECK



HAULING BACK



HOOKING UP THE BOOM TACKLE