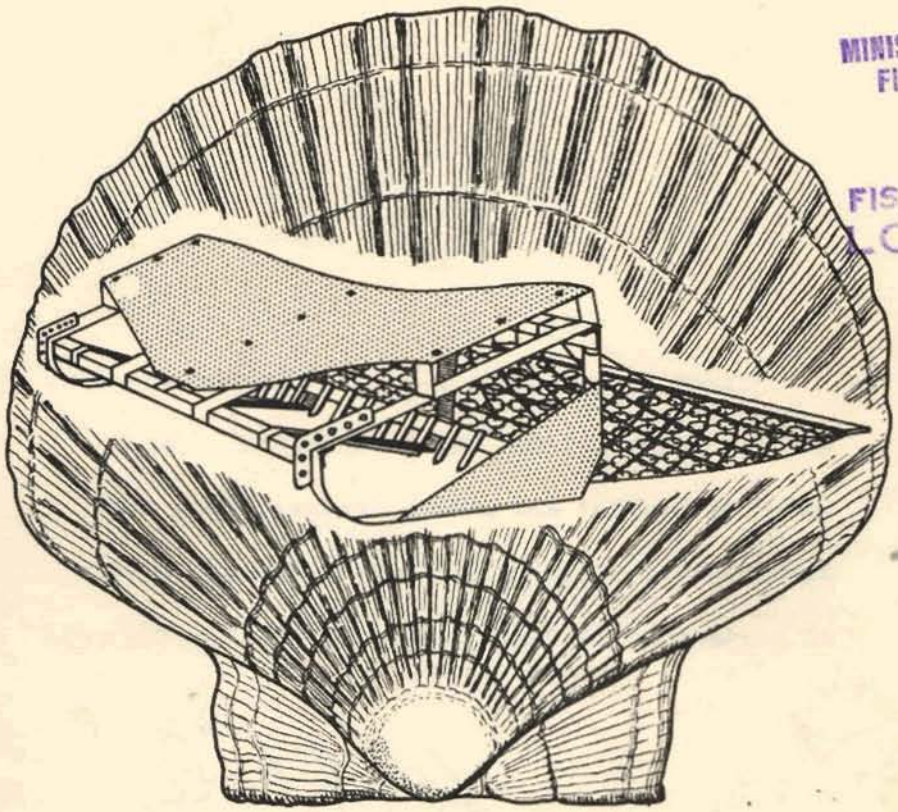
MINISTRY OF AGRICULTURE, FISHERIES AND FOOD

NOTES ON ESCALLOPS



AND DETAILS OF THE BAIRD SLEDGE DREDGE AND ITS HANDLING

LABORATORY LEAFLET (NEW SERIES) No. 5
FISHERIES LABORATORY
BURNHAM ON CROUCH
ESSEX
FEBRUARY 1965

Laboratory Leaflet (New Series) No. 5

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I. NOTES ON ESCALLOPS

Where found

Escallops occur in many places around our coasts, but are found in commercial quantities only in relatively few areas. They appear to prefer a coarse sandy or shelly bottom but are also dredged from stony, gravelly and muddy ground; they are found in a wide range of depths, but usually between 10-30 fathoms. The most important grounds around England and Wales are those near the Isle of Man, in the Channel off Newhaven, Sussex and near Brixham, with smaller quantities at several points along the south coast and off North Wales and Northumberland. Escallops also occur off the Yorkshire and Durham coasts but only in small numbers and on or among ground that is too rough for any dredging.

Life history

The eggs and larvae are free-floating and drift at the mercy of the tides and currents. After a period of unknown duration they sink to the bottom and attach themselves with sticky threads to seaweed or other marine growth on the bottom. Finally they detach themselves and continue their lives on the sea-bottom. Escallops lie recessed in the sea-bed in shallow depressions, the curved shell down and the flat shell just level with the surface. Contrary to what was once believed escallops do not start their lives in shallow water and then move to deeper ground, but appear to remain in more or less the same area all their lives.

The escallop is able to swim by expelling water backwards from its "ears", thus moving with its curved edge forward; in effect it is jet-propelled. Apparently it uses this method of movement only to escape from enemies or to get off an unsuitable bottom - for instance, if by chance it is moved on to a hard bottom into which it cannot recess.

Escallops feed by filtering microscopic organisms from sea water which they pass through their gills. Around the edges of the mantle, lining the inside of the shell, there are a considerable number of bright blue light-sensitive spots which act as eyes, permitting the animal to close its shell rapidly when approached by a potential enemy.

Age and growth

The rings on the shell are formed at the end of each winter and

are usually clear enough (especially on the flat shell) to show the age. Twelve- to fifteen-year-old escallops are not infrequently found in areas where there has been little or no dredging.

In Devon and the Isle of Man, there is a minimum size limit for escallops of 4½ inches across the widest part of the shell. Escallops grow quickly and it is well worth while to return the undersized fish to the sea.

Spawning and condition

Escallops become mature when they are two to three years old and about 3½ inches across their widest part - though this may vary from area to area. The male and female parts of each escallop are combined into one structure, usually called the "tongue", the base of which is creamy-white (the male part) and the pointed part orange-red (the female organs). Spawning usually occurs in late spring and again in the autumn. Thus escallops usually have full bright tongues during the winter and early spring and are then in their best condition; after spawning the tongues become shrunken, soft and dull brown in colour, and in Europe there is little market for them in this condition. However, they quickly recover and may be in good condition again for a short time in the summer before the autumn spawning.

The large muscle of the escallop, which (with the tongue) is the main edible part, is usually bright white or near white, but the muscle of older individuals becomes dull in colour and, though still good to eat, is not so attractive.

Fishing

Escallops are usually caught with toothed dredges that lift them out of the sea-bed in which they lie, leaving any stones behind. There are two main kinds of dredge:-

(a) The traditional standard dredge: in this the blade carrying the teeth (which are 3 inches long and set 2½ inches apart between the centre) is set at 45° in a triangular frame.

(b) The Baird sledge dredge: in this the blade carrying the teeth is set on to a frame with runners and a diving plate. The design of this dredge and the method of handling it are set out in detail in Section II of this leaflet.

These two dredges are fished quite differently; the traditional dredge requires a warp at least four times the depth of the water and to keep the gear fishing on the bottom it is necessary to move relatively slowly, otherwise the dredge proceeds in a series of jumps. The newer sledge dredge, however, has a diving plate which uses the

water drag to keep the gear on the bottom, while the runners ensure the correct depth and angle of the teeth. The faster the dredge is pulled the closer it hugs the bottom.

Catches of over 24 escallops per 15-minute haul are usually considered of commercial value for a 40-foot boat having a crew of two and using a winch to haul two 6- to 8- foot dredges.

At Brixham, after big seas have disturbed and lifted escallops from their depressions in the sea-bed, some fishermen trawl for them with a small trawl of conventional mesh size having a heavily chained foot-rope.

Handling of escallops

(a) Live: The shells are cleaned of any adhering marine growth and stored in boxes out of the sun, but unlike many other shellfish escallops cannot completely close their shells, and so in warm weather drying out (and hence loss of quality and value of the meats) becomes a serious problem. However, this difficulty can be overcome by shucking and freezing.

(b) Shucking

Opening: The escallop can be most easily opened by placing it on a board with the curved shell down and the hinge away from the operator. The escallop is held on the board by the left hand while a knife is inserted just in front of the ear and moved slightly backwards and forwards until the small muscle situated alongside the main muscle is severed. The escallop will then gape and the main muscle, which should be damaged as little as possible, can be cut cleanly away from the flat shell which can then be removed.

Cleaning: All the tissues surrounding the muscle and tongue are pulled away and discarded, leaving the tongue attached to the muscle. This is now washed clean of adhering tissue and then cut cleanly off the curved shell. The meats, with the tongues, are packed with ice in boxes until taken to the factory where they are quick-frozen on trays separately.

II. DETAILS OF THE BAIRD SLEDGE DREDGE AND ITS HANDLING

As stated in Section I nearly all escallops lie recessed in the bottom, usually with the flat shell lightly covered with bottom material. It is therefore necessary for a dredge to have sufficient penetration of the bottom to get below the edge of the shell. This is usually accomplished by having teeth fitted to the dredge blade, although not all escallop dredges have teeth. Diving observations of dredges in action have shown that on a clean, sandy bottom a penetration of only a quarter to half an inch is obtained with the standard type dredge, thus missing many of those escallops that are more deeply recessed. A dredge of the standard pattern has an efficiency in the order of 10%.

The sledge dredge consists of a toothed bar, supported on runners and set to maintain an angle of 45° to the bottom. This toothed bar can be raised or lowered to allow for lesser or greater penetration of the bottom.

In order to allow greater speed of tow without the dredge leaving the bottom, a diving plate is fitted which is raised at the sides to form an anhedral angle; this gives stability while the dredge is in midwater during shooting.

Figure 1 shows the construction of a 5-foot sledge dredge suitable for use from a 20- to 30- foot boat. If a larger boat is to be used, the size of the materials of the framework of the dredge has to be increased, particularly that of the angle iron at the leading edge of the dredge, which takes much of the load when the dredge strikes an obstacle. Figure 2 shows details of a 6-foot dredge incorporating these features. If the size of the dredge is increased beyond six feet, it has been found to be useful to incorporate a third runner in the centre and to have three points of tow in order to distribute the loading more evenly.

Rigging the dredge

The rigging of the sledge dredge is very little different from that of a standard dredge. A chain-link belly is fitted to the top edge of the toothed bar in the normal way. This belly consists of 3-inch internal diameter rings of $\frac{1}{4}$-inch steel rod joined together by 1-inch rings of similar material. Details of the construction of the toothed bar and ring mesh are shown in Figure 3.

The top of the bag is made from netting of sisal, manila or nylon with a 5-inch stretched mesh. One row of rings of the belly is turned inwards along both sides and at the back, the netting being attached to these edge rings by rawhide thongs, and the front edge of the netting

is attached to a line fixed at either end of the upper horizontal bar at the back of the dredge. A cross-stick is fixed to the back of the belly of the dredge by staples. The cross-stick has a bridle fitted for lifting and emptying the bag after the dredge has been hauled. The free end, or eye, of this bridle is usually tied to the dredge frame so that it can be easily reached when the dredge is hauled inboard. The towing bridle, which is of wire or rope, is shackled into the towing eyes at the front of the dredge. When using wire warps for towing, the tow points can be taken from the leading edge of the dredge. When rope towing warp is used, it is necessary to have the tow points about a third of the way back along the side members as shown in the drawings.

Shooting and hauling

The dredge is shot from a slip hook on a derrick (see Figure 4) while the boat steams straight ahead. When using wire warps and a winch, the brake is left off the winch and the warp allowed to run freely until the required amount has been paid out. When a rope warp and capstan are used, one turn of the warp on the capstan is sufficient and again the warp is allowed to run out freely. Once on the bottom, the dredge may be towed as fast as conditions permit.

Hauling the dredge is perfectly straightforward. It may be done while still towing, although little advantage is gained by doing so. When the bridle of the dredge has reached the gallows block or the molgogger or roller fairlead, the tackle which is used in conjunction with the slip hook for shooting is hooked into the eye of the bridle and the dredge is hauled until the frame is just clear of the rail. The frame is tipped inboard while the tackle is slacked away, leaving the bag with catch lying outboard. Then the tackle is hooked to the bridle on the cross-stick, and this is hauled until the bag is vertical.

Notes on tooth setting

Where the bottom is of soft gravel, it is advisable to use longer teeth than usual. The toothed bar should be set so that there is a definite shine on the front of the teeth for about 1-1½ inches after towing. If the toothed bar is set too low, too much trash will be taken, entailing too frequent hauling and loss of efficiency: the dredge will not, of course, continue to fish when the bag is full.

Comparisons with standard dredges

When the sledge dredge has been fished against a standard Manx dredge on a clean sandy bottom, it has caught twice as much as the standard; when the speed of tow has been increased for both dredges the catches of the sledge dredge have increased by half, but the catches of the standard dredge have not increased. Thus, when both dredges have been towed at their best speeds, the sledge dredge has caught three times as much.

On stony ground the sledge dredge catches more stones because of its firmness on the bottom, and this may often be a grave disadvantage. On soft gravel bottoms, the sledge dredge has not given the same increase in efficiency as on sandy bottoms. A sledge dredge with longer teeth has been built for a firm in Cornwall for use on a soft gravel bottom. No controlled comparisons have been made between this dredge and the standard type on this ground, but it has been reported that the catches of the sledge dredge were about twice those of the standard.

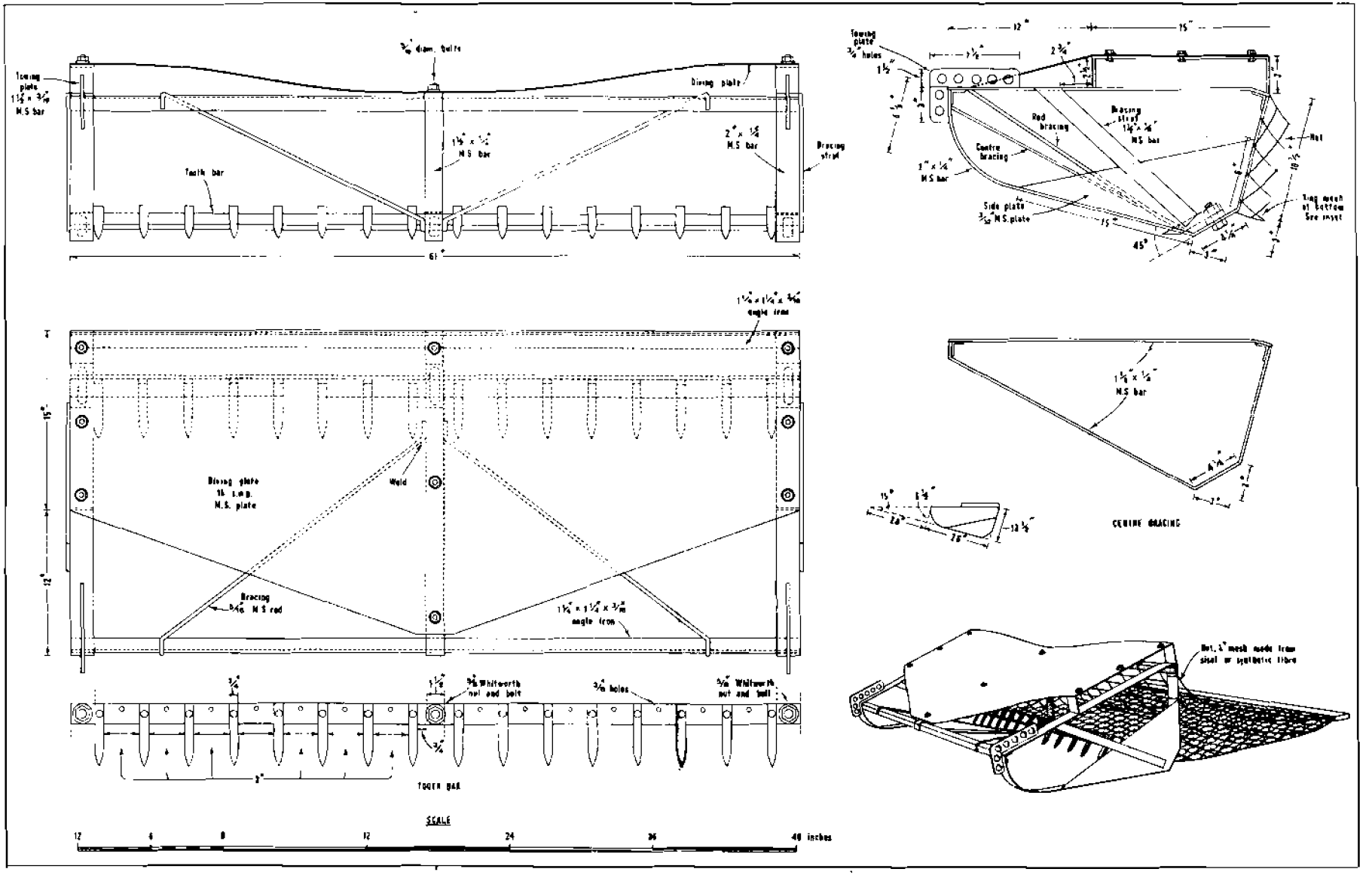


Figure 1. Details of the construction of the Baird sledge dredge (5-foot model).

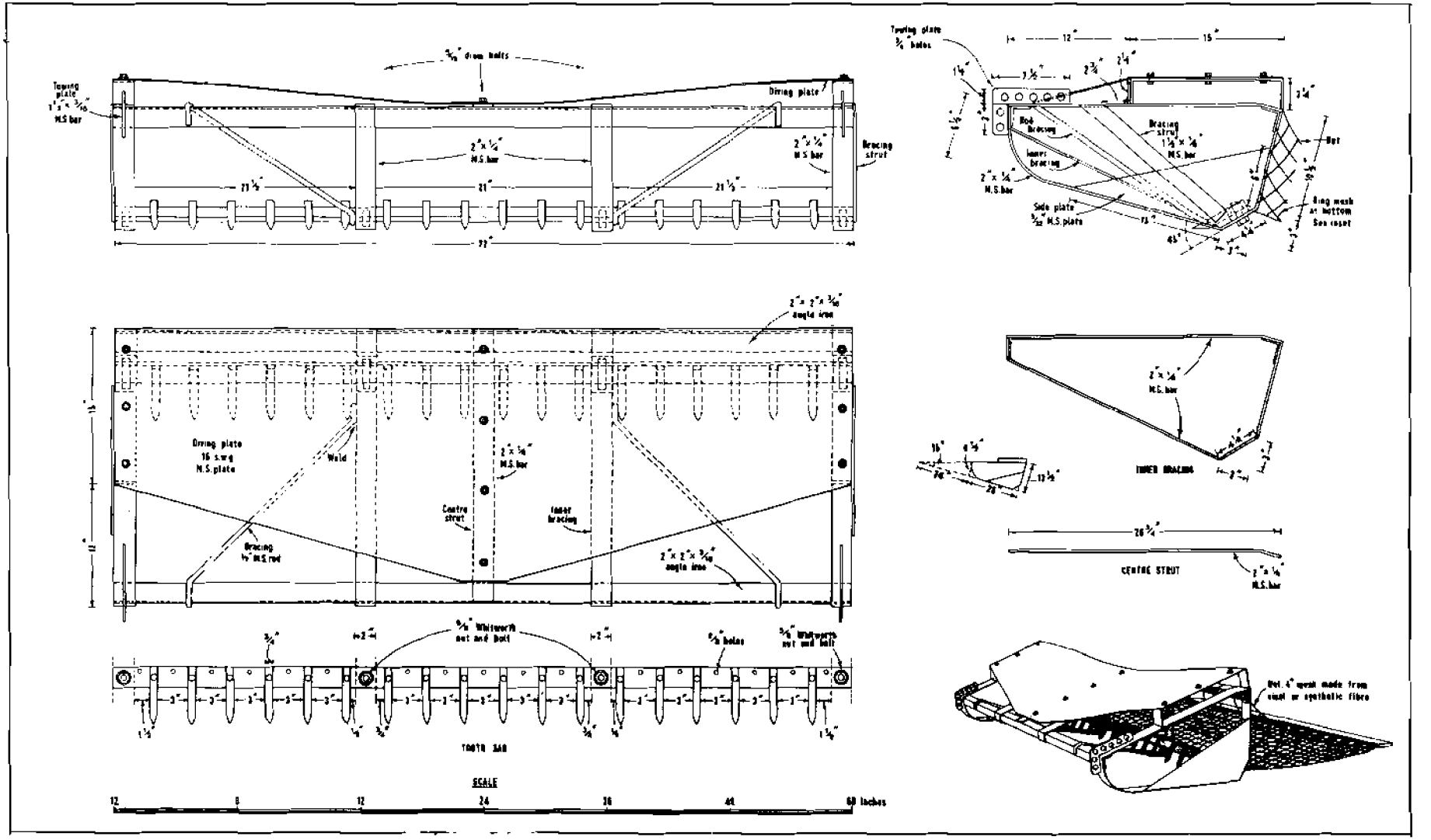
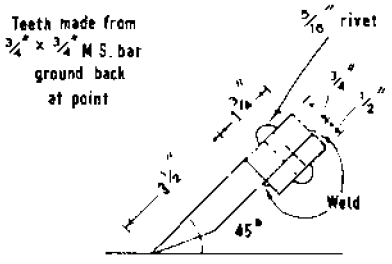


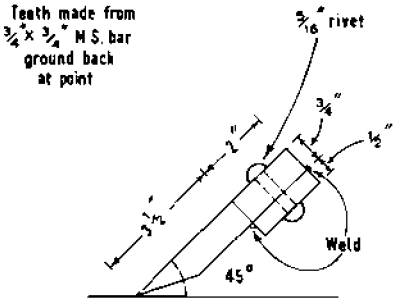
Figure 2. Constructional details of a large sledge dredge (6-foot model), showing modifications to the size of the materials of the framework.

A

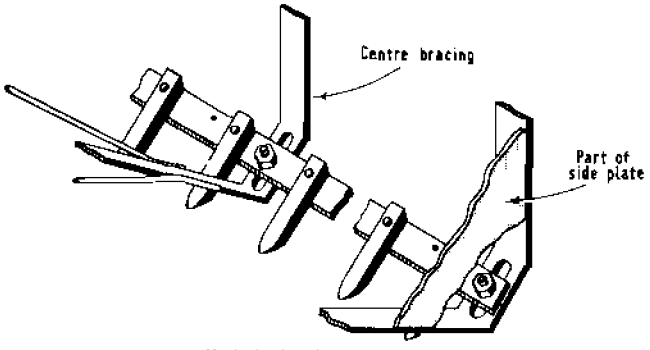


Working position of teeth

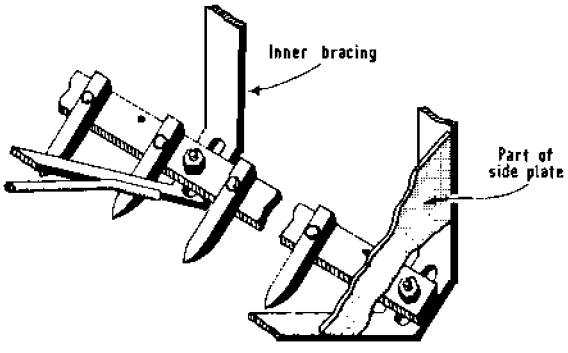
B



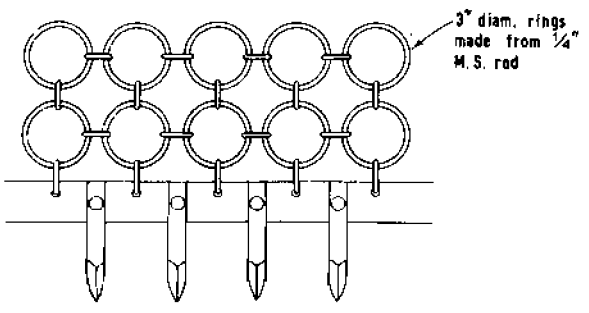
Working position of teeth



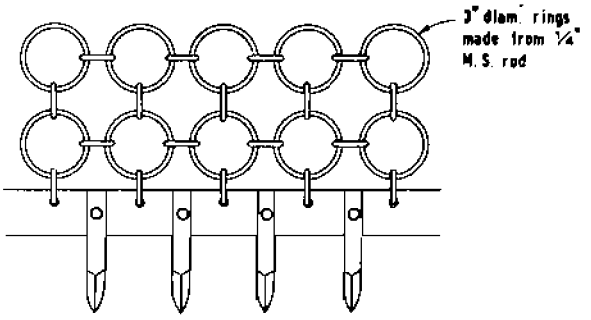
Method of adjustment



Method of adjustment



Underneath view of part of tooth bar
showing ring mesh attachment



Underneath view of part of tooth bar
showing ring mesh attachment

Figure 3. Details of tooth bar and ring mesh.
A: 5-foot model; B: 6-foot model
(drawings not to scale).

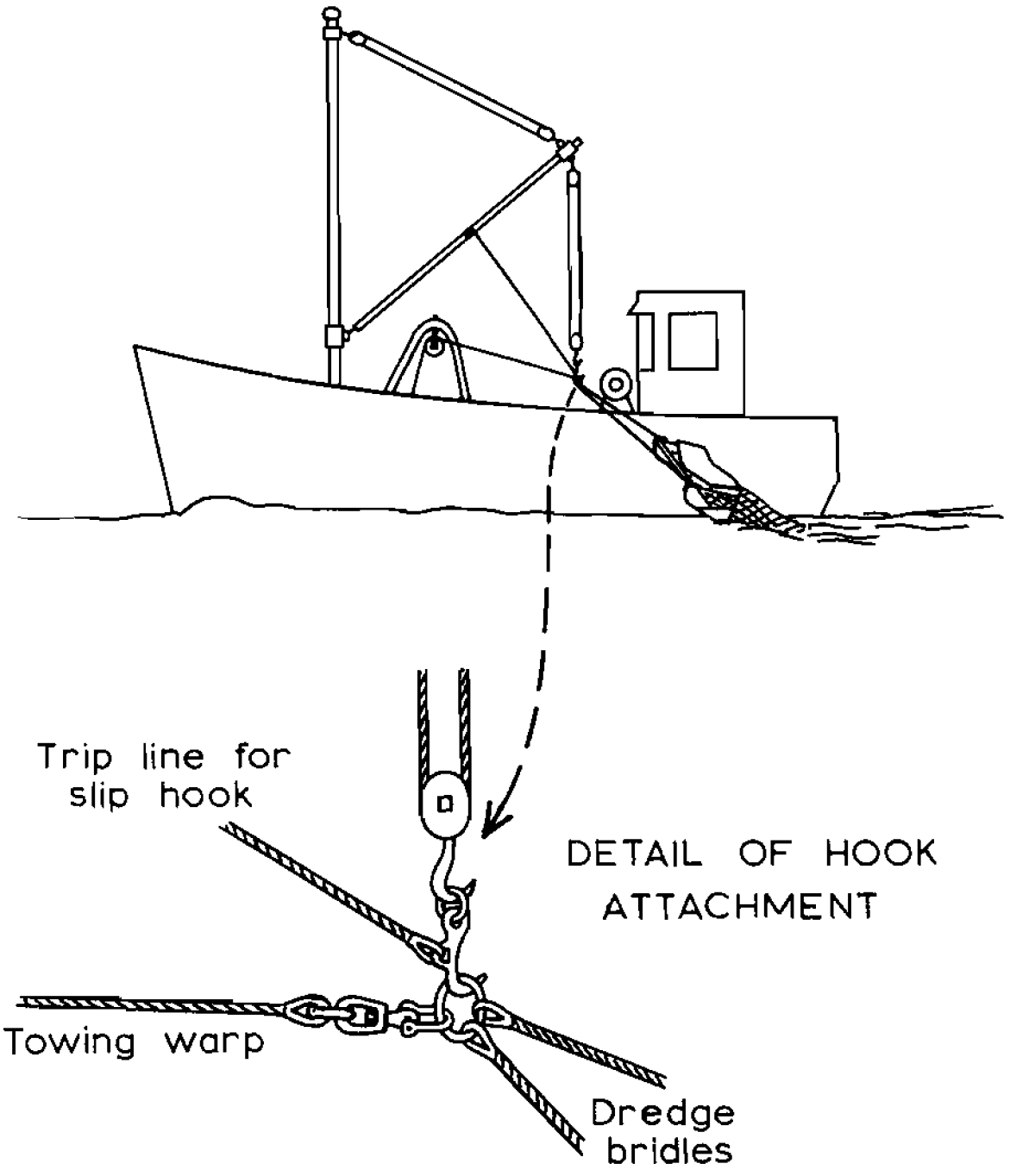


Figure 4. Method of shooting the Baird sledge dredge, using a derrick and slip hook.