

RECENT INNOVATIONS FOR TRAWL NET REELS

By William L. High*

Over 90% of Pacific Northwest United States trawlers now are equipped with trawl net reels. Reels permit many vessel crews to be reduced from 4 to 3 men. Hydraulic power has largely replaced the original cable drive "yo-yo" system. Restrictive flanges on reels confine the groundlines. Flanges bolted around the core allow convenient adjustment. The trawler "Westness" has a net reel that holds 2 complete trawls, and the crew can set either trawl with no loss in fishing time. The net reel aboard the Bureau of Commercial Fisheries Research Vessel "John N. Cobb" has been modified so that it also operates as a constant-tension winch. Most net reel-equipped trawlers also have a stern rail roller to reduce chaffing and wear to web and groundlines as they slide over the stern.

Trawl net reels were first introduced to United States fishermen of the Pacific Northwest in 1954 (Alverson, 1959). The reel greatly reduced the work while setting or retrieving a trawl. Many captains credit the trawl net reel as being a major factor in reducing their crews from 4 to 3 men. Since no major modifications to vessel or gear were necessary, the reel was easily installed on nearly any stern trawler (Wathne, 1959).

A net reel provides several advantages over the early method of fishing, which used bypass links to wind groundlines on the main towing winch and to strap in the net. Now, the groundlines are transferred from the otter board to the reel and are quickly wound onto the drum. Forward sections of the trawl are also wound onto the drum before the bag is maneuvered to the vessel's starboardside for unloading. Since the net is no longer lifted high into the rigging while the web is strapped in, chances of injury to fishermen by the swinging floats are eliminated.

RECENT INNOVATIONS

Since 1954, numerous worthwhile improvements have been made on net reels:

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Hydraulic Drives

Early reels were turned by a cable wound around the reel and attached to the main winch. The cable was rewound onto the reel by water resistance on the trawl as it was set over the stern. This technique was called "yo-yo" power (Lippa, 1967) and has now been replaced largely by hydraulic power sources.

Groundline Flanges

The basic design of the trawl net reel requires fishermen to guide the retrieved groundlines evenly back and forth on the reel core. This action prevents cable from building up excessively and the trawl being recovered unevenly. Also, groundlines sometimes foul if unattended.

To eliminate the need for levelwinding groundlines by hand, some captains have added a second flange about 12 inches inside each end flange (Fig. 1). Groundlines are wound within this restricted area and need not be closely attended. As the net reaches the reel, the groundlines are pushed through a notch on the inside flange (Fig. 2) and the net wound on the center part of the reel. Until recently, the inside flanges were welded to the core, but a more versatile means is illustrated in figs. 1 and 2. The flange is securely bolted around the core and can easily be removed or adjusted.

Dual-Section Reels

The trawler Westness has incorporated a useful modification that allows the crew to change trawls rapidly. This net reel is very large and is divided in the middle with a flange (Fig. 3). One net complete with groundlines is attached to each section. The value of the dual-section reel is twofold. First, most trawlers carry at least one spare trawl in the event that gear is lost or damaged severely while fishing. If a spare net is carried on the reel, no fishing time is lost when the primary net requires repair--because this can be

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Sep. No. 817

one while the spare trawl is used during the next tow. Secondly, captains like to have one net rigged that sweeps the bottom when capturing flatfishes and another that has a high mouth opening for capturing rockfishes.

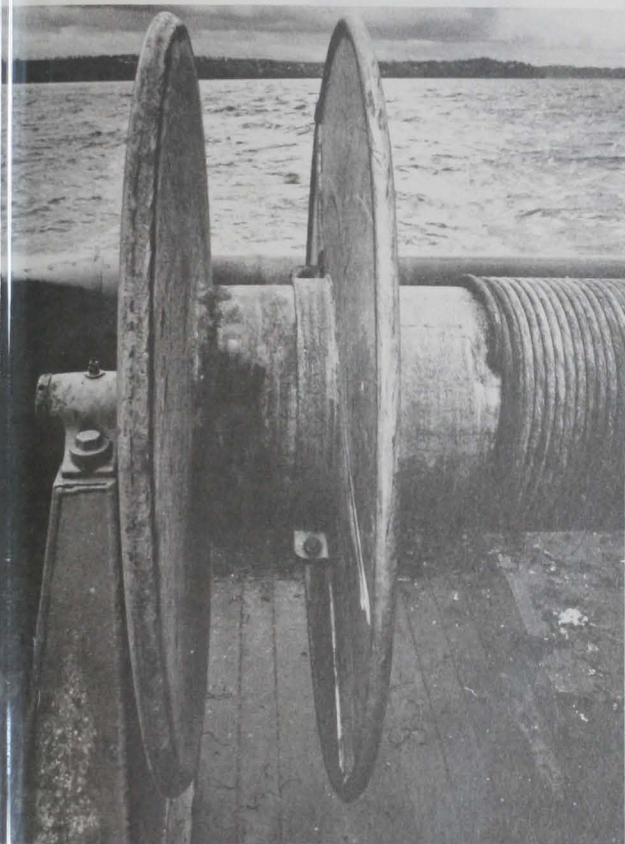


Fig. 1 - Dual flanges keep the net groundlines in a restricted section with minimal supervision. Note that the inside flange is of two half circles bolted around the drum core to permit easy removal or adjustment of width.



Fig. 2 - When the groundlines are nearly retrieved, they are pushed through a notch in the inner flange so that the trawl will be wrapped onto the center portion of the core.

If the captain operates with nets having different fishing characteristics, he can immediately set whichever trawl is appropriate. It is only necessary to firmly tie the unused net in place so that it will not loosen when the reel rotates.

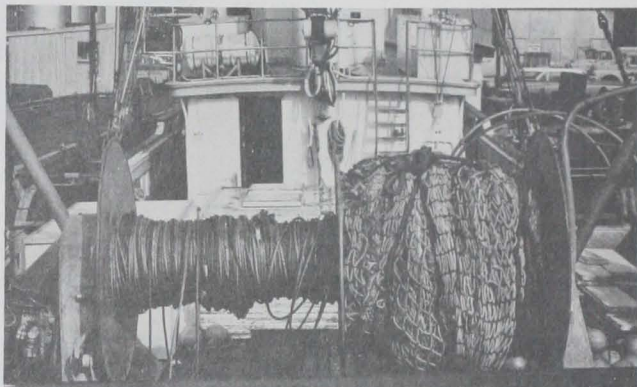


Fig. 3 - The stern trawler Westness is shown with a dual-section net reel, which can hold two nets simultaneously. Either trawl may be set without adjustments because the remaining trawl is firmly lashed in place while the reel is turned.

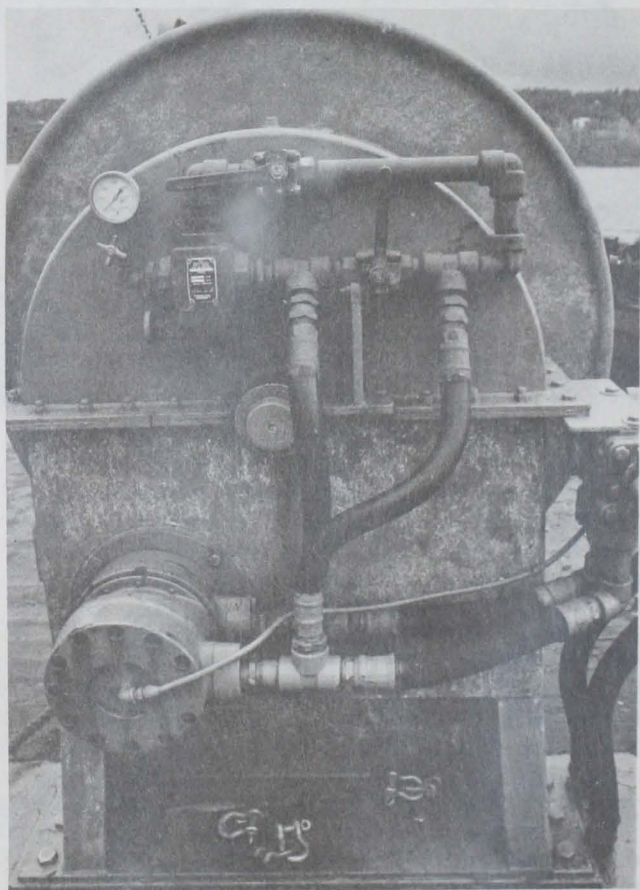


Fig. 4 - The hydraulic bypass system on the John N. Cobb's trawl net reel. This system allows the net reel to be used as a constant-tension winch.

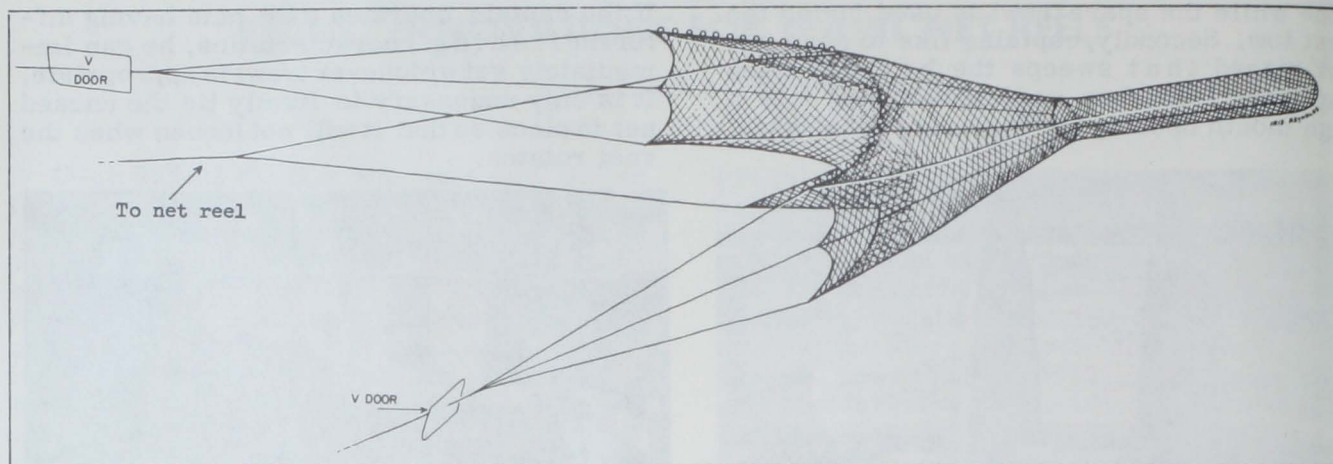


Fig. 5 - Arrangement of an eight-bridle trawl using a trawl net reel for the third towing point.

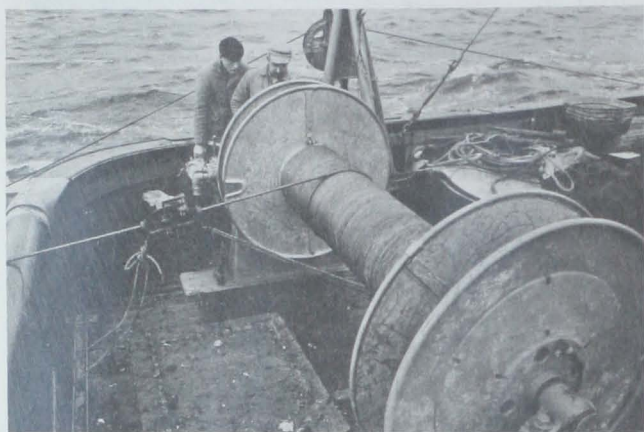


Fig. 6 - Trawl net reel modified to operate as a constant-tension winch and net reel. A cable meter is attached to the third wire after the net has been wound off the reel. Note the quick disconnect waterproof plug near the axle on the end flange, which links telemetry packages on the trawl to the vessel by electromechanical towing cable. A stern rail roller is shown at the left of the picture. (Photos: William L. High)

Use As a Third Wire Winch

The Bureau of Commercial Fisheries has modified the trawl net reel aboard its research vessel John N. Cobb to work also as a constant tension third wire winch in which the tension is varied manually. This third wire system also allows an electrical core wire to be linked with the trawl for various applications. The reel hydraulic power supply has a bypass system operating in parallel to the reel's normal hydraulic system (Fig. 4). A controllable relief valve is installed in the bypass to regulate tension to the desired magnitude. As the tension changes from that selected at the control valve, the reel automatically winds in or out to take in slack or pay out cable, thus maintaining the proper

balance. A selector valve is operated to return the reel to its net-handling function.

The John N. Cobb's constant tension net reel has been used as an additional towing point for an experimental 8-bridle midwater trawl. Thirty-fathom bridles from the center headrope and footrope were joined to a single cable wound onto the net reel (Fig. 5). The distribution of towing strain could be altered between the two main trawl cables and the third wire by a simple adjustment of the hydraulic pressure relief valve (Fig. 6).

By installing a single electromechanical towing cable on the reel, the system was easily used to place a third wire depth telemetry system on a midwater trawl. The third wire system eliminates the need for underwater connectors to pass telemetry beyond the otter board to the trawl. Also, it allows use of conventional trawl cable on port and starboard tow points. This results in lower installation costs of telemetry equipment.

Stern Rollers

Trawlers with net reels soon found that a stern rail roller was a valuable addition. About 80 percent of the Pacific Northwest trawlers that have net reels also use a stern rail roller. It greatly reduces chaffing and wear to web and groundlines as they slide over the stern. Rollers are constructed of 8- to 10-inch steel pipe. The length of the rolling surface depends on the vessel and net reel width, but it usually equals the full width of the net reel (Fig. 6). Bearings at each end allow the roller to rotate freely. A portion of the rail is cut away to install the roller nearly flush with the rail top.

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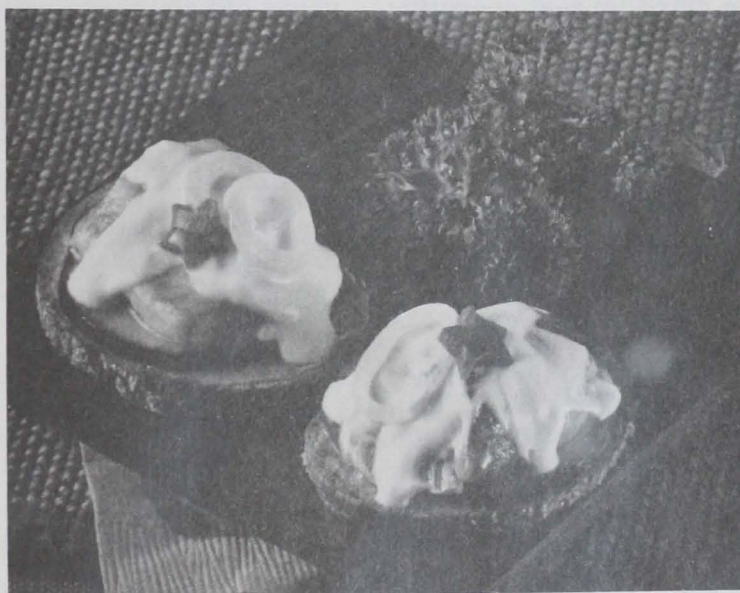
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BUSY DAY CANAPES



1 jar (12 ounces) herring in
sour cream
1 large cucumber
2 teaspoons salt
3 cups ice water

1 loaf (8 ounces) party rye bread
2 tablespoons butter or margarine,
softened
Paprika

Wash cucumber. Score cucumber by running a sharp-tined fork down the length of the cucumber from end to end. Cut crosswise into very thin slices. Place in a bowl of salted ice water and let stand 30 minutes to crisp. Drain on absorbent paper. Spread bread with butter. Overlap 2 slices cucumber on each slice of bread. Top cucumber with 1 large or 2 small pieces of herring. Sprinkle with paprika. Makes approximately 24 canapes.

This idea for entertaining is from a 22-page, full color booklet, "Nautical Notions for Nibbling," released by the United States Department of the Interior's BCF. It is available for 45¢ from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. Ask for Market Development Series No. 10 (catalog no. I-49.49/2:10).