

“Pioner” Handed Over to Murmansk Crew

On January 13, the first of the twenty Diesel trawlers building for Russian owners at the Lowestoft yard of Brooke Marine, Ltd., was officially handed over. Our special review gives full details of her many interesting features.

FIRST trawler of this important order is an attractive vessel with well flared bow, cruiser stern and streamlined superstructure, and is to Lloyd's Class + 100 A.1 motor trawler with notation for navigation in ice. Her principal particulars are as follows:—

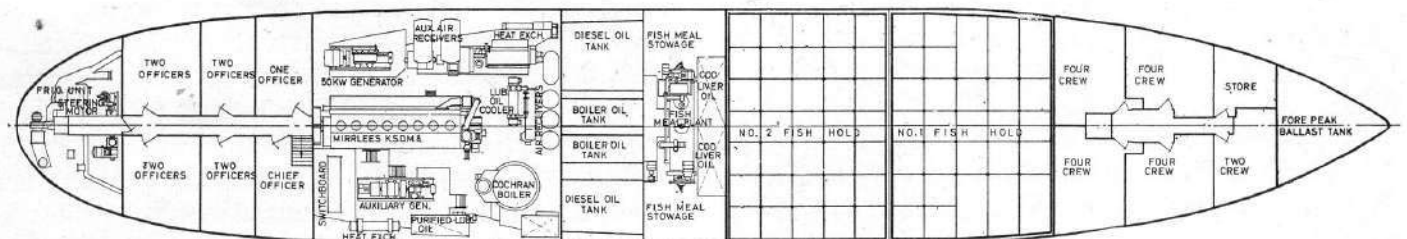
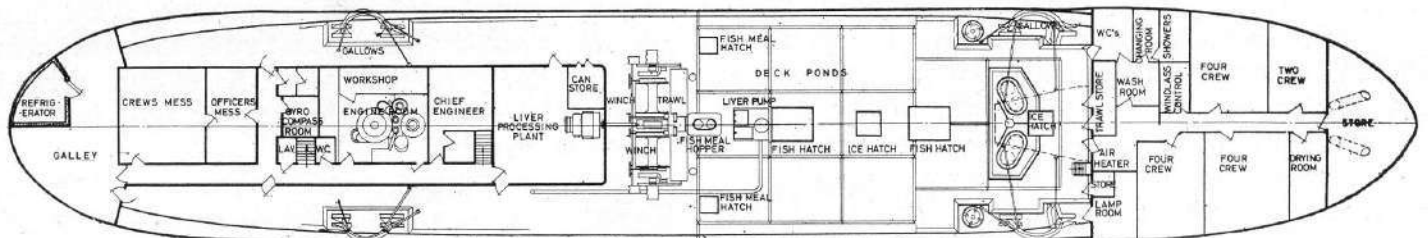
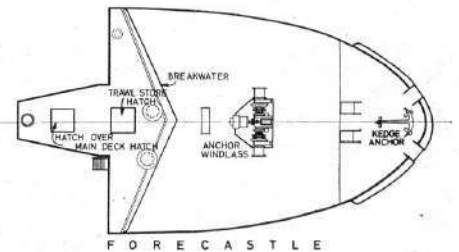
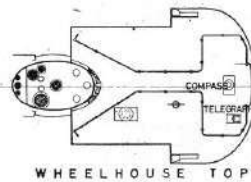
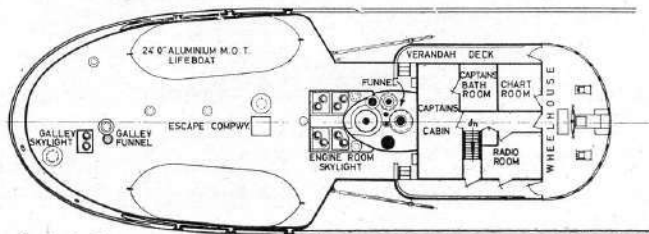
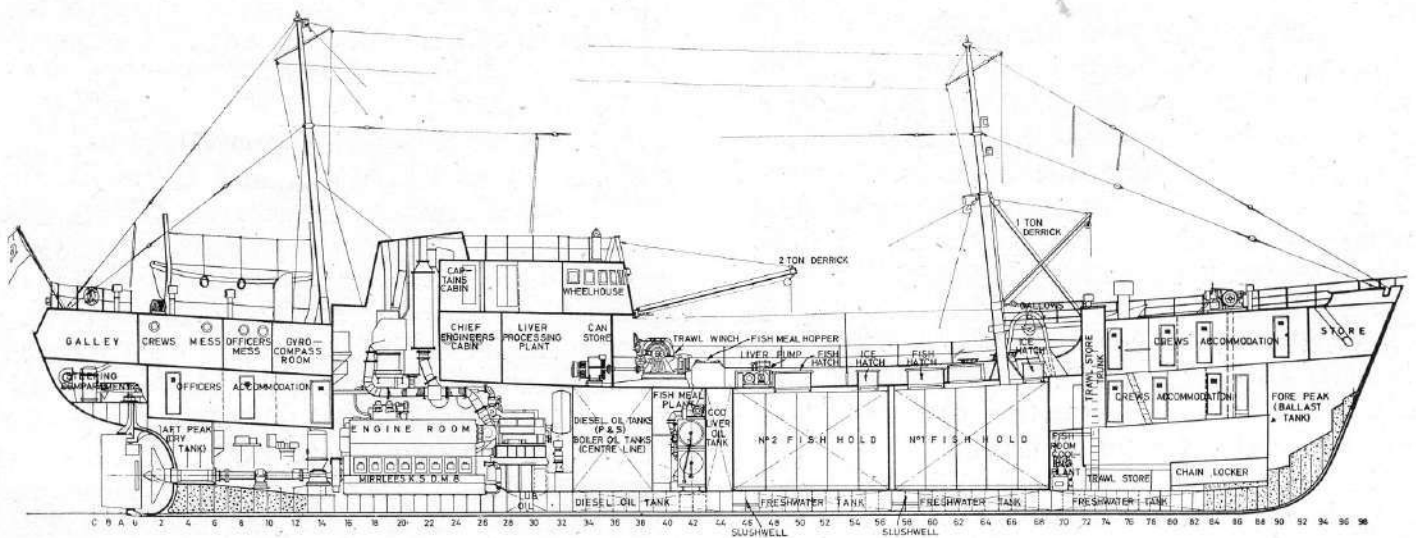
Length o.a. ...	189ft. 9in.
Length b.p. ...	171ft. 9in.
Breadth, moulded ...	32ft. 0in.
Depth, moulded ...	16ft. 0in.
Fish hold capacity ...	420 cu. m.
Meal hold capacity ...	50 cu. m.
Liver oil capacity ...	20 tons
Canned livers (cans)	15,000 (each 5 grammes capacity)
Diesel and lubricating oil capacity ...	95 tons
Boiler oil capacity ...	40 tons
Fresh water capacity	53 tons (not including forepeak capacity)

The vessel is of the flushdeck type, with four watertight and two oil-tight bulkheads forming

the forepeak ballast tank, trawl store and crew accommodation, Nos. 1 and 2 fish holds, fishmeal plant and stowage space, Diesel and boiler tanks, engine room and aft peak. Domestic fresh water and boiler feed water is carried in the double-bottomed tanks beneath the fish holds and trawl store, whilst additional Diesel oil is carried in double-bottomed tanks beneath the deep tanks and fishmeal compartment.

The rudder is of the semi-balanced, streamlined type and a Donkin electric-hydraulic steering gear is fitted which provides alternative power and hand steering from the bridge. Two rams working in cast iron cylinders directly operate the rudder tiller and are supplied with oil for power steering by a continuously running electric pump. A change-over cock is provided on the bridge for changing from power to hand control. Mechanical hand emergency steering gear is provided in the steering gear compartment. A Donkin gland packed rudder carrier and bearing is also fitted.

On the forecastle deck is an electrically driven worm and spur geared windlass, manufactured by Clarke, Chapman & Co., Ltd., and capable of simultaneously lifting two Halls improved type stockless bower anchors from a depth of 265 ft. at a speed of 30 ft. per minute. Three hundred mm. of 1-5/16 in. dia. stud link chain cable is carried in the chain locker.



GENERAL ARRANGEMENT DRAWINGS OF "PIONEER"

Aluminium alloy lifeboats fitted with Flemings improved seating arrangements are stowed in Schat davits on the boat deck.

Officers' and crew accommodation

Special attention has been given to the accommodation which is of a high standard throughout. To give added comfort for the officers and crew all external bulkheads and those adjacent to cold spaces of the living accommodation have been insulated and hot air heating is provided to maintain an internal temperature of 18 deg. C. against external air temperatures as low as -30 deg. C. The ventilation and heating system has been designed and fitted by R. B. Stirling & Co., Ltd., while the Darlington Insulation Co., Ltd., have been responsible for the insulation.

The captain's suite is situated on the bridge and comprises separate day room, sleeping room and bathroom.

At the forward end of the casing, accommodation with separate toilet is provided for the chief engineer. Four double rooms and two single rooms are provided on the lower deck aft for 10 officers, one of the single rooms having a swinging cot and fitted out for use as the ship's hospital. The crew are accommodated in double and 4-berth cabins in the forecabin and on the lower deck forward. Separate wash-place, showers, W.C.s and drying rooms are also provided.

All bunks, including those for the crew, are fitted with reading lights and in addition the officers' cabins are each provided with a wash basin with hot and cold water. Fresh and salt water is supplied throughout the ship by the Drysdale "Pneupress" systems, and steam calorifiers are fitted for hot fresh water.

The officers' and crew's mess rooms are situated in the deckhouse, the upper portion of the dividing bulkhead being portable to enable them to be transformed into one large room for use as a cinema. The crew's mess is fitted with a serving hatch direct to the galley.

The galley is fitted with a Swinney patent oil fired cooker with ovens capable of cooking 200 kilograms of bread each day. An electric potato peeler and mincing machine are also provided, together with a steam water boiler. Adjacent to the galley is a provision room and domestic refrigerated store.

Aluminium alloy bridge and wheelhouse

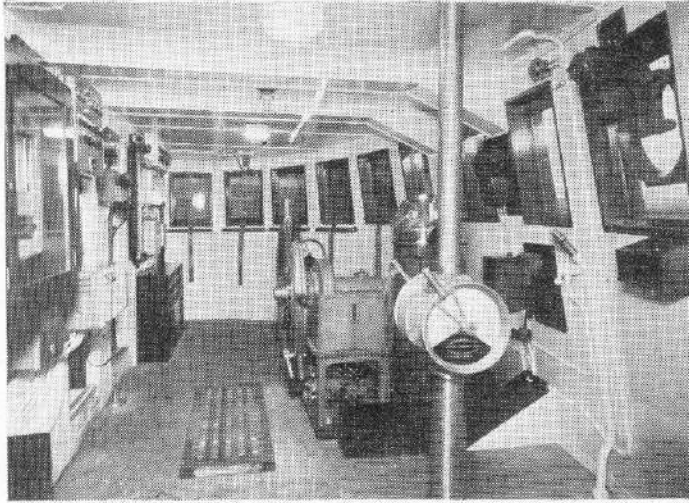
Aluminium alloy supplied by T. I. Aluminium Co., Ltd., has been used exclusively for the funnel,

wheelhouse and bridge, and it is interesting to note that the lifeboats are also constructed of this material.

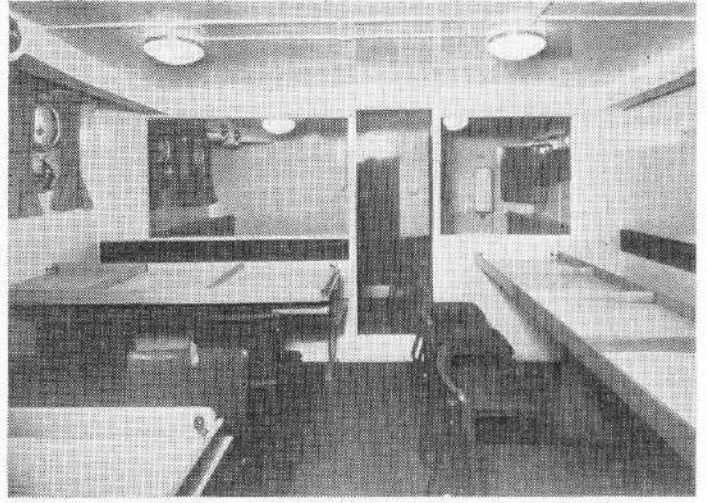
The wheelhouse and bridge are equipped with the most modern navigational aids, including wireless equipment by Redifon, Ltd., comprising Type G.80 transmitter, R.50 and R.55 all wave receivers, a DF 26 combined medium and short wave D/F, and all the associated ancillary units. A Pye Marine sound reproduction equipment with radio receiver, record player and for relaying captain's orders from the wheelhouse, is provided with loud speakers in each cabin and throughout the living accommodations. Each speaker is fitted with full volume restoration priority for captain's orders. Other aids include a Bendix echo sounder and Chernikeeff log (Submerged Log Co., Ltd.), and Revometer fitted in the wheelhouse. Standard and steering compasses by Henry Browne & Sons, Ltd., a searchlight and loud hailer are provided. An 8-way batteryless telephone communication system by the Telephone Manufacturing Co., Ltd., is fitted. George Kent Clear View screens are provided. These particular units, although the standard 13 in. dia. type, are unique in that they are the first to be fitted with electrical heating coils for keeping the waterways free from ice. The heating element is a special Pyrotenox cable fitted into the annular space of the screen frame. This terminates into a special switchbox containing two switches, one for the driving motor of the screen and the other for the heating unit. The switches are so interlocked that when the electric driving motor is switched on, the heating unit is automatically switched off.

An electric trawl winch manufactured by J. Robertson & Sons, Ltd., with electric by Laurence Scott & Electromotors, Ltd., is fitted on deck, having two barrels each capable of holding 1,200 fathoms of 3 in. circumference wire rope and giving a pull of eight tons at a speed of 60 mm. per minute on a mean barrel radius. The winch motor, capable of developing 175 b.h.p. at 600 r.p.m., is independently mounted in the forward end of the deckhouse, immediately behind the winch, and operates from a Ward Leonard control generator situated in the engine room. Automatic, with alternative hand warp, guiding gear is provided to each barrel. The motor is fitted with a magnetic brake having hand release lever with extended control to the wheelhouse above.

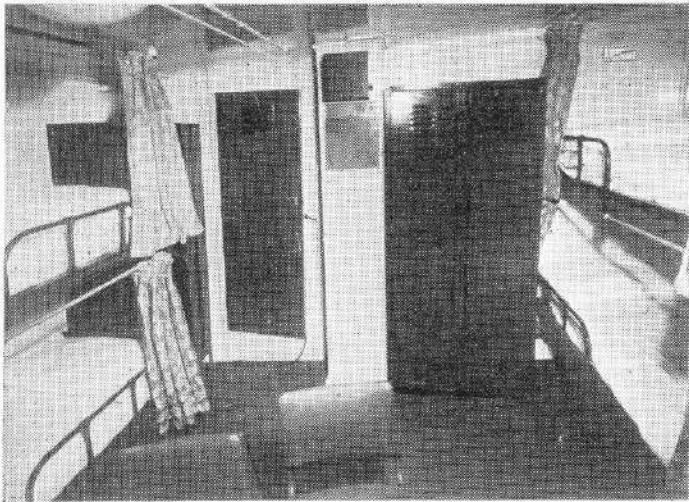
Both fish holds are insulated by Miller Insulation & Engineering Co., Ltd., with plastic X.1003 slabs manufactured by the Expanded Rubber Co., Ltd.,



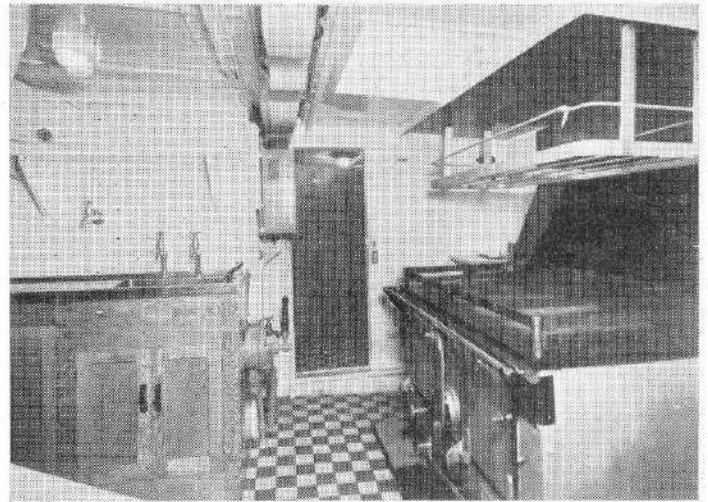
ABOVE: *Wheelhouse, looking to port*



ABOVE: *Mess with dividing partition down*



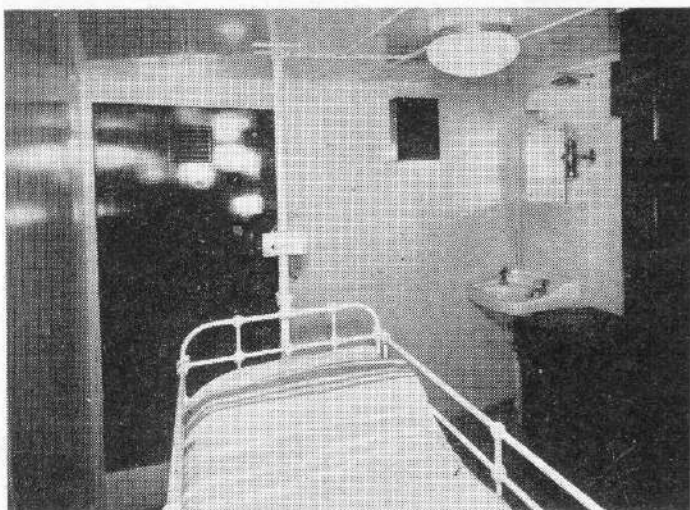
Crew's accommodation—a 4-berth cabin. All bunks are fitted with reading lights



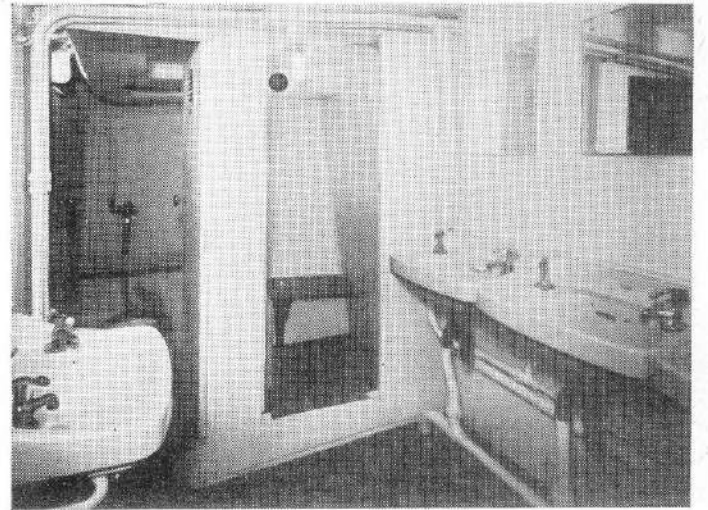
The galley is lavishly equipped—the cooker is a Swinney oil-fired unit

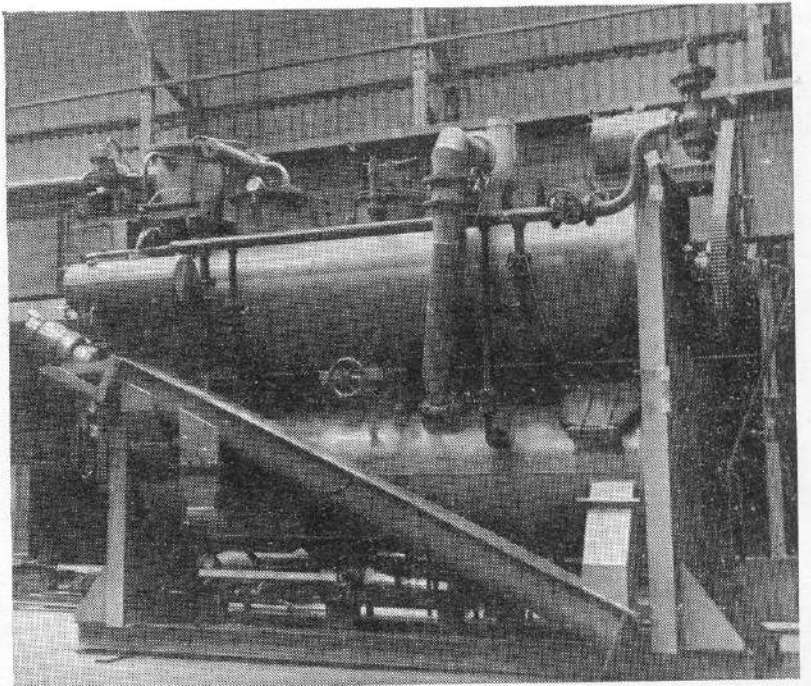
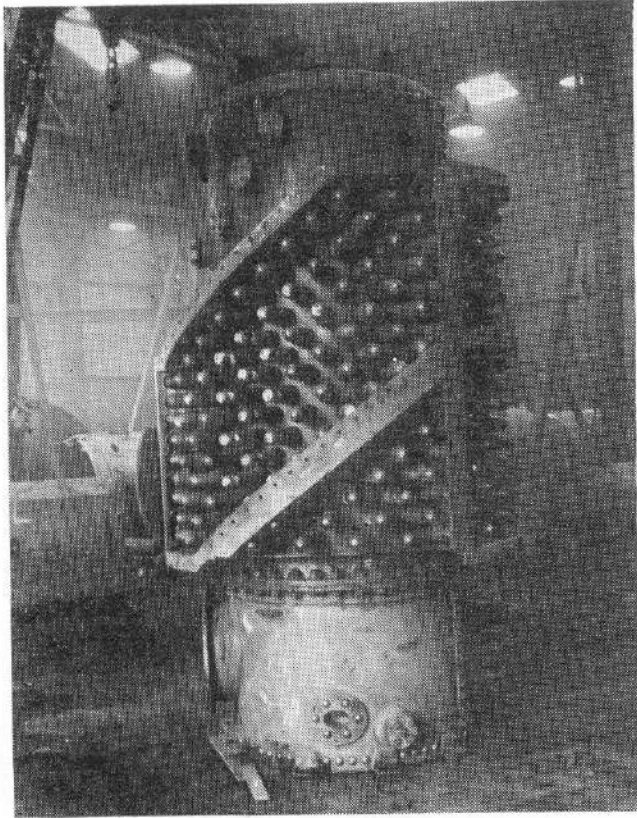
ACCOMMODATION ON THE "PIONER"

The "Pioneer's" sick bay



Crew's washroom and toilet





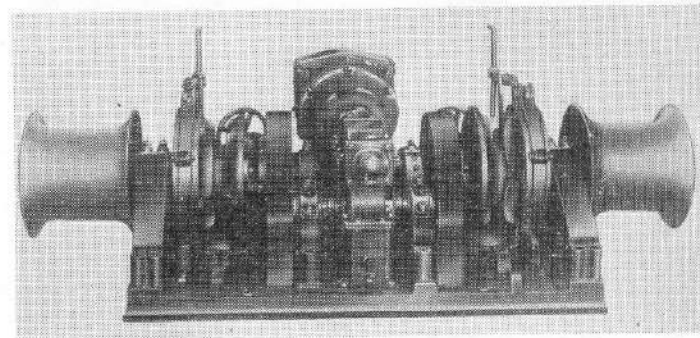
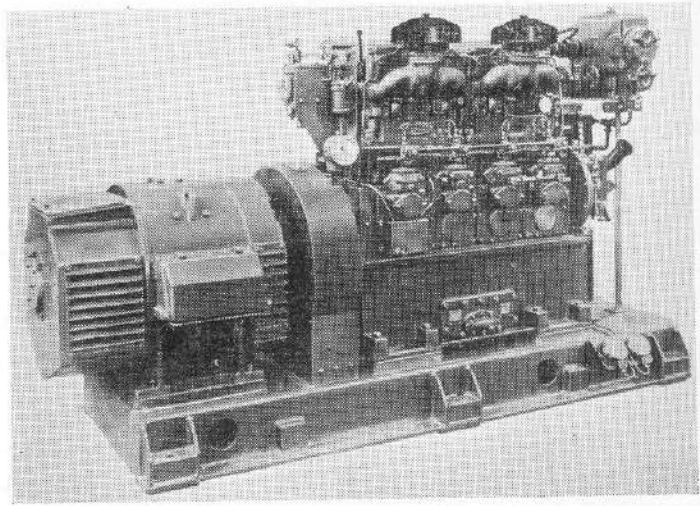
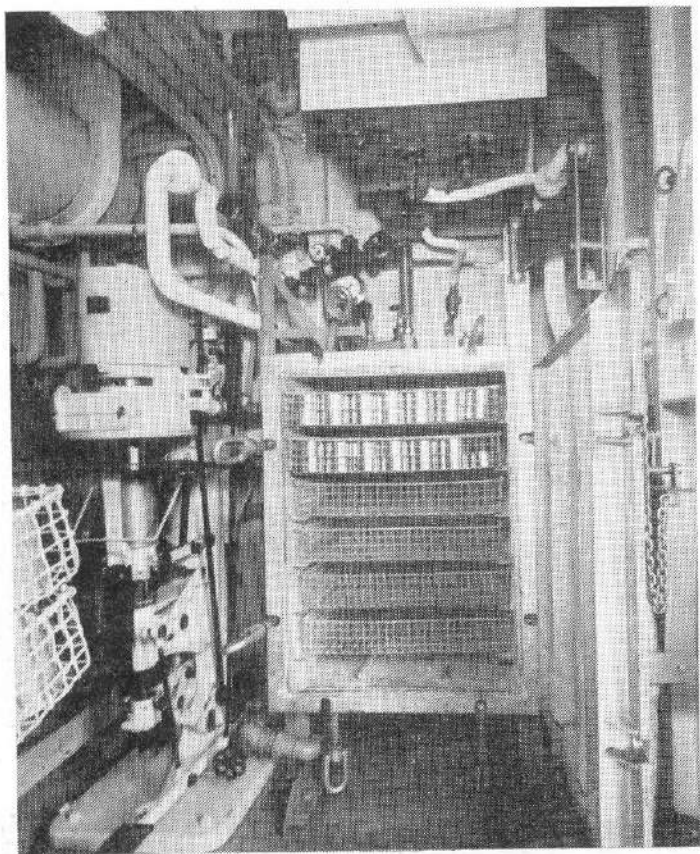
ABOVE: *The fishmeal plant by Farrar Boilerworks, Ltd.*

LEFT: *Clarkson thimble tube composite boiler as fitted to the "Pioner"*

BELOW: *McLaren Diesel for auxiliary purposes*

BELOW: *The liver canning plant by Premier Filterpress Co., Ltd., which is designed to handle approximately 1,500 8 oz. cans a day*

BOTTOM: *Electrically driven worm and spur geared anchor windlass by Clarke, Chapman & Co., Ltd.*



and lined with aluminium alloy sheeting running down to the tank top. Each room is divided into pounds, as shown on the drawing, by corrugated aluminium boards, which are interchangeable throughout fitted into slotted aluminium posts. Permanent aluminium back half divisions are fitted at the sides of the ship. The floor is insulated and covered with cement sloping to a gutterway on the centreline of the ship leading to slush wells at the after end of each hold.

Refrigeration plant

The refrigerating plant is supplied by L. Sterne & Co., Ltd., and comprises a Freon compressor. Automatic temperature control is provided by means of thermostatic type expansion valves, and a distance thermometer of the Malone Instrument Co., Ltd., is fitted to each hold with gauges in the wheelhouse. The duty of the plant is to maintain a temperature of -2 deg. C. during the passage to the fishing grounds, and thereafter a temperature of 0 deg. C. during fishing and the return to port. The refrigeration is fitted with the object of slowing down the rate of ice melting which is packed between the layers of fish when stowed in the holds. The Freon 12 installation has a capacity of approximately two tons of refrigeration per hour, when operating under conditions where the condensing temperature of the seawater will be 32.2 deg. C. and the evaporating temperature of the Freon 12 refrigerant -6.7 deg. C.

The plant is fully automatic in operation and divided into two circuits, each of which will serve one hold, the arrangement being such that when any space comes to the required temperature, that circuit will automatically be cut off by the operation of a thermostat in conjunction with a magnetic liquid stop valve. When both spaces are down to the required temperature, the refrigerating machine will automatically stop, and will remain so until any one or both fish holds rise to the predetermined temperature, which will bring the thermostat into operation.

The fishmeal plant

Fishmeal plant, manufactured by The Farrar Boilerworks, Ltd., is fitted abaft the fish holds, and comprises a batch-type cooker/dryer designed to work under vacuum, situated directly above a circulating dryer, complete with an external conveyor, this latter item being fitted with a meal discharge chute. Both dryers are cylindrical in shape, being fully steam-jacketed on their circumference, and

each has an internal shaft, also steam-heated, fitted with stirrer arms.

The plant is designed to handle one ton of raw fish at a time. This material is collected in a steel hopper, which discharges direct into the cooker/dryer, the inlet door then being securely closed. Breaking down, cooking and partial drying takes place at the low temperature obtainable under vacuum and after about $3\frac{1}{2}$ hours the semi-processed material is transferred through a chute to the circulating dryer. The cooker/dryer is immediately recharged with another 1 ton batch of raw fish.

The semi-processed material passes continuously through the circulating dryer and external conveyor until it is converted into a fish meal of about 10 per cent moisture content, when it is collected in bags at the meal discharge chute on the conveyor. This final processing takes rather less time than the semi-processing in the cooker/dryer, hence the circulating dryer is always empty when a new batch of semi-processed material is ready to leave the cooker/dryer. Thus, 1 ton of raw fish enters the plant every 4 hours, giving a capacity of approximately 6 tons of raw material over 24 hours, this being dependent to some extent on the type and condition of the raw fish used. Steam consumption of approximately 800 lb. per hour at a pressure of 20 lb. per sq. in. for operation of the plant is supplied by the ship's auxiliary boilers.

A screw-type F.12 Mono pump, with a capacity of 72 cu. ft. per hour, is provided on deck to pump fish livers through a 4 in. bore pipeline to a receiving tank in the liver processing house immediately abaft the trawl winch. The livers are gravity fed from this receiver into two steam boilers, and after processing, the liver oil is passed through a filter to a 20 ton deep storage tank at the forward end of the fish meal compartment.

Liver canning plant

Also situated in the processing house is a liver canning plant, designed to handle approximately 1,500 8 oz. cans a day. The plant consists of a semi-automatic vacuum double-seaming machine, manufactured by the Premier Filterpress Co., Ltd., and a horizontal steam sterilizing retort built by G. C. Engineering, Ltd. Owing to the very limited space available, and because it would be operating at sea, the plant had to be designed so that it could continue to operate under difficult conditions. It was decided to keep the cans housed in

(continued on p. 64)

"Pioner" Handed Over

(Continued from p. 49)

trays throughout the process, and for this purpose the special stowage rack was devised and built into the partition separating the can store from the packing room. The sterilizing retort holds 500 cans in 12 trays, and a further 12 trays are provided which are initially used in the special storage rack where they are filled with empty cans from the can store. The cans are conveyed in the trays to the packing table. A spare set of crates is provided to enable the second batch of canned livers to be prepared while the first batch is being sterilised. Stowage is provided for a total of 15,000 cans.

Main and auxiliary machinery

The main propelling machinery comprises a Mirrlees type KSSDM 8-cylinder, vertical, 4-stroke cycle, single acting, airless injection, turbo charged, direct reversing, heavy marine oil engine, developing 950/1,100 s.h.p. at 255/265 r.p.m. The forced lubricating oil system is operated on the dry sump principle, and an ample supply of oil is supplied under pressure to all moving parts of the engine by two engine driven lubricating oil pumps. A Hamworthy electrically driven stand-by lubricating oil pump is fitted. An engine driven fresh water circulating pump is arranged to draw from the circulating line to the main engine jackets, and thence to the heat exchanger. Sea water is circulated through the heat exchanger by an engine driven sea water pump with a bypass to the main engine jackets for emergency cooling and discharging overboard. A Drysdale stand-by electrically driven water pump is arranged to serve the main

engine fresh and salt water systems through a locked valve and is cross connected to the wash-deck line and firemain.

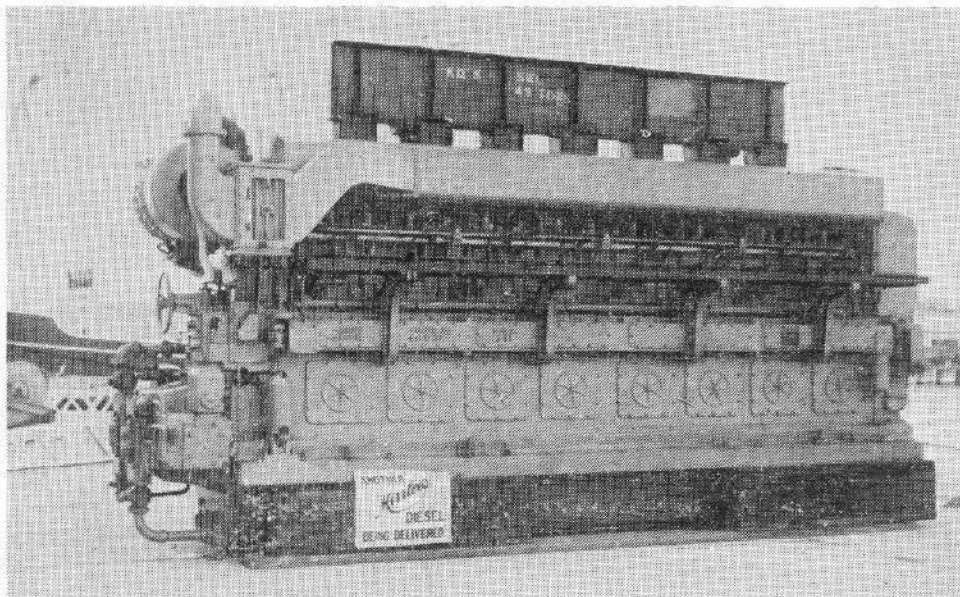
The trawl winch generator set comprises a Ward-Leonard generating unit differentially compound wound developing 146 kW., direct coupled to a Mirrlees type JS4 Diesel engine developing 380 b.h.p. when running at 750 r.p.m. A further generator with a capacity of 53 kW. is mounted in line and direct coupled to an extension of the large generator shaft. Three kW. of this capacity is used for excitation purposes leaving a margin of 50 kW. for main supply to switchboard.

A second generator is fitted developing 50 kW. and flexibly coupled to a McLaren type M4 Diesel engine developing 88 b.h.p. at 1,000 r.p.m. The auxiliary general purpose set comprises an 18 kW. generator flexibly coupled to a McLaren type M2 Diesel engine, developing 44 b.h.p. at 1,000 r.p.m. with a 28 cu. ft. per minute air compressor fitted on an extension shaft from the generator and operated through a friction clutch.

To warm the main engine and winch generating set for easy starting the fresh water system of the 50 kW. and 15 kW. auxiliary sets are led into the main engine line. A Hamworthy electrically driven air compressor having an output of 28 cu. ft. per minute at a pressure of 350 lb. per sq. in. and a fire pump having a capacity of 9,000 gals. per hour against a head of 164 ft. are also fitted.

Steam is provided for all requirements by a vertical Cochran multi-tubular boiler with 400 sq. ft. heating surface, and built for 100 lb. per sq. in. working pressure. The boiler is suitable for operation on very heavy oil fuel, and the oil firing equipment is made by Laidlaw Drew & Co., Ltd. It is of steam-jet type and each boiler is rated to give 1,000 kilos of steam per hour from cold feed water under normal oil-fired conditions.

A second boiler is fitted in the engine casing, and comprises



"Pioner" is powered by a Mirrlees type KSSDM 8-cylinder Diesel engine developing 950/1,100 s.h.p. at 255/265 r.p.m.