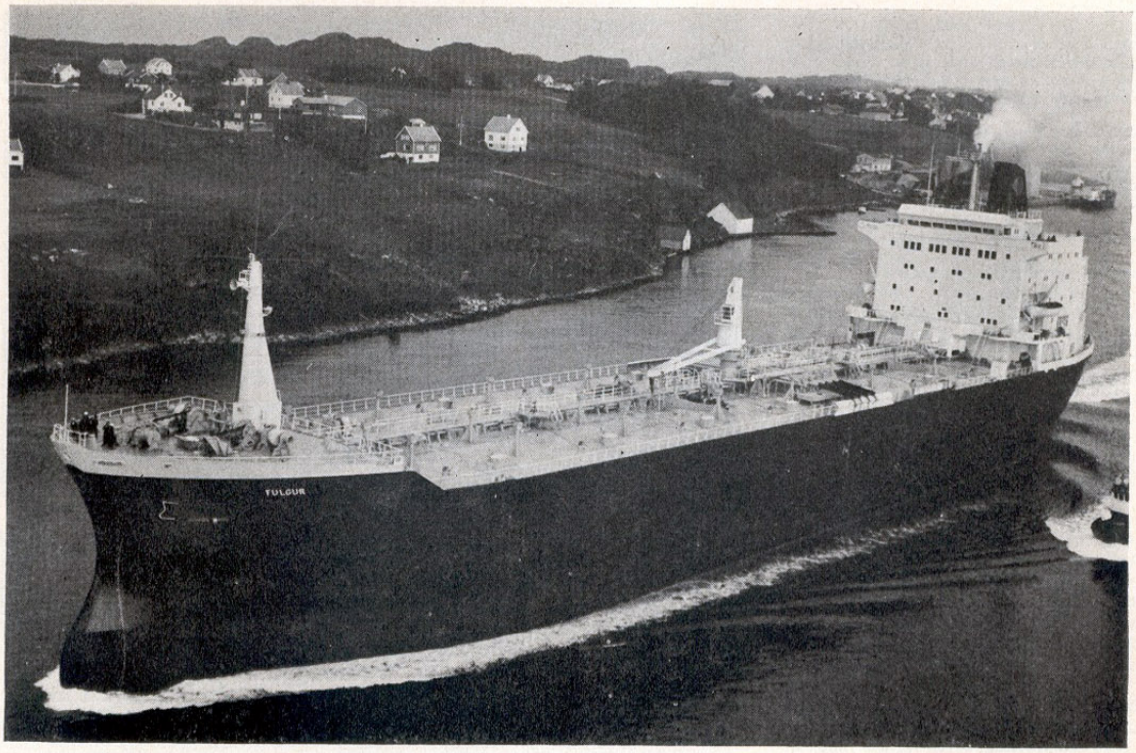
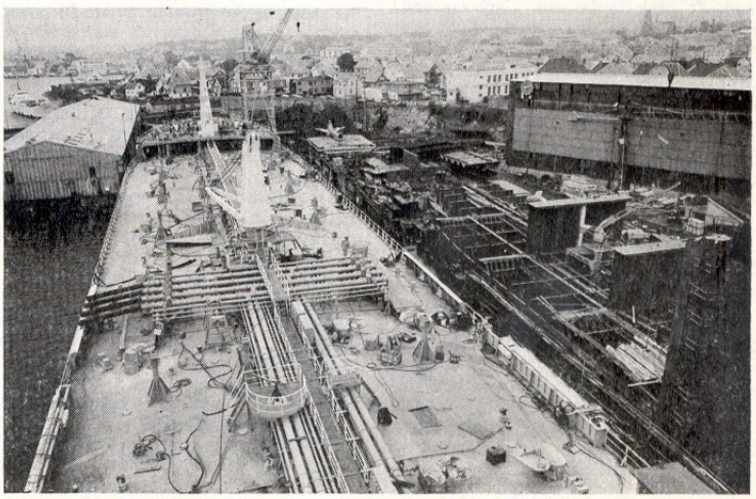


Shell's new products tanker series from Haugesund

PRODUCTS tankers built today are tending to be of standard design, especially those ordered by the main oil companies, with the current popular size for this type of vessel around the 30 000 tonne d.w. mark. Generally, products tankers of this size are being built to carry clean or dirty products and most are powered by low-speed diesel or steam turbine machinery, and have a fairly extensive generating plant to meet the heating demand. Thus, it was of interest last month when the international oil company, Shell, took delivery of its first medium - speed - engined vessel, "Fulgur", from Haugesund Mek. Verksted A/S, at Haugesund, Norway. Not only does this vessel represent a milestone for Shell in that like many other major tanker owners the company has finally adopted the medium-speed engine, for main propulsion, but no steam raising plant of any kind is fitted while the vessel has a number of unique features, some hitherto unseen on products tankers.

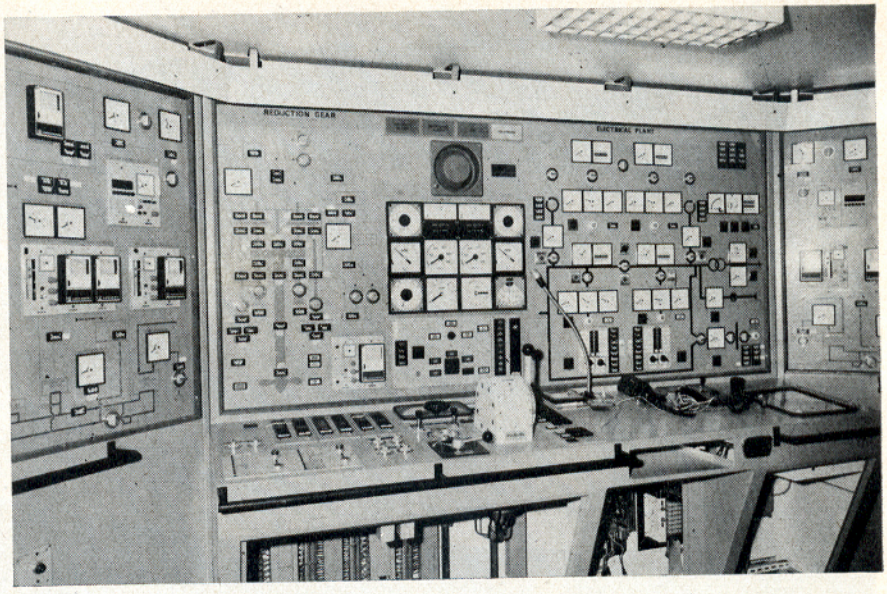
In late 1971, Shell International Marine Ltd. placed an order worth more than £47 million with the Haugesund shipyard for a total of nine 32 000 tonne d.w. products tankers to be delivered during the period 1974-1976. The first vessel "Fjordshell" was delivered earlier this year for operation by A/S Norske Shell, this being a dirty products tanker powered by a Sulzer 6RND76 low-speed engine, but the "Fulgur" and her seven sister vessels to follow, are clean products tankers with propulsion by two M.A.N. RV6 52/55 type medium-speed engines coupled to an A.G. "Weser"

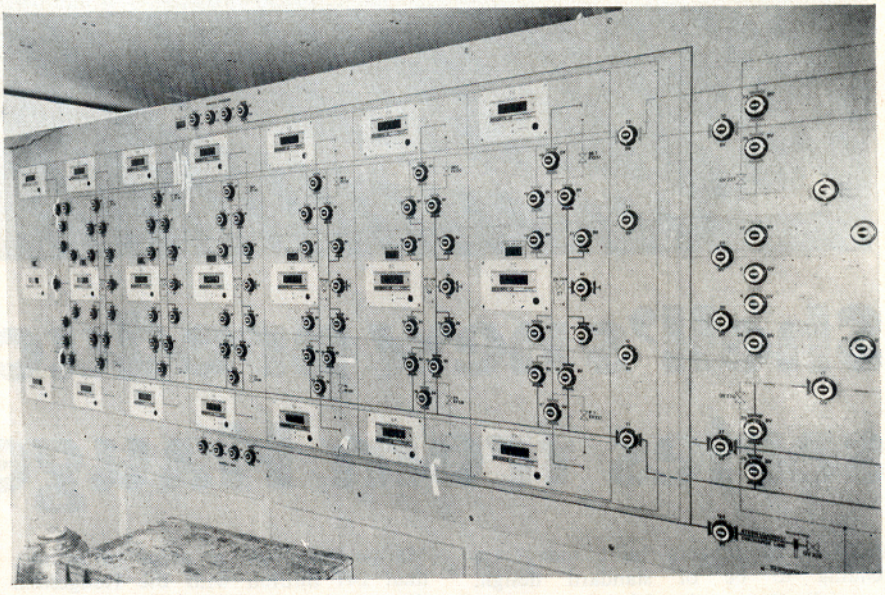


A view of the main deck of the "Fulgur", during construction, showing the loading/discharge manifold, and the 10-ton N.M.F. hose-handling crane.

Right. The control desk portion of the machinery control room instrumentation installation showing the Kamewa Combinator unit and control, and mimic diagrams for the transmission and electrical systems.

Below right. This cargo control panel located in the combined machinery/cargo control room comprises a mimic diagram, digital readout tank gauges, and switches for the electro-hydraulic valve actuation system.





gearbox to drive a single Kamewa c.p. propeller. Additionally, this class of vessel incorporates two high-voltage shaft generators, and high-voltage electrically-driven cargo pumps, while other unusual features are a high-pressure hydraulic deck machinery arrangement, a central fresh water cooling system, and a combined machinery/cargo control room located within the accommodation deckhouse.

Recently inspected before delivery by a member of *The Motor Ship's* technical staff, the "Fulgur" was built to Lloyd's Register of Shipping class ✠ 100 A1 "Oil Tanker", ✠ LMC Part C.C., as a 32 000 tonne d.w. single-deck type vessel with two longitudinal bulkheads, a forecastle, but without raised poop, a "soft nose" stem, and a square transom stern.

Athwartships bulkheads divide the hull from, foreward, into the forepeak tank, a bunker deep tank, the cargo space comprising seven centre and 14 wing tanks, a pump room aft of No. 7 tank, the machinery space, and the aft peak tank. A double bottom is arranged only in way of the engine-room while wing bunker tanks are also arranged on both sides of the machinery space; the large deep tank forward of No. 1 cargo tank has been provided to meet the desired operating range because insufficient fuel could be carried in the engine-room double bottom and deep tanks, without incurring trim problems. The total bunker fuel capacity is about 1 992 m³ and that for cargo in the 21 tanks, 43 311 m³, while 880 m³ of water ballast can be carried in the fore and aft peak tanks combined. The cargo tanks are all coated with epoxy paint while tar epoxy paint is used for coating the fore and aft peak tanks and vinyl tar and vinyl is used for the external hull and weather decks respectively.

Cargo pumping arrangements

The special requirements of Shell for a parcel tanker that can carry a great number of segregated products in complete safety without fear of contamination, and the need for discharge of up to four cargo grades at any one time, has resulted in a cargo pumping system based on the use of four electrically-driven cargo pumps each able to draw from any of the 21 cargo tanks. Each of the cargo pumps is of vertical centrifugal type with twin volute barrel casings, of Weir make, and having a capacity of 900 m³/h at a pressure of 16 kg/cm² against a head of 160 m. The pumps are located in the pump room between the engine-room and No. 7 cargo tank and are driven in each case by an AEG 3·3 kV, 650 kW, 3-phase a.c. motor through a vertical shaft. The motors are mounted in the engine-room at the intermediate deck level, directly above the pump-room recess below.

No stripping pumps are provided on the vessel as the priming system for each pump comprises a reservoir placed before the pump suction which has a level controller which automatically operates the main cargo pump discharge valve; with a falling liquid level in the suction tank, the discharge valve is closed to keep the pump casing full of liquid with automatic opening of the discharge valves as the liquid level rises. Also connected to the main tank suction lines are two electrically-driven line drainage pumps; these are of Bornemann vertical screw type with a capacity of 110 m³/h with the AEG electric motors mounted in the engine-room flat near the main cargo pumps.

The suction piping is arranged on the double ring main system comprising four 0·4 m diameter lines equipped with suitable cross-overs and valving. Most cargo valves in the tanks are of the Weir Pacific ball type which have no glands and require little maintenance and are operated by hydraulic linear actuators from the cargo control console in the main control room, through a Kracht electro-hydraulic system. As a back-up to the main cargo suction valves, manually-operated gate valves with extended spindles to the main deck, are fitted to by-pass loop circuits in each tank. The four 0·35 m cargo pump discharge lines are coupled to the four transverse discharge manifolds located on deck amidships, with there also being a smaller 153 mm discharge line from the cargo tank drainage pumps.

Valves located within the pump room are either of the Wier Pacific ball-type,

PRINCIPAL PARTICULARS
"FULGUR"

	metres
Length, o.a.	170·68
Length, b.p.	163·06
Breadth, moulded	25·90
Depth, moulded	15·29
Draught	11·36
Deadweight	32 000 tonnes
Machinery	2 × M.A.N. R6V 52/55
Output	2 × 6 000 bhp at 430 rev/min
Speed, service	15·5 knots

Blackborough manually - operated or hydraulically-operated gate type, or Weir butterfly-type valves.

The control of the cargo valves is from boxes arranged on deck—one for each set of tanks—which contain solenoid-operated hydraulic control valves with the electrical connections from each box to the cargo console in the main control room. This control station compresses a large vertical panel supplied by ASEA and including a mimic for the cargo lines and valves with remote indicator/controllers for the valves, and digital readouts for the Whessomatic - 50 tank gauges. The remote valve indicators are calibrated to show the degree of opening of each valve.

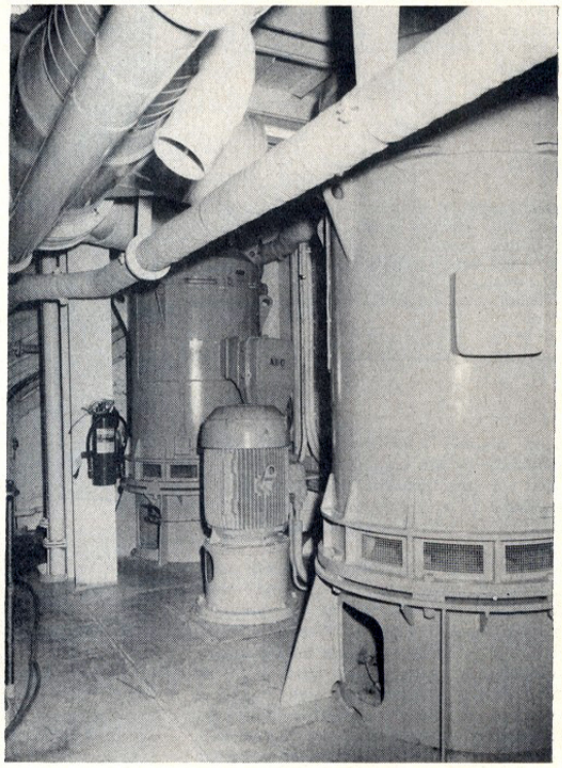
Adjacent to the cargo mimic panel is a separate panel for the cargo pumps. From here the four cargo pumps and two drainage pumps are started and speed controlled, and provided for each pump is a separate alarm system covering such parameters as bearing temperatures, loss of suction and so on, while also mounted on this panel are Jungner draught indicators and telephone communications equipment.

High-pressure deck hydraulics

Although hydraulic deck machinery is fairly common nowadays on tankers, what is unusual with the "Fulgur's" installation is that a high-pressure system is employed. Two separate hydraulic circuits with power packs located in the engine-room and the forecastle respectively are arranged to operate hydraulic deck machinery and lifting gear.

The pump units are supplied by Friedrich Kocks and the forward hydraulic system is connected to two Kocks mooring winches and two separate windlass units; these have a dog clutch arrangement between each unit to enable operation of each cable drum from either hydraulic motor unit. The forward pumps and oil tank are located in the forecastle with access at the base of the foremast mounted on the forecastle deck. The second hydraulic circuit has its pumps and oil tank located on the second deck of the engine-room and connected to the circuit are three Kocks mooring winches mounted on the aft deck, port and starboard lifeboat winches, a large 10-ton N.M.F. hose handling crane mounted on deck amidships, and a Munck stores handling crane which runs on a gantry mounted on the deckhead of a cross alleyway at main deck level; this latter crane is of the rotating jib-type, gantry mounted, and is capable of covering flush hatches in the main deck which lead to the engine-room below, while the track is extended port and starboard to the ship's side, for over-side lifts.

Very few pipes are visible on the main deck but for each cargo tank there is a deck-mounted Wilson Walton Hi-Jet ventilating unit and the Whessoe tank gauging unit, with local digital readout of the liquid depth. Also on the main deck, mounted on pedestals, are three Svenska Scumsläcknings fire - fighting foam monitors with a further unit mounted at each forward wing, atop the pump room access deckhouse.



Two of the AEG 3·3 kV, 650 kW cargo pump motors and a smaller drainage pump motor, located on the engine-room lower platform, and connected by vertical shafts to the pumps beneath.

Halon fire-fighting system

While the fire-fighting arrangements on the "Fulgur" comprise the normal seawater, foam, and portable appliances to meet the requirements of the Dept. of Trade and Industry and SOLAS 1960, an unusual feature is the application of a Halon extinguishing system to the engine-room and pump room.

Supplied by Saval B.V., of Holland, the system uses Halon 1301 as the extinguishing medium in place of CO_2 and an important characteristic of this gas is that the quantity necessary for extinguishing of fires is not considered toxic and thus harmless to humans. The system is designed for total flooding of the engine and pump rooms with the Halon 1301 stored in two large pressure vessels; the contents of both vessels is sufficient for the engine room while one alone will suffice for flooding of the pump room.

Actuation of the control valves which admit the Halon to the machinery spaces is by a pneumatic system with the control air supplied from compressed air storage bottles. The actuation system is manually operated by opening the control cabinet—an action which sets off the fire alarms and automatically stops the engine-room ventilation fans. Discharge of the Halon from the storage bottles is effected by CO_2 gas introduced to the top of the tanks from CO_2 storage bottles, and discharge of the medium is commenced on rupture of bursting discs, in the line, caused by over-pressure in the tank. Discharge nozzles are arranged in the machinery space to provide an evenly distributed concentration of the Halon, while special care is taken to avoid the nozzles discharging into escape routes.

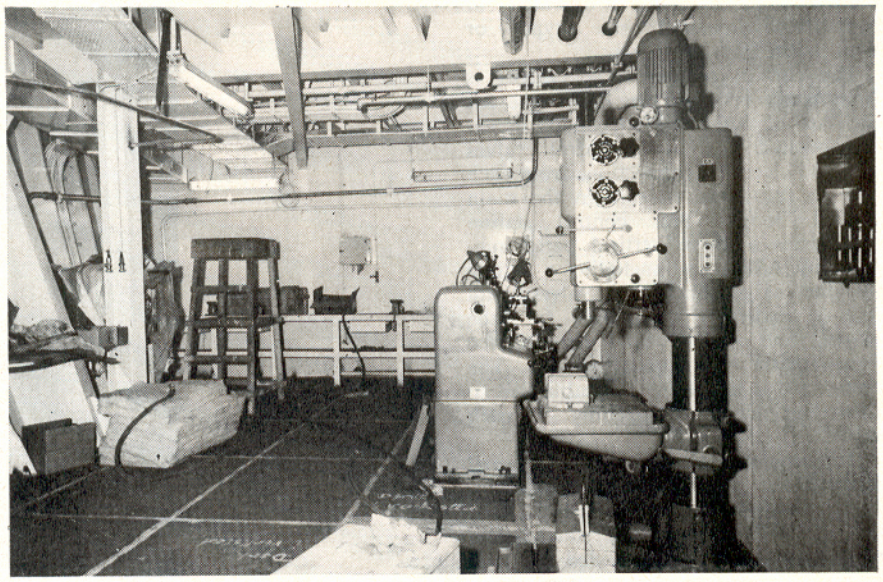
Though Halon is considered non-toxic, and according to present medical knowledge a concentration of five per cent of the net volume of the machinery space can be tolerated by humans for at least 10 minutes, the normal CO_2 precautions taken on ships, are followed.

First Shell medium-speed installation

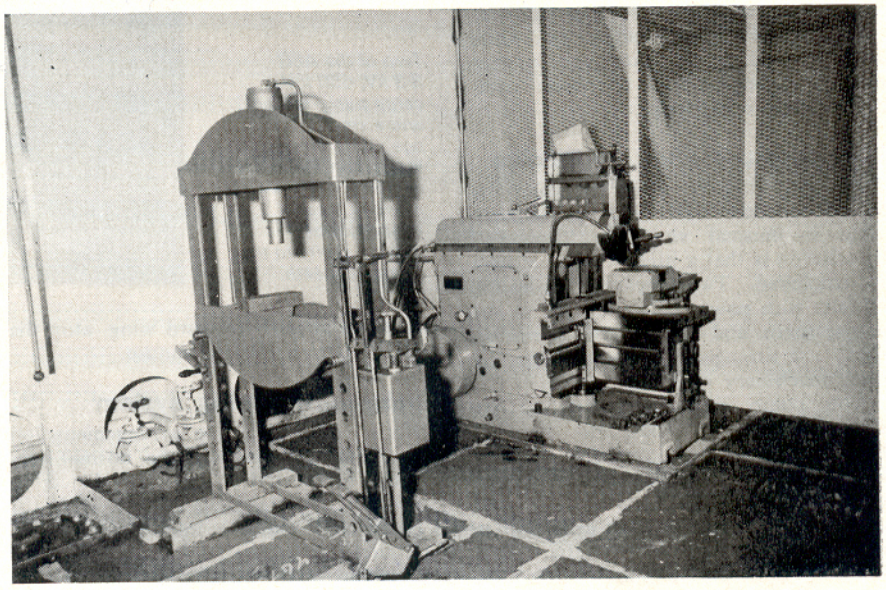
As previously mentioned, the "Fulgur" is the first Shell tanker to be propelled by medium-speed engines. This decision has been based on the belief that for this type of vessel, in-line medium-speed engines are the easiest to overhaul by the replacement-of-components method, while in this case the main engines are also used in port as all electrical supplies are obtained from shaft-driven alternators.

The two main engines are of the M.A.N. six-cylinder in-line RV6 52/55 type, each capable of developing 6 000 bhp at 430 rev/min. They are not handed machines and both are coupled to an A.G. "Weser" reduction gearbox through Vulkan clutches to drive the single Kamewa four-bladed c.p. propeller at 108 rev/min. Also connected to the main gearbox are two A.E.G./LDW 3 750 kVA, 3·3 kV, 60 c/s alternators; clutches are fitted between each alternator and the gear take-off while the main propul-

Right. A view inside the very well equipped and air-conditioned engineers' workshop showing the lathe and a large drilling machine.



Below right. Another section of the spacious workshop contains a shaping machine and hydraulic press, both pictured here. Also provided are a milling machine, welding machines, general and valve grinding machines, drilling machines, and a number of special tools.



sion clutches connect the quill shaft attached to the engine output shaft, to that of the gearbox primary pinion. Because of this arrangement each main engine can only drive its respective alternator.

Two other generating sets are also provided; these are 735 kW, 450 volt machines each driven by a radiator-cooled Bergen LDG-8 diesel engine of 1 065 bhp. These auxiliary machines are mounted at second deck level high in the engine-room and are only used for harbour or emergency duties. Radiator cooling is employed because the vessel's machinery installation has been designed to have all piping for cooling systems located on the lower level alone; air compressors located on the 2nd deck level are also air-cooled.

The radiators for the two auxiliary engines are large Serck units with the cooling fans driven by an extension shaft from each of the Bergen diesel engines. The cooling air is drawn into a special casing forward of the engine uptakes casing, blown across the radiator cooling tubes by the engine-driven fan, and then discharged into the engine-room uptakes casing. The system is designed to minimise heat losses by sealing of the cooling air inlet and exhaust casings from the engine-room below.

Centralised cooling system

Another novel feature of the "Fulgur's" machinery installation is the use of a central cooling system—in fact two separate central cooling systems. This has been introduced to eliminate corrosion of piping and equipment, and to reduce the maintenance work load on auxiliary machinery while the cooling arrangements comprise two identical systems, one for each main engine.

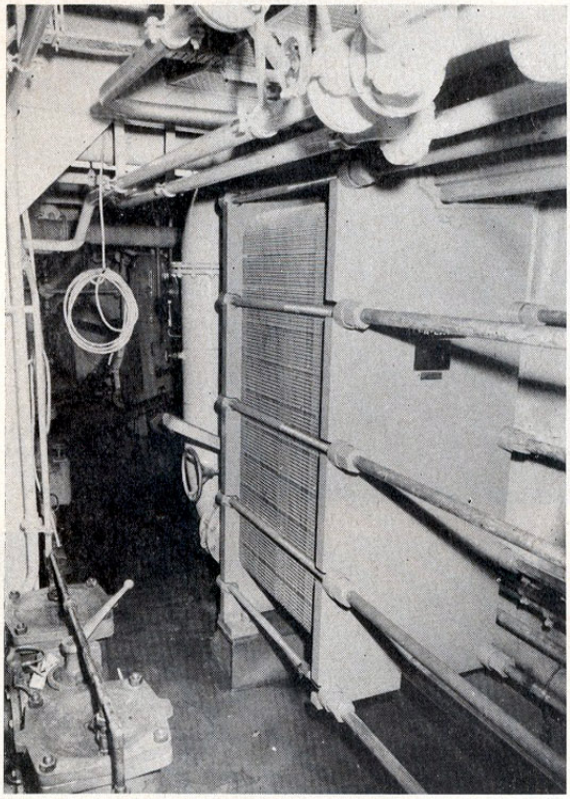
The central cooling systems comprise in each case an Alfa-Laval plate-type sea water-cooled heat exchanger circulated by a 465 m^3/h capacity Weir sea water pump. This pump circulates the water from the sea to the central cooler and then overboard and is the only sea water line anywhere in the engine-room. All other water cooling is on a two-temperature fresh water system with the cold fresh water being circulated by a 465 m^3/h capacity main fresh water pump to the Alfa-Laval plate-type main engine jacket water cooler, the main engine lubricating oil cooler, gearbox oil cooler, fuel valve cooler, charge air cooler, alternator air cooler, and the condenser circuit for the Nirex jacket water-powered evaporator. This latter is connected to the main engine jacket—or hot fresh water—circuit and is capable of producing 23·2 tons/day of fresh water from the sea, with the heat derived from the engine cooling water. The hot fresh water is circulated through the engine jackets and evaporators by a 117 m^3/h Weir pump while also connected to the circuit is a 36 kW electric heater, as there is no steam raising plant on the vessel and warming of the engines from cold will sometimes be required.

In addition to the two fresh water cooling circuits a further secondary hot fresh water circuit is provided to extract heat from the main engine lubricating oil. The 115 m^3/h Imo main lubricating oil pump delivers the oil through a secondary heat exchanger from where the resultant heated fresh water is used for accommodation and fuel heating. Additionally, electric heaters are provided for purifier oil heaters, should insufficient heat be available from the main engine lubricating oil. Thus it is seen that maximum heat recovery is obtained from both the engine cooling water and lubricating oil, while fresh water is also generated from the jacket water circuit.

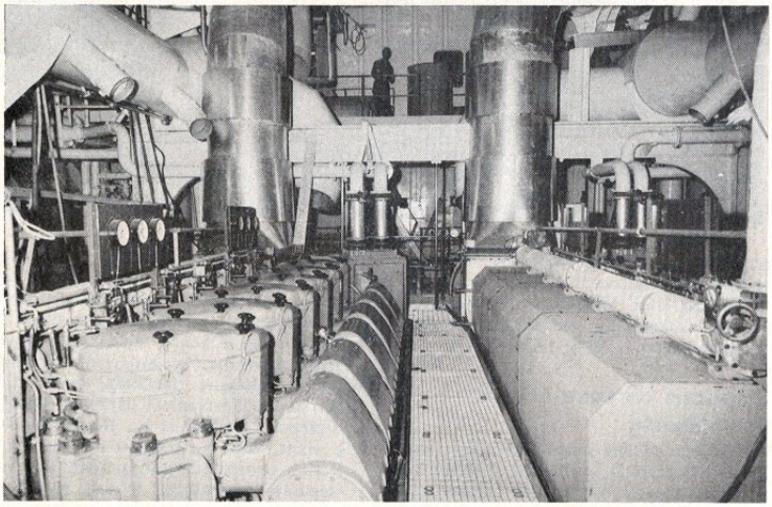
Two independent circuits as described are installed—one port and the other starboard for each main engine—and the machinery layout at the lower level is identical on both sides of the vessel's centreline, forming a mirror image installation.

Also of interest is that all machinery is mounted direct on the tanktops for easier access for maintenance with only the two main engines, gearbox, and shaft alternators, sited on raised bearers in the centre of the engine-room. Also, from the ease of maintenance point of view, a complete spare pump and motor unit for each main circulating pump is carried on board, designed to be lifted into position for repair by replacement; using this method, the classification society has agreed that standby pumps are not necessary while also dispensed with are cross-connections between the port and starboard cooling systems.

Right. The centre-piece of the "Fulgur's" central fresh water cooling system is this Alfa-Laval plate-type main fresh water cooler. This, and a similar unit on the port side, utilise the only sea water lines on the vessel.



Below. A view over the top of the starboard M.A.N. R6V 52/55 main engine of 6 000 bhp. The two six-cylinder in-line units comprise the first Shell medium-speed machinery installation and were chosen for ease of maintenance.



Other items of auxiliary machinery are mounted on the second deck level; these comprise two Atlas Copco 285 m³/h capacity general service air compressors and two Hatlapa 85 m³/h starting air compressors. A 20 m³/h emergency air compressor has also been supplied by Hatlapa and all the above mentioned machines are air-cooled. The fuel and lubricating oil separators are housed in two separate and identical rooms at the forward corners of the engine-room on the lower level. These two rooms are enclosed and can be sealed from the rest of the machinery space and mounted in each is an Alfa-Laval MAPX 309 self-cleaning lubricating oil purifier, and a similar unit for heavy fuel. The grade of fuel used will be of 600 sec Red. 1. viscosity, though the purifying and heating plant has been designed to cope with heavier fuel grades up to 1 500 secs, if required. The main engine lubricating oil filters are of the automatic self-cleaning Boll and Kirch type, while the heavy fuel and diesel oil transfer pumps are of Bornemann manufacture.

High-voltage electrical system

As mentioned earlier, the electrical power supplies are derived at sea and in port from the 3·3 kV alternators driven from each main engine. The two alternators are each connected to their own 3·3 kV busbars from which the supplies are taken to two of the cargo pump motors and a 3·3 kV/440-volt transformer. This installation is perhaps unique in that the port alternator is connected to the port high-voltage busbar and port transformer, and a similar arrangement is used for the starboard side, while a connecting breaker is fitted between the two high-voltage busbars for in-port use when it may be required to operate all four cargo pumps from one main engine-driven alternator alone. A simplified diagram of the electrical system is reproduced on the pull-out drawing with this article.

Similar to the high-voltage electrical arrangement, two 440-volt auxiliary busbars are fitted, each being fed from the 3·3 kV boards through its respective transformer. The system is so designed that under normal operating conditions the port 440-volt switchboard will supply only the port side engine-room auxiliaries and associated lighting and heating circuits, while the starboard board is connected similarly to the starboard side electrical equipment. However, an automatic tie-breaker is fitted between the two 440-volt busbars, designed to operate only on power failure at either switchboard; interlock arrangements are supplied such that before the tie-breaker closes, the appropriate connecting breaker between the busbar and transformer is opened.

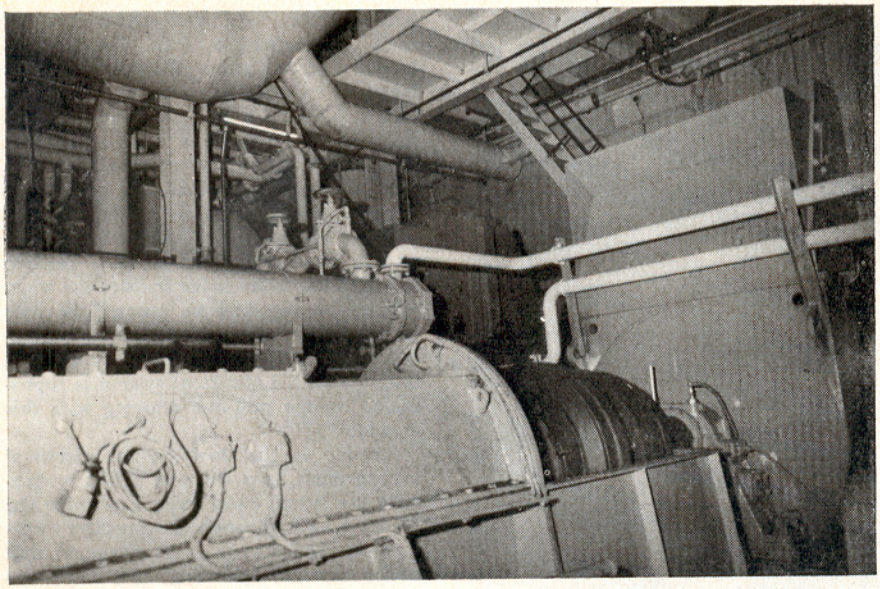
Also connected to each 440-volt busbar is the auxiliary diesel alternators and using these it is possible to energise both switchboards and in reverse through the transformers, the 3·3 kV boards for the cargo pumps. Sufficient electrical power can be supplied from the auxiliary alternators for operation of one cargo pump motor. A further diesel generator which can be connected to the 440-volt switchboards is an emergency 140 kW unit driven by a Scania-Vabis diesel engine and located on the main deck, designed to cut in automatically on complete blackout of the other electrical systems.

The electrical switchboards and transformers are all located on the port side of the 2nd deck in a special compartment while the transformers are enclosed from the rest of the room by wire mesh screens. The 3·3 kV switchboards are of Whipp and Bourne manufacture while the 440-volt boards and transformers have been supplied by A.E.G., of West Germany.

Combined machinery/cargo control room

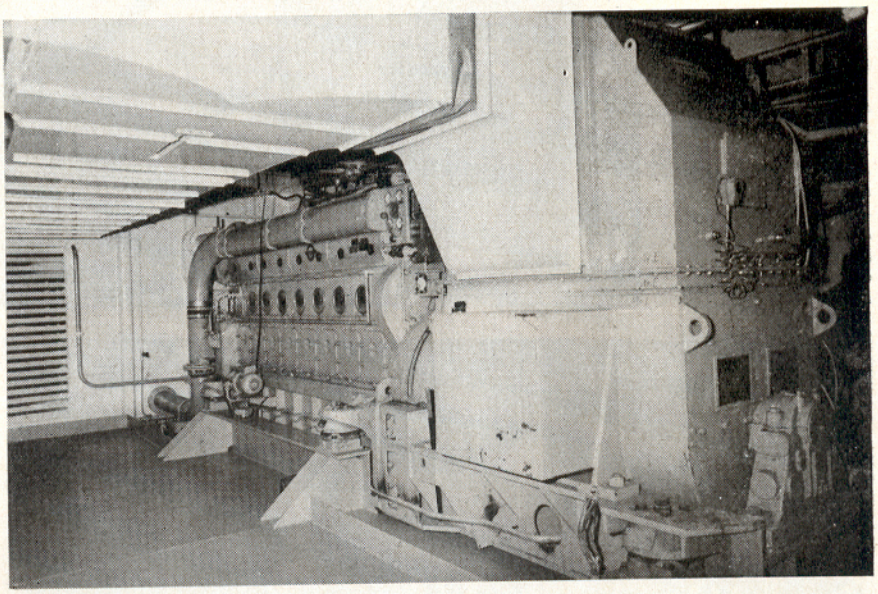
Another notable feature of the "Fulgur" is the siting of all the machinery and cargo control equipment in a room on the 1st poop deck. Here the control arrangements are fairly extensive and comprise controls, indicators, mimics and gauges mounted on vertical panels or desk tops.

The control panels for the engine-room equipment comprise four units and have been supplied by ASEA, of Sweden with



Left. One of the main 3·3 kV 3 750 kVA, 60 c/s, alternators driven from the main reduction gear by a power take-off shaft.

Below. One of the two radiator-cooled 450 volt, 735 kW auxiliary alternator sets located at the top of the engine-room. The prime mover is a Bergen LDG-8 unit of 1 065 bhp.



two similar panels for each main engine, a desk console with engine and propeller controls, backing which are mimic diagrams and indicators for the gearing and electrical plants, and a fourth panel for the secondary hot fresh water circuit and equipment. The panels for each of the two main engines comprise a mimic diagram showing fuel, fresh water lubricating oil, charge air, air start, and valve cooling, parameters, also ASEA automatic temperature and pressure recorders and alarms. Between the two engine panels is the manoeuvring console which mounts an Autronica alarm system, Kamewa Combinator propeller pitch controller, a Jungner push-button telegraph, telephone equipment and a Kienzle alarm printer. Backing the manoeuvring console on a vertical panel is a mimic diagram with alarms and controls for the reduction gearing and clutches, engine and propeller speed tachometers, engine load meters, and ship's speed and propeller pitch indicators. On the right hand side of the panel is a mimic panel for the electrical systems showing the busbars, breakers, and interlocks, while also mounting voltage, frequency, amperage and wattage meters. Although the switchboards are located in the engine-room, all electrical control functions can be operated and monitored from the control room.

The cargo control panel which mounts the Kracht electro-hydraulic system and mimic diagram is, together with the adjacent cargo pump controls, located on the starboard side of the control room. Thus, all machinery and cargo operations can be controlled and monitored from this one room and if required, both functions can be carried out by one officer from either deck or engine-room. The vessel has been equipped for unmanned machinery operation, and indicators in the engine-room workshop notify personnel there by a large flashing sign whether the alarm being registered is of primary, secondary, CO_2, or telephone categories. Positioning of the control room within the accommodation deckhouse has been designed to save sometimes unnecessary trips to the engine-room by off-duty engineers, to answer alarms. A number of alarms and indicators are repeated on the wheelhouse for surveillance by the watchkeeping deck officer.

Emphasis on ease of maintenance

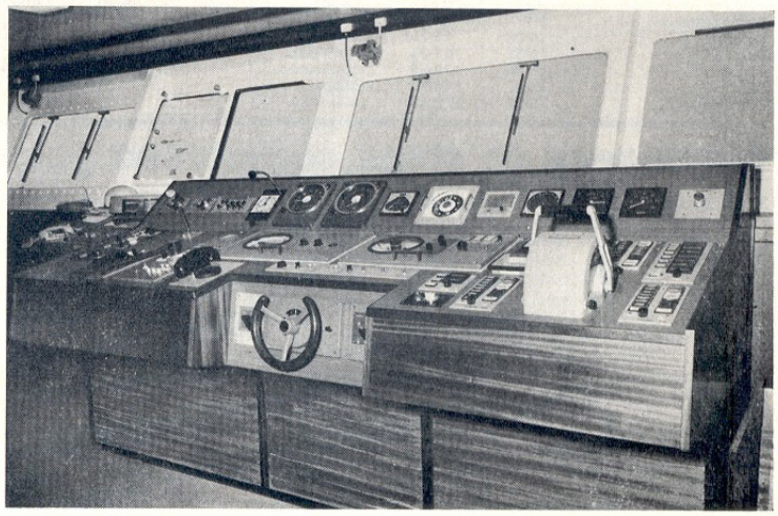
The design of the machinery space and fitting of various tools and mechanical handling devices, very much reflects the owner's desire to ease the task of maintaining the vessel's machinery while undertaking most tasks on board using the ship's engineers and the general-purpose ratings.

To this end, the 1st deck of the engine-room immediately below the air-cooled auxiliary alternators is used for maintenance purposes alone. At the forward end of this deck are stored the spare pump units previously mentioned, and spare pistons, liners, cylinder covers and other components for the two main engines. The aft part of this deck forms a vast workshop area containing stores and work spaces fitted with a greater number of machine tools than normally found on ships. Within the air-conditioned workshop space, which is sound insulated and completely enclosed from the rest of the engine-room, there is a large lathe, a bench and a floor type drilling machine, a universal milling machine, shaping machine, hydraulic press, and a mechanical hacksaw. Other equipment supplied is an electric welding plant, valve grinding machine, fuel injection equipment testing gear, and in a separate enclosure, a test bay for instruments. Ample large work benches and tool racks are also provided.

Mounted on a gantry at the top of this deck is a 4·5 ton capacity Munck swivelling jib crane which is designed for direct lifts from the main engine cylinders below, or through openings in the deck to the auxiliary pumps on either side of the engine-room, for maintenance by replacement of these as mentioned earlier. For transport of engine components from this deck into the workshops for overhaul, a mono-rail system on which hand lifting blocks are mounted, is employed. It is intended that main engine cylinder covers complete with valves and fittings will be replaced

Right. A section of the officers' lounge showing the bar in the port aft corner.

Below right. The manoeuvring console in the wheelhouse, which mounts the engine and propeller pitch controls, and alarm instrumentation.



by spares on overhaul, with removed parts overhauled by the day working engineers at sea.

Therefore, the maintenance aids described have been designed to allow rapid maintenance of the main engines and auxiliaries in port for which in-line medium-speed engines are ideally suited —while if necessary the vessel could steam at sea on one engine while repairs are undertaken.

Well-equipped wheelhouse

The wheelhouse of the "Fulgur" covers a large area and is of the combined wheelhouse/chartroom type. On each bridge wing there is a free-standing Anschütz compass repeater and engine rev/min, propeller pitch, and rudder angle indicators. The wheelhouse windows are of the large rectangular type with horizontal - sliding wipers and the conning position is from a console mounted against the bridge front in the centre of the wheelhouse.

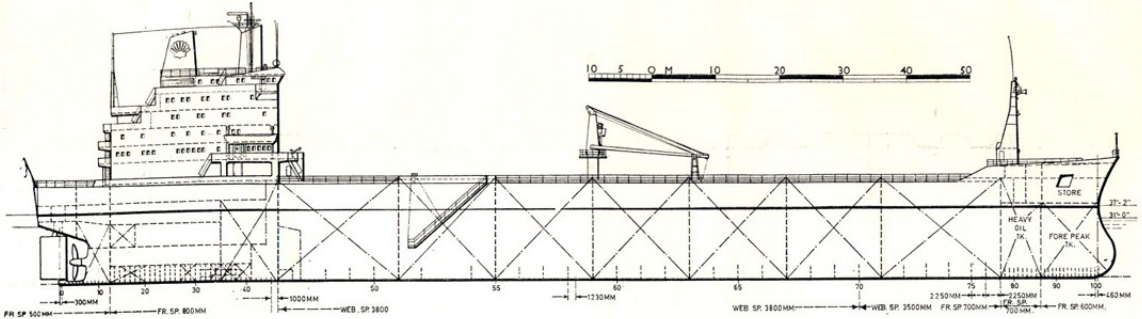
This manoeuvring console comprises at its port side end, telephone equipment, and to starboard the Kamewa Combinator unit, engine alarms, a Jungner push-button telegraph, and indicators for engine and shaft speed, propeller pitch, ship's speed, rudder angle, and a magnetic compass. The steering position is from a small handwheel mounted at the front of the console in its centre.

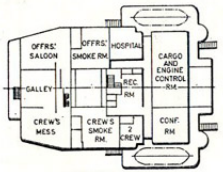
Extensive navigational aids are fitted in the wheelhouse; among these are two Raytheon radar sets, Decca Navigator Mk21, Atlas eschosounder, Anschütz course recorder, Marconi Lodestar direction finder, Sal speed log and the gyro compass and autopilot is also of Anschütz make. Two separate chart tables are located in the centre of the wheelhouse while against the aft bulkhead is a long locker for flags and documents, atop which is a washbasin. The navigation lights control and indicating panel mounted in the starboard aft corner is of AEG supply while also in the wheelhouse is a Salen and Wincander fire alarm panel and a Kockum's LMC Loadmaster.

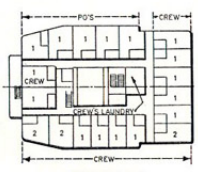
Having previously inspected a ship built at the Haugesund shipyard we were not too surprised at the very high standard of accommodation finish on the "Fulgur". Identical suites comprising a bedroom, dayroom, office, and bathroom, are provided for the master and chief engineer on the 4th poop deck while also housed on this deck in three-room suites are the chief officer and second engineer, radio officer and owner. The remainder of the ship's officers are accommodated on the 3rd poop deck with suites also provided for other senior officers, and four junior officers are in large single-berth cabins. Also arranged on this deck is a gymnasium and officers' laundry. The ratings are all housed in attractive single-berth cabins each with private shower and toilet facilities on the 2nd poop deck.

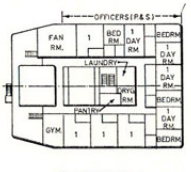
Mess and recreation rooms for officers and crew are located on the 1st poop deck, as is the galley, while the cargo and engine control room and a conference room are on the forward end of this deck. The officers' smoke room on the port side leads aft to the dining saloon while in a similar position to starboard is the crew's smoke room leading aft to the crew's mess. Amidships between the two messrooms at the aft end is the ship's galley which is equipped with an Electrolux cooking range, Hobart mixing and dish washing machines, and a Haigh waste disposal unit. The domestic stores and provision rooms are located on the main deck with easy access from the athwartships running stores crane while the forward section of the main deck accommodation comprises to port an emergency generator room and to starboard, deck foam fire-fighting equipment. The small deckhouse built-on forward of the accommodation block on the main deck, forms the pump room casing and access.

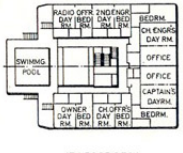
The many special features of this vessel and the others to follow in this series, reflect Shell's thinking towards the reduction of operating costs through maintenance aids and the utilisation of waste-heat recovery obviating the need for expensive steam raising plant. Readers may recall that we previously described another vessel with a similar propulsion and high-voltage electrical installation ("Esso Mersey" *The Motor Ship,* December 1972), but in our opinion the "Fulgur" is a much more functional and versatile ship than the "Esso Mersey". With the sophisticated yet functional design having many special features the ship will be watched with interest and could be a trendsetter in products tanker design, for others to follow. □

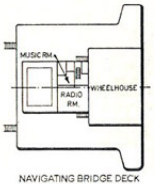

10 5 0 M 10 20 30 40 50
STORE
HEAVY OIL TK.
FORE PEAK TK.
FR. SP. 50CMM
FR. SP. 800MM
WEB. SP. 3800
WEB. SP. 3800MM
WEB. SP. 3500MM
FR. SP. 700MM
FR. SP. 600MM.

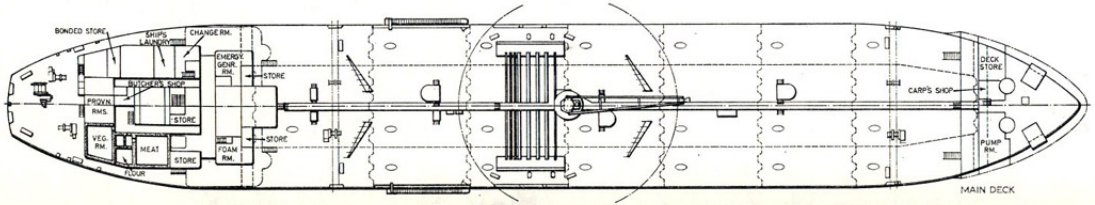

OFFRS' SALOON
OFFRS' SMOKE RM.
HOSPITAL
CARGO AND ENGINE CONTROL RM.
GALLEY
REC. RM.
CREW'S MESS
CREW'S SMOKE RM.
CONF. RM.
1ST. POOP DECK

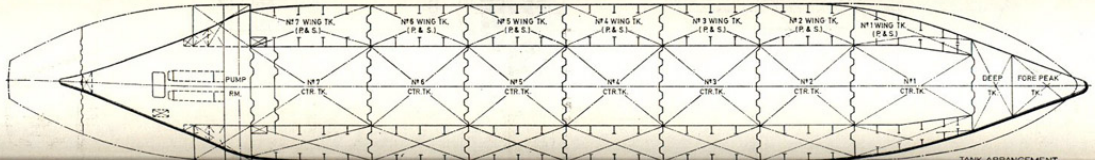

PO'S
CREW
CREW
CREW'S LAUNDRY
2ND. POOP DECK


OFFICERS (P & S)
FAN RM.
BED RM.
1 DAY RM.
BEDRM.
LAUNDRY
PANTRY
GYM
3RD. POOP DECK


RADIO OFFR. DAY RM.
2ND ENGR. DAY RM.
BEDRM.
CH. ENGRS. DAY RM.
SWIMMG. POOL
OFFICE
OFFICE
CAPTAINS DAY RM.
OWNER DAY RM.
CH. OFFRS. DAY RM.
4TH. POOP DECK

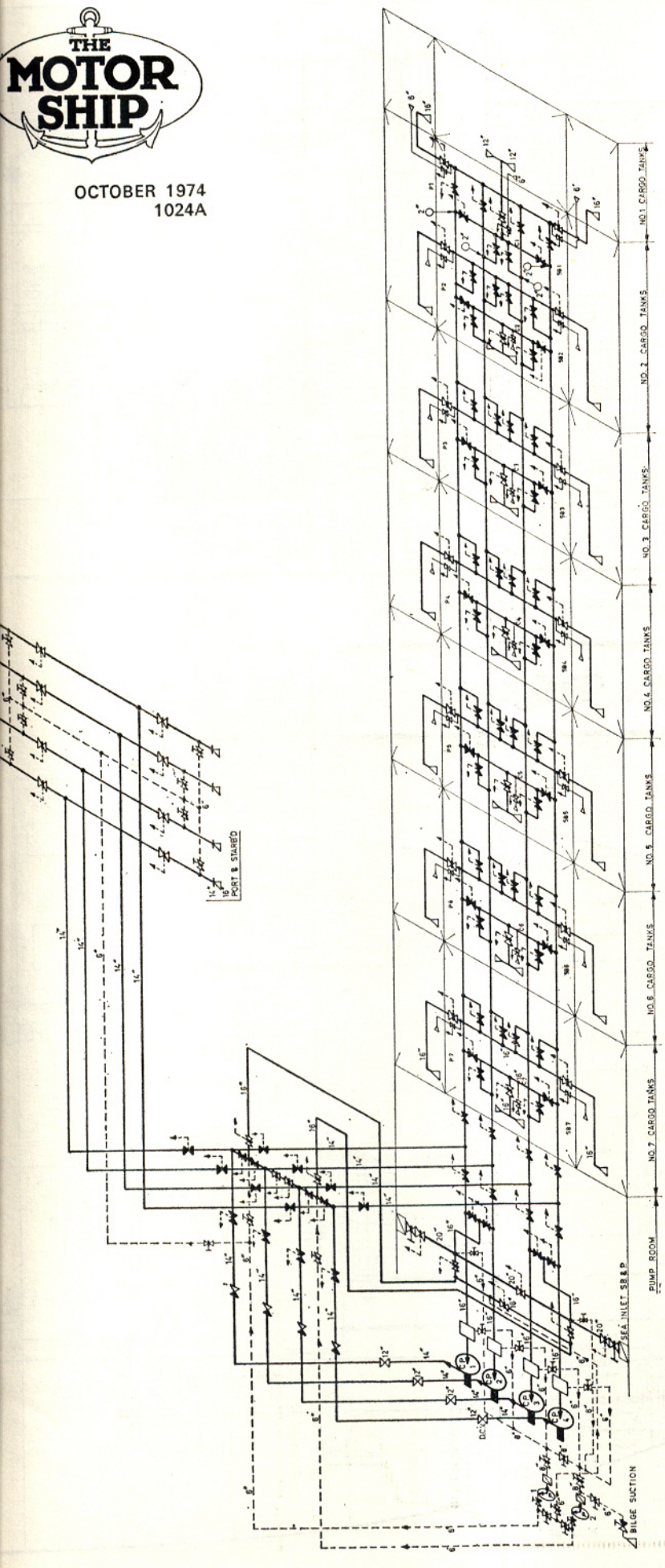

MUSIC RM.
WHEELHOUSE
RADIO RM.
NAVIGATING BRIDGE DECK

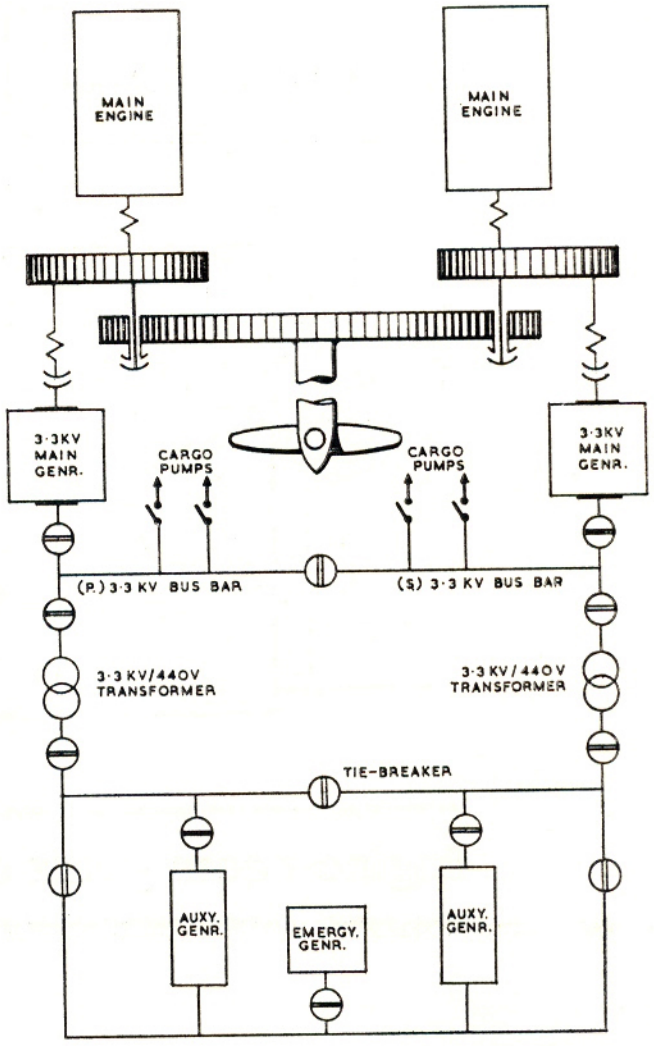

BONDED STORE
SHIPS LAUNDRY
CHANGE RM.
EMERGY GENR. RM.
STORE
BUTCHER'S SHOP
PROVN. RMS.
STORE
VEG. RM.
MEAT
STORE
FOAM RM.
STORE
FLOUR
DECK STORE
CARP'S SHOP
PUMP RM.
MAIN DECK


Nº7 WING TK. (P & S.)
Nº6 WING TK. (P & S.)
Nº5 WING TK. (P & S.)
Nº4 WING TK. (P & S.)
Nº3 WING TK. (P & S.)
Nº2 WING TK. (P & S.)
Nº1 WING TK. (P & S.)
PUMP RM.
Nº7 CTR. TK.
Nº6 CTR. TK.
Nº5 CTR. TK.
Nº4 CTR. TK.
Nº3 CTR. TK.
Nº2 CTR. TK.
Nº1 CTR. TK.
DEEP TK.
FORE PEAK TK.
TANK ARRANGEMENT

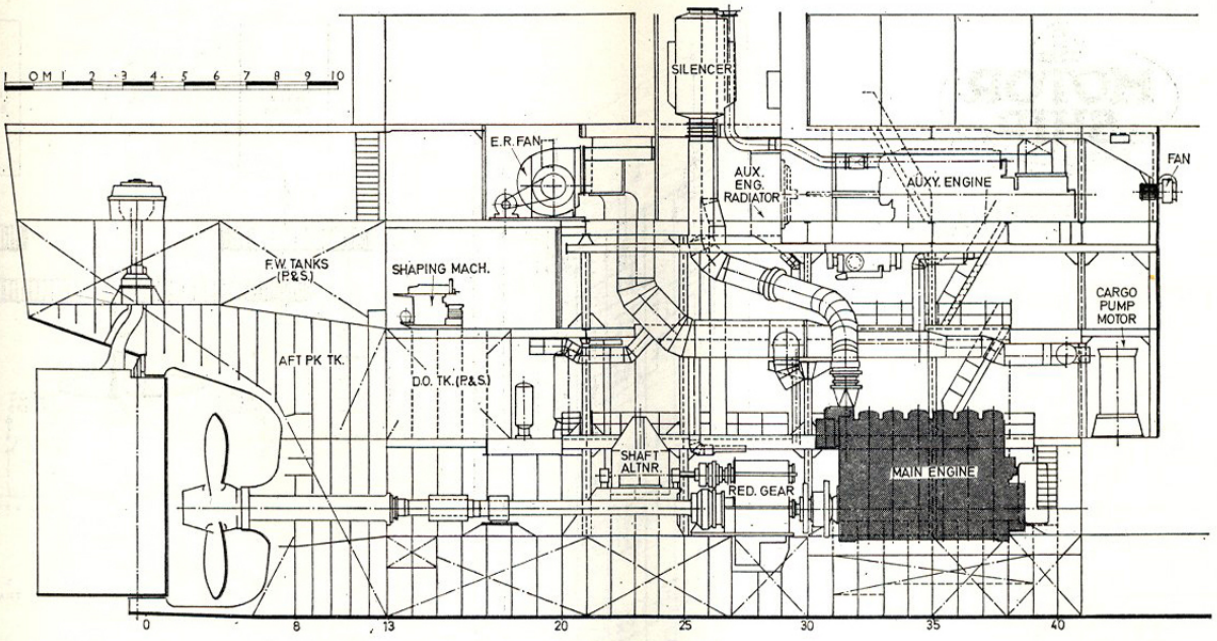
THE MOTOR SHIP

OCTOBER 1974
1024A



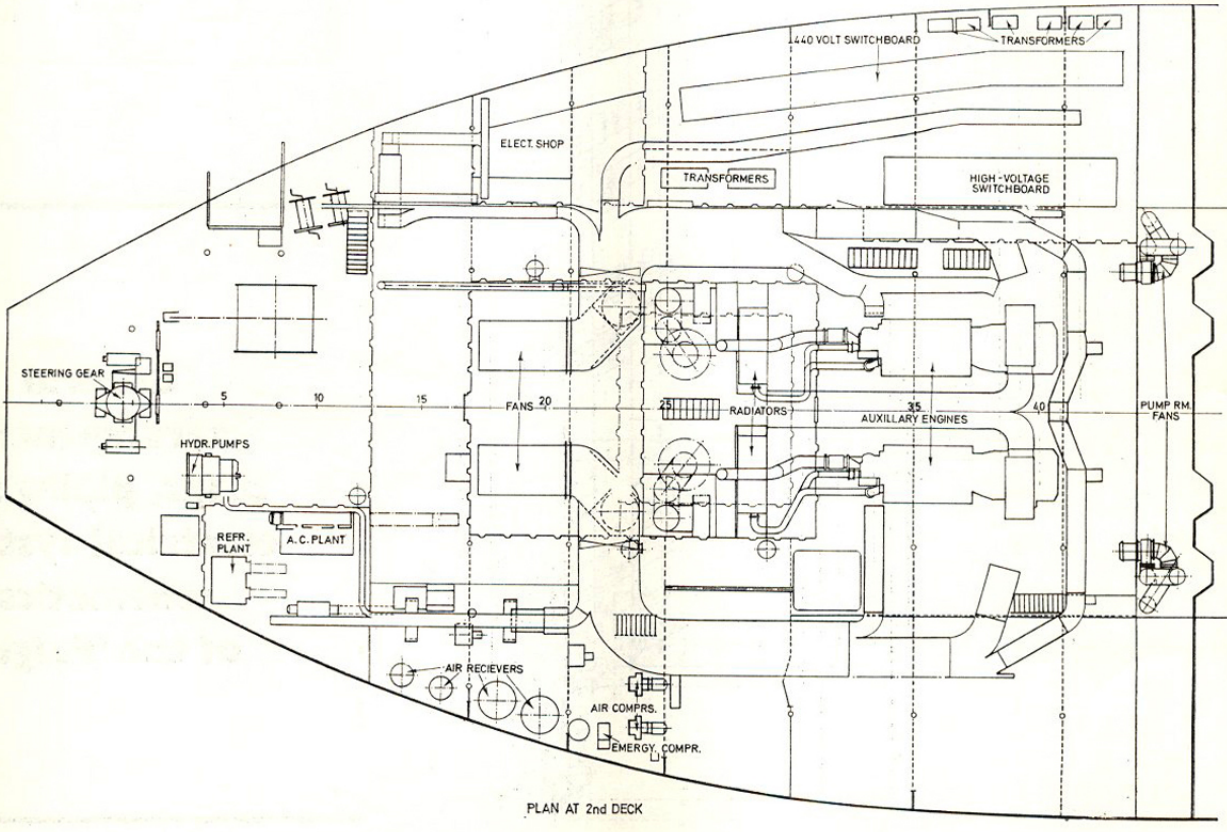


General arrangement plans, piping and electrical systems schematics, of the 'Fulgur'

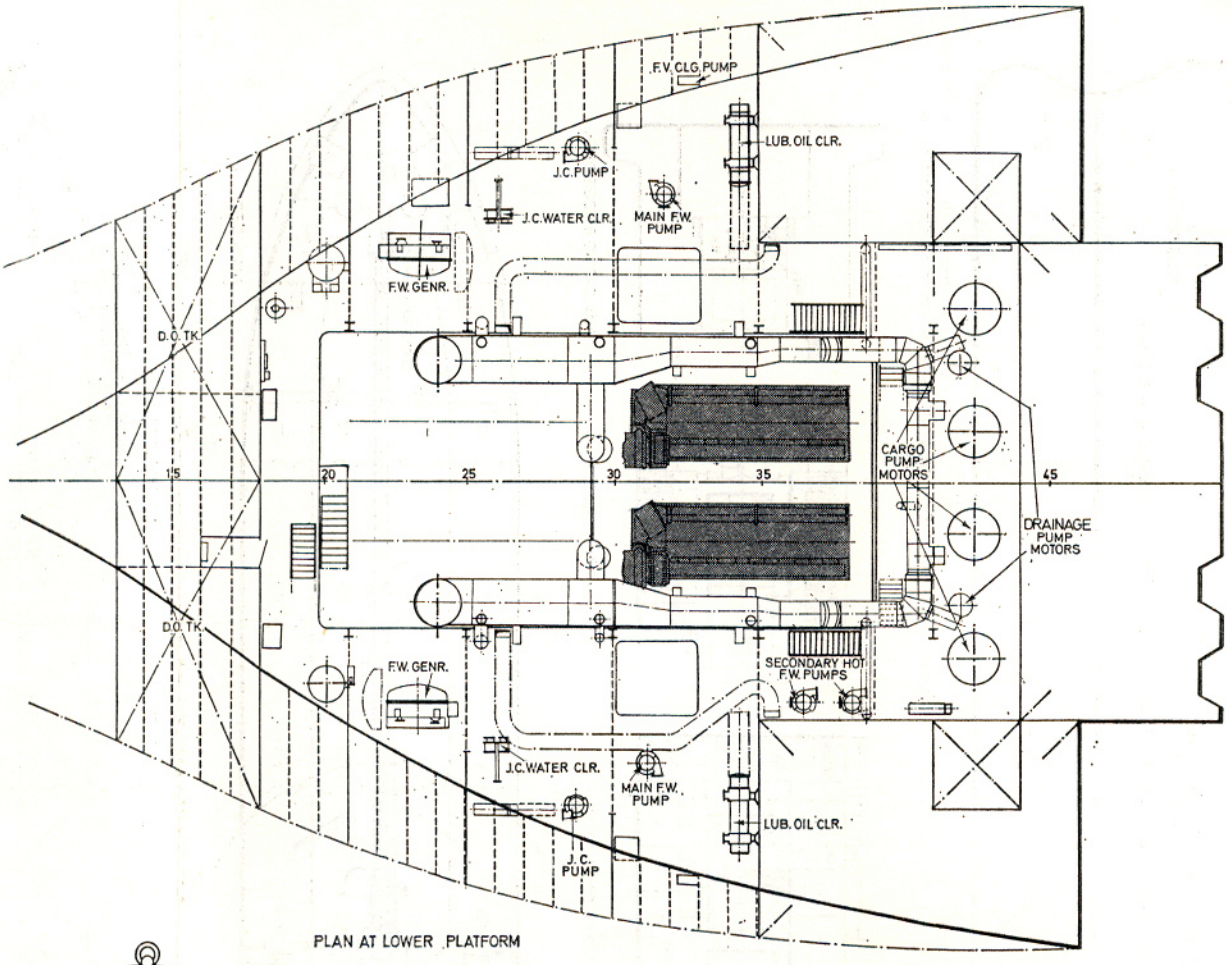


LONGITUDINAL SECTION IN ℄ LOOKING TO PORT

Engine-room plans of the 'Fulgur'



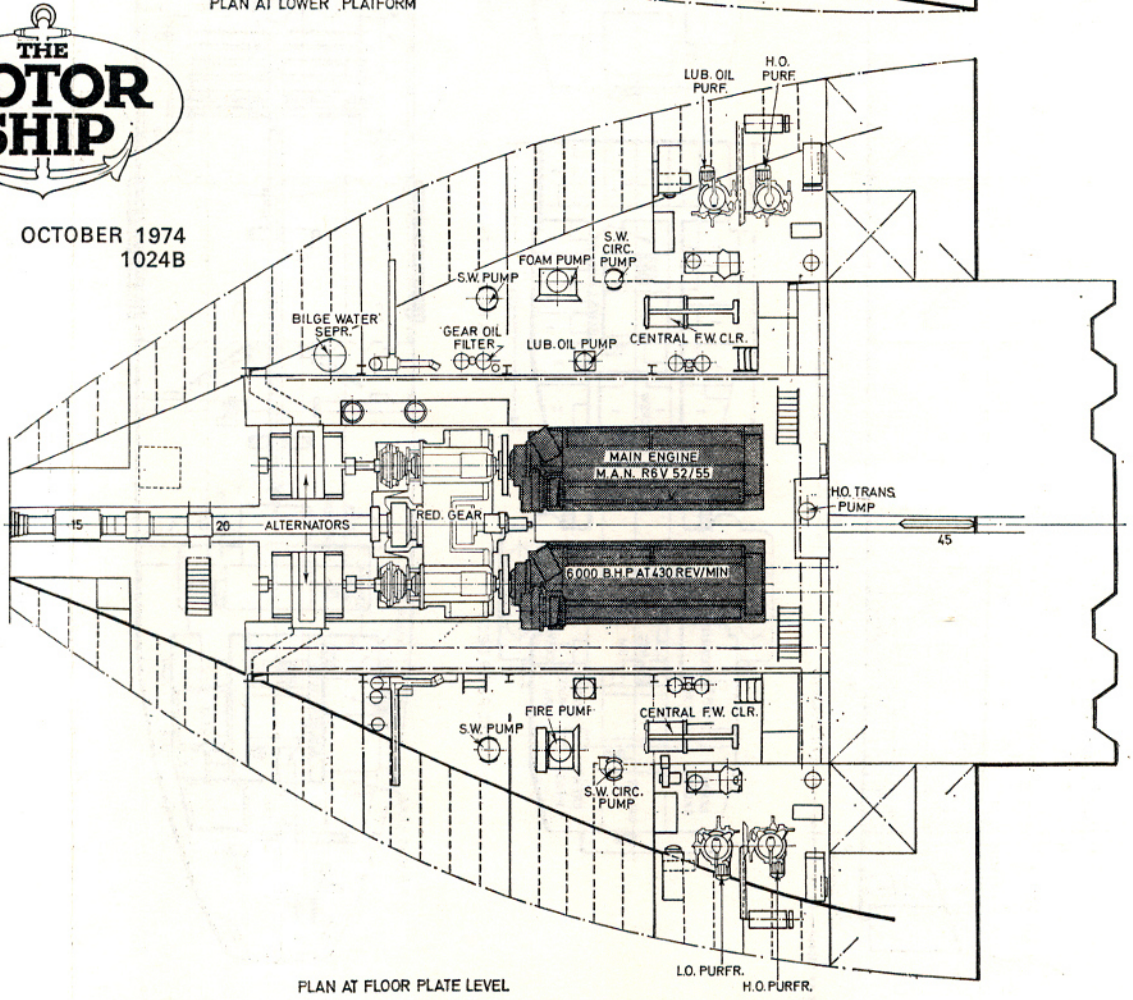
PLAN AT 2nd DECK



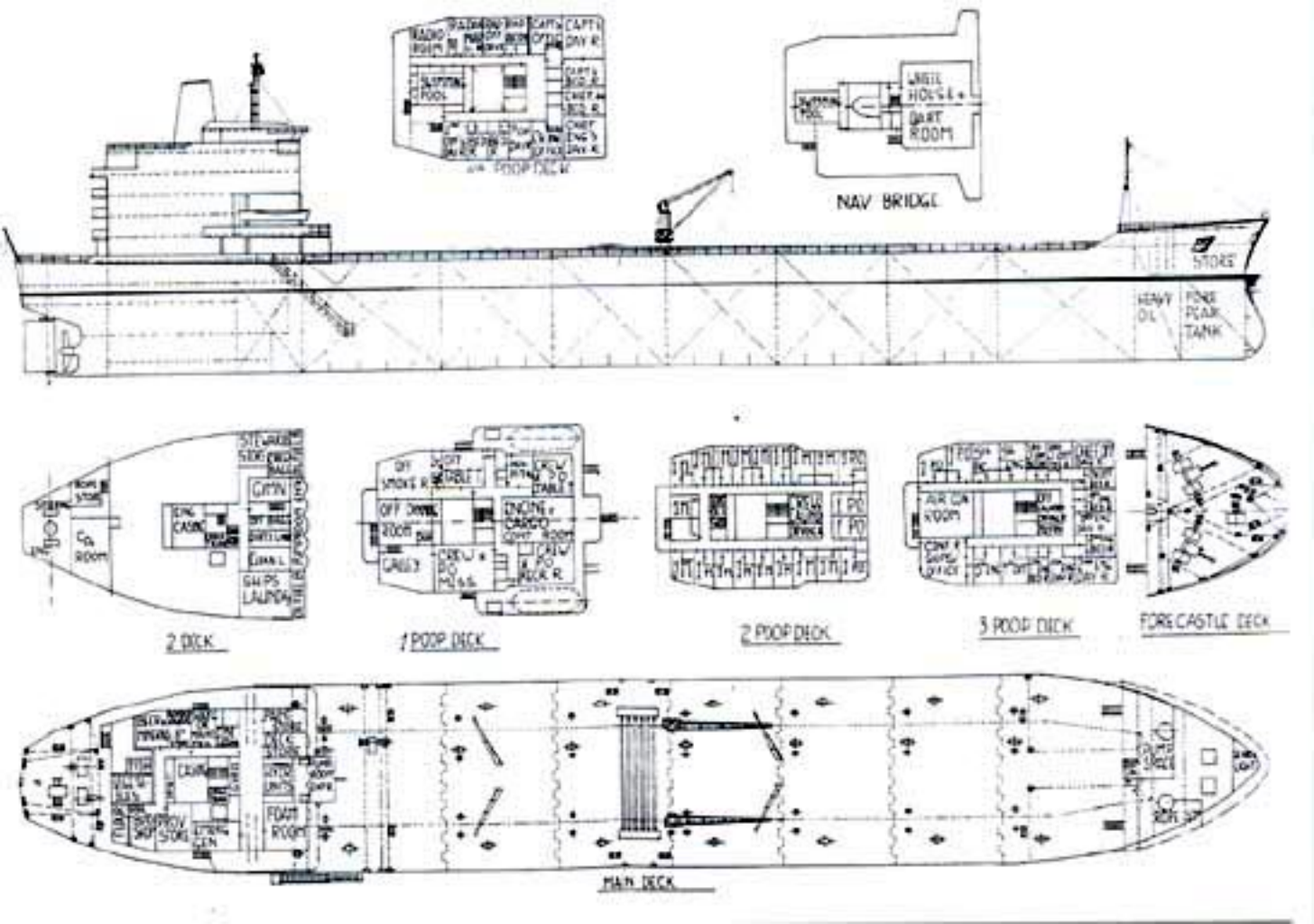
PLAN AT LOWER PLATFORM

THE MOTOR SHIP

OCTOBER 1974
1024B



PLAN AT FLOOR PLATE LEVEL


NAV BRIDGE
STORE
HEAVY OIL
FORE PEAK TANK
2 DECK
1 POOP DECK
2 POOP DECK
3 POOP DECK
FORECASTLE DECK
MAIN DECK

zaterdag, 01 maart 2008

Shell tanker awaits re-float

The supertanker **Ficus** which struck a reef and ran aground while attempting to deliver fuel to the Clifton Pier facility on Wednesday morning could be stuck until Monday, according to the Controller of the Port Authority Captain Anthony Allens.

"We had a briefing today and we don't expect the tanker to be refloated before Sunday or Monday," he said.

The product carrier ran aground on Goulding Cay, New Providence just after 9 a.m. on Wednesday. The Port Department of the Ministry of Maritime Affairs has assigned two government tugs and two privately-operated tugs, and is also receiving assistance from the Royal Bahamas Defense Force for the removal of the 44,788-ton Shell F-Class oil tanker.
In addition, Shell has activated a re The vessels **Geosea**, **Geobay** and **Geosounder** are now dedicated to, and operated out of DOF Subsea Asia and ideally positioned to meet demand in the region's buoyant offshore market.
DOF Subsea Asia Pacific has had a strong start to the year with news of awards for its fleet and related services; the total value of work secured to date exceeds USD33M. Arriving in Singapore on 20 January 2008 Geobay, having been relocated from the North Sea, has been contracted to Coogee Resources Pty Ltd. The programme of work starts in early February, 2008 and includes IRM and light construction support works in the Joint Development Area of the Timor Sea. The work is expected to continue up through June.

On completion of existing campaign work in the Gulf of Thailand, Geosea, sailed directly to Australia's North West Shelf under carter to Woodside Energy Ltd, to undertake a saturation diving campaign at the beginning of March. And lastly, the Geosounder as of second week of February is on hire with The Finding Sydney Foundation to perform survey, positioning and personnel services in the continued search for the wreckage of HMAS Sydney II.Says CEO, Mons Aase, "I am very happy to see that Geobay which just recently arrived in the region is immediately chartered out in the market at very attractive prices." Adding to this, Steve Brown Managing Director for DOF Subsea in Asia states that the market in the region is very strong and DOF Subsea is well positioned to take advantage of this with its modern fleet of vessels. sponse team to investigate the situation. Meanwhile, the Port Department is also conducting its own investigations.

Captain Allens said it was too early to determine the cause of the collision, but he said investigations are ongoing. "Our major concern right now is getting it off the reef and making sure it causes no further damage to the reef. That's our main concern. Simultaneously, we are doing our investigation, but primarily we are concerned about the reef," he told The Guardian last night. According to him, steps are being taken to

determine the level of damage the ship would have sustained. Yesterday the Best Commission was undertaking an investigation in an effort to mitigate the problem, Allens revealed. "This is a large ship so we expect some damage. When you damage a reef you move some of the living coral and they can move around," he explained, adding that he was not an expert. Meantime, Allens said the vessel is not leaking and is unlikely to do so under current conditions. However, he added that there is some urgency in the removal of the oil tanker because a frontal weather system is expected to move through the northern Bahamas.

The '**Ficus**' -- a modern double hulled vessel -- is owned by Elka Shipping Limited and operated by Shell International Trading and Shipping Company Limited. Global United is the company's local agent. Captain Allens said he could not reveal who was the captain of the tanker. Meanwhile, Shell spokesperson Alexandria Wright said the tanker is partially laden with clean products and 120 barrels of oil. Clean products are jet gases, which, evaporate when exposed to the air.

When such a gas touches the water it will dissipate "quite quickly", Wright said. She reported that the ship is stable and there are no reported injuries on board. Wright is a part of Shell's crisis team in London, England. The company is doing a number of things to ensure that the investigations into the incident go smoothly. "Following extensive evaluation of the situation, in the interest of environmental concerns and preserving the integrity of the vessel and the cargo, we (Shell) have enlisted an expert salvage master. He is at the scene coordinating the refloating of the vessel," she said yesterday.

Capt Jeremy Hudson (right) addresses Monday's press conference. Also pictured are Maritime Affairs and Labour Minister, Dion Foulkes (centre), and Port Controller Captain Anthony Allens. (BIS Photo/Derek Smith)

NASSAU, Bahamas - Steps are being taken to re-float the 183-metre oil-laden tanker, Ficus, which ran aground off southwestern New Providence, a press conference was told on Monday. Utilizing a process called 'lightering', some of the cargo will be transferred to a barge moored alongside the vessel, said Capt. Jeremy Hudson, Oil Fleet Manager, Shell International Trading and Shipping Company."This option has been deemed to be the most environmentally sound and will ensure the integrity of the vessel," said Capt. Hudson. The

barge required for that operation arrived Monday morning from Tampa, Florida. Maritime Affairs and Labour Minister Dion Foulkes noted that the grounding of the Ficus makes the National Oil and Chemical Spill Contingency Advisory Committee “even more relevant.” “I shall expect that after a full investigation into the cause of this incident, the committee will make recommendations to decrease the chances of re-occurrence,” said Mr Foulkes.

Capt. Hudson said the operation “is going to plan.” Shell is conducting “a full internal investigation” into the cause of the incident and will also assist any investigation launched by the authorities, said Capt Hudson. “We very much regret that this incident has occurred and any impact it may have caused to the coral,” he said. “I assure you that our key priority now is to re-float the vessel as safely as possible, while minimizing further environmental impact.”

Nobody was injured during the incident and there has been no pollution or release of oil, said Capt Hudson. The Ficus, a modern double hull tanker, is managed and operated by Shell International Trading and Shipping Company Limited.

At the time of the grounding last week Wednesday morning, Ficus was underway to the Clifton Pier terminal. It is partially laden with a cargo of jet (aviation kerosene), mogas (motor gas) and gasoil (light automotive diesel). Within minutes of the incident happening, said Capt Hudson, Shell reported it to the local Bahamian authorities and at the same time fully manned its London Shipping Incident Room. A response team consisting of engineers, naval architects and other nautical experts were assembled, he said. He flew from London to Nassau with a team of senior marine experts to manage the response, arriving early the following morning, said Capt Hudson.

This team was soon joined by a number of world class environmental experts, including coral and marine life specialists.

A state of the art oil spill response vessel, the Florida Respondent, is now at the scene as a precautionary measure, said Capt Hudson.

Successful Removal of Ficus Tanker
Mar 5, 2008 - 11:40:28 AM

Nassau, The Bahamas - Senator the Honourable Dion A. Foulkes , Minister of Maritime Affairs & Labour is pleased to announce the successful removal of the Shell “Ficus” from a reef located off the south west coast of New Providence. The tanker which ran aground on the 27th of February, 2008 is a double –hulled oil tanker carrying fuel was refloated without incident early this morning.

As announced previously, SMIT International, a salvage company, proposed rescuing the vessel by removing its cargo and refloating the vessel at high tide. The operation which began Monday afternoon (Monday 3rd March, 2008) was completed today (Wednesday, 6th March, 2008). The Government wishes to stress that every effort was made to effect the removal of the vessel without further destruction to the reef or marine life in the area.

Once again, The Ministry of Maritime Affairs & Labour seeks to assure the public that a full investigation will be conducted into this incident and an environmental assessment will be done by the BEST Commission.

mv Flammulina

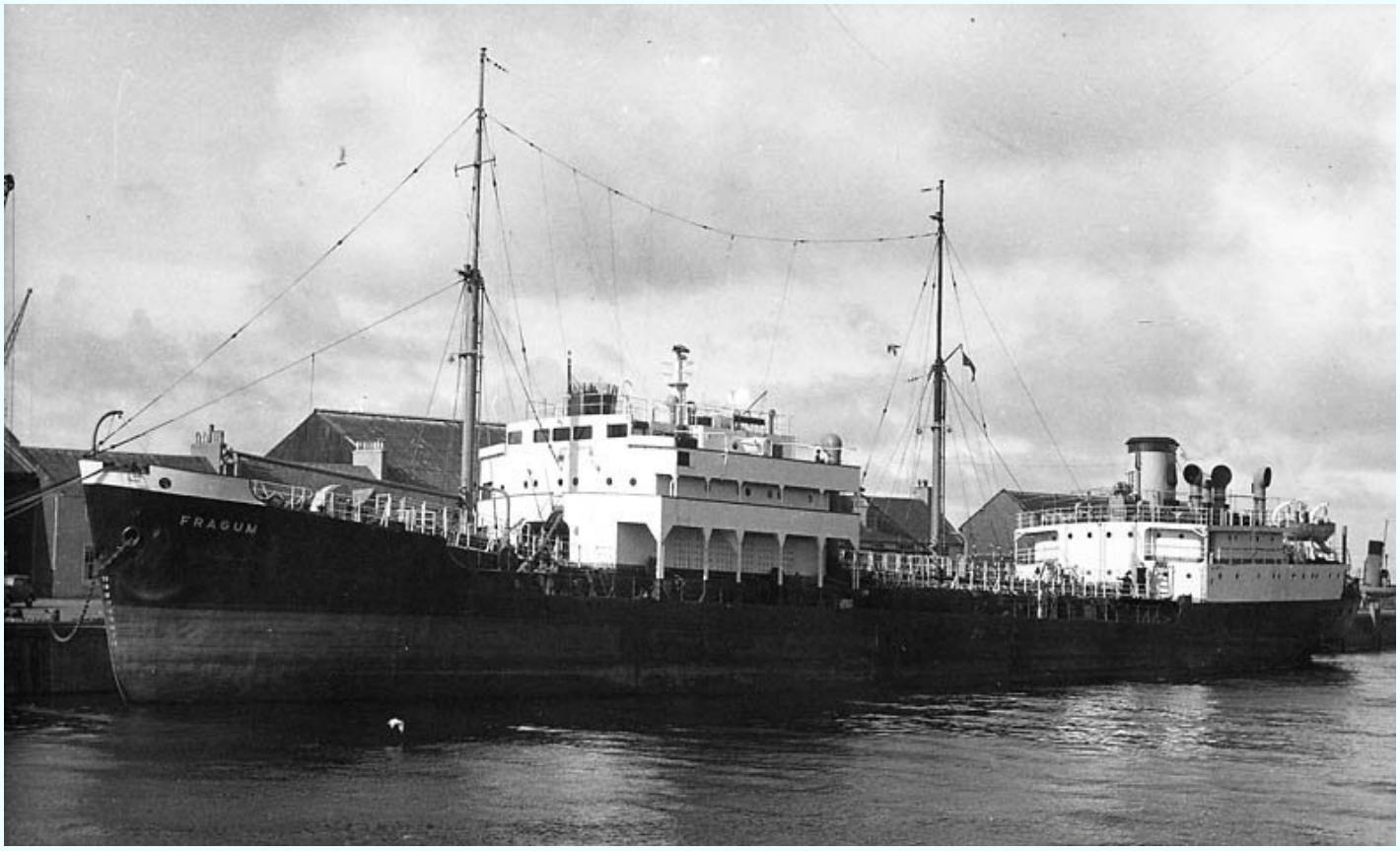
Forthfield

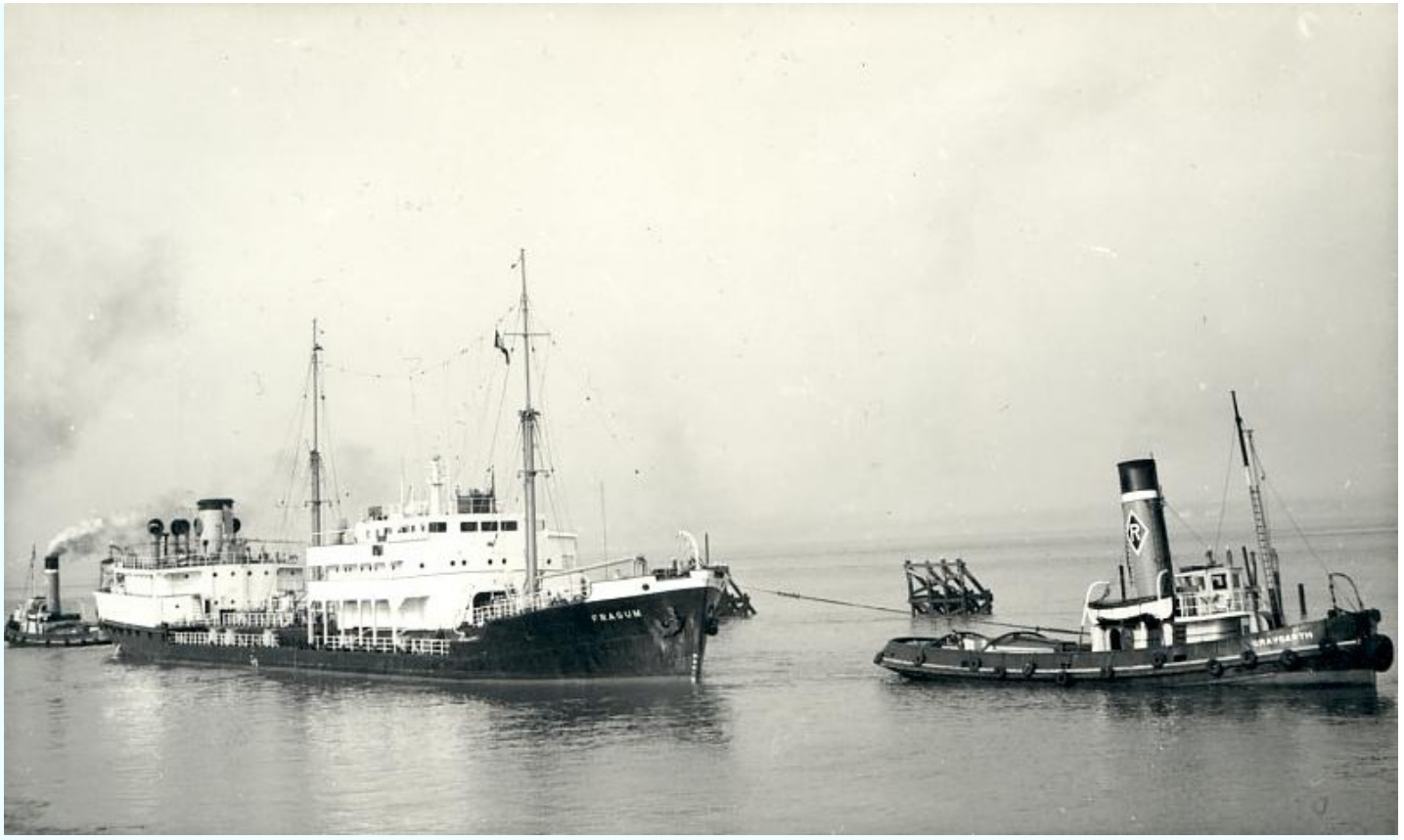
Hunting's FORTHFIELD is pictured above in the River Tees. She became a constructive total loss after grounding in the River Orinoco in January of 1975.

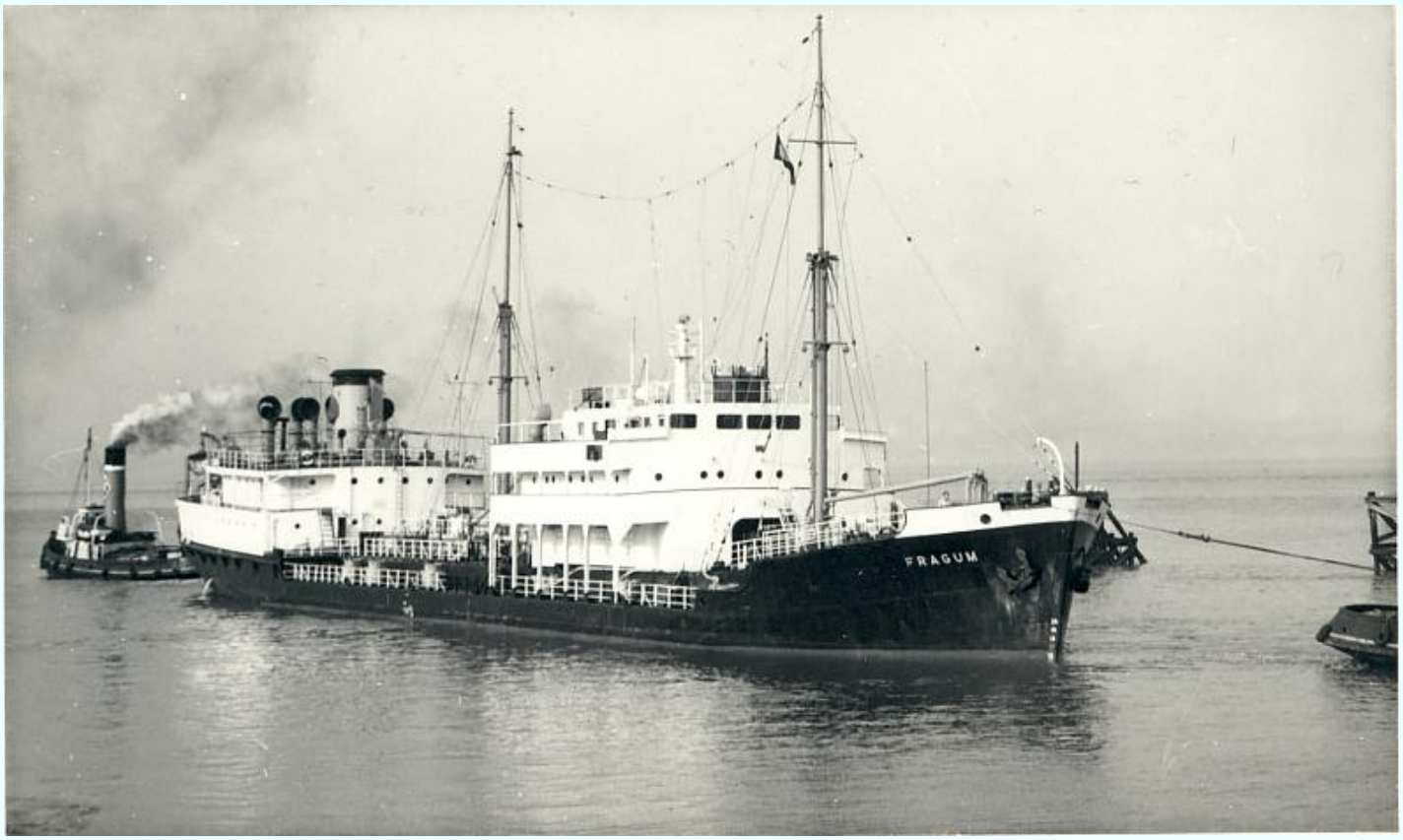
ss Fossarina

SMITH'S DOCK COMPANY LTD., SOUTH BANK

Name	FRAGUM
Type	Tanker
Yard Number	1219
Launched	28/11/1951
Completed	04/1952
Off. Number	184605
Engine builder	Smith's Dock
Engine type	T. 3cyl.
GRT	2928
Length (feet)	331.9
Beam (feet)	46.1
First owner	Anglo-Saxon Petroleum Company, London
History	1955 Shell Tankers (U.K.) Ltd.
	1964 MAUREA, Shell Oil New Zealand Ltd.
	1971 MAYU, Ocean Bitumen Carriers Inc., Liberia
	1973 Associated Gas Transports Inc., Liberia
Fate	03/1976 broken up at Hong Kong



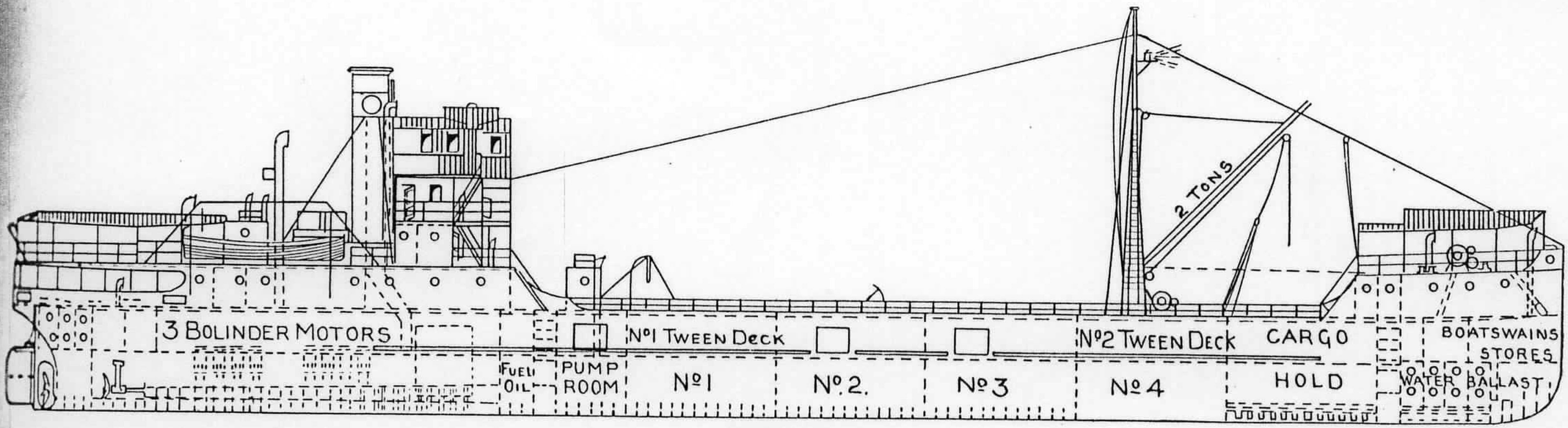




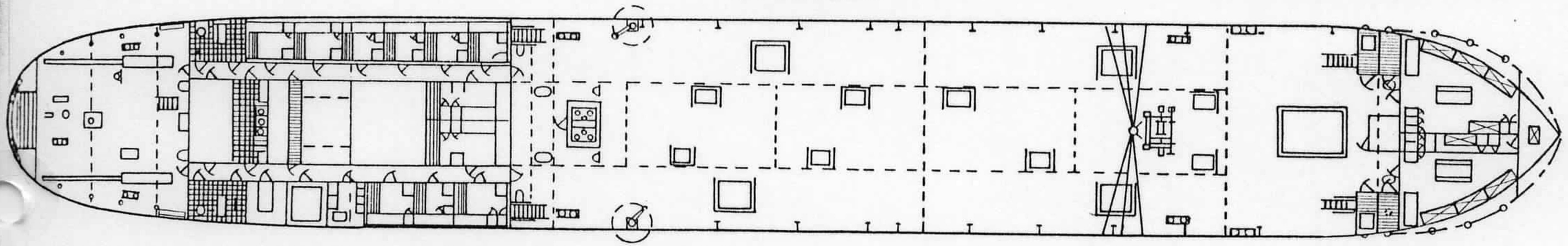
Use browser to return to this year

Return to this builder's yardlists

Return to all builders main index



UPPER DECK



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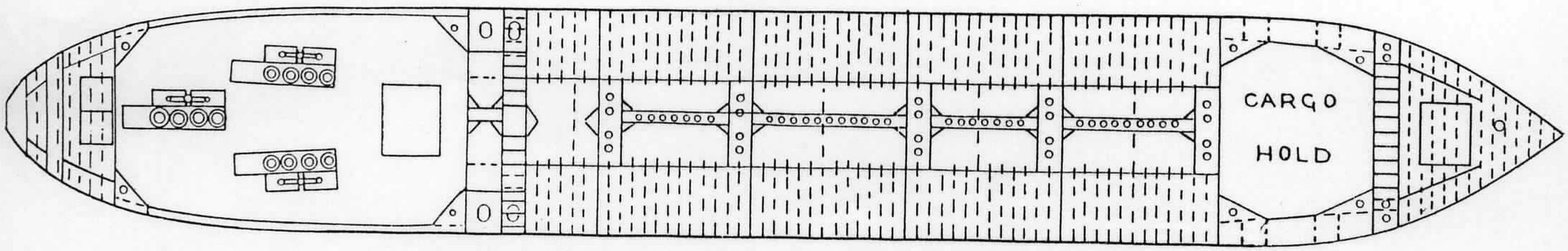
LOWER DECK



PROFILE AND PLANS OF THE TRIPLE-SCREW BOLINDER-ENGINED OIL TANKER "FU KWANG," BUILT FOR THE ASIATIC PETROLEUM CO. BY THE ROTTERDAM DRYDOCK CO.

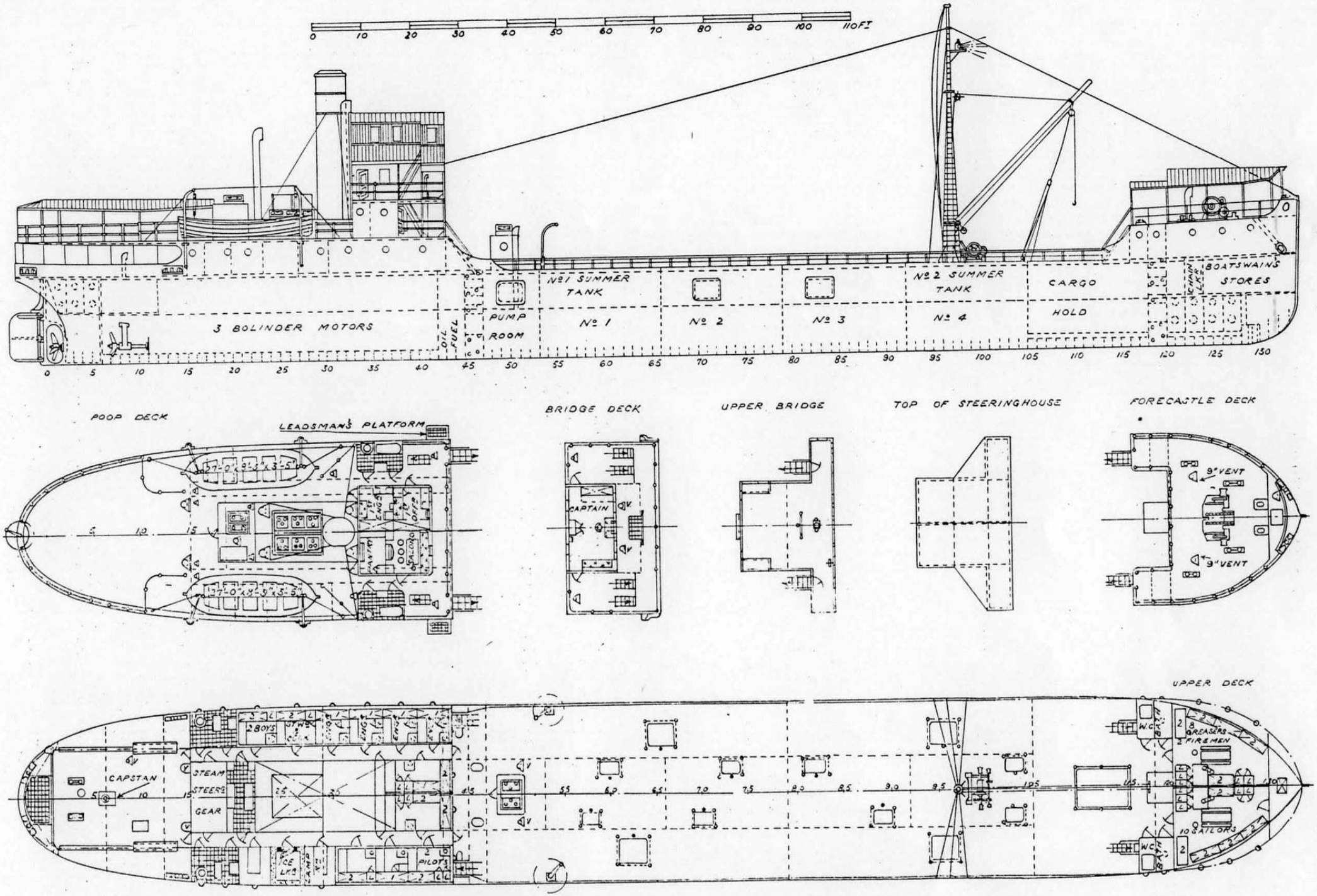


Fig. 10.—General Arrangement of the Triple-screw Motor Ship "Fu Kwang."

Fulgur

Fusinus

Fusus

Goodrich

A four-masted steel barque built in 1892 by Workman, Clark & Co., Belfast. Dimensions: 86,61×12,82×7,43 meters [284'2"×42'1"×24'5"] and tonnage: 2243 GRT and 2153 NRT.

Rigged with royal sails over double top and topgallant sails.

1892 July

Launched at the shipyard of Workman, Clark & Co., Belfast, for Boyd Bros. & Co., Belfast. Captain R.A. Williams.

1895

Sold to Raumo Nya Skeppsrederi AB (J.W. Söderlund), Raumo, and was renamed *Fennia*. Captain F.W. Laine.

1907

Sold to Finska Rederi AB (W.A. Söderman), Helsingfors.

1911

Finska Rederi AB was reconstructed as AB Finska Skolskeppsrederiet, Helsingfors.

1915

Taken over by Great Britain.

1919

Rebuilt as the tanker *Fiona Shell* for the Anglo-Saxon Petroleum Co.

1921

Oil storage tank at Pireaus.

1923

Oil storage tank at Gibraltar.

1941

Sunk by an Italian torpedo boat.