

At night when a breeches buoy has been rigged from shore to a stranded vessel, what is the meaning of the waving of a white flag or arms in a vertical motion by day, or at night a white light or flare being waved in the same manner?

What is the color of rockets, shells, or rocket parachute flares used as distress signals to indicate that the vessel firing them is in distress, and requires assistance from other vessels, or the shore?

What is the lifesaving signal for "This is the best place to land"?

When using a breeches buoy what signals are used at night to signify:

- (a) Haul away;
- (b) Slack away;
- (c) Avast hauling?

What is the lifesaving signal for "you are seen," "assistance will be rendered as soon as possible"?

- (a) By day.
- (b) By night.

During the day, at sea, a vessel is sighted displaying the international code flags "NC." What would this indicate to you, and what action would you take?

What signals are employed in connection with the use of shore lifesaving apparatus to signify in general, "Affirmative"?

What is indicated when a vessel displays a red light over a white light, not over six feet apart, on her arrival in port?

What is the signal used on vessels equipped with radio telephone by which they can inform other vessels or shore stations that they are in distress and require assistance? Will such a signal be understood in any language?

What distress signals would be appropriate for use in international waters in a fog to obtain assistance from other vessels in the vicinity?

What are the day and night signals to be made by a vessel seeking the services of a pilot?

If you sighted several red parachute flares, but no aircraft or surface vessels in the vicinity, what would be indicated and what should be your action?

What does a day signal consisting of a square flag with a ball above or below it indicate?

Should you sight rockets or shells, throwing red stars one at a time at short intervals, what would be indicated?

What custom is followed in hoisting the ensign, jack, house flag, etc.?

What signal should be displayed, by day and by night, when loading or discharging oil in bulk at a dock?

Should you sight a yellow flare floating downward from a small parachute about three hundred feet in the air, what would it indicate, and what action would you take?

At night a vessel is reported showing flames on board (as from a burning tar or oil barrel). What would this indicate and what action would you take?

What is the lifesaving signal for "slack away":

- (a) by day;
- (b) by night?

What does the following landing signal for the guidance of small boats bringing away the crew of the wrecked ship signify?

(a) Vertical motion of a white flag.

What is the lifesaving signal for "haul away":

- (a) by day;
- (b) by night?

Describe the day and night Hurricane warning.

Describe the Small Craft storm warning signals, day and night.

24. SEAMANSHIP.

What precautions should be taken with respect to portable stanchions on a gangway or accommodation ladder?

In using an accommodation ladder at

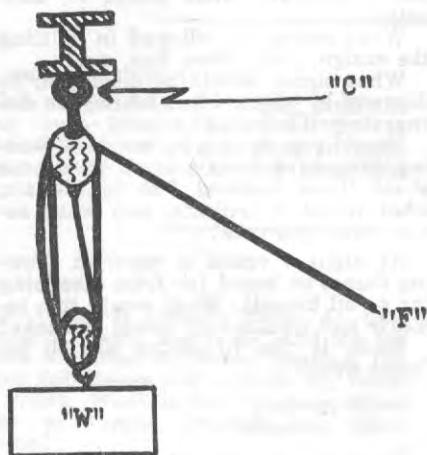
anchor in a seaway how can boats be prevented from getting under the ladder because of their rising and falling with the waves?

If a force of 50 pounds is applied at point "F" of a two fold tackle as shown;

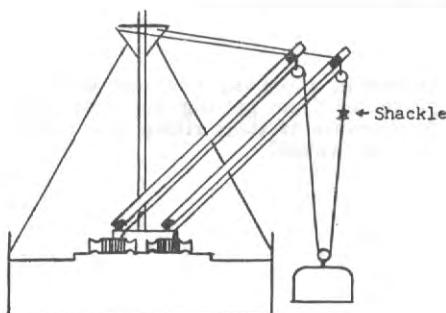
(a) What weight may be lifted at "W," allowing 10 percent friction loss at each sheave?

(b) If "W" is lifted 2 feet, how far must the line at "F" be pulled?

(c) What is the stress on the padeye at "C" when lifting the weight?



Stevedores employed on vessels fitted with two booms at a hatch occasionally use a floating block between the two booms for handling weights, swinging the two booms together, as shown in the sketch below. If the weight is 6 tons, what is the weight on each boom? If the shackle joining the two runners should fetch up on the floating block, what will be the effect?



What objection could be raised to a number of men, such as troops, marching in step up a gangway?

How is the size of a shackle measured?

What precautions would you take with regard to a shackle used aloft on a boom or the mast?

When a seaman shackles his bos'n's chair to rigging for work aloft such as slushing down, what precaution must be taken if a screw pin shackle is used?

In handling a weight, what part of a tackle has the greatest stress?

(a) In hoisting.

(b) In lowering.

(c) State reasons for answers to (a) and (b).

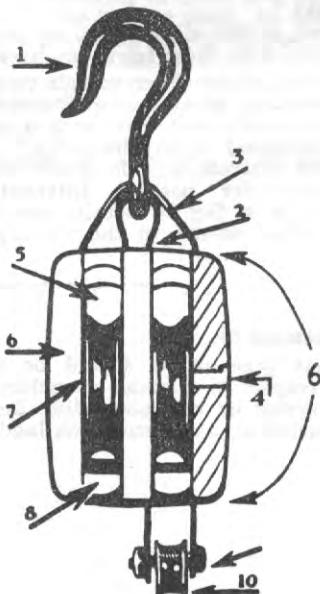
What should be done when, in transferring bulk oil, an oil hose leaks badly at the connection?

Describe the proper method of closing a valve in cargo piping, and state the reasons for doing it in this manner.

Describe the proper method of opening a valve in cargo piping.

What precautions should be taken before starting a steam windlass or winch which has been standing idle?

Name seven of the ten parts of a block indicated on the diagram below.



Would you drive in wooden wedges with the smooth grain parallel to the cleat as in Figure "A" or with the smooth grain parallel to the batten as shown in Figure "B"? Why?



Name three types of pumps used in the handling of liquid cargo.

When using turnbuckles for securing gear, particularly where the turnbuckles are inaccessible for routine inspection, what precautions should be taken to insure that the turnbuckle does not back off?

Is a hook or a shackle of the same size stronger?

Give two good reasons why wire rope cargo falls, topping lifts for booms, and other wire rope gear should be lubricated periodically.

What is the minimum size block you would use with a specified size of manila rope?

What is the minimum size block that should be used for a 3" manila rope?

What is the minimum diameter sheave that should be used with a 3" manila rope?

When a vessel is fitted with sideports, what precautions must be taken to assure that they are accessible for being secured, and for inspection at sea?

How are sideports usually secured?

If the warranted breaking strength of a wire rope is divided by the safety factor required for a particular application, the result is known as the _____.

This question may be stated also as follows:

$BS = ?$ where $BS =$ breaking strength
 FS $FS =$ factor of safety

Some grades of sisal rope are listed by their manufacturer as having 80 percent of the strength of the same size manila. For a certain sling, a 3 inch manila line was necessary. What size sisal would you use for the same sling?

If the 3 inch manila was used for 2000 pounds of weight, what weight would you lift with 3 inch sisal having 80 percent of the strength of manila?

What precautions must be enforced by ship's officers when working cargo at a hatch with only part of the portable hatch beams or pontoons removed?

On freight vessels what is the purpose of the wooden ceilings under the square of a hatch?

What precautions should be taken with wet manila rope?

Does a splice or a knot weaken a manila line more?

What is a preventer stay and how is it rigged?

Name at least five factors that make an adequate factor of safety necessary on any wire rope purchases or topping lifts.

Describe the proper method of opening and uncoupling a new manila line.

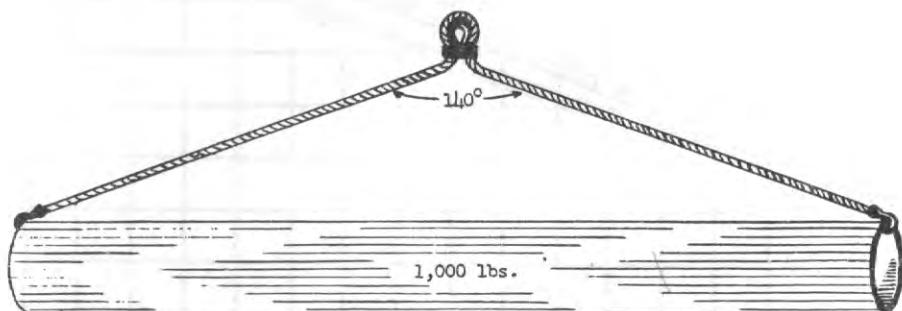
Using the formula $B = C^2 \times 900$, where "B" is the breaking stress in pounds and "C" is the circumference, compute the breaking stress of a 3 inch manila rope.

How is the draft of a vessel affected when passing from salt to fresh water? Give reasons.

What precautions must be taken with respect to stuffing-boxes and glands on pumps when discharging petroleum cargoes?

What precautions should be taken when using a spray gun for painting?

A sling is rigged on a piece of pipe weighing 1,000 pounds. What stress is exerted on each sling leg when the pipe is lifted? See sketch below.



What is the purpose of the telemotor equalizing valve and bypass valve in the wheelhouse on vessels fitted with this type steering apparatus?

What devices, other than telemotors, are used to control steering engines from the pilot house?

In the event that the pump room on a tank vessel becomes flooded with oil, what means must be provided for pumping it out?

When electric cable passes through a watertight bulkhead, what equipment must be provided and maintained in good condition? When electric cable passes through a fire-screen bulkhead, what care is needed?

In what condition is armored electric cable required to be maintained?

Describe briefly a marine boiler and precautions that deck officers should bear in mind with respect to its operation.

What precautions should be enforced when men are working with pneumatic or electric chipping hammers?

What is the purpose of the fresh water line on the load line markings?

Where machinery, such as gears, piston cranks, or other hazards, is exposed, what safety measures are required by the Regulations?

Name at least three types of engines used on merchant vessels and state briefly their characteristics with respect to maneuvering the vessel, i. e., backing power, starting and stopping, etc.

On vessels fitted with power ventilation, where may the switches be found for shutting off the ventilation in the event of an emergency such as a fire?

What care should be taken of steam deck machinery during freezing weather?

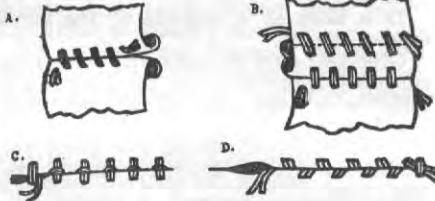
Describe reciprocating steam engines, and state the usual method of connecting them to the shaft when they are used as main propulsion units.

On vessels equipped with refrigeration, other than small unit type refrigeration of not more than 20 cubic feet capacity, what equipment is required to be provided so that men may work on the machinery in the event of leakage of the refrigerant?

What is the purpose of the following:

- Main circulating pump;
- Main bilge and ballast pump;
- Thrust bearing?

Name the four following canvas stitches and describe briefly the use of each.

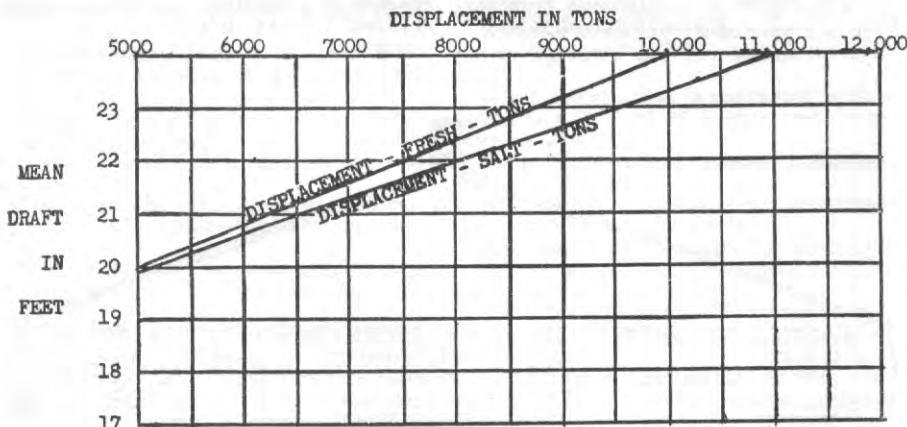


- Which is longer, a No. 15 sail needle or a No. 10 sail needle?
- From what materials is canvas made?

What is meant by the phrase "reefing a sail" or "taking a reef" in a sail?

What precautions should be taken when stretching tarpaulins to cover hatches?

A vessel in fresh water draws 23 feet. What does she draw in salt water, using the scale below?



Describe briefly diesel engines. State how they are connected to a propeller shaft. What are their maneuvering characteristics?

Describe a capstan.

Describe briefly turbo-electric drive.

What is freeboard?

What is the purpose of a towing engine?

Where must draft marks be placed on a vessel?

What is loaded displacement?

What is light displacement?

What type of sails are required in lifeboats?

Give the steps, in rigging a lifeboat mast and sail.

What is the total deadweight capacity of a ship?

What is "gybing"?

Where is the load line located on a ship?

What is net tonnage?

What is gross tonnage?

How are grommets installed on canvas work?

What equipment is required by the Regulations to enable persons to get in and out of a boat in the water and climb to the boat deck?

How do you know how many persons a lifeboat is allowed to carry?

If you were hove to by the sea anchor and the dragline carried away, how would you keep the boat's head up to the wind and sea?

How is a sea anchor hauled in?

Which oar is the stroke in a lifeboat?

What are the parts of an oar?

From what wood are oars usually made?

How is a sea anchor used?

What may be used in lieu of a sea anchor?

In addition to sufficient air tankage to float when it is filled with water, what quantity of air tankage is required for each person permitted in a lifeboat?

How are air tanks of lifeboats tested?

What materials are used for the construction of lifeboats?

When steel or iron is used for the construction of lifeboats, what is done to prevent corrosion?

In sailing a lifeboat:

(a) What is the effect of putting more weight in the forward end of the boat?

(b) What is the effect of putting more weight aft?

In a lifeboat under sail, what is meant by:

(a) Tacking;

(b) Wearing?

Canvas is normally designated as to weight by a number. Is No. 0 canvas heavier or lighter than No. 4?

How are lifeboats numbered on board a vessel?

What is a bolt rope?

What is a trysail?

How would you test canvas?

What equipment is required for signalling distress from a lifeboat at sea in the daytime?

State the procedure that you would use in bringing a lifeboat aboard.

How would you land a lifeboat on a beach with a strong wind blowing on shore, a high sea, and heavy surf?

Lowering a lifeboat when the ship has sternway, what precautions would you take?

Where vessels are provided with manila lifeboat falls, how must such falls be stowed in order to protect them from ice?

List the equipment for a lifeboat which would be suitable for signalling purposes during the hours of darkness.

In a lifeboat which is not equipped with simultaneous releasing gear, which fall should be unhooked first?

State in sequence the commands usually employed by the person in charge of a lifeboat in the water to get the boat under way using oars. At the start of the sequence the oars are in the stowed position in the boat.

What command is usually employed, meaning, "Complete the stroke and then temporarily cease rowing"?

What command is used when it is desired to check the headway of a lifeboat?

Before swinging out a lifeboat, which gripes would you let go first? Why?

In a motor lifeboat, how does the torque of a right-handed propeller affect the boat?

What are the most important things to be done before a boat is lowered?

In what part of a lifeboat are the hatchets kept and for what purpose?

How would you launch a boat in a heavy seaway?

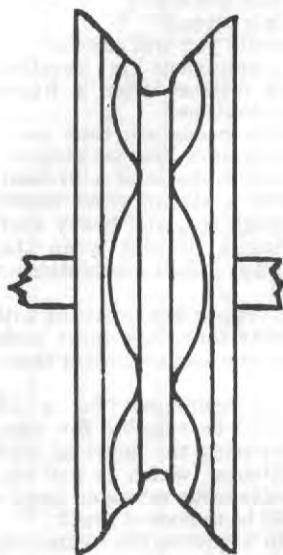
Which end of an anchor chain connecting shackle is placed outboard and why?

Why are studs used in an anchor chain?

State the advantages in having an ample scope of chain out when anchored. (Illustrate by sketch if you desire).

How would you let go an anchor in deep water?

Name the device pictured and describe one or more methods of engaging the motor or engine drive to heave up the anchor chain.



What precautions must be observed by a vessel anchored in an exposed roadstead?

Standing anchor watch in a fog, what signal can you give when a vessel approaches so close that collision seems possible?

If an anchor drags in a clay bottom, how may its holding power be affected?

Describe the advantage of detachable links over U-shaped connecting shackles in anchor cable.

How do crosses, elbows, or round turns get into cables?

Where would you make an anchor buoy-rope fast?

How is the size of a chain cable measured?

Name the mooring lines in the sketch below.

Why is it advisable to have a man stationed at the windlass to handle the anchors, if necessary, when proceeding in constricted or congested waters?

Describe the use of the anchor in turning a ship.

What would you do if, riding to a single anchor, you found you were dragging?

A vessel 450 feet long anchors with 105 fathoms of chain, and with 20 fathoms from her hawse pipe to the bottom. What diameter circle will she describe as she swings to the tide?

What is a lee tide? What is a weather tide?

Anchored in an exposed roadstead, what precautions should you observe?

When a vessel is moored to two anchors, what is the most advantageous position for the cable shackles, or detachable links, in event of a foul hawse?

Why are ships moored with two anchors?

What is the length of a shot of chain?

In a congested anchorage, what precautions are necessary at slack water when the tide is changing?

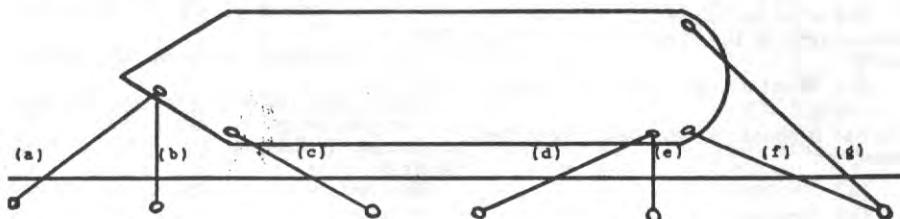
Describe how you might carry out an anchor using ship's lifeboats.

On a vessel fitted with cowl type ventilators it is necessary to trim the ventilators at night with only one standby man available. The ventilators are stiff so that using the handles he could not trim them alone. Using a pinch bar through the handle would break off the handle. How could he trim the vent alone? (If you wish, illustrate the answer by a sketch).

You are left in charge of a vessel at night alongside of a dock in New York Harbor, and you discover that a serious fire has started on your vessel. Explain in detail what you would do.

A mate standing on the port wing of the bridge, 30 feet from the vessel's center line, sights a vessel across the jackstaff, 200 feet forward of the bridge, and assumes the vessel is dead ahead. How much is he in error?

What is the best position for determining the relative bearing of an object seen from the bridge?



What is the usual method employed on merchant vessels to stopper off a wire mooring line?

What is the usual method employed on merchant vessels to stopper off a manila mooring line?

Why is the rudder of a single screw vessel most effective when the propeller is turning ahead?

What are the Coast Guard instructions for use of the breeches buoy?

What are two reliable signs that the vessel is in the vicinity of field ice?

In the event of grounding, what consideration must be kept in mind before ordering the use of the engines in an effort to get into deeper water?

Man overboard from a steamship. What would you do?

Describe at least three methods which are employed on merchant vessels to reduce corrosion.

On a steamship running into and shipping heavy seas, what would you do?

How can two mooring lines be made fast to one bollard on a pier so as to permit casting off either line without slackening the other?

On a deep-sea vessel you receive orders to get the anchors ready for anchoring in an hour. Describe in detail all the steps that should be taken to have both anchors in complete readiness. What other gear should be available?

What is the usual amount of chain used when anchoring to a single anchor? What factors must be considered in determining the amount of chain used?

On a single screw steamer (right-hand propeller) going full ahead, the engine is put full speed astern. Which way will the stern swing (no wind or current) if the rudder was:

- (a) Amidship;
- (b) Hard left;
- (c) Hard right?

Why should rubber gaskets not be painted or greased?

Is it possible to steer a vessel laying at anchor?

List at least six items of ground tackle ordinarily carried by an ocean-going power-driven vessel of 15,000 tons displacement (approximately).

When making fast alongside where there is a big rise and fall of tide, what care is required?

How could you make the eye of a mooring line safe for handling?

What is the effect of storm oil?

Why is a buoy-rope used on an anchor?

How would you make a quick turn to starboard in a twin-screw vessel with headway and both propellers turning full ahead?

With what equipment should a ship be provided to prevent injury from stepping into the hawse pipes?

If you were in charge of the foc'sle head when getting underway from an anchorage, what information would you furnish the bridge?

How would you protect a line in way of a mooring chock?

On an old-fashioned stock anchor, what is the purpose of the stock?

On the modern, commonly used form of stockless anchor, what part serves the same purpose as the stock of an old-fashioned anchor?

State the effect on handling qualities caused by variation in a vessel's displacement; i.e., what may be expected in a deeply loaded ship, a ship in the light condition, etc.

Is a vessel under better control when going ahead on the engines or when backing?

What is a devil's claw and how is it used?

What is meant by a left-handed screw?

Describe briefly the action of educators fitted on many modern vessels for pumping water out of a chain locker.

What is the purpose of the preventer bars on the Rottmer type releasing gear illustrated?



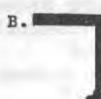
How are the shots of chain in an anchor cable joined together?

How are the shots of chain marked?

Lying at anchor, you dropped a second anchor when it started to blow. When would you pick up the second anchor? Why?

What is a messenger?

Name the types of beams sketched below:



What steps to avoid oil pollution should be taken by a vessel when loading or discharging bulk petroleum products?

What is the advantage of taking a round turn on the bitt toward the direction of strain before taking the other turns on a set of bitts?

Where must a ship's lookout be stationed during the hours of darkness, and poor visibility?

What are the dangers involved in paint or oil soaked rags on a vessel, and how would you avert these dangers?

Describe the precautions that should be observed to eliminate fire hazards in paint lockers.

May paints be stowed in locations other than in properly equipped and fitted paint lockers?

Because of fire on board, you have to abandon ship and take to the lifeboats. After leaving the burning vessel, should the boats be sailed away or kept near the position of the ship?

In a smooth sea, how would you approach a burning foreign vessel in a lifeboat to take the passengers and crew off?

You are using a steel snatch block on deck through which is rove a steel cable used for a heavy strain. What precautions would you take?

Describe the precautions that should be observed when men work over the side on stages.

How often must a vessel be placed in dry dock or hauled out for examination?

What is the purpose of the nonreturn valves or valves fitted with reach rods to the deck on bilge suction piping in the holds of all passenger ships and many freight vessels?

Why is the use of doubler plating for repairs or alterations to be avoided on plating of compartments designed to carry fuel oil or other inflammable or combustible liquids?

If the power plant of a vessel is shut down and she is rolling heavily in a seaway, how may the rudder be held steady?

What is the purpose of ballast tanks aboard ship?

How would you prevent chafing damage to tarpaulins from the locking bars on the hatches?

25. CARGO STOWAGE AND HANDLING.

When cargo is marked "USE NO HOOKS," what precaution may be taken to avoid damage by longshoremen?

To avoid oil pollution, what precautions should be observed when discharging ballast in coastal waters?

When cargo received for shipment appears in poor condition or deficient in packing, what measures are necessary to protect the vessel against damage claims?

In writing a report for the Chief Officer or Master concerning cargo which appears to be in poor condition, what information should be included?

In examining a cargo hold prior to loading general cargo, name at least ten points to which you should pay particular attention.

Describe briefly the purpose of a dock receipt.

Describe briefly the purpose of a mate's receipt.

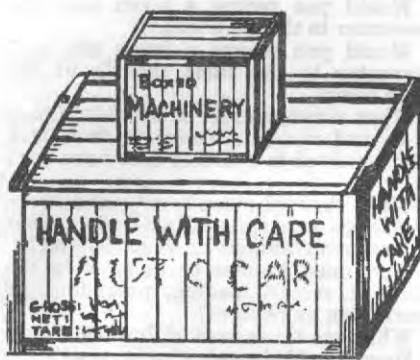
In the event that cargo is damaged by longshoremen, what information should be contained in the report of the officer observing the goods?

What method of extinguishing fire in a cargo hold is the best to minimize damage to the cargo?

Why should full barrels be stowed "bung up and bilge free"?

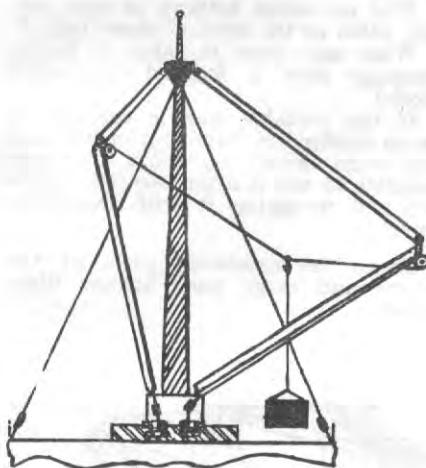
Referring to the illustration:

(a) What objections may be raised to the stowage shown?
 (b) What measures could be taken if such a stowage was necessary?



Describe briefly at least four methods by which pilferage of cargo can be reduced.

What measure could you require to eliminate need for a "fiddle-string" span when handling cargo as shown?



Define:

(a) Grain Cubic.
 (b) Bale Cubic.
 (c) Measurement ton (used in computing freight charges).

When stowing deck cargo, what areas of the deck must be kept free?

What is a good method for cautioning longshoremen against using for

stowage areas of the deck which should be kept free?

When filling oil or water tanks contiguous to loaded cargo holds, what precautions should be observed to protect the cargo?

When a vessel is loading a general cargo for discharge at several different ports, what precautions are usual to minimize the dangers of short landing or overcarriage of cargo?

What are the duties, during transfer operations, of the senior deck officer on duty on a tank vessel?

Describe briefly how you would avoid cargo damage caused by leakage or drainage from wet cargo.

On a tank vessel, under what conditions must cargo operations be stopped?

Why is it advisable to make frequent inspections of the pump room when loading a tank vessel?

What must be done by the deck officer on duty when loading or discharging is suspended because of failure of deck machinery?

What are the meanings of the following three terms used in marking shipping containers: Gross, Tare, Net?

What precaution is necessary to avoid danger from an accumulation of hazardous gases prior to and during operation of pump room machinery?

What are the seven classifications of dangerous articles that may be carried as cargo?

What is meant by the term "dew-point"?

What care must be taken in the stowage of 'tween deck cargo to assure the safety of men handling 'tween deck hatches and beams, or working cargo in the lower hold?

In loading general cargo, why should the space between the spar battens (sweat boards) and the shell be kept free of cargo?

How would you stow metal drums?

Why is it inadvisable to stow cargoes susceptible to heat damage on tank tops of tanks carrying fuel oil?

What is a bill of lading?

What is a stiff ship?

What is a tender ship?

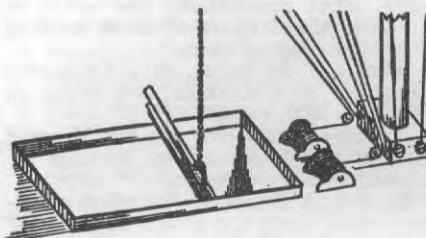
In handling cargo by the "yard and stay" or "married falls" method, how would you rig to assure that both preventer and guy are taking their share of stress?

Why should preventer and guy take stress together rather than preventer being slack?

What is a measurement ton?

What is the advantage of a net sling fitted with a "pie-plate" over a plain net?

When loading long reinforcing rods, pipe, rails, or similar steel items using a single chain sling as shown, what is the usual method employed to prevent the draft slipping out of the sling? Explain the reasons for this.



How should cargo falls be wound on a drum?

What precautions to avoid injury should be observed by men landing drafts?

If the dry bulb temperature is 80° and the wet bulb temperature 70°, what is the relative humidity in a cargo hold?

From what book could you determine the applicable regulations relating to a dangerous commodity to be transported?

How does measurement cargo differ from deadweight cargo?

In loading a general cargo, what provisions could you make to minimize loss of cubic space due to broken stowage?

Name the sources of moisture in the air of a cargo hold.

What is spontaneous combustion?

What types of cargoes are most liable to take fire through spontaneous combustion?

What measures should be taken to avoid fires caused by spontaneous combustion?

What reasons, other than preventing sweat, make ventilation necessary for many cargoes?

What is meant by the stowage factor of any consignment? Of what use is it?

What is meant by the absolute humidity of the air?

What does "full and down" mean?

What is the difference between a long ton and a short ton?

How could you find the bung of a dirty cask?

What type of dangerous cargo is indicated by each of the following?

(a) Green label.

(b) Red label.

(c) Skull & crossbones.

In loading or discharging automo-

biles, what precautions should be taken against damage?

In stowing automobiles, state the measures that should be taken to assure their discharge in good condition.

Would you secure a boom guy and preventer to the same cleat?

Would you secure a boom guy and preventer to the same shackle at the boom head?

What stowage must be provided fibers of animal or vegetable origin that have been involved in a fire or that have been wet?

What stowage must be provided fibers or fabrics impregnated with more than 5 percent of animal or vegetable oil?

How must lumber be handled in the holds of vessels loading, unloading, or containing explosives?

What are three uses of dunnage?

How should dunnage be stacked?

In what part of the hold would you require most dunnage? Explain your answer.

In what direction would you lay dunnage?

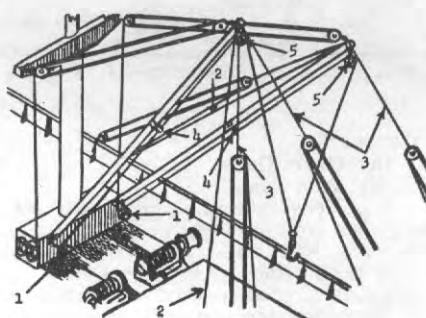
What precautions must be taken when stowing containers of inflammable liquid in a hold whose boundary bulkhead adjoins the boiler or engine room?

Why are cargo battens, or spar ceiling, fitted on the sides of cargo holds?

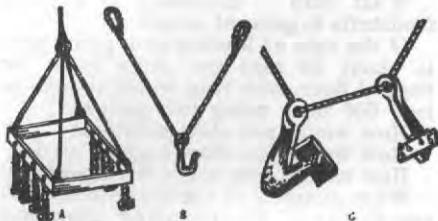
What care must be taken in laying dunnage over a finished commodity block?

If the portable electric cord for a cargo cluster light were cut in two during cargo operations, would it be permissible to use it after carefully splicing and wrapping it with insulating tape?

Name the numbered parts of the booms and cargo gear fittings illustrated.



On what types of cargo would you use the slings illustrated?



How many board feet of dunnage would you estimate to be in a stack whose outside dimensions are 6 feet high, 4 feet wide, and 14 feet long?

What precaution is advisable in stowing cargo adjacent to a ladder?

What precautions are necessary in the loading or unloading of sulfur in bulk?

Why is sulfur dust dangerous?

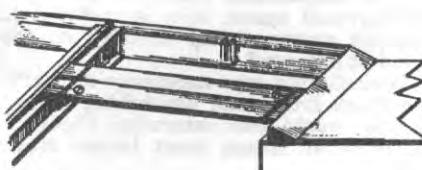
What precautions should be observed when stowing fibers of vegetable origin, such as jute, hemp, flax, sisal, coir and kapok?

What precautions should be observed in the stowage of excelsior either as cargo or as packaging material for other commodities?

In order to load a consignment of goods into the 'tween decks, stevedores in a foreign port request permission to use one king beam and hatch boards, leaving the blind beam out to expedite resuming work in the lower hold.

(a) Would you regard this as an advisable procedure?

(b) What precaution against men falling into the open hold from the 'tween deck should be taken?



Why is it important that the switch for an electric cargo winch be in the off position when the winch is not being operated?

When the controller for an electric winch is in the neutral or off position, what prevents the winch drum paying out when the cargo whip is subject to tension?

In carrying fresh vegetables to ports subject to severe winter conditions, what precautions may be necessary?

What care would you take to avoid sweat damage when stowing cargo in a deep tank not fitted with ventilation?

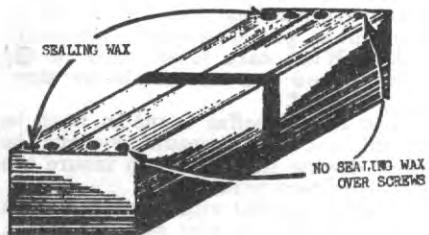
What precautions are necessary in the stowage of matches which may be struck anywhere?

What precautions are required in the stowage on deck of combustible liquids?

What are the general stowage requirements for corrosive liquids?

What precaution is necessary when using a gasoline powered fork lift truck for stowing tin plate in the hold of a vessel?

Checking parcels into a special cargo locker you receive a small case as sketched. What action would you take?



Would you permit longshoremen to move railroad freight cars or barges with cargo falls led from the booms?

How may cargo be protected against possibility of falling into the water between the ship and the dock?

If a boom could not be lowered to rig a rain tent gantline, how would you send a man aloft on the purchase?

What precautions should be taken during the loading of a cargo of grain in bulk?

When is the use of redwood, oak, mahogany, or similar types of wood inadvertious for dunnaging?

When is the use of resinous pine wood inadvertious for dunnaging?

Would you permit longshoremen employed by a stevedore to perform cargo operations while under the influence of liquor?

How should dunnage be laid for bag goods and fragile paper cartons?

How would you secure a deck cargo of empty drums or barrels?

In stowing crated cargo in the holds, you are obliged to stack vertically the three crates whose ends are illustrated. How would you arrange them in order to have the strongest on the bottom supporting the others, the next strongest in the middle and the weakest on top? The materials used in fabricating the crates are of equal strength, the only difference being in the manner of construction.



Describe the hazard involved in the transportation of the various types of fish oils, and the care necessary in stowing such oils.

How would you stow nitrocellulose motion picture film used for the entertainment of passengers on a passenger vessel? What care is required in the stowage and use of acetate or slow-burning film?

How should coffee beans in bags be stowed, and what precautions should be taken during the voyage to insure the arrival in good condition?

A vessel is fitted with deep tanks with a capacity of 1000 tons of fresh water. What quantity of peanut oil with a specific gravity of 0.92 could be transported in such tanks?

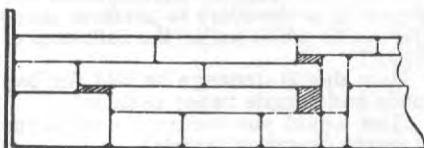
Where would you stow bags of strong smelling cargo?

A crate of machinery has a hole knocked through a board and tar paper lining in the process of loading. Should you note an exception? State your reasons.

In stowing cartons of canned goods how could you avoid soiling and crushing by longshoremen?

What care must be taken in a cargo hold following leakage from packages containing poisonous material?

What precautions would be necessary in the stowage of the cased goods as shown?



When it is necessary to heat a vegetable oil, such as palm oil, to keep it liquid for discharge, what care is necessary to avoid damage?

What care is necessary in stowing foodstuffs in general cargo?

If the rate of loading at a given port is about 30 tons per gang hour for bagged flour, how long would it take to load 600 tons, using two gangs?

How would you stow potatoes?

How would you stow bags of seeds?

How should case goods be stowed?

What quantity of marble with a stowage factor of 20 (including allowance for broken stowage) can be loaded into a hold containing 40,000 cubic feet of stowage space?

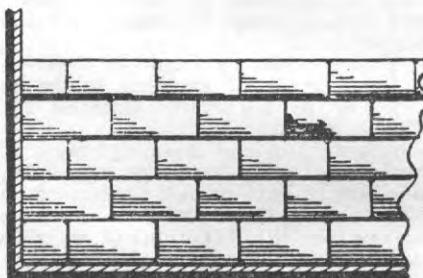
During the loading of explosives, what should be done with damaged or leaking containers of explosives?

Describe the stowage required for rice.

What precautions are necessary when stowing tea?

How do you stow steel plates?

What are the advantages of stowing cases or cartons as sketched?



When refrigerated spaces are accessible to personnel during a voyage, what devices are fitted to enable a man to warn other crewmen should he be locked in the cold compartment?

If a longitudinal bulkhead divides a refrigerated space, how is it fitted to prevent asymmetrical flooding in the event of damage?

Describe the care necessary in carrying fresh fruits and vegetables.

How would you determine the temperature of frozen meat before stowage?

Into what three general classes are refrigerated cargoes divided?

In connecting cargo hose, what is the minimum number of bolts permitted at a flanged joint?

What provisions should be made for any leakage from cargo hose connections?

How would you remove any odors after discharging refrigerated cargo?

After discharging refrigerated cargo, what are the advantages of thoroughly airing the cold storage compartments?

In defrosting coils in reefer spaces using sea water, what precautions should be taken to assure cleanliness?

How are drains in refrigerated 'tween deck spaces fitted to preserve insulation when carrying cargoes that require a very low temperature?

Where lower holds are used for frozen cargoes, how may bilges be kept free from frozen water?

Describe briefly the methods employed to provide refrigeration in the holds of vessels.

What would you do if you noticed a large quantity of oil on the water near your vessel while loading bulk oil on a tanker?

If you were loading a cargo of gasoline and a tug tried to come alongside in the way of cargo tanks, what would you do?

What should be done with oil in the oil hose after the oil transfer has been completed?

State the hazards incident to the refrigeration of perishable cargo by means of blocks of so-called "dry ice."

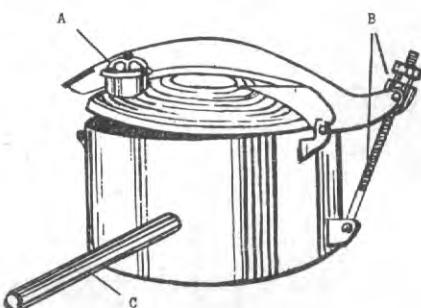
In lifting a cargo of heavy oil, when the vessel is down to her marks before all tanks are full, is it best to leave each tank slack or to fill up as many tanks as possible, and leave only the minimum number of tanks slack? Explain your answer.

In an emergency, is it necessary for the senior officer on a tank vessel to follow the tanker rules?

In transferring an oil cargo, what would you do if your vessel surges badly along the dock?

An oil hose has an inside diameter of 6 inches. What is the minimum radius circle in which such an oil hose should be bent?

Sketched is a typical tank top arrangement on a tank vessel. Name and state the purpose of "A," "B," and "C."



What precaution should be taken to prevent a deck spill from running overboard?

In transferring an oil cargo, what would you do if the oil hose got pinched between vessel and the dock?

What is meant by "topping off" an oil tanker?

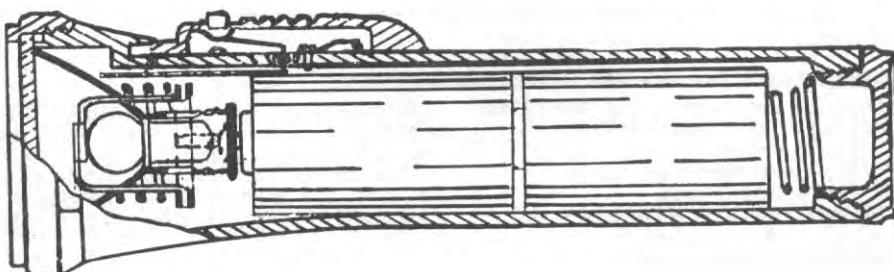
In starting to transfer an oil cargo, what would be your duties and how would the oil pumps be operated?

Describe what is meant by:

- Grade A inflammable liquid.
- Grade B inflammable liquid.
- Grade C inflammable liquid.
- Grade D combustible liquid.
- Grade E combustible liquid.

In rigging a windsail to ventilate oil tanks after cleaning operations, would you place the lower end of the canvas duct at the top or bottom of the tank? Why?

What safety features make the type flashlight illustrated below suitable for use on board tank vessels where an ordinary flashlight might be hazardous?



Describe the operation of a jet exhauster.

How often must cargo piping be tested on tank vessels?

How often must cargo pump pressure gauges on a tank vessel be tested for accuracy?

How often must cargo pump relief valves on a tank vessel be tested for satisfactory operation?

What pressures are forbidden by regulation for cargo hose when transferring cargo on a tank vessel?

What type of device may be used by shippers and consignees to detect any variation in cargo temperature that may have occurred during a voyage?

What precautions should be taken in opening a hold in which barrels or cases of gasoline are stowed?

As applied to bulk oil cargoes, what is meant by:

- (a) Ullage;
- (b) Innage;
- (c) Thiefage?

What is the usual method of cleaning oil tanks?

What would you do if you had a bad

oil spill on deck while transferring oil cargo on a tanker?

In loading an oil cargo, what would you do if the tank valve jammed when open?

When loading case oil, what should be done with leaking cases?

What permission should be secured before general cargo, freight, etc. can be handled at the same time that gasoline in bulk is being transferred?

How could you determine the regulations governing shipment of animals exported from the United States?

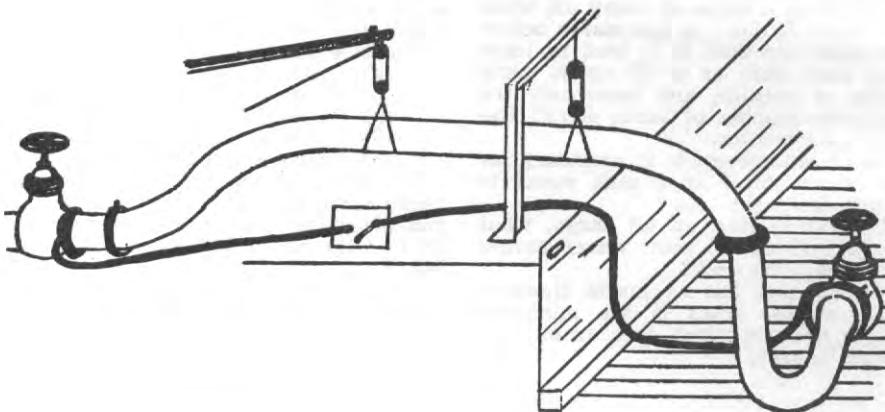
What should be done if an oil hose leaks badly at the hose connection?

How should the sampling or sounding hole (ullage hole) in an oil tank be protected when the tank is open and not gas free?

What is the purpose of a bonding wire as illustrated and where should it be connected?

Why should a bonding wire be connected before the cargo hose, and the connection maintained until the hose is removed?

Explain the use of a switch in a bonding cable.



28. LIFESAVING APPARATUS AND FIREFIGHTING EQUIPMENT.

Describe the purpose and use of the following lifeboat equipment.

- (a) Hatchets.
- (b) Smoke signals.
- (c) Drinking cups.

What is the length of line which is required to be attached to one of the lifebuoys on each side of a vessel?

What amount of buoyant apparatus is required on ocean passenger vessels, and how is it to be stowed?

How many lifeboats and type "A" life rafts are required aboard coastwise passenger vessels of over 300 gross tons?

One of the lifeboats on each side of a passenger vessel shall be of suitable size and design for doing emergency work at sea. Describe how these boats are to be fitted and carried while at sea.

What defects make cork life preservers unfit for service?

Describe the daytime distress smoke signals required on lifeboats and life rafts, and state how they are operated.

Describe the distribution and stowage of life preservers aboard ocean passenger vessels.

Would it be necessary to turn a life raft over if it capsized?

How do you know how many persons a lifeboat is allowed to carry?

Describe the construction of a life preserver.

Describe the auxiliary line required to be carried aboard ocean passenger vessels as equipment for the impulse-projected rocket type line throwing appliance or the Lyle gun.

How many service lines are required, and how shall they be stowed?

Can a painter of a lifeboat be of any size besides 2 1/4 inch rope?

Describe a lifeboat compass, and state the requirements for compass and mountings in new installations or replacements.

Name the items carried in lifeboats for signalling or attracting attention.

What care should be given ring buoys?

How are all ring life buoys to be distributed and secured aboard ocean passenger vessels?

How many means of escape must be provided on steamers from all enclosures where passengers or crew may be quartered, or where anyone may be employed? How are such avenues of escape required to be located?

Describe in detail the markings required to be shown on each lifeboat of a vessel.

How would you test the air tanks of a lifeboat for tightness?

How are lifeboats required to be numbered and marked?

Describe the electric water light, and state how it is ignited.

What is the service use of the following items of lifeboats equipment:

- (a) Batteries in flashlights;
- (b) Red hand flare distress signals;
- (c) Floating orange smoke distress signals?

What equipment is required for each lifeboat of less than 60 persons capacity carried aboard ocean passenger vessels?

What color are the sails carried in

lifeboats aboard ocean and coastwise passenger vessels?

Are all lifeboats installed on a particular passenger vessel required to be fitted with the same type of releasing gear?

What markings do the Regulations require for watertight doors and associated equipment?

How long may the spare flashlight batteries be used as equipment in lifeboats aboard ocean passenger vessels?

How many spare bulbs must be provided for each lifeboat flashlight?

How many years after the date of manufacture may red flare distress signals be used as lifeboat equipment?

Describe the following items which are required to be carried in lifeboats aboard ocean passenger vessels.

- (a) Heaving line.
- (b) Jackknife.
- (c) Ditty bag.
- (d) Bucket.

How many of each of the following distress signals must be carried as lifeboat equipment aboard ocean and coastwise passenger vessels, and what is the limit of their service use?

- (a) Floating orange smoke signals.

- (b) Red hand flare signals.
- (c) Red parachute flare signals.

How many of each of the following distress signals must be carried in lifeboats aboard ocean cargo vessels?

- (a) Floating orange smoke signals;

- (b) Red hand flare signals;
- (c) Red parachute flare signals?

How must a water light be attached to a life float or buoyant apparatus?

What care should be given kapok life preservers?

Describe the calcium carbide water light, and state how it is ignited.

How are all lifeboats and liferafts required to be carried or stowed?

What equipment for the stowage and protection of falls must be provided for properly lowering the lifeboats aboard ocean passenger vessels of over 1000 gross tons, where lifeboat winches are not used?

State the number of lifeboatmen required for:

- (a) A lifeboat carrying less than 41 persons.

- (b) A lifeboat carrying from 41 to 60 persons.

- (c) A lifeboat carrying from 61 to 85 persons.

- (d) A lifeboat carrying from 86 to 110 persons.

- (e) A lifeboat carrying over 110 persons.

Describe the distress lights or flares with which lifeboats and liferafts are equipped, and state how they are ignited.

To what equipment are self-igniting water lights attached, and what two types of water lights are in general use?

Who must be placed in charge of a lifeboat on all services other than rivers?

How often are fire and boat drills required?

What is the minimum length of lifeboat falls?

Describe briefly the Carbon Dioxide Fire Extinguisher System.

In what weather conditions are tank vessels forbidden by the regulations to start or continue transfer operations?

Would you use a canister type gas mask for entering a hold into which CO₂ gas had been injected to extinguish a fire?

Describe the Smoke Pipe Fire Detection System.

Where will you find listed the life-saving and fire-fighting equipment required to be carried aboard ocean passenger vessels?

How many complete recharges must be carried for each gas mask required to be carried aboard ocean passenger vessels and where must they be stored?

Where shall fire axes be located aboard passenger vessels?

How is fire hose tested, how often, and by whom?

What care would you give the ship's davits?

What are the three basic methods of fighting fire?

Name three types of fire detecting systems.

How many extra charges are required to be carried for portable fire extinguishers?

When a tank vessel is provided with steam smothering system for the extinction of fire in the liquid cargo tanks, in what position should the valves to the tanks be left? Under what circumstances may they be in other than the normal position?

How would you mark the steam smothering line valve to a dry cargo hold on a tank vessel, unless a line independent of the line for the liquid cargo tanks was provided?

On a tanker at sea carrying cargo, would you use portable electric lights to provide illumination for work being performed in the enclosed space below the midship house directly above the cargo tanks? If you use portable lights, what type should you use?

How would you mark a locker containing oxygen breathing apparatus?

How is the location of emergency squad equipment indicated?

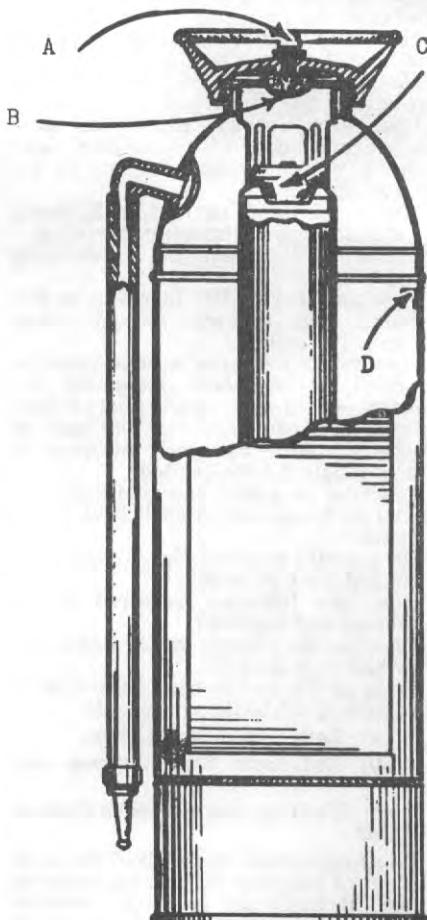
How are fire doors marked?

What distress signals are required to be carried within the pilot house or on the navigators bridge of ocean and coastwise vessels?

Name the four types of fire extinguishers, and state the kind of fire on which each is most effective.

How often should all fire equipment be examined and inspected by the vessel's personnel?

On the foam type fire extinguisher sketched, name and describe the function of each of the parts indicated by letters.



Who shall be assigned the duty of seeing that the lifeboats and other life-saving equipment is at all times ready for immediate use?

How would you combat fire in a cargo hold using a CO₂ extinguishing system? State in detail the steps you would take.

What is the purpose of the electric drill required to be carried in the emergency equipment? How would you make use of a half-inch electric drill for this purpose?

Describe the steam fire-extinguishing system for cargo spaces on tank vessels and its method of operation.

Describe the sign required to be posted at the gangway of tank vessels at a dock transferring cargo.

Describe the signals required to be displayed by a tank vessel at a dock transferring cargo.

In the event that the remote controls for release of CO₂ gas failed to operate for a fire, what alternate method of release is required by the regulations?

What regulation has for its purpose the placing of fire extinguishers only in the correct and authorized position should they be moved temporarily for any reason?

What precautions are to be taken regarding paint and lamp lockers?

How would you combat a fire in the engine room of a vessel fitted with CO₂ extinguishing equipment?

When must a supervised patrol be maintained aboard ocean passenger vessels on an international voyage?

How do the Regulations define an "inflammable liquid?"

Certificates of Inspection often use the phrase "approved for the carriage of Grade 'E' liquids in the deep tanks." What is meant by Grade "E" liquids?

What equipment must a fire watchman have in his possession at all times when on duty?

Is it permissible to require a watchman to sweep passageways in the early hours of morning when no other crew members are available for this work?

How is the spread of fire by convection prevented?

How are manual alarm boxes for use in event of fire marked?

How are the bells or other alarm devices which operate from manual alarm boxes, sprinkler devices, or smoke detectors identified?

How are fire extinguishing system controls marked?

State the precautions demanded by the Regulations with respect to cargo tank hatches, ullage holes and Butterworth plates on a tank vessel which is not gas free.

In working on tanker hatch covers, what type of tools must be used?

How would you prevent the spread of fire by conduction of heat?

30. RULES AND REGULATIONS FOR INSPECTION OF MERCHANT VESSELS.

When the seamen of a merchant vessel sign articles, how do they agree to conduct themselves?

What do the articles stipulate must be done in event of embezzlement, or willful or negligent destruction of any part of the vessel's cargo or stores?

In what manner must any member of the crew who feels aggrieved by any breach of the articles of agreement or otherwise represent the same, and to whom must he state his case?

What recourse is provided in the articles for the master of a vessel when an individual signs on for a rating which he is incompetent to perform?

What is the penalty for coercing of witnesses or inducing a person to testify falsely in a marine investigation of a shipping casualty?

When and how are passengers and crew instructed in the method of putting on and adjusting life preservers?

What is the duty of the master, or person in charge of a vessel in the

event of collision with another vessel, and what is the penalty for failing to perform this duty?

What is the penalty for unreasonably refusing to serve after signing articles?

For what reasons may an officer's license be suspended or revoked?

What is the Law regarding lookouts at night?

Should the passengers aboard an ocean passenger vessel be encouraged to participate in fire and boat drills?

What is the penalty for inattention to, and neglect of duty whereby the life of any person is destroyed?

What is the penalty for being under the influence of liquor aboard ship and thereby failing to perform duty in preventing danger to vessel and persons aboard?

What is the penalty for a licensed officer if he places his license beyond his control, or voluntarily parts with it?

When, where, and how should the license of officers be posted on a vessel? What is the penalty for failure to comply with this rule?

What attention should be given to airports, coal ports, or other openings in the ship's side:

- (a) When ready to leave port;
- (b) At sea?

What is the minimum diameter required for a fog bell?

Where must a fog bell be located?

What is the law regarding officers and crew frequenting steerage passengers quarters?

Describe the draft marks required to be marked on vessels 50 gross tons and over.

What is the law on bringing a dangerous weapon or explosive aboard a vessel of the merchant marine?

How often must the lifeboats aboard ocean cargo vessels be swung out to ascertain that the gear is in proper order?

How often must fire and boat drills be held?

Where must the whistle for a vessel be located?

Where shall station bills be posted?

What is the law relating to smuggling goods into the United States, and what is the penalty for its violation?

What is the fire alarm signal?

What sort of report is made of the fire and boat drills?

What does the law require regarding hatches, side ports, etc., before proceeding to sea?

What is the signal for boat stations?

How are steering orders to be given?

What information must the station bill show?

What is the purpose of a station bill?

What is the signal for dismissal of fire drill?

What color must side light screens be painted?

What is the signal for dismissal from boat stations?

**SPECIMEN EXAMINATION
FOR
SECOND MATE**

1. LATITUDE BY POLARIS.

On 25 July 1958 in D. R. Longitude $160^{\circ}03'$ West, Polaris was observed at morning twilight to have a sextant altitude of $49^{\circ}02'$ and a bearing of 002° by gyro-compass. The chronometer read 2h-18m-12s. The chronometer was fast

6 minutes and 4 seconds. The sextant error was 1' off the arc. The height of eye was 25 feet.

Required:

The latitude at time of sight.
The gyro-compass error.

2. LATITUDE BY MERIDIAN ALTITUDE METHOD.

Alpheratz is observed on the meridian bearing South with an observed altitude of $75^{\circ}03'8$. Declination of Alpheratz is $28^{\circ}51'1$ North.

Required: The latitude at time of sight.
Show all work.

3. FIX OR RUNNING FIX.

Enroute from Naples, Italy to the Dardanelles, in D. R. Latitude $36^{\circ}21'$ North and Longitude $19^{\circ}45'$ East, four celestial bodies were observed. Given

the following information on the celestial bodies, determine the ship's position.

Body	Observed Altitude	Greenwich Hour Angle	Declination
VEGA -----	$29^{\circ}03'4$	$260^{\circ}38'7$	$38^{\circ}44'5$ N.
DUBHE -----	$56^{\circ}48'0$	$14^{\circ}20'8$	$61^{\circ}59'4$ N.
SPICA -----	$42^{\circ}38'1$	$338^{\circ}57'9$	$10^{\circ}56'2$ S.
ALPHECCA -----	$59^{\circ}59'2$	$306^{\circ}31'6$	$26^{\circ}51'7$ N.

Candidates may use any method of solution.

4. STAR IDENTIFICATION (any method).

On 18 March 1956, at Latitude $15^{\circ}08'$ South, Longitude $64^{\circ}19'$ East, an evening observation is taken at 14h-32m-44s GMT of a star whose corrected altitude is $43^{\circ}02'7$ and whose

azimuth is $338^{\circ}5$ True.

Required: Identify the star.

Candidates may use any method of solution. Show all work.

Given:	No 1 Alpheratz	No. 2 Ankaa	No. 3 Schedar
Date -----	7 January 1958	12 January 1958	17 January 1958
GMT -----	1h-14m-37s	12h-39m-53s	18h-03m-49s
Long. -----	$125^{\circ}36'$ West	$05^{\circ}27'$ East	$02^{\circ}58'$ East

Required: The meridian angle and declination of the star in each of the 3 cases. Indicate whether the star is

East or West of the Meridian in each case.

The following 3 sextant altitudes of stars were obtained. The height of eye was 22 feet; the sextant index error was 2'.0 on the arc in all observations.

Given:

	<i>Observation No. 1</i>	<i>Observation No. 2</i>	<i>Observation No. 3</i>
Star Sext. Alt.-----	4°-19'.8	14°-05'.1	48°-56'.2
Bar. Pressure-----	30.6 in.	980 mb	29.6 in.
Temperature -----	92° F.	(-) 20° Celsius (Centigrade)	48° F.

Required: The observed altitudes.

5. CHART NAVIGATION.

How would you assess the accuracy of a nautical chart?

What type pencils and erasers are best for chart work?

What care should be taken in using pencils and erasers, to keep charts in good condition?

How is information concerning magnetic variation shown on Pilot Charts?

Some foreign charts are published with the depths shown in meters. Convert 10 meters into fathoms.

How should charts be stowed?

What is the importance of the issue date shown on charts?

A vessel steams 27 minutes at 20 knots from bearing "1" to bearing "2." Would the position of the vessel at bearing "2" be at point "A," "B" or "C," assuming she sailed along one of the tracks plotted?

Where may the issue date be found on a chart?

When Notices to Mariners are received on board a vessel, how long should they be retained before being discarded?

What is the vertex of a great circle?

What is a chain of soundings?

What is composite sailing, and when is it used?

How can you determine what charts and publications are to be corrected by the notices listed in the Notices to Mariners?

What government agency prepares light lists for foreign waters?

What government agency prepares light lists for the United States and its possessions?

When plotting a fix by means of three cross bearings taken at approximately the same time, what would you assume if the three bearing lines do not intersect in a point or in a very small triangle?

What branch of the government prepares the American Ephemeris, the Air Almanac and the Nautical Almanac?

Describe briefly the contents of at least two of the three publications mentioned in the preceding question.

Why are the backs of pages in "Notices to Mariners" left blank?

What government agency publishes the Coast Pilot?

What government agency publishes the Sailing Directions?

Describe what is meant by the point of tangency on a gnomonic chart.

What information is contained in H. O. No. 205, "Radio Navigational Aids"?

