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Federal Court Decides Radar Collision

The United States District Court for the Southern District of New York on October 18, 1947, decided a case involving a collision between the British steamer *Australia Star* and Panamanian S. S. *Hindoo*, which took place on September 9, 1944, in the Caribbean Sea, about 150 miles northeast of Cristobal, Panama Canal Zone. The night was dark and cloudy; visibility was good; and, the sea was smooth and the wind slight.

The *Australia Star* was proceeding at full speed of 15 knots, in a southwesterly direction, enroute from United Kingdom to Cristobal. The *Hindoo* was traveling at full speed of 10 knots on a course from Guantanamo, Cuba, to Cartagena, Colombia. The ships were running blacked out through waters where the presence of enemy underseas craft was suspected. The *Australia Star* was proceeding singly with her radar in operation while the *Hindoo*, which had no radar, was escorted by the U. S. S. *PC–616*, which was equipped with radar.

The collision occurred at 9:32 p. m. *Australia Star* time. Twenty-eight minutes prior thereto the *Australia Star* picked up the *Hindoo* in her radar at a range of 16,000 yards, 25° on her starboard bow.

The court found it impossible to reconcile the claimed course of the *Australia Star* 237° true, the claimed course of the *Hindoo* 108° true, and the four radar observations of the *Hindoo* made by the *Australia Star*, but did find that unquestionably the two vessels were on converging courses with the *Hindoo* off the *Australia Star's* starboard bow.

Testimony from the crews of both the *Australia Star* and *PC–616* was that the navigation lights of the *Australia Star* were thrown on 12 minutes prior to the collision. Because of insufficient lookout the *Australia Star's* lights were at first not seen by the *Hindoo*. Ten minutes before the collision a green light was finally observed, but minutes were wasted because of a search through the Signal Code in the belief that it was an aircraft warning signal being given by the *PC–616*. When the light was at last recognized as the starboard navigation light of an unknown vessel it was too late. The *Hindoo* switched on its lights, gave a blast on its whistle, and went hard astarboard, but the collision could not be avoided.

It was held that the failure of the *Hindoo* to see the *Australia Star's* lights was culpable negligence for which there was no excuse, and that whether or not the starboard hand rule, making the *Hindoo* the privileged vessel, was applicable to the case at bar, a competent lookout would have given the *Hindoo*, privileged or not, enough warning so that a successful collision-avoiding maneuver could have been executed. Insufficient lookout and failure to recognize meaning of the green light contributed to the collision.

With respect to the use of the radar by the *Australia Star* the court had this to say:

"Since the heading of a ship can be plotted from its bearing and distance at two or more points in time, the radar operator can with great accuracy plot the heading of a ship after taking a number of radar readings.

"* * * the *Australia Star* had ready at hand apparatus which made these conjectures and inferences only second best guides for her navigation. By means of her radar the *Australia Star* could observe the *Hindoo* and determine her heading and speed with greater exactitude than if the *Hindoo* had shown her navigation lights. By

means of the intelligence radar supplied she could have navigated safely with respect to the *Hindoo* without relying on the surmises, in the one case, that the *Hindoo's* continued darkness was in fact a signal, 'I am keeping clear of you,' and in the other, that the *Hindoo* was maintaining a steady course and speed. Had the master made more intelligent use of his radar he would have known at 9:24 p. m. that he was almost certainly on a collision course and would have taken precautionary measures.

"* * * The notion that a ship, equipped with radar, may, once her navigation and range lights are bright, plunge through the seas at 15 knots in the hope that all other craft will keep clear of it can not be accepted as a rule of safe and prudent navigation.

"It has been suggested that to hold the *Australia Star* at fault is to penalize her because of her equipment with radar. That is a misconception. The conduct which is regarded as negligent on the part of a person of sound vision is not the same as that which is condemned when practiced by the blind. The fault of the *Australia Star* is that she chose to remain blind when she had the means to see.

"Prudent navigation involves taking advantage of all the safety devices at hand. * * *"

A number of points were discussed by the court, such as the duty of an escort vessel to its escortee and other vessels, and the duty of a blacked out vessel keeping clear of a vessel with its lights on. The only point to be covered in this article is that involving the use of radar. In following the *Barry-Medford* decision, which was reported in the December 1946 issue of the "Proceedings," the court adds to the precedent that a vessel equipped with radar shall use it when the circumstances demand. The court stated "prudent navigation involves taking advantage of all the safety devices at hand." This case differs from the *Barry-Medford* case in that the *Australia Star* was operating her radar, whereas the *Barry*, although equipped with one, did not use it in approaching a fog bank. Therefore, the question of what was required of a vessel operating a radar was not involved in the *Barry-Medford* case. In the subject case the court held that, in addition to making use of the radar, it would be necessary to take a succession of ranges and bearings to determine the course and speed of any vessel picked up by the radar in order that proper avoiding action could be taken by the radar equipped vessel. The court stated: "Since the heading of a ship can be plotted from its bearing and distance at two or more points in time, the radar operator can with great accuracy plot the heading of a ship after taking a number of radar readings. * * *

"By means of her radar the *Australia Star* could observe the *Hindoo* and determine her heading and speed with greater exactitude than if the *Hindoo* had shown her navigation lights. By means of the intelligence radar supplied she could have navigated safely with respect to the *Hindoo* * * *."

The case in question involved the approach of a radar-equipped vessel upon a blacked-out vessel. The situation can be likened to the approach of a radar-equipped vessel upon another vessel in a fog. From the holdings in the two cases, one can expect that a radar-equipped vessel operating in a fog must operate her radar, and in addition, must obtain a succession of ranges and bearings in order to determine the course and speed of any vessel picked up by radar. In the September 1947 issue of the "Proceedings" an elementary article on radar plotting was published. In view of the two decisions involving radar-equipped vessels it seems that the burden is upon management personnel to issue instructions to the deck officers on such radar-equipped vessels as they may have in their fleets in order that they may know what is expected of them in the operation of the radar and in the application of the information supplied by the radar.

Flame Safety Lamps[1]

Flame safety lamps are required equipment aboard passenger vessels. Flame safety lamps should be used to test the oxygen content before men are allowed to enter places where oxygen deficiency is liable to occur, such as holds in which a fire has been smoldering, or where solid CO_2 has been used as a refrigerant, or in deep tanks which have been filled with oil or molasses and which have not been thoroughly aired out; or in fuel or water tanks which may have been sealed for some time, etc.

As a special safety precaution men wearing gas masks in any part of the vessel where a deficiency of oxygen might be encountered should carry a flame safety lamp.

Normal air contains 21 percent oxygen. Candles or flame safety lamps cease to burn when the oxygen content is lowered to 16 percent. (Unconsciousness occurs in humans when the oxygen content drops to 10 percent.) Therefore, the user is warned of oxygen deficiency in time to withdraw to a place of safety.

The flame safety lamp with metal-gauze enclosure was invented more than a century ago, primarily for its safe light; however, it soon became the standard device for detecting the presence of explosive gases. It still is the most widely used device for this purpose and is also the most practicable means of detecting deficiency of oxygen in confined spaces.

A permissible flame safety lamp is similar in all respects to one that, after a series of tests, has been approved by the Bureau of Mines as safe for use in gassy spaces. However, safety depends largely upon the way lamps are maintained and used.

Occasional reports of gas ignitions by supposedly permissible safety lamps indicate much misconception as to the construction and assembly of lamps and of limitations in their use.

Details of the Koehler and Wolf round-wick lamps are shown in figures 1 and 2, respectively. The corresponding flat-wick models differ only in the shape and position of the wick tube. Additional details of all the lamps are given in table 1.

As originally approved by the Bureau of Mines, the Wolf lamp had a nonsymmetrical expansion ring inside the lamp over the lower-gauze ring, where it was not readily visible. Both the expansion and lower-gauze ring could be reversed inadvertently, in which positions the expansion ring permitted less expansion and the gauze ring nearly closed the inlet openings of the fount top. Lamps equipped with these old expansion and gauze rings are still in use and, if correctly assembled, are permissible.

The Koehler and Wolf round-wick permissible lamps may be equipped with a bimetal device as shown in figure 3; they then are designated as "improved" lamps.

The bimetal unit is a strip of bimetal, *a*, $\frac{3}{32}$ inch wide and 0.005 inch thick, wound as a helix and mounted in a stainless-steel tube, *b*. The top of the helix is attached to yoke *d* and the bottom to pointer rod *e*. The tube is spot-welded to spider *f*, which permits its assembly in the inner gauze as shown in figure 3, *A*.

The unit is used with scale *g*, which has a translucent part, *h*, through which the shadow of pointer extension

[1] Excerpt from Miners Circular No. 44 published by the U. S. Department of the Interior, Bureau of Mines. Copies may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 10 cents per copy.

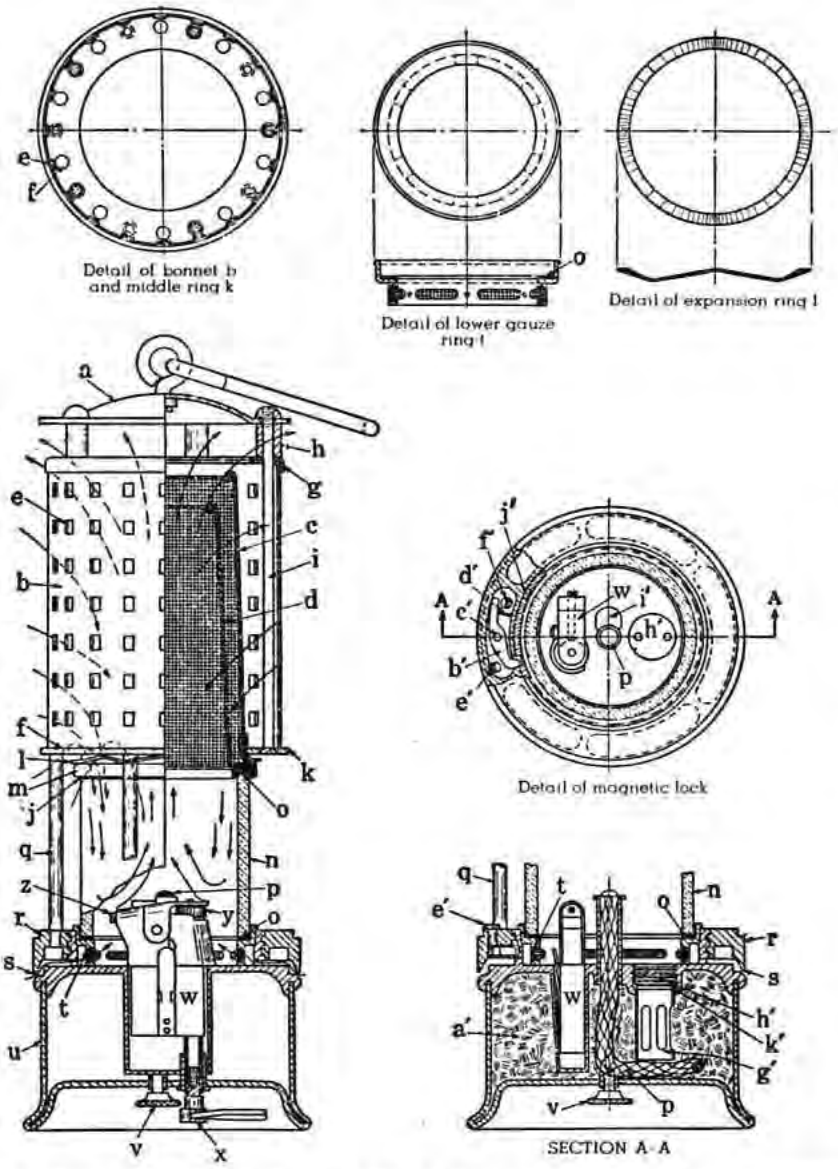


FIGURE 1.—Details of Koehler lamp: *a*, Hood; *b*, bonnet; *c*, outer gauze; *d*, inner gauze; *e*, louvers; *f*, air inlet holes; *g*, stiffening ring; *h*, spacer sleeves; *i*, assembly rods; *j*, gasket ring; *k*, middle ring; *l*, expansion ring; *m*, gauze ring; *n*, lamp glass; *o*, asbestos gaskets; *p*, wick; *q*, guard rods or standards; *r*, bottom or lock ring; *s*, baffle; *t*, lower-gauze ring; *u*, fuel fount; *v*, wick adjuster; *w*, relighter; *x*, relighter handle; *y*, friction or file wheel; *z*, spark-adjustment screw; *a'*, absorbent cotton; *b'*, lock dog; *c'*, lock-dog pivot; *d'*, lock spring; *e'* and *f'*, magnet contacts; *g'*, cotton spreader; *h'*, filling plug; *i'*, adjustment screw cap; *j'*, lock recesses; *k'*, filling-plug gasket.

i is visible; a special glass with etched parallel lines permits setting the flame at a definite height. The unit is applied to round-wick lamps only because the wick tube in all flat-wick lamps is off-center; this eccentricity and the irregular shape of the flame give erratic heating of the bimetal and an unsatisfactory shadow of the pointer.

The wick of the improved lamp is larger and therefore fits more tightly in its tube; the fuel fount is vented. These improvements tend to give a more-constant flame height.

The bimetal-helix units as approved with the Koehler and Wolf lamps are identical, but details of the mountings are different, as shown in figure 3, *B* and *C*, respectively. The spider of the Koehler unit is fitted with gasket ring *j*, which is mounted with the gauzes in the regular way. The bimetal is riveted at *k* and *l*. The latter purposely is left loose to permit freedom of alignment as the helix operates. Four parallel lines spaced one-fourth inch apart are etched on the inside of the Koehler glass. The position of the lines is such that when the flame tip is at the second line *m* it is about fifteen-sixteenths inch high. The top line is covered by the scale when used with the bimetal unit.

Rim *n* of the Wolf unit is a flat stainless-steel disk connected by four arms to spot-welded collar *o*. When the unit is assembled this disk is placed next to the rim of the inner gauze, with an asbestos gasket, *p*, at the bottom next to the glass. The bimetal is held loosely at the top by bolt *q* and is fastened at *r* by a loop in the pointer rod. Three parallel lines are etched on the outside of the Wolf glass. When the flame tip is at the second line *s* it is about seven-eighths inch high.

The helix is assembled with sufficient clearance to permit limited, free vertical movement of the pointer rod. Each is a left-hand spiral wound with the expansion side outward. Thus the helix turns the pointer rod counterclockwise, causing pointer *i* to move from left to right behind the scale, and the helix in turning becomes smaller in diameter.

Inch and quarter-inch divisions are marked on the translucent part of the scales. The inch divisions are designated as I, N, C, H, E, and S, instead of 0, 1, 2, 3, 4, and 5, to emphasize that they do not represent percent methane but only inches deflection of the pointer and that setting the scale to zero is not necessary. Each scale is held in place by one or two springs *t*, which permit the scale to be moved to any desired position.

The lined glasses are shown in proper position. Sometimes the lines inadvertently are added without regard to the manufacturer's trademarking, in which case the marking should be disregarded.

Because of excessive gumming regular motor gasoline is not suitable as flame-lamp fuel; however, the following suitable fuels are available:

1. Atlantic 70° naphtha (Atlantic Refining Co.).
2. Freedom safety-lamp fuel (Freedom Oil Works Co.).
3. Gulf, clear, 70 octane aviation gasoline (Gulf Oil Corporation).
4. Sinclair safety-lamp fuel (Sinclair Refining Co.).
5. Standard solvent naphtha No. 1 (Standard Oil Co. of New Jersey and subsidiaries).
6. Waverly safety-lamp fuel (Waverly Oil Works Co.).

These fuels are uncolored, straight-run gasoline having a medium distil-

lation range of 90° to 330° F. Because all fuels may develop gumming properties on standing, especially if exposed to sunlight, they should be bought in limited amounts—not more than 1 month's supply—and kept in an opaque container.

When a lamp is refueled care should be taken not to spill the fuel on the relighter, as this decreases the intensity of the relighter spark and is also a source of vapor, which tends to destroy steady burning of the normal flame. The excess fuel should be poured from the fount after each filling.

One requirement for permissibility is that a new lamp shall burn at least 12 hours per filling with approximately 1 inch flame height. This insures that all lamps, if given reasonable care, will burn for at least 8 hours. Failure to burn for 8 hours is due chiefly to decreased fuel space in the fount as the cotton and wick become filled with gum. Lamps can be so neglected in this respect that they will not burn for 8 hours unless the founts are filled to overflowing.

Even though the lamp is not used there will be a gradual loss of fuel through evaporation from the wick. It is, therefore, advisable to have available a reserve supply of fuel. One satisfactory method of keeping a small reserve handy is to use a 1-pint copper-plated engineer's filler with screw cap on the filler spout. This filler should be kept filled with fuel and stored near the lamp.

The care that lamps receive depends upon the relative experience of the person in charge, age of lamps, conditions under which they are used, availability of lamp auxiliaries and repair parts, and degree of supervision and discipline.

The following factors in maintenance are suggested as essential to keeping permissible flame safety lamps in a safe and satisfactory condition.

Cleaning involves the removal of all dirt, rust, and inflammable materials from all parts of the lamp.

Cleaning the fount should include removal of any deposits from the relighter file wheel and of charred materials from the wick. The relighter then should be adjusted to give adequate sparking.

One of the most severe tests of a flame safety lamp in methane-air mixtures is to place it unlighted in an 8.5-percent mixture and then operate the relighter to produce an internal explosion, which drives the flame of the explosion through the gauze at high speed. To prevent external ignition the gauze wires must cool the flame in this very short time to below the ignition temperature of the surrounding mixture. Therefore,

TABLE 1.—*Details of lamps*

	Koehler lamp (Koehler Manufacturing Co., Inc.)				Wolf lamp (Wolf Safety Lamp Co. of America)			
	"Steel," flat wick	"Steel," round wick	Aluminum, flat wick	Aluminum, round wick	"Steel," round wick	Aluminum, round wick	Aluminum, flat wick	"Steel," flat wick
Approval No.	201	201A	203	203A	204	205	206	208.
Size of wick	1/16 by 5/8 inch	9/32-inch diameter.	1/16 by 5/8 inch	9/32-inch diameter.	9/32-inch diameter.	9/32-inch diameter.	1/16 by 5/8 inch	1/16 by 5/8 inch.
Weight of lamp without fuel	3 pounds 6 ounces.	3 pounds 6 ounces.	2 pounds 6½ ounces.	2 pounds 6½ ounces.	3 pounds 5 ounces.	2 pounds 13½ ounces.	2 pounds 13½ ounces.	3 pounds 5 ounces.
Gauzes:								
Material	Steel or brass				Steel or brass.			
Mesh	28				28 or 30.			
Outer gauze:								
Height ... inches	4 1/16				3 13/16.			
Outside diameter, top ... do	2				1½.			
Outside diameter, bottom ... do	2¼				1⅞.			
Inner gauze:								
Height ... do	3⅝				3¼.			
Outside diameter, top ... do	1 7/16				1 3/16.			
Outside diameter, bottom ... do	1 11/16				1 19/32.			
Glass:								
Manufacturer	Corning Glass Works				Corning Glass Works.			
Marking	Pyrex [1 2 3 4]				Wolf ("Made in U. S. A.").[1 5]			
Height ... inches	2 13/32				2 11/32.			
Inside diameter ... do	2 1/32				2 1/32.			
Outside diameter ... do	2 5/16				2 5/16.			
Allowable deviation from parallelism of ends ... do	1/64				1/64.			
Allowable deviation in squareness of ends ... do	1/32				1/32.			
Weight of fuel per filling	95 grams (3.34 ounces)				74 grams (2.61 ounces).			
Approximate amount of cotton to repack bowl	23 grams (0.81 ounce)				16 grams (0.56 ounce).			

[1] The "Smoking Chimney" glass made by the Jena Glass Co., Germany, and approved with this lamp is not now available, but many still are in use.
[2] The "MacBeth—2100 High Speed" glass formerly made by the MacBeth-Evans Glass Co., Pittsburgh, Pa., and approved with the Koehler lamp is not available but still may be in use with or without parallel lines.
[3] The "Libbey" glass formerly made by the Libbey Manufacturing Co., Toledo, Ohio, and approved with the Koehler lamp is not available but still may be in use.
[4] The Pyrex glass is approved with or without etched parallel lines on inside.
[5] The Pyrex glass is approved with or without etched parallel lines on outside.

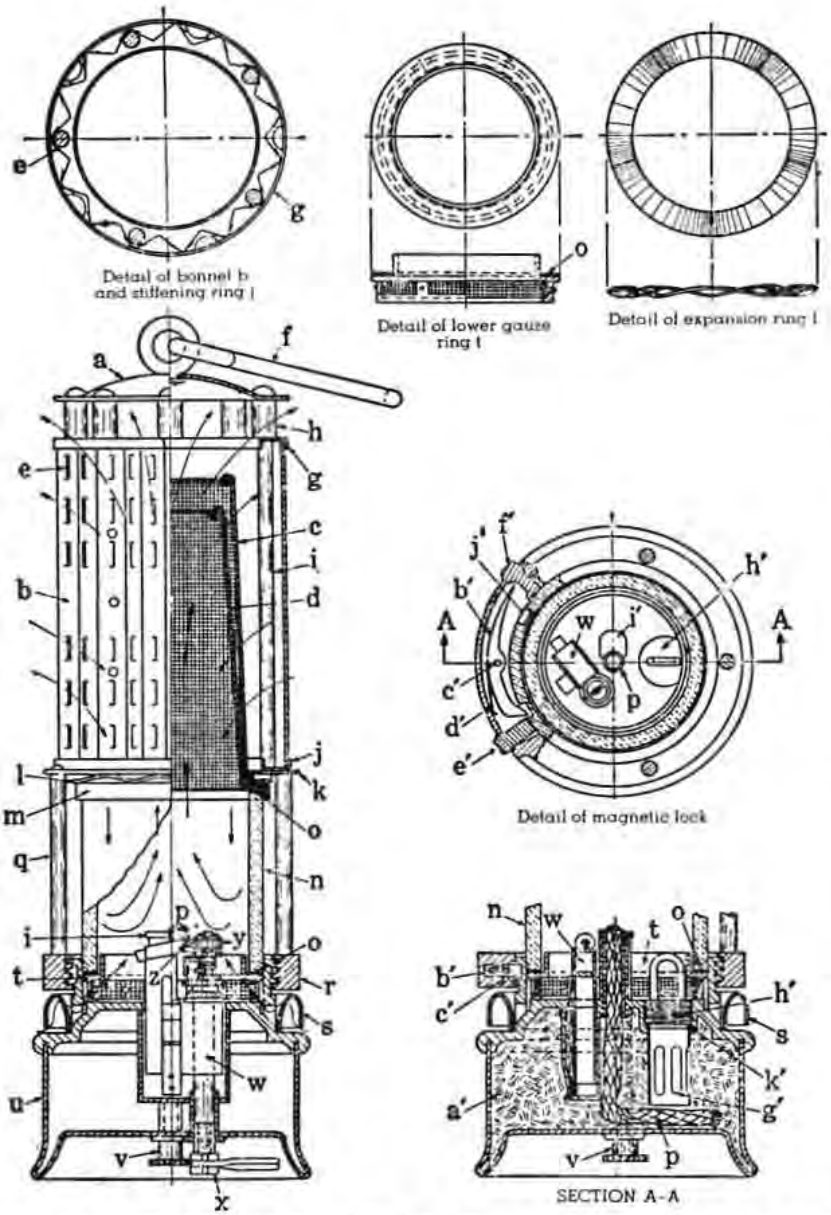


FIGURE 2.—Details of Wolf lamp: *a*, Hood; *b*, bonnet; *c*, outer gauze; *d*, inner gauze; *e*, louvers; *f*, bail; *g*, stiffening ring; *h*, spacer sleeves; *i*, assembly rods; *j*, lower stiffening ring; *k*, middle ring; *l*, expansion ring; *m*, gauze ring; *n*, lamp glass; *o*, asbestos gaskets; *p*, wick; *q*, guard rods; *r*, bottom or lock ring; *s*, baffle ring; *t*, lower-gauze ring; *u*, fuel fount; *v*, wick adjuster; *w*, relighter; *x*, relighter handle; *y*, friction or file wheel; *z*, cerium spark pin; *a'*, absorbent cotton; *b'*, lock dog; *c'*, lock-dog pivot; *d'*, lock spring; *e'* and *f'*, magnet contacts; *g'*, cotton spreader; *h'*, filling plug; *i'*, adjustment-screw cap; *j'*, lock recesses; *k'*, filling-plug gasket.

while the gauzes and glass are being cleaned all parts and surfaces should be inspected carefully for possible defects.

Any of the following defects in the gauze lowers the capacity of the gauze to cool the explosion flame and therefore decreases safety: A broken gauze wire, an enlarged mesh, mesh wires that have decreased appreciably in diameter by successive cleanings, and wires that are coated with scale or rust of lower thermal conductivity than the original wire. A gauze that has any of these defects should be destroyed to prevent further use.

The inspection also should show other possible defects, such as a cracked or chipped glass, a broken gasket, a gasket doubled back on itself, an inadequate relighter, or a deformed bonnet. Failure of a glass would expose the lamp flame and cause ignition of an external explosive mixture; a glass therefore should not be used if it is damaged in any way. A defective gasket usually does not form an adequate safety joint between the glass and gauze ring. A defective relighter is indirectly hazardous in that it invites unsafe opening of the lamp in an attempt to relight it.

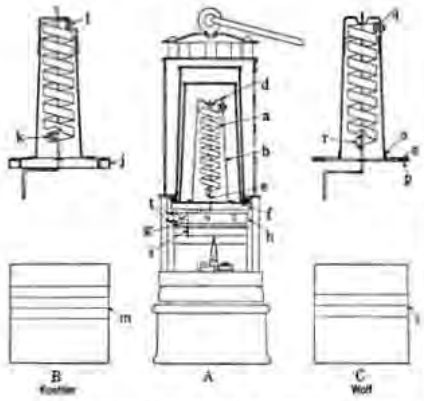


FIGURE 3.—Details of improved lamp.

The size of the bonnet louvers is determined by the opposing requirements of adequate ventilation in still atmospheres to give a freely burning flame and effective shielding of the gauzes in moving atmospheres; deformation of the bonnet usually interferes with normal burning of the lamp and may seriously lower its safety factor.

Each lamp part also should be examined as the lamps are assembled to make sure that all parts are included in the assembly, that each is in its proper place, and that asbestos gaskets are above and below the glass. When the bowl is screwed to the frame it should be turned until the glass can just be turned by a thumb and one finger to allow for expansion.

The following precautions should be observed in using a flame safety lamp:

Be sure that the lamp is locked.

Examine the lamp carefully to see that it is in good condition before using it.

Do not carry the key which opens the lamp with you.

Do not attempt to open the lamp in hold or tank. Always take into fresh air.

Be sure that lamp gauze is clean. Do not use one with rust, dirt, or oil on gauze.

Do not let lamp smoke. Soot may fill up the gauze.

Lamps that have not been used for some time may have rusty gauzes and hardened wick or gummy fuel. Do not use such a lamp.

HAZARDS OF AMMONIUM NITRATE FERTILIZER

The dangers involved in stowing and shipping ammonium nitrate fertilizer on board merchant vessels came into sharp focus when the French ship S. S. *Grandcamp* caught fire and exploded at Texas City. The Secretary of the Treasury appointed an Interagency Committee on Hazard of Ammonium Nitrate, Fertilizer Grade, to study every possible hazardous aspect of ammonium nitrate. The report of this committee will be in three parts. Part I is confined to a study of every possible hazardous aspect of the characteristics of ammonium nitrate fertilizer together with information relative to its hazards in marine transportation, the evaluation of suggested proposals for assuring safety in marine transportation, and recommendations to attain maximum safety in handling and stowage in such transportation. Part II will consist primarily of information relative to the hazards of ammonium nitrate fertilizer in land transportation, and in storage under various conditions. Part III will contain the results of chemical and physical tests of the ammonium nitrate fertilizer and recommendations of national policy not included herein designed to attain the objective of maximum safety in the manufacture, handling, storage, stowage, and transportation of ammonium nitrate fertilizer.

This article contains excerpts from part I of the committee's report, since it is not possible to reprint the report in its entirety. These excerpts have particular reference to the ammonium nitrate fertilizer hazards in transportation on board vessels.

CHARACTERISTICS OF AMMONIUM NITRATE FERTILIZER WITH PARTICULAR REFERENCE TO ITS HAZARDS IN TRANSPORTATION ON BOARD VESSELS

[10.] The following conclusions reached by the committee, based upon information and experience thus far developed, are set forth:

(*a*) Ammonium nitrate fertilizer of the type involved in the explosion on board the S. S. *Grandcamp* at Texas City is not of itself unstable at a temperature below 200° F.

(*b*) Ammonium nitrate fertilizer as of itself, and lacking mixture with combustible material, is not readily ignitible. It is however, a vigorous and strong supporter of combustion. When subject to heat its melting point is at a temperature about 336° F. Apparently the lowest critical temperature of ammonium nitrate fertilizer is at about its melting point, at which temperature it gives off gaseous products, some of which are both combustible and toxic.

(*c*) The most common hazard to ammonium nitrate fertilizer in marine transportation is fire involving combustible containers or adjacent combustible material that may be present in the hold. Fire may be caused by, but not limited to open flame, sparks, burning embers, live cigarettes, cigar butts, or pipe ashes, oxyacetylene burning and welding torches, grounds and short circuits in electrical systems, exhausts of internal combustion engines, contamination by or contact with oxidizable substances capable of heating spontaneously and igniting, contact with wet paint, or oxidizable and drying oils.

(*d*) Limited tests and experience indicate that ammonium nitrate fertilizer of the type involved in the Texas City disaster, stowed as cargo in holds of ships, does not heat spontaneously, when the temperature of the fertilizer at the time of loading does not exceed 140° F.

(*e*) Tests so far conducted indicate that it is not possible to adversely affect ammonium nitrate fertilizer by friction.

(*f*) Many small-scale tests indicate that in the absence of confinement and without added combustible or contaminating material it has not been possible to cause the detonation of ammonium nitrate fertilizer by the application of heat.

(*g*) Experience with ammonium nitrate fertilizer packed in combustible containers and involved in a fire in a nonconfining structure or in a sufficiently vented compartment indicates that the combustible material will burn until consumed and that the combustion will then cease without causing the fertilizer to detonate. The record in this respect is extensive in railroad freight cars and well ventilated storage building. A ship's hold is not considered to be a nonconfining or sufficiently vented compartment when measured by this experience.

(*h*) Explosion, by any impact to which the fertilizer may be normally subjected to in transportation, is not likely at any temperature that will normally be encountered during transportation.

(*i*) Tests so far conducted have failed to prove that it is possible at normal temperatures and under ordinary conditions to propagate a mass detonation of ammonium nitrate fertilizer by the use of blasting caps. The ammonium nitrate fertilizer in contact with the blasting cap apparently decomposed but such decomposition was confined to a very limited area and the action failed to propagate decomposition of the entire amount of the sample under the conditions of the tests.

(*j*) Combustible material impregnated with ammonium nitrate fertilizer will, when ignited, burn in a vigorous manner.

(*k*) In many tests samples of ammonium nitrate fertilizer, under conditions of loose piling, have stood the application of heat and flame without exploding.

(*l*) In the committee's opinion, it is necessary to change the chemical stability of ammonium nitrate fertilizer to cause its explosion or detonation under conditions associated with its transportation as cargo. This chemical stability can be altered by the application of heat to a sufficiently high degree or by involvement of the fertilizer in a fire of combustible materials under certain conditions, that is confinement in a compartment which lends itself to the retention of heat and the building up of pressure generated by the products of decomposition. Excessive temperature and pressure create a dangerous condition in the storage or stowage of ammonium nitrate fertilizer, and in the opinion of the committee are the key factors that can cause the substance to explode or detonate.

(*m*) Ammonium nitrate fertilizer of the type involved in the Texas City disaster is not classified as an explosive under the definition contained in regulations governing "Explosives or Other Dangerous Articles on Board Vessels."

SUGGESTED PROCEDURES TO ATTAIN SECURITY OF VESSELS WHEN IN PORT AND HAVING ON BOARD OR LOADING OR UNLOADING A CARGO OF AMMONIUM NITRATE FERTILIZER

[14.] (A) The committee suggests that such provisions of the following procedures as can be legally incorporated in regulations be so treated and the remaining procedures publicized in the widest possible manner as recommendations.

(B) *Condition:* A vessel about to load a cargo of ammonium nitrate fertilizer:

(1) Prior to the beginning of actual loading of cargo the master shall:

(*a*) Notify the Officer in Charge, Marine Inspection, United States Coast Guard, and

(*b*) The municipal or state port warden if there is such an officer in the port, or

(*c*) The chief of the municipal fire department if there is no port warden.

(*d*) Consult sections 146.02–1 to 146.02–22, inclusive, 146.06–1 to 146.06–19, inclusive, 146.22–1 to 146.22–6, in-

clusive, and 146.22–100 (specifically the item ammonium nitrate) of the U. S. Coast Guard regulations entitled "Explosives or Other Dangerous Articles on Board Vessels, April 9, 1941."

(e) Take cognizance of the fact that the owners, the agent, and the master of the vessel, the stevedores, and longshoremen, the freight forwarder, shipper, and all other persons engaged in the handling and stowage of the ammonium nitrate fertilizer have the responsibility of observing the provisions of the regulations.

(f) Call a conference on the vessel of officers of the vessel, chief stevedore, hatch bosses, port warden, or chief of the local fire department to discuss all phases of the proposed loading and action to be taken in an emergency.

(g) Require all of the vessel's fire-fighting equipment to be checked to be certain that there is water under pressure in the mains, that sufficient hose is available to reach into the hold, that the engine department is instructed to maintain proper pressure on the fire mains with reserve pump or pumps in ready status, that oxygen or fresh air breathing apparatus and masks are ready and handy for use. (The most dangerous gases likely to be encountered are oxides of nitrogen and carbon monoxide.)

(h) Instruct the vessel's cargo officer to maintain a continuous watch over every feature of the handling and stowage and the behavior of personnel engaged therein. For foreign vessels supervision shall be maintained by a licensed officer of the vessel. For domestic vessels a licensed officer of the vessel or a port officer possessing a merchant marine officer's license issued by the United States Coast Guard may be so assigned.

(2) Prior to the beginning of actual loading of cargo, domestic vessel operators, or agents of foreign vessels, shall be responsible for providing and maintaining a fire watch authorized and instructed to prevent smoking by any means within their command. (One man of the fire watch shall be stationed in the cargo hold in which the fertilizer is being stowed.) The master is charged with the responsibility of supervising the fire watch. He may delegate this responsibility to the cargo officer in writing (log entry).

(3) Prior to the beginning of actual loading of cargo it shall be the responsibility of the master to have the following operations performed and carried to completion:

(a) Remove all debris and broom clean the hold in which the ammonium nitrate is to be stowed, in addition to other requirements herein.

(b) Lay clean dunnage on tank top or deck of the hold.

(c) Do not allow paper to be used as dunnage.

(d) Inspect housekeeping of other portions of the ship, removing dirt and rubbish from the ship.

(e) Fit fire screens of not more than one-sixteenth inch mesh over outlet of galley smoke pipe. Fit fire screen of not more than one-eighth inch mesh over outlet of main ship funnel. Have cowl ventilator screens in place.

(f) Designate either on the ship or ashore a compartment or an area in which smoking is permitted. If the compartment is on board ship, the port holes must be screened or remain closed to prevent disposal of "butts" outside of the smoking room.

(g) Prohibit smoking on deck or elsewhere in the ship, including living quarters, (designated smoking compartment excepted). Instruct fire watch to enforce this prohibition when hatches are open.

(h) Post "No smoking" signs at the gangplank and at the approaches to open hatches. "No smoking" legends painted on deck houses, bulwarks, and hatch coamings are not considered sufficient for this purpose. The signs should be bright, clean and painted on portable boards having hangers or fitted on standards, and lettering should be in block letters, at least 3 inches high. Red lettering on a white background, or the reverse thereof, is required. Foreign vessels shall post "No smoking" signs in English, and in the language of the country of registry.

(i) Conduct a fire drill, assuming a fire is in the hold in which the ammonium nitrate fertilizer is to be stowed.

(4) During loading or unloading operations, repairs involving cutting or welding shall not be undertaken on board the vessel, except in accordance with the provisions of section 146.02–20 of the United States Coast Guard regulations entitled "Explosives or Other Dangerous Articles on Board Vessels," and then only upon written permission of the Officer in Charge, Marine Inspection, United States Coast Guard, and such operations shall be attended by a fire watch supplied with the proper fire extinguishing equipment.

(5) A ship having ammonium nitrate fertilizer on board shall, while moored or anchored, be maintained in an operating status.

(6) A ship loading, unloading, or having on board a cargo of ammonium nitrate fertilizer, and unable to move under its own power, shall not be permitted to moor or anchor in a port, except upon express permission of the Officer in Charge, Marine Inspection, United States Coast Guard, and then only when the owner or master provides one or more tugs in constant attendance to move the ship. A ship unable to maintain power for fire pumps shall provide fire protection suitable to the Officer in Charge, Marine Inspection.

(7) When a vessel is working ammonium nitrate fertilizer at any location in the navigable waters, the following operations shall not be permitted until all cargo hatches are secured and with tarpaulins in place:

(a) Oil or coal bunkering.

(b) Cleaning of the fireside of boilers.

(c) Machinery or structural repair, except as specifically permitted by the Officer in Charge, Marine Inspection, United States Coast Guard.

(8) A vessel having ammonium nitrate fertilizer on board shall:

(a) When moored to a pier be moored bow out to permit easy exit. When moored to a wharf it shall be moored with bow in the direction affording easy exit to an isolated deep water section of the port. With the exception of barges servicing the vessel, no other vessel shall be moored outboard of the principal vessel.

(b) Provide a towing hawser made fast to the bits with slack coiled on deck and hung through the chock on the offshore side of the vessel so that the eye is approximately 10 feet from the water. One such hawser shall be so fitted fore and one aft on the vessel.

(c) Have sufficient engine and deck crew on board the vessel at all times in order to properly man the vessel in event of an emergency.

(d) When moored to a pier or wharf, have the vessel's anchors stowed and secured in its hawse pipes.

(C) *Condition:* The master of a vessel entering a harbor and having on board a cargo of ammonium nitrate fertilizer shall:

(a) Notify the Officer in Charge, Marine Inspection, United States Coast Guard, and

(b) Notify the municipal or state port warden if there is such an officer in the port, or

(c) Notify the chief of the municipal fire department if there is no port warden established.

(d) Observe all of the applicable provisions of instructions set forth in the foregoing paragraphs of this directive, and in addition any other local instructions given by the port warden, the chief of the local fire department, or the Officer in Charge, Marine Inspection.

PROCEDURE IN EVENT OF FIRE INVOLVING AMMONIUM NITRATE FERTILIZER IN A CARGO HOLD OF A VESSEL

[15.] (A) The committee recommends the following procedures be in-

corporated in the dangerous cargo regulations as provisions of regulations, if legally possible, or as recommended practices if statutory authority does not exist.

(*a*) In event of fire notify local fire department immediately.

(*b*) Apply water immediately and in as much volume as possible, preferably by using fire hose of 1½ inches to 2½ inches diameter. Bring as many hose lines to bear as the capacity of the supply will permit.

(*c*) Salt or fresh water may be used with equal efficiency.

(*d*) Do not hesitate to apply the water directly to the containers of the ammonium nitrate fertilizer as instantaneous cooling is the desired objective. No consideration shall be given to saving the cargo from water damage. Extinguish the fire first, and only then consider salvage.

(*e*) The effectiveness of water sprinkler or spray systems or water fog for fires involving ammonium nitrate fertilizer is doubtful. Water deluge systems have been effective in extinguishing fires in this type of substance. Carbon dioxide gas would be ineffective insofar as excluding oxygen is concerned but might aid in cooling. Its use is not recommended except as an assisting agent while water is being applied. Foam would be of no particular value. Hand extinguishers are useless in this type of fire.

(*f*) Do not apply steam as an extinguishing agent. The heat of the steam will increase the temperature of the mass and this will increase the hazard.

(*g*) Do not close the hatch and do not blank off the hold ventilators. Ammonium nitrate fertilizer is an oxidizing material and is capable of liberating sufficient oxygen to support a hot fast-burning fire. Sealing the hold will confine the heat of the fire, increase the temperature of the mass, cause pressure to rise, and thus aggravate the situation and compound the hazard. Remember high temperature and pressure are conditions to be avoided. At temperatures less than 200° F. it is not likely that the chemical stability of ammonium nitrate fertilizer will be affected.

(*h*) Oxygen breathing apparatus or hose-connected, fresh-air breathing apparatus will guard personnel against fumes generated in a fire involving ammonium nitrate fertilizer. Oxides of nitrogen and carbon monoxide are the most dangerous of the gases likely to be encountered in such a fire. The normal practice in combating a fire in the hold of a vessel is to batten down the hatches, close or blank off ventilators, and thus exclude the supply of oxygen to the fire. However, such practices have no such effect when the substance involved in the fire is an oxidizing material. Ammonium nitrate fertilizer is an oxidizing material and involved in a fire will liberate oxygen freely.

(*i*) If sufficient heat is present it may happen that during the application of water, steam may form in pockets in the stowage of the bags of fertilizer and develop eruptions with force comparable to explosions. For this reason it is judicious not to approach too close to the fire and not become too alarmed at such steam explosions. The fire fighter should protect himself by guiding the stream from behind the protection of the hatch coaming, deck house, or other substantial barrier. The foregoing should not be interpreted as superseding "on the spot" judgment. The quicker the temperature is lowered the less likelihood there will be of steam explosions or the generation of oxides of nitrogen fumes. Rapid reduction of temperature is the essence of the entire control. After extinguishing the fire do not enter the hold without oxygen or hose connected, fresh-air breathing devices, until it has been determined all gases have been vented from the hold.

(*j*) Warn unnecessary personnel to leave the area, police the area, to evacuate and exclude personnel not required for emergency operations.

(*k*) *Clean-up operations.* After the extinguishment of the fire, the damaged fertilizer should be removed and disposed of. Unsalvageable fertilizer may be disposed of by burying in the ground or by dumping in deep water inasmuch as it is soluble in water. When all the fertilizer has been removed the hold should be hosed and scrubbed and all residue of fertilizer washed overboard. It is advisable that all metal of the ship's hold that has been contacted by ammonium nitrate fertilizer be thoroughly washed and scrubbed to prevent corrosion. Wooden ceiling, cargo battens, and other wooden protective battens that have been contacted by wet or molten ammonium nitrate fertilizer shall be removed and replaced by new material. Wood impregnated with ammonium nitrate fertilizer, if contacted by open flames, will ignite readily and burn vigorously.

LESSONS FROM CASUALTIES

Drowned by Lightning?

Acts of God do not always, by themselves, endanger the lives of those on board ship. More frequently than not, the acts of man which follow the acts of God bring misfortune to man himself. This lesson was repeated recently on a small tanker struck by lightning in a southern east-coast port. Five of the crew members immediately jumped overboard, one of whom was drowned.

The vessel, having discharged a part cargo of gasoline, departed from the oil dock and was en route down river, tank tops and openings properly secured. A heavy rain and an electrical storm was in progress at the time. The second assistant engineer was on watch in the engine room and the master was navigating the vessel in the pilothouse. At about noon, while less than a mile from the dock, the mate and deckhand entered the pilothouse to relieve the master. At that instant there was a sharp crackling sound and an explosion. The forward deck and port side of the vessel became engulfed in flames.

The deckhand stepped through the starboard door of the pilothouse, seized a life-ring and jumped overboard. The mate stepped out of the port door, ran aft and jumped overboard on the starboard side. The master stopped outside the port door and pulled the valve to the CO_2 system to the cargo tanks. Thereafter, all flames subsided with the exception of those coming from the expansion trunks at No. 3 and No. 4 tanks just forward of the pilothouse.

The master went aft and called into the engine room. The second assistant engineer answered from the starboard side of the main deck close by. He informed the master that all hands with the exception of themselves had jumped overboard and recommended that they do likewise. The master asked the second assistant to stop the engines as the vessel was proceeding at its full speed of 6 knots. While the engineer stopped the engines, the master went forward and dropped the anchor. He then attempted to put out the fire in No. 3 and No. 4 expansion trunks with a portable CO_2 extinguisher, but to no avail.

The master then asked the engineer to start the fire pump. The master noted that by directing a stream of water into the expansion trunks, only increased the flames. He then

directed the water against the forwardhouse, which caused a spray to cover the tank tops, thus extinguishing the flames.

In the water, the deckhand with the life-ring heard his name called by another deckhand, 4 or 5 yards away. Unable to swim towards the second deckhand because of the ring around his body, the first deckhand tried other efforts to answer the frantic calls for "help." He was too late; the second deckhand disappeared below the surface. A short while later, a small yacht rescued the four remaining crew members from the water and the master and engineer from the vessel.

Of the five men who had jumped overboard, only two had availed themselves of lifesaving equipment. One had taken a life-ring, and the other a life preserver.

There were no personnel injuries as a result of the explosion and fire. Matériel damage consisted of four missing tank tops and vent pipes and minor damage to other parts of the vessel, including the lightning arrestor on jack staff forward.

It should be obvious from the entire incident that the only person who acted wisely was the master. He is to be commended for his levelheadedness throughout. He practically fought the whole fire singlehanded. He used good judgment, which not only saved the owner from possible total loss of the vessel, but demonstrated conclusively that the fire-fighting equipment required on such vessels actually fulfills its purpose.

Little can be said in favor of the action taken by the five crew members who jumped overboard with or without lifesaving equipment. They should have at least hesitated long enough to appraise the casualty and to consult the master, as in the case of the second assistant engineer. Had they done so, chances are they would have been asked to assist in fighting the fire which might have resulted in an even sooner extinguishment of the fire. It is axiomatic that the longer a shipboard fire is left burning, the more difficult it is to extinguish. The most effective fire-fighting efforts are those initiated immediately after the fire begins.

Had the crew members remained on board to assist the master, the one drowning would not have occurred.

Had the master not used the fire-fighting equipment, or had he heeded the engineer's recommendation to go overboard, the vessel, a small tanker engulfed in flames and moving at 6 knots, would have been a menace to navigation, as well as to dock and shore facilities had the vessel altered course on its own and headed toward shore.

Had the incident taken place prior to the vessel's departure from the oil dock, the consequences would have been far more serious.

Contact by lightning is a happenstance. It does not foretell doom, even to a tank vessel, if all those on board act wisely and in accordance with good seamanship.

Small Boat Casualties and Accidents

Now that the yachting season is over in the northern parts of the United States a review of casualties and accidents is worthwhile before making next year's plans. Each spring we all look forward with anticipation to enjoyment found in small boating, but often gloss over the hazards involved. While the Coast Guard does not have complete jurisdiction over the reporting and investigation of small boat casualties and accidents, yet during the period from July 1945 to August 1947, 95 serious casualties or accidents were reported in which a total of 13 lives were lost and approximately $331,635 of damage was reported.

The big hazard in small boating arises from fumes collecting in the bilges. These fumes collect through improper ventilation and often result in either an explosion or fire when a spark or flame is introduced into the confined space. Petroleum vapors are heavier than air and flow towards the lowest points within a boat. Experiments have shown that 50 cubic feet of explosive vapor can be generated from one-quarter pint of gasoline (about one-half a teacupful), and if allowed to accumulate in confined spaces it can easily wreck by explosion a 50-foot boat.

The 95 boats of less than 15 gross tons which were involved in casualties or accidents reported to the Coast Guard were damaged or destroyed due to the causes set forth in the following list:

Fumes in bilges (improper ventilation)	*48
Fire or explosion of unknown origin	13
No backfire screen on carburetor	10
Engine spark ignited bilge fumes	4
Short circuit, electric system	4
No bilge ventilation	3
Backfire of engine	2
Motor starter spark	2
Fire in galley	1
Leaky gasoline line	1
Fire from overheated engine	1
Fire following collision	1
Explosion of batteries	1
Careless use of matches	1
Faulty installation of gas tank	1
Electric hand drill	1
Lightning	1
	95

*The explosion of one boat caused damage to two other boats moored close aboard.

These casualties or accidents demonstrate forcibly the necessity for the following:

1. Properly ventilated bilges and engine spaces. This is absolutely essential to the safe operation of any boat.

2. Properly installed vents for fuel tanks. The vent pipe should discharge to open air away from the hull openings, hatches, windows, doors, etc., and the outside end of the vent should be screened.

3. Properly installed fill pipes. The fill pipe should be firmly attached to tight deck plate. The fill pipe should extend to bottom of tank with a well to form a liquid seal.

4. Properly installed bilge ventilating blower of adequate size for the space in which used. The ventilating bilge blower should be operated for at least 5 minutes before attempting to start the engines.

5. Properly installed drip pans and backfire screens for each carburetor. The drip pans should be cleaned before starting the engines.

6. Properly installed cooking equipment. Gasoline stoves should not be used. Gasoline should never be used for priming.

7. Maintain good housekeeping practices. The entire boat and especially the engine compartment should be kept clean and free from flammable rubbish, loose oil and grease, and dirty waste or rags.

8. Proper fueling operations should be followed. Except in emergency, all fueling should be completed before dark. All fires or open lights should be put out and spark-causing devices should be secured before fueling operations are started and sufficient time allowed for proper ventilation after the fueling operation has been completed before fires or open lights or other spark-causing devices are put into operation.

9. Maintain fire extinguishers located strategically throughout the boat in proper working order at all times.

10. Maintain proper ventilation while the boat is idle and work is being performed in the engine room or other confined spaces so that no accumulation of fumes can be set off by a spark or light.

11. Make frequent inspection of the electrical system and equipment to check for short circuits and broken insulation.

12. Prevent fuel spills from getting into hull or bilges during fueling operations. When fuel is spilled be sure to wipe up all of it.

SAFETY HINTS

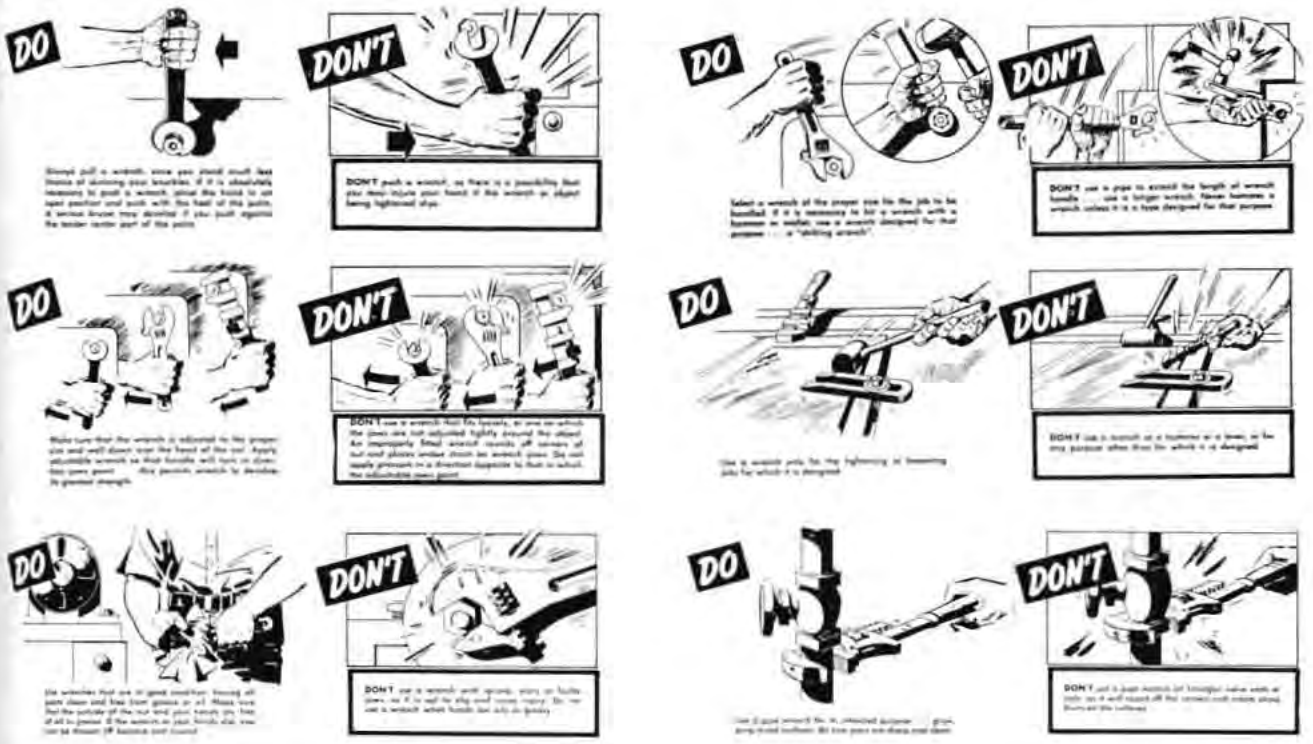
Rope does not have to be around your neck to kill you.

There are three ways of doing a job—
*The right way
*The wrong way
*The haphazard way
Think safety—do it the safe way.

An injured eye has no trade-in value on an artificial eye.

WHAT NOT TO PAINT

*Rubber gaskets on watertight doors, portholes, and deadlights.
*Threads on bolts and nuts.
*Builders name plates on lifeboats.
*Manufacturers plates on boat davits.
*Identification plates over compartments or rooms.
*Fire extinguishers or lifebuoy lights.
*Radio antenna leadin or outlet.
*Valve tags on fire extinguishing systems.
*Gear clutch shaft on anchor windlass.
*Detector heads or sprinkler heads.
*Knife edges of watertight doors and hatches.



APPENDIX

Navigation and Vessel Inspection Circular No. 10–47

UNITED STATES COAST GUARD,
Washington 25, D. C., Oct. 24, 1947.

Methods of Construction of Class A–60, A–30, and A–15 Bulkheads and Decks to Meet the Requirements of Subchapter M, Construction or Material Alteration of Passenger Vessels of the United States of 100 Gross Tons and Over Propelled by Machinery

1. Requests have been received from shipbuilders and others concerned for information concerning the application of insulation, bulkhead panels, and deck coverings to achieve the various classifications of bulkheads and decks required by subchapter M.

2. There are inclosed sketches showing typical constructions which will meet the various classifications. The thicknesses of approved materials required are minimums and greater thicknesses will be permitted. It is obviously impossible to anticipate all of the combinations of materials which might be used, but approval will be given in specific instances where it is desired to use a method of construction not indicated by the sketches, provided it is equivalent in integrity and heat transmission qualities.

3. Care should be taken in applying materials other than those required. Additional approved bulkhead panel material, structural insulation, deck covering, or incombustible material may be used without restriction provided the integrity of the construction is not affected. Combustible trims and veneers may be used where permitted by the regulations, but may perform no structural function and may not be used to maintain the integrity of the construction. Overlays, such as rubber tile, linoleum, etc., not exceeding $\frac{3}{8}$" in thickness may be applied over the required deck construction. Such overlays need not be approved. Rugs and carpets may be used in addition to any deck covering or overlay installed. Rugs and carpets used in stairways or corridors shall be of wool or other material having equivalent fire-resistive qualities.

4. There are also inclosed [1] lists of materials approved as of this date which may be used in accordance with the sketches.

(S) J. F. FARLEY,
Admiral, U. S. C. G.,
Commandant.

Equipment Approval by the Commandant

By virtue of the authority vested in me by R. S. 4405 and 4491, as amended (46 U. S. C. 375, 489), and section 101 of the Reorganization Plan No. 3 of 1946 (11 F. R. 7875), as well as the additional authorities cited below, the following approvals of equipment are prescribed and shall be effective for a period of five years from date of publication in the FEDERAL REGISTER unless sooner canceled or suspended by proper authority:

CLEANING PROCESSES FOR LIFE PRESERVERS

(Where buoyancy fillers are not removed from envelope covers during cleaning process)

Approval No. 160.006/10/0, Western Canvas cleaning process for kapok life preservers, as outlined in attachment to manufacturer's letter of 14 October 1947, submitted by Western Canvas Products Co., 1200 Tenth Avenue, Seattle 22, Washington.

(R. S. 4417a, 4426, 4488, 4492, 35 Stat. 428, 49 Stat. 1544, 54 Stat. 164, 166, 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 391a, 396, 404, 481, 490, 526e, 526p, 1333, 50 U. S. C. 1275; 46 CFR 160.006-4) (12 F. R. 7814, November 19, 1947.)

MECHANICAL DISENGAGING APPARATUS

(For lifeboats)

Approval No. 160.033/36/0, Steward type B releasing gear, approved for maximum working load of 16,600 pounds per set (8,300 pounds per hook), identified by general arrangement Dwg. No. 2131-8, dated 24 September 1947, approved for use on all vessels except ocean and coastwise over 3000 gross tons where it may be used for replacement purposes only, submitted by Welin Davit and Boat Division of the Robinson Foundation, Inc., Perth Amboy, N. J.

(R. S. 4417a, 4426, 4488, 49 Stat. 1544, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended; 46 U. S. C. 367, 391a, 404, 481, 1333, 50 U. S. C. 1275; 46 CFR 37.1-7, 59.68, 76.62, 94.59) (12 F. R. 7814, November 19, 1947.)

LIFEBOATS

Approval No. 160.035/177/0, 31.0' x 11.25' x 4.5' steel motor-propelled lifeboat with radio cabin, 74-person capacity, identified by general arrangement Dwg. No. 2891, dated 7 March 1947, manufactured by the Welin Davit and Boat Division of the Robinson Foundation, Inc., Perth Amboy, N. J.

Approval No. 160.035/178/0, 16.0' x 5.5' x 2.37' steel oar-propelled lifeboat, 12-person capacity, for service on vessels other than ocean and coastwise vessels, identified by construction and arrangement Dwg. No. 16-1, dated 21 January 1947, and revised 6 October 1947, manufactured by Marine Safety Equipment Corp., Point Pleasant, N. J.

Approval No. 160.035/175/0, 12' x 4.5' x 1.85' steel, oar-propelled lifeboat, Type OMS, for service on vessels other than ocean and coastwise vessels, 6-person capacity, identified by construction and arrangement Dwg. No. OMS 1A dated October 1947, manufactured by Tregoning Industries, Inc., Seattle, Wash. (12 F. R. 7269, November 6, 1947.)

(R. S. 4417a, 4426, 4481, 4488, 4492, 35 Stat. 428, 49 Stat. 1544, 54 Stat. 346, and sec. 5 (e), 55 Stat. 244, as amended (46 U. S. C. 367, 391a, 396, 404, 474, 481, 490, 1333, 50 U. S. C. 1275; 46 CFR 37.1-1, 59.13, 76.16, 94.15, 113.10) (12 F. R. 7814 November 19, 1947.)

J. F. FARLEY,
Admiral, U. S. Coast Guard,
Commandant.

[1] Incl: Sketches of Bulkhead and Deck Constructions.
List of Approved Deck Coverings.
List of Approved Structural Insulations.
List of Approved Bulkhead Panels.
List of Approved Incombustible Materials.

NOTE.—The sketches and list of materials approved referred to in paragraphs 2 and 4 of this circular are not reproduced due to limitation of space, however, copies of this circular may be obtained from the Commandant (HA), Coast Guard Headquarters, Washington 25, D. C., or from any Coast Guard District Commander.

Certification of Articles of Ship's Stores and Supplies

Articles of ship's stores and supplies certificated from October 25, 1947, to November 25, 1947, inclusive, for use on board vessels in accordance with the provisions of Part 147 of the regulations governing "Explosives or Other Dangerous Articles on Board Vessels:"

G. N. Coughlan Co., West Orange, N. J., Powder Chimney Sweep Soot Destroyer, Certification No. 236, November 5, 1947.

INDEX FOR "PROCEEDINGS OF THE MERCHANT MARINE COUNCIL"

Volume IV, January Through December 1947

Coast Guard District Commanders and Merchant Marine Activities

District	Title	City	State	Address
1st	Commander, 1st Coast Guard District	Boston	Massachusetts	1400 Customhouse.
	Marine Inspection Officer	do	do	1300 Customhouse.
	Officer in Charge, Marine Inspection	do	do	447 Commercial St.
	do	Portland	Maine	76 Pearl St.
	do	Providence	Rhode Island	409 Federal Bldg.
2d	Commander, 2d Coast Guard District	St. Louis	Missouri	232 Old Customhouse.
	Marine Inspection Officer	do	do	210 Old Customhouse.
	Officer in Charge, Marine Inspection	do	do	216 Old Customhouse.
	do	Cairo	Illinois	425–427 New Post Office Bldg.
	do	Dubuque	Iowa	301 Post Office and Courthouse.
	do	Cincinnati	Ohio	748 Federal Bldg.
	do	Louisville	Kentucky	Kentucky Home Life Bldg.
	do	Memphis	Tennessee	322 Customhouse.
	do	Nashville	do	1018 Stahlman Bldg.
	do	Pittsburgh	Pennsylvania	1215 Park Bldg.
	do	Point Pleasant	West Virginia	Post Office Bldg.
3d	Commander, 3d Coast Guard District	New York	New York	42 Broadway.
	Marine Inspection Officer	do	do	Do.
	Officer in Charge, Marine Inspection	do	do	Do.
	do	New London	Connecticut	302 New Post Office Bldg.
	do	New Haven	do	311 Federal Bldg.
	do	Albany	New York	313 Federal Bldg.
	do	Philadelphia	Pennsylvania	801 Customhouse, 2d and Chestnut Sts.
5th	Commander, 5th Coast Guard District	Norfolk	Virginia	Box 540, New Post Office Bldg.
	Marine Inspection Officer	do	do	Do.
	Officer in Charge, Marine Inspection	do	do	204 Customhouse.
	do	Baltimore	Maryland	209 Chamber of Commerce Bldg.
7th	Commander, 7th Coast Guard District	Miami	Florida	935 DuPont Bldg.
	Marine Inspection Officer	do	do	500 Professional Bldg.
	Officer in Charge, Marine Inspection	do	do	501 Professional Bldg.
	do	Tampa	do	406 Federal Bldg.
	do	Charleston	South Carolina	32 Customhouse.
	do	Savannah	Georgia	205 Customhouse.
	do	Jacksonville	Florida	210 Federal Bldg.
8th	Commander, 8th Coast Guard District	New Orleans	Louisiana	382½ Customhouse.
	Marine Inspection Officer	do	do	313 Customhouse.
	Officer in Charge, Marine Inspection	do	do	311 Customhouse.
	do	Mobile	Alabama	565 Courthouse and Customhouse.
	do	Port Arthur	Texas	410 Bleustein Bldg.
	do	Galveston	do	232 Customhouse.
	do	Houston	do	310 Appraisers Store Bldg.
9th	Commander, 9th Coast Guard District	Cleveland	Ohio	1700 Keith Bldg.
	Marine Inspection Officer	do	do	Do.
	Officer in Charge, Marine Inspection	do	do	1134 Keith Bldg.
	do	Buffalo	New York	440 Federal Bldg.
	do	Oswego	do	205 Federal Bldg.
	do	Detroit	Michigan	430 Federal Bldg.
	do	Duluth	Minnesota	311 Federal Bldg.
	do	Toledo	Ohio	402 Courthouse and Customhouse.
	do	Saint Ignace	Michigan	Municipal Bldg.
	do	Chicago	Illinois	Customhouse, 610 Canal St.
	do	Ludington	Michigan	National Bank of Ludington.
	do	Milwaukee	Wisconsin	533 Federal Bldg.
10th	Commander, 10th Coast Guard District	San Juan	Puerto Rico	La Marina.
	Marine Inspection Officer	do	do	Federal Bldg.
	Officer in Charge, Marine Inspection	do	do	Do.
11th	Commander, 11th Coast Guard District	Long Beach	California	707 Times Bldg.
	Marine Inspection Officer	do	do	1119 Times Bldg.
	Officer in Charge, Marine Inspection	do	do	Do.
12th	Commander, 12th Coast Guard District	San Francisco	California	941–K U. S. Appraisers Bldg.
	Marine Inspection Officer	do	do	907 U. S. Appraisers Bldg.
	Officer in Charge, Marine Inspection	do	do	227 U. S. Appraisers Bldg.
13th	Commander, 13th Coast Guard District	Seattle	Washington	New World Life Bldg.
	Marine Inspection Officer	do	do	Do.
	Officer in Charge, Marine Inspection	do	do	Do.
	do	Portland	Oregon	1005 Failing Bldg.
	do	Ketchikan	Alaska	Federal Bldg.
14th	Commander, 14th Coast Guard District	Honolulu	Territory of Hawaii	210 Federal Bldg.
	Marine Inspection Officer	do	do	Do.
	Officer in Charge, Marine Inspection	do	do	Do.

Merchant Marine Personnel Statistics

MERCHANT MARINE LICENSES ISSUED DURING OCTOBER 1947

DECK OFFICERS

Region	Master										Chief mate										Second mate									
	Ocean		Coastwise		Great Lakes		B. S. & L.		Rivers		Ocean		Coastwise		Great Lakes		B. S. & L.		Rivers		Ocean		Coastwise		Great Lakes		B. S. & L.		Rivers	
	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R
Atlantic coast	39	57	----	8	----	----	3	40	----	1	23	12	----	----	----	----	----	2	----	----	30	10	----	----	----	----	----	----	----	----
Gulf coast	13	10	----	4	----	1	1	6	1	3	7	1	----	----	----	----	----	----	----	3	11	4	----	----	----	----	----	----	----	----
Great Lakes and rivers	----	----	----	----	----	4	----	1	2	9	----	----	----	----	----	----	----	----	3	9	----	1	----	----	----	----	----	----	----	----
Pacific coast	15	31	2	2	----	----	2	11	----	----	8	1	----	----	----	----	2	4	----	----	8	3	----	----	----	----	----	----	----	----
Total	67	98	2	14	----	5	6	58	3	13	38	14	----	----	----	----	2	6	3	12	49	18	----	----	----	----	----	----	----	----

Region	Third mate										Pilots						Master mate				Total		
	Ocean		Coastwise		Great Lakes		B. S. & L.		Rivers		Great Lakes		B. S. & L.		Rivers		Uninspected vessels, high seas				Original	Renewal	Grand total
	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R			
Atlantic coast	9	9	----	----	----	----	----	----	----	----	1	----	32	101	1	----	2	----	----	----	140	240	380
Gulf coast	3	3	----	----	----	----	----	----	----	----	----	1	8	20	6	5	----	----	----	----	50	61	111
Great Lakes and rivers	----	----	----	----	----	----	----	----	----	----	----	7	----	1	6	17	----	----	----	----	11	49	60
Pacific coast	5	6	----	----	----	----	----	----	----	----	----	----	13	36	----	----	3	----	5	----	63	94	157
Total	17	18	----	----	----	----	----	----	----	----	1	8	53	158	13	22	5	----	5	----	264	444	708

ENGINEER OFFICERS

Region	Chief engineer, steam				First assistant engineer, steam				Second assistant engineer, steam				Third assistant engineer, steam				Uninspected vessels			
	Unlimited		Limited		Unlimited		Limited		Unlimited		Limited		Unlimited		Limited		Chief engineer		Assistant engineer	
	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R
Atlantic coast	14	86	8	50	16	16	1	3	11	32	1	1	5	13	3	----	----	----	----	----
Gulf coast	3	30	2	5	3	3	2	----	3	7	----	----	4	2	----	----	----	----	----	----
Great Lakes and rivers	----	3	1	19	----	----	----	4	----	----	----	1	----	----	----	----	----	----	----	----
Pacific coast	5	40	6	4	4	3	1	1	9	10	----	----	2	4	1	----	----	----	----	----
Total	22	159	17	78	23	22	4	8	23	49	1	2	11	19	4	----	----	----	----	----

Region	Chief engineer, motor				First assistant engineer, motor				Second assistant engineer, motor				Third assistant engineer, motor				Totals		
	Unlimited		Limited		Unlimited		Limited		Unlimited		Limited		Unlimited		Limited		Original	Renewal	Grand total
	O	R	O	R	O	R	O	R	O	R	O	R	O	R	O	R			
Atlantic coast	4	19	6	24	----	4	1	----	----	4	----	----	2	11	----	----	72	263	335
Gulf coast	----	7	2	6	----	2	1	----	----	1	----	----	----	----	----	----	20	63	83
Great Lakes and rivers	1	3	3	6	----	----	1	1	----	----	----	----	----	----	----	----	6	37	42
Pacific coast	2	20	3	8	1	----	1	----	2	1	----	----	3	1	1	----	41	92	133
Total	7	49	14	44	1	6	4	1	2	6	----	----	5	12	1	----	139	455	594

ORIGINAL SEAMEN'S DOCUMENTS ISSUED MONTH OF OCTOBER 1947

REGION	(1) Staff officer	(2) Continuous discharge book	(3) U. S. Merchant mariner's documents	(4) AB any waters unlimited	(5) AB any waters 12 months	(6) AB Great Lakes 18 months	(7) AB tugs and towboats any waters	(8) AB* bays and sounds	(9) AB seagoing barges	(10) Lifeboatman	(11) Q. M. E. D.	(12) Radio operators	(13) Certificate of service	(14) Tankerman
Atlantic coast	100	0	1,851	141	189	4	0	0	0	436	277	32	1,427	9
Gulf coast	18	30	879	36	94	6	0	0	0	131	134	9	805	15
Pacific coast	33	0	586	33	80	2	0	0	0	257	130	6	486	3
Great Lakes and rivers	3	3	809	21	57	24	0	0	0	80	95	0	759	18
Total	154	33	4,125	231	420	36	0	0	0	904	636	47	3,477	45

*12 months, vessels 500 gross tons or under not carrying passengers.

NOTE.—Columns 4 through 14 indicate endorsements made on U. S. Merchant Mariner's documents.

WAIVERS OF MANNING REQUIREMENTS FROM OCTOBER 1 TO OCTOBER 31, 1947

Authority for These Waivers Contained in Navigation and Vessel Inspection Circular No. 8–47, Dated August 21, 1947

REGION	Number of vessels	Deck officers substituted for higher ratings	Engineer officers substituted for higher ratings	Able seamen substituted for deck officers	Ordinary seamen substituted for able seamen	Qualified members of engine department substituted for engineer officers	Wipers or coal passers substituted for qualified members of engine department	Wipers, coal passers or cadets substituted for engineer officers	Ordinary seamen or cadets substituted for deck officers	Total
Atlantic coast	409	13	26		687	3	203	1		933
Gulf coast	206	2	16		360	3	95			476
Pacific coast	112	3	14	2	101	1	66	4	3	194
Great Lakes	164	4	10		161	2	191			368
Total	891	22	66	2	1,309	9	555	5	3	1,971

CREW SHORTAGE REPORTS FROM OCTOBER 1 TO OCTOBER 31, 1947

These Reports Submitted in Accordance With Navigation and Vessel Inspection Circular No. 8–47, Dated August 21, 1947

REGION	Number of vessels	Ratings in which shortages occurred												Total
		Chief mate	Second mate	Third mate	Radio	Able seamen	Ordinary seamen	Chief engineer	First engineer	Second engineer	Third engineer	Qualified member engine department	Wiper or coal passer	
Atlantic coast	22	1		1	2	9	6			1	1	16	4	41
Gulf coast	8		1	1		1	4				1	2		10
Pacific coast	5		1							1		3	1	6
Great Lakes	174	5	3	27		76	18		7	11	38	68	18	271
Total	209	6	5	29	2	86	28		7	13	40	89	23	328

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