BOARD OF TRADE INSTRUCTIONS AS TO THE

SURVEY

OF LIFE SAVING APPLIANCES

LONDON: HIS MAJESTY'S STATIONERY OFFICE 1936

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BOARD OF TRADE

INSTRUCTIONS AS TO THE

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1936

(Reprinted 1951)

INTRODUCTION

In this edition of the "Instructions as to the Survey of Life Saving Appliances" the Merchant Shipping (Life Saving Appliances) Rules, 1932, which, in pursuance of the provisions of the Acts under which they are made, have the force of law, are printed first and are followed by the Instructions. The relevant sections of the Merchant Shipping Acts are reproduced in Appendix A.

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Merchant Shipping (Life-Saving Appliances) Rules, 1932

The Merchant Shipping (Life-Saving Appliances) Rules, 1932, dated December 9, 1932, made by the Board of Trade under Section 427 of the Merchant Shipping Act, 1894 (57 & 58 Vict. c. 60), and sections 4 & 5 of the Merchant Shipping (Safety and Load Line Conventions) Act, 1932 (22 & 23 Geo. 5. c. 9).

In pursuance of the provisions of Section 427 of the Merchant Shipping Act, 1894 (57 & 58 Vict. e. 60) Sections 4 and 5 of the Merchant Shipping (Safety and Load-Line Conventions) Act, 1832 (22 & 23 Geo. 5. c. 9), and of all other powers enabling them in that behalf, the Board of Trade hereby make the following Rules:—

Interpretation and Repeal.

- 1.—(1) These Rules may be cited as the Merchant Shipping (Life-Saving Appliances) Rules, 1932, and shall come into operation on the first day of January, 1933.
 - (2) In these Rules, unless the context otherwise requires:—
 - "Person" means a person over the age of one year.
 "Daylight" shall be reckoned as extending from one
 - Daylight "shall be reckoned as extending from one hour before sunrise to one hour after sunset.
 - "Approved" means approved by the Board of Trada.

 "Length" as applied to a ship means registered length.
- (3) The Interpretation Act, 1889 (53 & 53 Vict. e. 63) shall apply to the interpretation of these Rules in like manner as it applies to the interpretation of an Act of Parliament.
- (4) The Merchant Shipping (Life Saving Appliances) Rules, 1924, the Rules dated 18th January, 1925, † and the Merchant Shipping (Life Saving Appliances) Rules, 1929, ‡ are hereby revoked.

Classification of Ships.

2. For the purposes of these Rules ships shall be arranged in the following classes, under the headings "Passenger Ships" and "Non-passenger Ships"

Passenger Ships.

Class L

Steamships carrying more than 12 passengers on international voyages other than ships of Class II (hereinafter referred to as ships of Class I).

^{*} S.R. & O. 1924 (No. 1289) p. 662, † S.R. & O. 1925 (No. 321) p. 1087. ‡ S.R. & O. 1929 (No. 315) p. 902.

Class II.

Steamships carrying more than 12 passengers on short international voyages (hereinafter referred to as ships of Class II).

Class III.

Home Trade steamships carrying more than 12 passengers on passages or voyages other than international voyages (hereinafter referred to as ships of Class III).

Class IV.

Steamships carrying passengers in pursuance of a passenger certificate entitled "Passenger Certificate for a Home Trade passenger vessel plying on short excursions to sea, i.e., beyond partially smooth water limits, between 1st April and 31st October inclusive, during daylight, and in fine weather" (hereinafter referred to as ships of Class IV).

Clam V.

Steamships carrying passengers in pursuance of a passenger certificate entitled "Passenger Certificate for a vessel plying in partially smooth water" (hereinafter referred to as ships of Class V).

Class VI.

Steamships carrying passengers in pursuance of a passenger certificate entitled "Passenger Certificate for a vessel plying in smooth water in estuaries and lakes" (hereinafter referred to as ships of Class VI).

Class VII.

Steamships carrying passengers in pursuance of a passenger certificate entitled "Passenger Certificate for a vessel plying in smooth water on rivers and canals" (hereinafter referred to as ships of Class VII).

Class VIII.

Steam launches and motor boats carrying passengers in pursuance of a passenger certificate entitled "Passenger Certificate for a vessel plying for short distances to sea" (hereinafter referred to as ships of Class VIII.

Class IX.

Foreign going sailing ships carrying more than twelve passengers (hereinafter referred to as ships of Class IX).

Class X.

Home Trade sailing ships carrying passengers (hereinafter referred to as ships of Class X).

Non-Passenger Ships.

Class XI.

Foreign going steamships not certified to carry passengers (hereinafter referred to as ships of Class XI).

Class XII.

Home Trade steamships not certified to earry passengers (hereinafter referred to as ships of Class XII).

Class XIII.

Steam fish carriers, tugs, lighters, dredgers, barges, hoppers and hulks, which proceed to sea (hereinafter referred to as ships of Class XIII).

Class XIV.

Steam fish carriers, tugs, lighters, dredgers, barges, hoppers and hulks, which do not proceed to sea (hereinafter referred to as ships of Class XIV).

Class XV.

Foreign going sailing ships not carrying more than twelve passengers (hereinafter referred to as ships of Class XV).

Class XVI.

Home Trade sailing ships not carrying passengers (hereinafter referred to as ships of Class XVI).

PROVISION OF LIFE-SAVING APPLIANCES.

Availability and adequacy of Lifeboats and Buoyant Apparatus.

- 3.—(1) The lifeboats and buoyant apparatus in a ship shall be readily available in case of emergency and shall be adequate.
- (2) To ensure that they are readily available, the lifeboats and buoyant apparatus shall comply with the following conditions:—
 - (a) They must be capable of being put into the water safely and rapidly even under unfavourable conditions of list and trim.
 - (b) It must be possible to embark the passengers in the boats rapidly and in good order.
 - (c) The arrangement of each boat and article of buoyant apparatus must be such that it will not interfere with the operation of other boats and buoyant apparatus.
- (3) To ensure that they are adequate, the provision of lifeboats and buoyant apparatus shall be in accordance with the requirements of such of the following rules 4 to 19 as is applicable.

Ships of Class I.

Steamships carrying more than 12 passengers on international voyages other than ships of Class II.

4—(1) This rule applies to ships of Class I.

(2) Every ship to which this rule applies shall, subject to the provisions of rule 44, be provided, in accordance with its length, with the number of sets of davits specified in column A of the table set out in the first schedule to these rules.

Provided that no ship shall be required to have a number of sets of davits greater than the number of lifeboats required to accommodate the total number of persons which the ship carries or is certified to carry, whichever number is the greater.

- (3)—(a) A lifeboat of Class 1 shall be attached to each set of davits.
- (b) Any additional lifeboats necessary to make up the total lifeboat accommodation required by paragraph (4) of this rule shall be lifeboats of Class 1 or Class 2.
- (4)—(a) Where the lifeboats carried in pursuance of paragraph (3) (a) of this rule do not furnish sufficient accommodation for the total number of persons which the ship carries or is certified to carry, whichever number is the greater, provision shall be made to the satisfaction of the Board of Trade to carry such additional lifeboats as are required to make up the deficiency in such accommodation.
- (b) Subject to the provisions of rule 36 such additional lifeboats shall be distributed as follows:—
 - (i) One additional lifeboat shall be stowed under each set of davits:
 - (ii) The remaining boats shall be carried inboard.
- (c) Notwithstanding the requirements of sub-paragraph (a) of this paragraph, the Board of Trade may, if they are of opinion that life-rafts will be more readily available and otherwise more satisfactory in a case of emergency than the additional lifeboats mentioned in sub-paragraph (b) (ii) of this paragraph, allow life-rafts to be carried in lieu of any such lifeboats with sufficient accommodation for those persons for whom accommodation is not provided in lifeboats, provided that in any case the total capacity of the lifeboats on the ship shall be at least equal to the minimum cubic capacity specified in column C of the table set out in the first schedule to these rules.
- (5) Where there is in force, in respect of any ship to which this rule applies, a memorandum under Section 12 of the Merchant Shipping (Safety and Load Line Conventions) Act,

1932 (which relates to the modification of safety certificates as respects life eaving appliances), the number of persons stated in the memorandum shall, for the purposes of this rule, be treated as the number of persons which the ship is certified to carry.

- (6) Where the number of lifeboats carried in pursuance of this rule is more than 13, one of such lifeboats shall be a motor boat fitted with an approved wireless telegraphy installation and searchlight, and where the number is more than 19 two of such lifeboats shall be motor boats so fitted.
- (7) Any of the other lifeboats, except such as the Board of Trade may require to be carried as emergency boats, may be motor boats, but these additional motor boats need not be fitted with wireless telegraphy installations or searchlights.
- (8) Every ship to which this rule applies shall, in addition to the lifeboats and life-rafts carried in pursuance of this rule, carry approved buoyant apparatus sufficient to support 25 per cent. of the total number of persons which the ship carries or is certified to carry, whichever number is the greater.
- (9) Every ship to which this rule applies shall carry at least the number of lifebuoys determined in accordance with the following table:—

| Minimum number | Length of Ship. | of lifebuoys. | Under 200 feet | 8 | Not under 200 feet but under 400 feet ... | 12 | Not under 400 feet but under 600 feet ... | 18 | Not under 600 feet but under 800 feet ... | 24 | 800 feet and over | 30 |

- (10) Every ship to which this rule applies shall carry one approved life-jacket for each person on board.
- (11) Every ship to which this rule applies shall carry an approved type of line-throwing appliance.

Ships of Class II.

Steemskips carrying more than 12 passengers on short international voyages.

- 5.—(1) This rule applies to ships of Class II.
- (2) Every whip to which this rule applies shall, subject to the provisions of rule 44, be provided, in accordance with its length, with the number of sets of davits specified in column A of the table set out in the first schedule to these rules.

Provided that no ship shall be required to have a number of sets of davits greater than the number of lifeboats required to accommodate the total number of persons which the ship carries or is certified to carry, whichever number is the greater.

- (3) (a) A lifeboat of Class I shall be attached to each set of davits.
- (b) Where the lifeboats carried in pursuance of sub-paragraph (a) of this rule do not provide the minimum cubic capacity specified in column D of the table set out in the first schedule to these rules or provide sufficient accommodation for the total number of persons which the ship carries, additional lifeboats of Class 1 or Class 2 shall be provided up to the minimum capacity specified in column D, after which additional lifeboats or approved life-rafts or approved buoyant apparatus shall be provided to the satisfaction of the Board of Trade so that the accommodation provided shall be sufficient for the total number of persons which the ship carries.
- (4) Where there is in force, in respect of any ship to which this rule applies, a memorandum under Section 12 of the Merchant Shipping (Safety and Load Line Conventions) Act, 1932 (which relates to the modification of safety certificates as respects life saving appliances), the number of persons stated in the memorandum shall, for the purposes of this rule, be treated as the number of persons which the ship is certified to carry.
- (5) Subject to the provisions of rule 44 where the number of lifeboats carried in pursuance of this rule is more than 13, one of such lifeboats shall be a motor boat fitted with an approved wireless telegraphy installation and searchlight, and where the number is more than 19 two of such lifeboats shall be motor boats so fitted.
- (6) Any of the other lifeboats, except such as the Board of Trade may require to be carried as emergency boats, may be motor boats, but these additional motor boats need not be fitted with wireless telegraphy installations or searchlights.
- (7) Every ship to which this rule applies shall carry approved buoyant apparatus sufficient to support 10 per cent. of the total number of persons which the ship carries or is certified to carry, whichever number is the greater, in addition to any buoyant apparatus carried in pursuance of paragraph (3) (b) of this rule.

(6) Every ship to which this rule applies shall carry at least the number of lifebuoys determined in accordance with the following table:—

Length of Ship.	Linimum number of lifebuoys			
Under 900 feet	***	8		
Not under 200 feet but under 400 feet	•••	12		
Not under 400 feet but under 600 feet	•••	18		
Not under 600 feet but under 800 feet	•••	24		
800 feet and over	•••	30		

- (9) Every ship to which this rule applies shall carry one approved life-jacket for each person on board.
- (10) Every ship to which this rule applies shall carry an approved type of line-throwing appliance.

Ships of Class III.

Home Trade steamships carrying more than 12 passengers on passages or voyages other than international voyages.

- 6.—(1) This rule applies to ships of Class III.
- (2) Every ship to which this rule applies shall comply with the provisions of rule 5 save that
- (a) any such ship when engaged on any approved voyage near the coasts of the United Kingdom, or on any approved daylight excursion between the 1st May and the 15th September inclusive, shall not be required to earry more sets of davits, or lifeboats of a greater aggregate cubic capacity, than are respectively specified in the second columns of tables A and B set out in the second schedule to these rules, and
- (b) an approved type of line-throwing appliance shall not be required on any ship of less than 500 tons gross tonnage.

Ships of Class IV.

Steamships carrying passengers in pursuance of a passenger certificate entitled "Passenger Certificate for a Home Trade passenger vessel plying on short excursions to sea, i.e., beyond partially smooth water limits, between 1st April and 31st October inclusive, during daylight and in fine weather."

- 7.—(1) This rule applies to ships of Class IV.
- (2) Every ship to which this rule applies shall, subject to the provisions of rule 44, be provided, in accordance with its length, with the number of sets of davits specified in the table set out in the third schedule to these rules.

Provided that no ship shall be required to have a number of sets of davits greater than the number of boats required to accommodate the total number of persons which the ship carries or is certified to carry, whichever number is the greater.

- (3) A lifeboat of Class 1 shall be attached to each set of dayits.
- (4) Such additional lifeboats of Class 1 or Class 2, or such number of approved buoyant apparatus, shall be provided, as shall be sufficient together with the lifeboats required by paragraph (3) of this rule to accommodate 70 per cent. of the total number of persons which the ship is certified to carry.
- (5) The lifeboats carried shall be of such capacity, having regard to the size of the ship, as the Board of Trade may require.
- (6) If a ship to which this rule applies is under 200 feet in length, at least four approved lifebuoys shall be carried, and if 200 feet or over in length, at least eight approved lifebuoys shall be carried.
- (7) Every ship to which this rule applies shall carry one approved life-jacket for each person on board.
- (8) Every ship to which this rule applies of 500 tonsgross tonnage and over shall carry an approved type of line-throwing appliance.

Ships of Class V.

Steamships carrying passengers in pursuance of a passenger certificate entitled "Passenger Certificate for a vessel plying in partially smooth water."

- 8.—(1) This rule applies to ships of Class V.
- (2) Every ship to which this rule applies shall, subject to the provisions of rule 44, be provided, in accordance with its length, with the number of sets of davits specified in the table set out in the third schedule to these rules.

Provided that no ship shall be required to have a number of sets of davits greater than the number of boats required to accommodate the total number of persons which the ship carries or is certified to carry, whichever number is the greater.

- (3) A lifeboat of Class 1 shall be attached to each set of davits.
- (4) Such additional lifeboats of Class 1, or Class 2, or such number of approved buoyant apparatus, shall be provided. as shall be sufficient together with the lifeboats required

under paragraph (3) of this rule to accommodate 60 per cent. of the total number of persons which the ship is certified to carry.

- (5) The lifeboats carried shall be of such capacity, having regard to the size of the ship, as the Board of Trade may require.
- (6) If a ship to which this rule applies is under 200 feet in length, at least four approved lifebuoys shall be carried, and if 200 feet or over in length, at least eight approved lifebuoys shall be carried.
- (7) Every ship to which this rule applies shall carry one approved life-jacket for each person on board.
- (8) Every ship to which this rule applies of .500 tons gross tonnage and upwards shall carry an approved type of line-throwing appliance.
- (9) The Board of Trade may in their discretion relieve a ship to which this rule applies wholly or partially from the provisions of this rule.

Ships of Class VI.

Steamships carrying passengers in pursuance of a passenger certificate entitled "Passenger Certificate for a vessel plying in smooth water in estuaries and lakes."

- 9.—(1) This rule applies to ships of Class VI.
- (2) Every ship to which this rule applies shall carry such lifeboats of Class 1, boats of Class 3, or approved buoyant apparatus, as shall be sufficient, together with the lifeboats or boats required to be carried in pursuance of paragraph (3) of this rule where that paragraph applies, to accommodate 40 per cent. of the total number of persons which the ship is certified to carry.
 - (3) Every ship to which this rule applies of 70 feet and upwards in length and under 150 feet in length shall carry at least one lifeboat of Class 1 or a boat of Class 3, and if 150 feet or over in length, at least two such lifeboats or boats. The lifeboats or boats shall be attached to davits.
 - (4) If a ship to which this rule applies is under 150 feet in length, at least four approved lifebuoys shall be carried, and if 150 feet or upwards in length, at least six approved lifebuoys shall be carried.
 - (5) Every ship to which this rule applies shall carry one approved life-jacket for each person on board.
 - (6) The Board of Trade may in their discretion relieve a ship to which this rule applies wholly or partially from the provisions of this rule.

Ships of Class VII.

Steamships carrying passengers in pursuance of a passenger certificate entitled "Passenger Certificate for a vessel plying in smooth water on rivers and canals."

- 10.—(1) This rule applies to ships of Class VII.
- (2) Every ship to which this rule applies shall carry such lifeboats of Class 1, beats of Class 3, or approved buoyant apparatus, as shall be sufficient, together with the lifeboat or boat required to be carried in pursuance of paragraph (3) of this rule where that paragraph applies, to accommodate 40 per cent. of the total number of persons which the ship is certified to carry.
- (3) Every ship to which this rule applies of 70 feet and upwards in length shall carry a lifeboat of Class 1 or a boat of Class 3 in such a position that it can readily be put into the water.
- (4) Every ship to which this rule applies shall carry at least four approved lifebuoys.
- (5) Every ship to which this rule applies shall carry one approved life-jacket for each person on board.
- (6) The Board of Trade may in their discretion relieve a ship to which this rule applies wholly or partially from the provisions of this rule.

Ships of Class VIII.

Steam launches and motor boats carrying passengers in pursuance of a passenger certificate entitled "Passenger Certificate for a vessel plying for short distances to sea."

- 11.—(1) This rule shall apply to ships of Class VIII.
- (2) Ships of this class of 70 feet and upwards in length shall comply with the provisions of rule 9.
- (3) Every ship to which this rule applies of less than 70 feet in length plying not more than three miles from its starting point in any direction shall be provided with approved buoyant apparatus sufficient to support at least 40 per cent. of the total number of persons which the ship is certified to carry, together with approved lifebuoys not less in number than is specified in paragraph (5) of this rule, so however that the buoyant apparatus, together with the lifebuoys, shall in all cases be sufficient to support at least 70 per cent. of the total number of persons which the ship is certified to carry.
- (4) A ship to which this rule applies of less than 70 feet in length plying more than three miles from its starting point shall be provided with approved buoyant apparatus sufficient to support at least 60 per cent. of the total number

of persons which the ship is certified to carry, together with approved lifebuoys not less in number than is specified in paragraph (5) of this rule, so however that the buoyant apparatus, together with the lifebuoys, shall in all cases be sufficient to support the total number of persons which the ship is certified to carry.

(5) The minimum number of approved lifebuoys to be provided shall be determined by the following table:—

Length of ship.

Minimum number of lifebuoys.

Ships not exceeding 30 feet in length 2
Ships exceeding 30 feet and not exceeding 35 feet 4
Ships exceeding 35 feet and not exceeding 40 feet 6
Ships exceeding 40 feet and not exceeding 50 feet 8
Ships exceeding 50 feet and not exceeding 70 feet 10

- (6) For the purposes of this rule an approved lifebuoy shall be deemed sufficient to support two persons.
- (7) In the case of ships not exceeding 26 feet in length to which this rule applies the Board of Trade may allow approved lifebuoys to be carried in lieu of part or all of the Duoyant apparatus required to be carried in pursuance of paragraphs (3) and (4) of this rule.

Ships of Class IX.

Foreign-going sailing ships carrying more than twelve passengers.

- 12.-(1) This rule shall apply to ships of Class IX.
- (2) Every ship to which this rule applies shall carry one or more lifeboats of Class 1 of sufficient aggregate capacity to accommodate all persons on board.
- (3) All such lifeboats shall be attached to davits so far as in the opinion of the Board of Trade is practicable
- (4) Every ship to which this rule applies shall carry at least six approved lifebuoys, together with one approved life-jacket for each person on board.
- (5) Every ship to which this rule applies of 500 tons gross tonnage and upwards shall carry an approved type of line-throwing appliance.

Ships of Class X.

Home Trade sailing ships carrying passengers.

- 13.—(1) This rule shall apply to ships of Class X.
- (2) Every ship to which this rule applies shall carry one or more lifeboats of Class 1 of sufficient aggregate capacity to accommodate all persons on board.

(3) Such lifeboats shall be attached to davits so far as in the opinion of the Board of Trade is practicable.

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(4) Every ship to which this rule applies shall carry at least four approved lifebuoys, together with one approved

life-jacket for each person on board.

(5) Every ship to which this rule applies of 500 tons gross tonnage and upwards shall carry an approved type of line-throwing appliance.

Ships of Class XI.

Foreign-going steamships not certified to carry passengers

14.—(1) This rule shall apply to ships of Class XI.

- (2) Every ship to which this rule applies shall carry on each side of the ship lifeboats of Class 1 in such number and of such aggregate capacity as will accommodate all persons on board; provided that so long as not less than half the total capacity on each side of the ship is provided in lifeboats of Class 1, the Board of Trade may allow, (a) if the total number of such lifeboats required under this rule is three, a boat of Class 3 to be carried in lieu of one of them; (b) if the number of lifeboats of Class 1 exceeds three, one or two boats of Class 3 to be carried in lieu of the same number of such lifeboats; and (c) any number of boats of Class 3 in lieu of the same number of lifeboats of Class 1 in ships engaged in special trades where the circumstances are such as to justify this replacement.
 - (3) The lifeboats and boats shall be attached to davita.
- (4) Every ship to which this rule applies shall carry at least six approved lifebuoys, together with one approved life-jacket for each person on board.
- (5) Every ship to which this rule applies of 500 tons gross tonnage and upwards shall carry an approved type of line-throwing appliance.

Ships of Class XII.

Home Trade steamships not certified to carry passengers.

15.—(1) This rule shall apply to ships of Class XII.

(2) Every ship to which this rule applies of 100 feet or over in length shall carry on each side of the ship one or more boats of sufficient aggregate capacity to accommodate all persons on board. Such boats shall be attached to davits.

(3) One of the boats may be a boat of Class 3. The remaining boat or boats shall be lifeboats of Class 1.

(4) Every ship to which this rule applies of under 100 feet in length shall carry at least one lifeboat of Class 1, so stowed that it can be readily placed in the water on either side of the ship, and of sufficient capacity to accommodate all persons on board.

- (5) Every ship to which this rule applies if of 100 feet or over in length shall carry at least four approved lifebuoys and if under 100 feet at least two approved lifebuoys. One approved life-jacket shall be carried on every ship to which this rule applies for each person on board.
- (6) Every ship to which this rule applies of 500 tons gross tonnage and upwards shall carry an approved type of line-throwing appliance.

Ships of Class XIII.

Steam fish carriers, tugs, lighters, dredgers, barges, hoppers and hulks, which proceed to sea.

16.—(1) This rule shall apply to ships of Class XIII.

(2) Every ship to which this rule applies shall comply with the provisions of rule 15 provided that the Board of Trade may in their discretion relieve a ship which proceeds only for short distances to sea wholly or partially from the operation of those provisions.

Ships of Class XIV.

Steam fish carriers, tugs, lighters, dredgers, barges, hoppers and hulks, which do not proceed to sea.

17.—(1) This rule shall apply to ships of Class XIV.

(2) Every ship to which this rule applies shall carry a lifeboat of Class 1 or a boat of Class 3 sufficient to accommodate all persons on board, two approved lifebuoys, and one approved life-jacket for each person on board.

(3) The Board of Trade may in their discretion relieve a ship to which this rule applies wholly or partially from the

provisions of this rule.

Ships of Class XV.

Foreign-going sailing ships not carrying more than twelve passengers.

18.—(1) This rule shall apply to ships of Class XV.

- (2) Every ship to which this rule applies shall carry lifeboats of Class 1 in such number and of such aggregate capacity as shall be sufficient to accommodate all persons on board; if only one lifeboat is required under this rule, a boat of Class 3 shall be carried in addition and if the number of lifeboats required under this rule exceeds two, a boat of Class 3 may be carried in lieu of one of them.
- (3) At least two boats shall be attached to davits, one on each side of the ship.
- (4) Every ship to which this rule applies shall carry at least four approved lifebuoys, together with one approved life-jacket for each person on board.

(5) Every ship to which this rule applies of 500 tons gross tonnage and upwards shall carry an approved type of line-throwing appliance.

Ships of Class XVI.

Home Trade sailing ships not carrying passengers.

- 19.—(1) This rule shall apply to ships of Class XVI.
- (2) Every ship to which this rule applies shall carry one or more boats of sufficient aggregate capacity to accommodate all persons on board. The boats shall be stowed in such a manner that they can readily be placed in the water on either side of the ship.
- (3) At least one of the boats shall be a lifeboat of Class 1 except in the case of a ship of under 100 feet in length engaged solely in the coasting trade when the boat or boats may be of Class 3.
- (4) Every ship to which this rule applies if of 100 feet or over in length shall carry at least four approved lifebuoys, and if of under 100 feet in length at least two approved lifebuoys.
- (5) Every ship to which this rule applies shall carry one approved life-jacket for each person on board.
- (6) Every ship to which this rule applies of 500 tons gross tonnage and upwards shall carry an approved type of line-throwing appliance.

REQUIREMENTS FOR BOATS, LIFE-RAFTS, BUOYANT APPARATUS AND OTHER LIFE-SAVING APPLIANCES.

General Requirements for Boats.

- 20. For the purposes of these rules the standard types of boats are classified as follows:—
 - Class 1. Open boats with rigid sides fitted either (a) with internal buoyancy appliances only, or (b) with internal and external buoyancy appliances, in these rules referred to as lifeboats of Class 1;
 - Class 2.—(a) Open boats fitted with internal and external buoyancy appliances—upper parts of sides collapsible, and (b) decked boats with either fixed or collapsible watertight bulwarks, in these rules referred to as lifeboats of Class 2;
 - Class 3. Open boats constructed in accordance with the provisions of these rules relating to lifeboats of Class 1, but not fitted with the internal or external buoyancy appliances of lifeboats of that Class, in these rules referred to as boats of Class 3.

- 21.—(1) All boats shall be properly constructed, and shall be of such form and proportions that they shall have ample stability in a seaway, and sufficient freeboard when loaded with their full complement of persons and equipment. They shall be fitted and arranged to the satisfaction of the Board of Trade.
- (2) (a) The structural strength of all boats shall be to the satisfaction of the Board of Trade.
 - (b) In the case of boats carried on ships of Class I, Class II or Class III, the strength of such boats shall be sufficient to permit of their being safely lowered into the water when loaded with a full complement of persons and equipment, provided that this requirement shall not apply to any ship of Class II or Class III where the height of the boat deck above the water line at the vessel's lightest seagoing draught does not exceed 15 feet, or to any ship of Class III engaged on any approved voyage or excursion mentioned in paragraph 2 (a) of rule 6.
 - (3) In all open boats, all thwart and side seats shall be fitted as low in the boat as practicable, and bottom boards shall be fitted so that the thwarts shall not be more than 2 feet 9 inches above them.
 - (4) The cubic capacity of every boat must be at least 125 cubic feet.
 - (5) No boat shall be accepted, the buoyancy of which depends upon the previous adjustment of one of the principal parts of the hull.
 - (6) The weight of a boat when fully laden with persons and equipment shall not exceed 20 tons.
 - 22. All lifeboats of Class 1 shall comply with the provisions of Part I of the fourth schedule to these rules in addition to the provisions of rule 21.
 - 23. All lifeboats of Class 2 shall comply with the provisions of Part II of the fourth schedule to these rules in addition to the provisions of rule 21.
 - 24. All boats of Class 3 shall comply with the provisions of Part I of the fourth schedule to these rules (save in so far as those provisions relate to the volume of the internal or external buoyancy appliances for wooden boats) in addition to the provisions of rule 21.

General requirements for Motor boats.

25. Every motor boat carried as part of the statutory lifesaving appliances of a ship of Classes I or II, whether

or not in compliance with paragraph (6) of rule 4 or paragraph (5) of rule 5, shall comply with the following conditions:—

- (a) the boat shall comply with the requirements for a lifeboat of Class 1, subject to the provisions of rule 26 as to buoyancy;
- (b) proper appliances shall be provided for putting the boat into the water speedily;
- (c) the boat shall be adequately provided with fuel, and kept so as to be at all times ready for use;
- (d) the motor and its accessories shall be suitably enclosed to ensure operation under adverse weather conditions, and provision shall be made for going astern;
- (e) the speed shall be at least six knots when fully loaded in smooth water.
- 26. The volume of the internal buoyancy appliances of a motor boat and, where fitted, the external buoyancy appliances shall be at least equal to that of the buoyancy appliances which would be required under these rules if the boat were not a motor boat and shall be increased above that volume if and to the extent that such increase is necessary to compensate for the difference between (a) the weight of the motor and its accessories, and if fitted, the searchlight and the wireless telegraph installation and their accessories, and if fitted, the searchlight and the wireless telegraph installation and their accessories, and if fitted, the searchlight and the wireless telegraph installation and their accessories were removed.
- 27. In the case of boats which are deemed fit to carry 100 or more persons the volume of the buoyancy appliances shall be increased beyond the volume required by rule 26 to such extent as may be determined by the Board of Trade.

Carrying Capacity of Boats.

28.—(1) (a) Subject as hereinafter provided, the number of persons which a boat shall be deemed fit to carry shall be equal to the greatest whole number ascertained by dividing the capacity of the boat in cubic feet, determined in accordance with the provisions of Part I of the fifth schedule to these rules, or the surface of the boat in square feet determined in accordance with the provisions of Part II of the said fifth schedule, as the case may be, by the standard unit

of capacity or unit of surface, as the case may be, shown in the following table.

Type of Boat.								Standard Unit
<u> </u>	,	(- \			•			of Capacity. 10 cubic feet.
CTMRS	1	(4)		•••	•••	•••	***	
Class	1	(b)	2	•••	•••		•••	9 cubic feet.
Class	3	•••		•••	•••		•••	10 cubic feet.
								Standard Unit of Surface.
Class	2		•••	•••		•••		31 square feet.

- (b) The Board of Trade may, in the case of a decked lifeboat of Class 2, accept, in place of 3½ square feet, a smaller unit of surface not being less than 3 square feet, if they are satisfied after trial that the number of persons for which there is proper seating accommodation in the boat is greater than the number obtained by applying the standard unit.
- (2) The number of persons which a boat is deemed fit to carry shall not
 - (a) exceed the number of adult persons wearing lifejackets for which there is proper seating accommodation arranged in such a way that the persons when seated do not interfere in any way with the use of the oars; and
 - (b) in the case of lifeboats of Class 2 be such as to reduce the freeboard of the boat, when fully laden, below the minimum freeboard laid down for each type of boat in Part II of the fourth schedule to these rules.
- (3) If the Surveyor is doubtful as to the number of persons any boat is fit to carry, he may require it to be tested afloat fully laden with equipment and the intended number of persons all wearing lifejackets.
- (4) In the case of boats of a depth of more than 4 feet, boats with very fine ends and boats very full in form, the number of persons which the boat is deemed fit to carry may be determined by the Board of Trade otherwise than in accordance with the foregoing provisions of this rule.

General requirements for life-rafts.

- 29. An approved life-raft shall comply with the following conditions:—
 - (a) It shall be of approved material and construction;
 - (b) It shall be effective and stable when floating either way up;
 - (c) It shall be fitted with fixed or collapsible bulwarks of wood, canvas or other suitable material around both the top and bottom platforms;

- (d) It shall have a line securely becketed round the outside:
- (e) It shall be of such strength that it can be launched or thrown from the ship's deck without being damaged, and if intended to be thrown it shall be of such size and weight that it can easily be handled;
- (f) It shall have not less than three cubic feet of aircases or equivalent buoyancy appliances for each person to be carried thereon;
- (g) It shall have a deck area of not less than four square feet for each person to be carried thereon; and it shall effectively support the occupants out of the water:
- (h) The air-cases or equivalent buoyancy appliances shall be placed as near as possible to the sides of the life-raft, and such buoyancy appliances shall not be dependent on inflation by air.

General requirements for Buoyant Apparatus.

- 30.—(1) Approved buoyant apparatus, whether buoyant deck seats, buoyant deck chairs or other buoyant apparatus, shall be deemed sufficient, so far as buoyancy is concerned, for the number of persons equal to the greatest whole number ascertained by dividing the number of pounds of iron which the apparatus is capable of supporting in fresh water by 32, and the apparatus shall be deemed fit to support the number so ascertained or a number equal to the number of feet in the perimeter of the apparatus whichever number is the smaller.
- (2) All approved buoyant apparatus shall comply with the following conditions:—
 - (a) It shall be of approved material and construction;
 - (b) It shall be effective and stable when floating either way up;
 - (c) It shall be of such size, strength and weight that it can be handled without mechanical appliances and, if necessary, thrown without damage from the ship's deck on which it is stowed;
 - (d) If it depends for its buoyancy on air it shall not be so constructed as to require inflation before use in an emergency;
 - (e) The air-cases or equivalent buoyancy appliances shall be placed as near as possible to the sides of the apparatus;
 - (f) It shall have a line securely becketed round the outside of the apparatus.

Marking of boats, life-rafts and buoyant apparatus.

- 31.—(1) All boats shall be permanently marked to the satisfaction of the Board of Trade in such a way as to indicate plainly their dimensions and the number of persons which they are deemed fit to carry.
- (2) All life-rafts shall be marked in the same manner with the number of persons which they may carry.
- (3) All buoyant apparatus shall be marked in the same manner with an indication that they are buoyant and with the number of persons which they are deemed fit to support.

Equipment of Boats.

- 32.—(1) Subject as hereinafter provided, every boat carried on any ship shall be equipped as follows:—
 - (a) With the full single banked complement of oars and two spare oars, and a steering oar;
 - (b) With two plugs for each plug hole, attached with lanyards or chains, and one set and a half of thole pins or crutches, attached to the boat by lanyards. Plugs shall not be required where proper automatic valves are fitted.
 - (c) With a sea anchor, a baler, a galvanised iron bucket, a rudder and a tiller, or yoke and yoke lines, a painter of sufficient length, and a boat-hook. The rudder, the baler, and the bucket shall be attached to the boat by sufficiently long lanyards, and kept ready for use;
 - (d) With a vessel capable of holding one quart for each person that the boat is deemed fit to carry. This vessel shall be kept filled with fresh water, and provided with a dipper with lanyard;
 - (e) With two hatchets, one to be kept in each end of the boat, and to be attached to the boat by a lanyard;
 - (f) With a line securely becketed round the outside of the boat;
 - (g) With an efficient lantern trimmed, with oil in its receiver sufficient to burn for eight hours, or with some other lantern or light approved by the Board of Trade; and with a box of suitable matches in a water-tight tin;
 - (h) With a mast or masts, and with at least one good sail and proper gear for each;
 - (i) With an efficient compass;
 - (j) With an air-tight case containing two pounds of biscuits for each person that the boat is deemed fit to carry;

- (k) With a vessel of approved pattern containing one gallon of vegetable or animal oil, so constructed that the oil can be easily distributed on the water and so arranged that it can be attached to the sea anchor;
- (I) With one dozen self-igniting red lights in a water-tight tin;
- (m) With one pound of condensed milk for each person that the boat is deemed fit to carry;
- (n) With a suitable locker for the stowage of the small items of the equipment.
- (2) Every boat which is deemed fit to carry 100 or more persons shall be fitted with a motor and shall comply with the requirements of rules 25, 26 and 27.
- (3) A motor boat need not carry a mast or sails or more than half the complement of oars, but it shall carry two boathooks.
- (4) A decked boat shall have no plug-hole, but shall be provided with at least two bilge-pumps.
- (5) In the case of a ship which carries passengers in the North Atlantic on a voyage not proceeding south of 35° North Latitude, only a proportion of the lifeboats, to be fixed by the Board of Trade, need be equipped with masts and sails, and only one-half the quantity of condensed milk specified in paragraph (1) (m) of this rule need be carried.
- (6) In the case of ships of Classes III, X, XII, and XVI, the boats shall not be required to carry the equipment specified in sub-paragraphs (h), (j) and (m) of paragraph (1) of this rule, and in the case of ships of Class II, the Board of Trade may allow this equipment to be dispensed with. In the case of ships of Classes IV, V, VI, VII, VIII, and XIV the boats shall not be required to carry the equipment specified in sub-paragraphs (h), (i), (j), (k), (l), (m), and (n) of paragraph 1 of this rule, and in the case of ships of Class XIII the Board of Trade may allow this equipment to be dispensed with.

Wireless installations and searchlights on motor boats.

33.—(1) The wireless installation to be carried on a motor boat in pursuance of paragraph (6) of rule 4 or paragraph (5) of rule 5 shall be capable of transmission and reception on a frequency of 500 kilocycles (wavelength 600 metres) and shall be provided with a source of power sufficient to give a minimum of 10 metre amperes (the number of metre amperes being determined by multiplying the current in amperes measured at the base of the aerial by the maximum height in metres of the aerial above the water line) and to

maintain the installation in operation, allowing for intermittent use, for a total period of six running hours;

- (2) The searchlight to be carried by a motor boat in pursuance of paragraph (6) of rule 4 or paragraph (5) of rule 5 shall include a lamp of at least 80 watts, an efficient reflector and a source of power which will give effective illumination of a light-coloured object over a width of about 60 feet at a distance of 200 yards for a total period of six hours, and shall be capable of working for three hours continuously:
- (3) Where the power for the wireless installation and the searchlight is derived from the same source, that source shall be of sufficient power to provide for the adequate working of both appliances simultaneously.

Equipment of life-rafts.

- 34.—(1) The normal equipment of every approved life-raft shall consist of:—
 - (a) Four oars;
 - (b) Five rowlocks;
 - (c) A self-igniting lifebuoy light;
 - (d) A sea-anchor;
 - (e) A painter;
 - (f) A vessel of approved pattern containing one gallon of vegetable or animal oil so constructed that the oil can be easily distributed on the water, and so arranged that it can be attached to the sea-anchor;
 - (g) An airtight receptacle containing two pounds of biscuits for each person to be carried;
 - (h) A watertight receptacle provided with a dipper with lanyard containing one quart of fresh water for each person to be carried;
 - (i) At least one dozen self-igniting red lights and a box of matches in watertight containers.
- (2) In the case of ships of Classes II or III, the Board of Trade may allow the equipment specified in sub-paragraph (g) of paragraph (1) of this rule to be dispensed with.

Stowage of equipment in boats and life-rafts.

35. All boats and life-rafts shall be fully equipped before the ship proceeds to sea, and the equipment shall remain in the boat or life-raft throughout the voyage, while the ship is at sea, or shall be stowed in some convenient place where it will be immediately available in case of emergency. Stowage and Handling of Boats, Life-rafts and Buoyant Apparatus.

- 36.—(1) All boats attached to davits and all boats stowed under boats attached to davits shall be stowed to the satisfaction of the Board of Trade in such a way that—
 - (i) they can be launched in the shortest possible time;
 - (ii) they will not impede in any way the prompt handling of any other of the boats attached to davits or stowed under boats attached to davits, or the buoyant apparatus carried in pursuance of paragraph (8) of rule 4 or paragraph (7) of rule 5, or the marshalling of the persons on board at the launching stations, or their embarkation:
 - (iii) even under conditions of list and trim unfavourable from the point of view of the handling of the boats, as large a number of persons as possible can be embarked in them.
- (2)—(a) Boats and life-rafts additional to boats stowed under boats attached to davits shall be stowed across a deck, bridge or poop and so secured that they will have the best chance of floating free of the ship if there is no time to launch them. They must not impede in any way the prompt handling of the boats attached to davits or the boats stowed under boats attached to davits, or the buoyant apparatus, or the marshalling of the persons on board at the launching stations or their embarkation.
- (b) As large a number as possible of the additional boats referred to in paragraph 2 (a) of this rule shall be capable of being launched on either side of the ship by means of approved appliances for transferring them from one side of the deck to the other.
- (c) Means shall be provided to the satisfaction of the Board of Trade for lowering the additional boats referred to in sub-paragraph (a) of this paragraph, into the water in the shortest possible time.
- (3) Subject to the foregoing provisions of this rule boats may be stowed one above the other, or they may, subject to such conditions as the Board of Trade may impose, be fitted one within another, but where boats so fitted require lifting before being launched they may only be so fitted if mechanical power appliances for lifting are provided. In no other case shall boats be so stowed as to require lifting before being launched.
- (4) Where a boat is stowed underneath another boat there shall be provided approved removable supports or other approved appliances, so as to secure that the weight of a boat is not unduly supported by the boat underneath it.

- (5) Boats may be stowed on more than one deck on condition that proper measures are taken to prevent boats on a lower deck being fouled by those stowed on a deck above.
- (6) Boats shall not be placed in the bows of the ship or in any positions in which they would be brought into dangerous proximity to the propellers at the time of launching.
- (7) All life-rafts and buoyant apparatus shall be so stowed as to be readily available in case of emergency.
- (8) Davits shall be of approved form and shall be suitably placed to the satisfaction of the Board of Trade They shall be so disposed on one or more decks that the boats placed under them can be safely lowered without interference from the operation of any other davits.
- (9)—(a) The davits, falls, blocks, and all other gear shall be of sufficient strength to the satisfaction of the Board of Trade.
- (b) In the case of ships of Classes I, II and III, the davits, falls, blocks and all other gear, shall be of such strength that the boats can be safely lowered with the full complement of persons and equipment, with the ship listed to 15 degrees either way.
- (c) Life-lines shall be fitted to the davit spans, and the falls and life-lines shall be long enough to reach the water with the ship at her lightest sea-going draught and listed to 15 degrees either way. Hooks shall not be attached to the lower tackle blocks.
- (10) In the case of ships of Classes I, II and III, the davits shall be fitted with gear of sufficient power to ensure that the boat, fully equipped and manned, but not otherwise loaded with passengers, can be turned out against the maximum list at which the lowering of the boats is possible.
- (11) Boats attached to davits shall have the falls ready for service, and means shall be provided for speedily, but not necessarily simultaneously, detaching the boats from the falls. The points of attachment of the boats to the falls shall be so situated as to ensure the boats being easily swung clear of the davits.
- (12) The boats' chocks shall be of such construction and arranged in such manner as shall be satisfactory to the Board of Trade.
- (13) Where more than one boat is served by the same set of davits, if the falls are of rope, separate falls shall be provided to serve each boat, but where wire falls are used with mechanical appliances for recovering them, separate falls need not be provided. The appliances used shall be such as to ensure lowering the boats rapidly and

in turn. Where mechanical power appliances are fitted for the recovery of the falls, efficient hand gear shall also be provided.

(14) In the case of ships of Class II or Class III, where the height of the boat deck above the water line when the vessel is at her lightest sea-going draught does not exceed 15 feet, and ships of Class III engaged on any approved voyage or excursion mentioned in paragraph (2) (a) of rule 6, the requirements of paragraphs (9) (b), (10) and (13) of this rule shall not apply but provision shall be made for the matters to which those paragraphs relate to the satisfaction of the Board of Trade.

Life-Jackets.

- 37.—(1) An approved life-jacket shall mean a jacket or other approved appliance capable of being fitted on the body, of approved material and construction, which is capable of floating in fresh water for at least 24 hours with 16½ lbs. of iron suspended from it. It shall be reversible and suitable both for adults and children.
- (2) No life-jackets shall be approved or carried the buoyancy of which depends on air compartments.

Lifebuoys.

- 38.—(1) (a) An approved lifebuoy shall be of solid cork or other approved material and shall be capable of floating in fresh water for at least 24 hours with 32 lbs. of iron suspended from it.
- (b) No lifebuoys filled with rushes, cork shavings, granulated cork or any other loose granulated material, or whose buoyancy depends upon air compartments requiring inflation, shall be approved or carried.
- (2) All lifebuoys shall be fitted with beckets securely seized, and at least one on each side of the ship shall be fitted with a life-line at least 15 fathoms in length.
- (3) (a) In every ship except ships of Classes IV, V, VI, VII or VIII, at least half the lifebuoys required by these rules shall be provided with approved self-igniting lights which cannot be extinguished in water, so however, that in the case of ships of Classes I, II or III, the number of lifebuoys so provided shall not in any case be less than aix.
- (b) In every ship of Class IV the number of lifebuoys so provided shall not be less than two.
- (c) These lights shall be kept near the lifebuoys to which they belong with the necessary means of attachment.

Stowage of Lifebuoys and Life-Jackets.

- 39.—(1) All lifebuoys and life-jackets shall be stowed to the satisfaction of a Board of Trade Surveyor and so as to be readily accessible to the persons on board; their position shall be plainly indicated so as to be known to the persons concerned.
- (2) Lifebuoys shall always be capable of being rapidly cast loose and shall not be permanently secured in any way

Line-throwing Appliances.

- 40.—(1) An approved line-throwing appliance shall consist of
 - (a) Four 2-lb. line-throwing rockets with suitable sticks or other approved apparatus capable of throwing a line 5/16ths inch in circumference, a distance of 120 yards in calm weather, and
 - (b) Two lines, 5/16ths inch in circumference each not less than 240 yards in length, having a breaking strain of not less than 150 lbs.
- (2) The rockets with the means of igniting them and the lines shall be kept in a water-tight case.

MISCELLANEOUS PROVISIONS.

Embarkation in the Boats and Life-rafts.

- 41.—(1) Suitable arrangements as required by the Board of Trade shall be made on ships of Classes I, II and III for embarking the passengers in the boats at an embarkation deck. Ships of Class I shall be provided throughout the ship with electrically operated signals controlled from the bridge for summoning passengers to muster stations.
- (2) All ships of Classes I, II, III and IV shall carry not less than one ladder of an approved type at each set of davits. Ships of Classes IX, X, XI, XII, XV and XVI shall carry at least one ladder of an approved type for every two sets of davits. The ladders shall be of sufficient length to reach the waterline with the ship at her lightest sea-going draught and listed to 15 degrees either way, and shall be carried in such a manner as to be always available for use in embarking the persons in the boats or life-rafts.

Means of Ingress and Egress. Emergency Lighting.

42.—(1) Proper arrangements shall be made to the satisfaction of the Board of Trade on all passenger ships for ingress to and egress from the different compartments and decks.

- (2) Provision shall be made on all ships of Classes I and II for an electric or other system of lighting, sufficient to the satisfaction of the Board of Trade for all requirements of safety, in the different parts of the ship, and particularly upon the decks on which the boats are stowed. On ships in which the boat deck is more than 30 feet above the waterline at the lightest sea-going draught, provision shall be made for the illumination from the ship of the boats when alongside and in process of or immediately after being launched. There must be a self-contained source of power capable of supplying, when necessary, this safety lighting system, and placed in the upper parts of the ship above the bulkhead deck.
- (3) In ships of Classes I and II the exit from every main compartment occupied by passengers or crew shall be continuously lighted by an emergency lamp. The power for these emergency lamps shall be so arranged that they will be supplied from the source of power referred to in paragraph (2) of this rule in the event of failure of the main generating plant.

Certificated Lifeboatmen.

43.—(1) The crew of every ship of Classes I, II, III and IV shall include, for each boat or life-raft carried as part of the statutory life-saving appliances, a number of certificated lifeboatmen not less than that specified in the following table:—

Prescribed complement of boat or life-raft.			Number of Lifeboatmen.
Less than 41 persons	•••	•••	2
From 41 to 61 persons			3
From 62 to 85 persons	•••		4
Above 85 persons	•••		5

- (2) An applicant for a lifeboatman's certificate shall be at least 18 years of age and shall submit himself for examination at such times and places as may be directed by the Board of Trade, who, on being satisfied that he has had sufficient service at sea and has been trained in all the operations connected with launching lifeboats and the use of oars; that he is acquainted with the practical handling of the boats themselves; and, further, that he is capable of understanding and answering the orders relative to lifeboat service, may issue a certificate to him.
- (3) If the Board of Trade have reason to believe that a certificated lifeboatman no longer possesses the qualifications described in the preceding paragraph, they may require him to submit himself for re-examination at such time and place as they may determine, and if he does not prove to the

satisfaction of the Board of Trade that he possesses the qualifications aforesaid, the Board may cancel the certificate, whereupon the holder shall deliver the certificate to the Board of Trade and shall be deemed to be no longer a certificated lifeboatman.

(4) For the purpose of this rule

"certificated lifeboatman" means any member of the crew who holds a certificate issued by or under the authority of the Board of Trade in accordance with the conditions laid down in paragraph (2) of this rule:

"prescribed complement" means the number of persons which a boat or life-raft is deemed fit to carry

under these rules.

Equivalents and Exemptions.

- 44.—(1) Where these rules require that a particular fitting, appliance or apparatus, or type thereof, shall be fitted or carried in a ship, or that any particular provision shall be made, the Board of Trade may allow any other fitting, appliance or apparatus, or type thereof, to be fitted or carried, or any other provision to be made, if they are satisfied that that other fitting, appliance or apparatus, or type thereof, or provision, is at least as effective as that required by these rules.
- (2) If it appears to the Board of Trade, on the application of the owner of any ship, that it is not practicable or reasonable to fit in that ship the number of sets of davits required by these rules, the Board may direct that one or more sets of davits may be dispensed with in that ship subject to such conditions, if any, as the Board may require.

Provided that, in the case of a ship of Class I or Class II, this exemption shall only be allowed under exceptional conditions and the number of sets of davits fitted shall in no case be less than the minimum number determined by Column B of the table in the first schedule to these rules.

(3) If a ship of Class I is permitted by the terms of her passenger certificate to carry, between specified ports or places abroad, a number of passengers in addition to the number allowed when the ship is proceeding to sea from the United Kingdom, the Board of Trade may, subject to such conditions as they think fit, allow as regards the part of the voyage between such specified ports or places such modifications of the provisions of paragraphs (4) and (8) of rule 4 (relating respectively to lifeboats and buoyant apparatus) as appear to them to be justified, so however that in no case shall the aggregate capacity of lifeboats or the provision of buoyant apparatus on that part of the voyage be less than

would be required under rule 5 if the ship were a ship of Class II.

- (4) The Board of Trade may, in their discretion, exempt any ship of Class II from the requirements of paragraph (5) of rule 5 relating to the carriage of motor lifeboats.
- (5) If a ship is so small as to be unable to carry more than one boat, the Board of Trade may, in their discretion, exempt that ship from carrying more than one boat, but whenever one boat only is carried proper provision shall be made to enable it to be placed readily in the water on either side of the ship.
- (6) If it is impracticable in any case for a ship to carry a boat of the minimum capacity prescribed by these rules, the Board of Trade may, in their discretion, allow a boat of smaller capacity to be carried by that ship.
- (7) The Board of Trade may, on such conditions as they think fit, exempt any ship constructed before the 1st July, 1931 (not being a ship in respect of which exemption can be granted under the provisions of proviso (a) to Section 4 of the Merchant Shipping (Safety and Load Line Conventions) Act, 1932), from any of the requirements of these rules, if they are satisfied that that requirement is either impracticable or unreasonable in the case of that ship.

Ships Certified to carry not more than Twelve Passengers.

45. A ship which is certified to carry a number of passengers not exceeding twelve, and which, if it were not certified to carry passengers, would be subject to the provisions of rule 14 or rule 15 as the case may be, shall comply with those rules respectively, and not with those applying to ships of any other Class.

Dated this 9th day of December, 1932.

Walter Runciman,
President of the Board of Trade.

SCHEDULES TO THE MERCHANT SHIPPING (LIFE SAVING APPLIANCES) RULES, 1932 FIRST SCHEDULE.

Rules 4, 5 & 6,

				` T.	ABLE.		
R		tered the S		(A) Minimum number of sets of davits.	(B) Smaller number of sets of davits authorised exception- ally.	Minimum capacity of lifeboats in cubic feet.	(D) Minimum capacity of lifeboats in cubic feet.
	and	unde		2	2	980	400
120	99	91	140	2	2	1,220	600
140	99		160	2 .	2	1,550	850
160	**		175	3	3	1,880	1,150
175	99	**	190	3	3	2,390	1,300
190	99	99	205	[4	4	2,740	1,450
205		99	220	4	4	3,330	1,600
220	99	99	230	5	[4	3,900	1,700
230	99	**	245	. 5	4	4,560	1,850
45	99	99 -	255	6	5	5,100	2,100
55	29	99	270	6	5	5,640	2,400
70	99	22	285	7 .	5	6,190	2,700
85 100	31		300	7	5	6,930	3,000
115	92	- 99	315	8	6	7,550	3,300
130	9:	99	330	8	6	8,290	3,700
350	25	**	350 370	9	1 7	9,000	4,100
70°	99	**		10	7 7	9,630	4,400
190	99		410	10	7	10,650	4,700
110	99	. 99	40.00	10	6	11,700	5,100
135	99	**	400	12		13,060	5,500
160	**	. 22	400	12	10	14,430	6,000
190	99	**	E00	14	10	15,920	6,550
520	99	79		16	12	17,310	7,100
550	99	**	E00	16	12	18,720	7,650
80	**	19	210	1 18	13	20,350 21,900	_
310	**		- 40	18	13	23,700	-
340	20	**	670	20	14	25,700	_
370	99	**	700	20	1 14	27,050	_
700	99	**	730	22	1 15	28,560	_
130	99	**	760	22	15	30,180	
760	99	**	790	24	17	32,100	I _
790	99	99	820	24	l i7	34,350	_
320	33	**	855	26	l is	36,450	_
355	22		890	26	l îš	38,750	_
390	**	.,	925	28	19	41,000	_
25	22	**	960	28	19	43,880	l <u> </u>
960	22	**	995	30	20	46,350	l —
MAE			1 020	90	مَمَّ ا	40 750	1

Note on columns (A) and (B).—When the length of the ship is 1,030 feet or upwards, the Board of Trade shall determine the minimum number of sets of davits for that ship.

48,750

Note on columns (C) and (D).—For the purposes of this table the capacity in cubic feet of a lifeboat of Class 2 shall be obtained by multiplying the number of persons which the lifeboat is deemed fit to carry by 10.

Note on column (D).—When the length of a ship is under 100 feet or is 550 feet or upwards, the minimum cubic capacity of the lifeboate shall be determined by the Board of Trade.

SECOND SCHEDULE.

TABLE A.

Minimum number of sets of davits to be provided in a ship of Class III in Bule 6 (2.) (a) certain cases.

Length of ship in feet.							Minimum number of sets of davits.	
Under 1	180	•••	•••	•••	•••		2	
180 and			***	•••	***		3	
210	-	240		•••	•••		4	
240	**	270	•••	***	•••		5	
270	**	300	•••	•••	•••		6	
300	**	330		•••	•••		7	
B30	•	360		•••	•••		8	

When the length of the ship is 360 feet or upwards, the number of sets of davits to be provided shall be determined by the Board of Trade.

TABLE B.

Minimum aggregate cubic capacity of lifeboats to be carried in a ship of Class III in certain cases.

Length of ship in feet.								Minimum aggregate capacity of lifeboats in cubic feet.
100 and under 120								
120	••	92	140	•	•••	•••		400
140			160		•••			500
160		••	180	•••	***	•••		600
180		99	195	•••	•••	•••		700
195		**	210	•••	•••			800
210	-	•	225	•••	•••	•••		950
225	**		240	•••	•••	•••		1,080
240	-	**	255	•••	•••	•••		1,250
255			270	•••	•••	•••		1.450
270		**	285	•••	•••	•••		1,700
285	•	•	300		•••	•••		1.900
000		••	330		***	•••		2,150
330			360			***		2,400

When the length of the ship is under 100 or is 360 feet and upwards, the minimum aggregate capacity of the lifeboats to be carried shall be determined by the Board of Trade.

THIRD SCHEDULE.

Ratus 7 & 8. Table showing the minimum number of sets of devits to be provided in a ship of Class IV, or Class V.

Length of ship in feet.								Minimum number of sets of devite.	
	or 2		•••		***	•••		2	
			240 280		***	***		3 4	
240 280	<i>p</i>	e7 99	320	•••	***	•••		5	

When the length of the ship is 320 feet or upwards, the number of sets of davits to be provided shall be determined by the Board of Trade.

FOURTH SCHEDULE.

Rules 22 & 23.

PART I.

Lifeboats of Class 1.

(1) Every boat shall have a mean sheer at least equal to four per cent. of its length.

(2) The air-cases of every boat shall be so placed as to secure stability when fully laden under adverse weather conditions.

(3) Internal buoyancy appliances shall be constructed of copper or yellow metal of not less than 18 css. to the superficial foot, or of other approved material.

Lifeboats with Internal Buoyancy Appliances only.—Class 1 (a).

(4) The buoyancy of a wooden boat of this type shall be provided by watertight air-cases, the total volume of which shall be at least equal to one-tenth of the cubic capacity of the boat.

(5) The buoyancy of a metal boat of this type shall not be less than that required for a wooden boat of the same cubic capacity, and the volume of watertight air-cases shall be increased accordingly.

Lifeboats with Internal and External Buoyancy Appliances.— Class 1 (b).

(6) The internal buoyancy of a wooden boat of this type shall be provided by watertight air-cases, the total volume of which is at least equal to seven-and-a-half per cent. of the cubic capacity of the boat.

(7) The external buoyancy may be provided by means of cork or any other equally efficient material, but buoyancy shall not be obtained by the use of rushes, cork shavings, loose granulated cork or any other loose granulated substance, or by any means

dependent upon inflation by air.

(8) If the buoyancy appliances are of cork, their volume, for a wooden boat, shall not be less than thirty-three thousandths of the cubic capacity of the boat; if of any material other than cork, their volume and distribution shall be such that the buoyancy and stability of the boat are not less than that of a similar boat provided with buoyancy appliances of cork.

boat provided with buoyancy appliances of cork.

(9) The buoyancy of a metal boat shall be not less than that required for a wooden boat of the same cubic capacity, and the volume of the watertight air-cases and of the external buoyancy

appliances shall be increased accordingly.

PART II.

Lifeboats of Class 2.

Open boats with Internal and External Buoyancy—Upper Part of Sides collapsible.—Class 2 (a).

(10) A wooden boat of this type shall be fitted both with watertight air-cases and with external buoyancy appliances, the aggregate volume of which, for each person which the boat is able to accommodate, shall be at least equal to the following amounts:—

Air-cases 1.5 cubic feet. External buoyancy appliances (if of cork)... 0.2 cubic feet.

- (11) Internal buoyancy appliances shall be constructed of copper or yellow metal of not less than 18 ozs. to the superficial foot or other approved material.
- (12) The external buoyancy appliances may be of cork or of any other equally efficient material, but buoyancy shall not be obtained by the use of rushes, cork shavings, loose granulated cork, or any other loose granulated substance, or by any means dependent upon inflation by air. If of any material other than cork, their volume and distribution shall be such that the buoyancy and stability of the boat are not less than that of a similar boat provided with buoyancy appliances of cork.
- (13) A metal boat of this type shall be provided with internal and external buoyancy appliances to ensure that the buoyancy of the boat shall be at least equal to that of a wooden boat of the same cubic capacity.
- (14) The freeboard of a boat of this type shall be measured vertically to the top of the solid hull at the side amidships, from the water-level, when the boat is loaded with its full complement of persons and equipment.
- .(15) The minimum freeboard in fresh water of a boat of this type shall be fixed in relation to its length and shall be determined by the following table:—

Length of boat.	Minimum Freeboard
Feet.	Inches.
26	8
28	. 9
3 0	10

The minimum freeboard of boats of intermediate lengths is to be found by interpolation.

(16) The collapsible sides of every lifeboat shall be watertight.

Decked Boats with either Fixed or Collapsible Watertight Bulwarks.—Class 2 (b).

(17) In the case of boats of the type having a well deck the area of the well deck shall be at least 30 per cent, of the total deck area. The height of the well deck above the water-line at all points shall be at least equal to one-half per cent, of the length of the boat, this height being increased to one-and-a-half per cent, of the length of the boat at the ends of the well. The freeboard in fresh water shall be such as to provide for a reserve buoyancy of at least 35 per cent.

- (18)—(a) The minimum freeboard of a poat of this type having a flush deck is independent of its length and depends only upon its depth. The depth of the boat is to be measured vertically from the underside of the garboard strake to the top of the deck at the side amidships and the freeboard is to be measured from the top of the deck at the side amidships to the water-level when the boat is loaded with its full complement of persons and equipment.
- (b) The minimum freeboard in fresh water shall be determined by the following table, which is applicable without correction to boats having a mean sheer equal to three per cent. of their length (hereinafter called the standard sheer).

Depth of boat.	Minimum Freeboard	d.
Inches.	Inches	
12	21	
18	34	
24	. 51	
30	6]	

For intermediate depths the minimum freeboard is obtained by interpolation.

- (c) If the sheer is less than the standard sheer the minimum freeboard shall be obtained by adding to the figures in the table one-seventh of the difference between the standard sheer and the actual mean sheer measured at the stem and stern post; no deduction shall be made from the freeboard on account of the sheer being greater than the standard sheer or on account of the camber of the deck.
- (19) Decked boats may be built of wood or metal. If constructed of wood, they shall have the bottom and deck made of two thicknesses with textile material between; if of metal, they shall be divided into watertight compartments with means of access to each compartment.
- (20) All decked boats shall be fitted with efficient means for clearing the deck of water. The orifices for this purpose shall be such that the water cannot enter the boat through them when they are intermittently submerged. The number and size of the orifices shall be determined by the Board of Trade for each type of boat by a special test.
 - (21) For the purpose of this test:-
 - (a) The decked boat shall be loaded with a weight of iron equal to that of its complement of persons and equipment;
 - (b) In the case of a boat 28 feet in length two tons of water shall be cleared from a boat with a well deck in not more than 60 seconds and in the case of a boat with a flush deck in not more than 20 seconds.
 - (c) In the case of a boat having a length (l) greater or less than 28 feet, the weight of water in tons to be cleared in the same times as mentioned in sub-paragraph (b) shall be for each type calculated by the formula l + 14.

FIFTH SCHEDULE.

PART I.

Cubic Capacity of Lifeboats of Class 1.

Rule 28.

(1)—(a) The cubic capacity of a lifeboat of Class 1 shall be determined by the formula set out below or by any other method giving the same degree of accuracy. The capacity of a square sterned boat shall be calculated as if the boat had a pointed stern.

Cubic Capacity =
$$\frac{l}{12}(4A + 2B + 4C)$$
, where

I denotes the length of the boat in feet from the inside of the planking or plating at the stem to the corresponding point at the stern post; in the case of a boat with a square stern, the length is measured to the inside of the transom.

A, B, C, denote respectively the areas of the cross-sections at the quarter length forward, amidships, and the quarter length aft, which correspond to the three points obtained by dividing *l* into four equal parts (the areas corresponding to the two ends of the boat are considered negligible).

The areas A, B, C shall be deemed to be given in square feet by the successive application of the following formula to each of the three cross-sections:—

Area =
$$\frac{h}{12}(a + 4b + 2c + 4d + e)$$
, where

h denotes the depth measured in feet inside the planking or plating from the keel to the level of the gunwale, or, in certain cases, to a lower level, as determined hereafter;

a, b, c, d, s denote the horizontal breadths of the boat measured in feet at the upper and lower points of the depth and at the three points obtained by dividing h into four equal parts (a and s being the breadths at the extreme points, and s at the middle point of h).

(b) If the oars are pulled in rowlocks, the bottom of the rowlocks shall be considered as the gunwale in measuring the depth

of the boat.

(c) If the sheer of the gunwale, measured at the two points aituated at a quarter of the length of the boat from the ends, exceeds 1 per cent. of the length of the boat, the depth employed in calculating the area of the cross-sections A or C shall be deemed to be the depth amidships plus I per cent. of the length of the boat.

(d) If the depth of the boat amidships exceeds 45 per cent. of the breadth, the depth employed in calculating the area of the midship cross-section B shall be deemed to be equal to 45 per cent. of the breadth, and the depth employed in calculating the areas of the quarter length sections A and C is obtained by increasing this last figure by an amount equal to 1 per cent. of the length of the boat, provided that in no case shall the depths employed in the calculation exceed the actual depths at these points.

(2) Unless the owner of a boat requires the cubic capacity to be determined by exact measurement the cubic capacity may be assumed to be the product of the length, the breadth and the depth multiplied by 0.6 if it is evident that this formula does not give a greater capacity than that obtained by the formula set out in paragraph (1) of this schedule.

The dimensions shall be measured in the following manner:-

Length.—From the intersection of the outside of the planking with the stem to the corresponding point at the stern post, or in the case of a square sterned boat, to the after aide of the transom.

Breadth.—From the outside of the planking at the point where the breadth of the boat is greatest.

Depth.—Amidships inside the planking from the keel to the level of the gunwale, but the depth used in calculating the cubic capacity may not in any case exceed 45 per cent.

of the breadth.

(3) The cubic capacity of a motorboat is obtained from the gross capacity by deducting a volume equal to that occupied by the motor and its accessories, and, when carried, the wireless telegraphy installation and searchlight with their accessories.

PART II.

Deck area of Lifeboats of Class 2.

(4) The area of the deck of a decked boat and the area within the "fixed" bulwarks of a lifeboat of Class 2 (a) shall be determined by the formula set out below or by any other method giving the same degree of accuracy.

Area =
$$\frac{1}{12}$$
 (2a + 1.5b + 4c + 1.5d + 2e), where

I denotes the length in feet from the intersection of the outside of the planking with the stem to the corresponding point at the

stern post;

a, b, c, d, e denote the horizontal breadths in feet outside the planking at the points obtained by dividing l into four equal parts and sub-dividing the foremost and aftermost parts into two equal parts (a and e being the breadths at the extreme sub-divisions, c at the middle point of the length and b and d at the intermediate points).

INSTRUCTIONS

CHAPTER I.—GENERAL.

- 1. Object of Instructions.—These Instructions are issued by the Board of Trade under the provisions of the Merchant Shipping Acts for the guidance and assistance of their Surveyors in surveying the lifesaving appliances and equipment of ships. As regards passenger steamers, the Instructions are supplementary to those contained in the "Instructions as to the Survey of Passenger Steamships"
- 2. Legal requirements.—The legal requirements relating to lifesaving appliances are contained in Sections 427 to 431 of the Merchant Shipping Act, 1894, as amplified and amended by Sections 4, 5, 6 and 9 of the Merchant Shipping Act, 1906, and Sections 4 and 5 of the Merchant Shipping (Safety and Load Line Conventions) Act, 1932. Surveyors should make themselves familiar with these legal provisions, which are reproduced in Appendix A to these Instructions and also with the Merchant Shipping (Lifesaving Appliances) Rules, 1932, made under the authority of Section 427 of the Merchant Shipping Act, 1894, and Sections 4 and 5 of the Merchant Shipping Act, 1932, which are reproduced above. References in these instructions to Rules are to the Merchant Shipping (Lifesaving Appliances) Rules, 1932.

Surveyors should note carefully the various circular instructions and notices issued by the Board of Trade from time to time on the subject of lifesaving appliances and should see that as opportunity occurs any new requirement is brought to the notice of shipowners, shipbuilders, and others interested.

3. Lifesaving Appliances Rules.—As is indicated in paragraph 2, the detailed requirements as to lifesaving appliances are contained in the Merchant Shipping (Lifesaving Appliances) Rules, 1932, S.R. & O. 1932, No. 1035. These Rules prescribe the boats and buoyant apparatus with their equipment, the lifejackets, lifebuoys, line throwing appliances and the number of certificated lifeboatmen which are to be carried on various classes of ships. They also specify the nature of the boat stowage to be provided and the means to be adopted for the handling and launching of the boats.

Fishing boats registered under Part IV of the Merchant Shipping Act, 1894, and employed in sea fishing or in the sea fishing service are outside the scope of the Rules.

On occasion boats and lifesaving appliances are carried in excess of the statutory requirements. Surveyors should see that such boats and appliances are of a safe and seaworthy character, and are in good condition.

4. Penalties for breach of the legal provisions.—All owners and masters of British ships to which the Statutory Lifesaving Appliances Rules apply are bound by Sections 428 and 430 of the Merchant Shipping Act, 1894, and Section 5 of the Merchant Shipping Act (Safety and Load Line Conventions) Acts, 1932, to comply with the statutory rules, and if on any voyage or excursion the appliances prescribed by the rules are not provided, or if such appliances are not kept so as to be at all times fit and ready for use, or if any provision of the rules applicable to the ship is contravened or not complied with, the owner, if in fault, is liable for each offence to a fine not exceeding £100, and the master, if in fault, is liable to a fine not exceeding £50. Further, the owner and master are liable to similar penalties if any of the appliances provided are lost or rendered unfit for service in the course of a voyage or excursion through the wilful fault or negligence of the owner or master, or if the master wilfully neglects to replace or repair on the first opportunity any such appliances lost or injured in the course of a voyage or excursion.

A ship may be detained in certain circumstances if the law regarding lifesaving appliances is not observed. Provision is made in Section 5 (3) of the Merchant Shipping (Safety and Load Line Conventions) Act, 1932, for the inspection of lifesaving appliances of British ships by Board of Trade Surveyors, and for this purpose the Surveyor is given all the powers of a Board of Trade Inspector. These powers are defined in Section 729 of the Merchant Shipping Act, 1894. There is also a general provision in Section 459, Merchant Shipping Act, 1894, that a ship may be detained if by reason of defective equipment it is unfit to proceed to sea.

5. Inspection of Lifesaving Appliances.—In order to ascertain whether a ship is provided with the required lifesaving appliances, a Surveyor may inspect the ship to verify that the various items of equipment required by the statutory rules have been provided, that all the equipment is in a satisfactory condition and ready for immediate use, that the means of stowage and launching of the lifeboats, buoyant apparatus, etc., are in accordance with these Instructions, and that the requisite number of certificated lifeboatmen is carried.

In a case of doubt as to the efficiency of any apparatus, the matter should be determined by actual test or trial wherever this course is practicable, and a report of all cases of an unusual nature where failure to comply with the requirements occurs should be made to the Board of Trade.

- Rules.—The Board of Trade have power to relieve ships in certain circumstances, either in whole or in part, from some of the requirements of the Lifesaving Appliances Rules. Applications for relief from any of the statutory requirements should be made to the Board of Trade by the owners or the builders of a ship and should be accompanied where necessary by complete plans. A full report should if possible be given by the Surveyor stating whether, in his opinion, it is practicable and reasonable to comply with the relevant requirements of the statutory rules and giving the reasons on which his opinion is based. Except in cases where special exemption or relief has been granted by the Board of Trade, the requirements of the statutory rules are to be complied with in full.
- 7. Ships subject to inspection.—(1) Ships registered in the United Kingdom.—All ships, whether passenger ships or cargo ships, registered in the United Kingdom are subject to inspection. Surveyors should take every opportunity of inspecting the lifesaving appliances of such ships and should carry out such an inspection whenever they have occasion to visit a vessel for any purpose, and especially when there is any reason to doubt whether the requirements of the statutory rules are being fulfilled.

Passenger ships and emigrant ships are subject to special supervision as regards lifesaving appliances as well as in regard to other matters relating to the construction and equipment of the ship. Under Section 724 of the Merchant Shipping Act, 1894, the Board of Trade have power to make regulations as to the manner in which surveys of passenger steamers shall be conducted and the instructions in this volume should guide Surveyors in making the annual surveys of the lifesaving appliances of passenger steamers. In addition to these annual surveys occasional visits should be made to passenger steamers to inspect lifesaving appliances so as to ascertain that they are being maintained in good order and ready for immediate use.

In the case of emigrant ships the Emigration Officer must, before clearance is granted for any voyage, satisfy himself that the lifesaving appliances are in good order and condition.

There is no prescribed periodical inspection of cargo ships, but in cases in which it is ascertained that the requirements of the rules are fully complied with on cargo ships, the Surveyor may, on the request of the owner or his representative, issue a certificate on Form Surveys 123 (see paragraph 9). This certificate is normally regarded as valid for

a period of at least one year, but in no circumstances are certificates on this form to be accepted after the expiration of two years from the date of issue or of the last renewal. The desirability of obtaining certificates on Form Surveys 123, as well as the necessity in their own interests for renewing such certificates at least once every two years, should be pointed out to owners of cargo ships. The issue of a certificate on Surveys 123 relieves a cargo ship in the normal way from further inspections for lifesaving appliances during the validity of the certificate. The certificate should, therefore be kept on board readily available for inspection by any Surveyor visiting the ship.

(2) Ships registered in other parts of the Empire.—
These ships are subject to inspection in the same manner as ships registered in the United Kingdom, but in the case of those Dominions which have ratified or acceded to the Safety Convention (viz. Canada, Australia, the Irish Free State, and New Zealand), of India and of those colonies to which the Convention has been applied (viz. Hong Kong and the Straits Settlements) valid Safety Certificates are to be taken as covering lifesaving appliances. No detailed inspection of ships producing Safety Certificates should normally be made, but Surveyors are entitled to verify that the conditions on board as regards lifesaving appliances correspond with the particulars given on the Certificate.

As regards other British territories the Board of Trade have power under Section 284 of the Merchant Shipping Act, 1894, to recognise passenger certificates issued in any part of H.M. dominions as being equivalent to Board of Trade Passenger Certificates. Separate Orders in Council are issued in respect of the recognition of any such certificates, and ships producing valid passenger certificates issued in any part of H.M. dominions covered by an Order in Council under Section 284, Merchant Shipping Act, 1894, should be accepted as covering lifesaving appliances and thus as freeing the ship from any inspection other than an inspection for the purpose of verifying that the conditions on board as regards lifesaving appliances correspond with the particulars on the certificate.

Cargo ships registered in other parts of H.M. dominions should be treated in the same manner as cargo ships registered in the United Kingdom.

(3) Foreign ships.—(i) Foreign passenger ships.—All foreign passenger ships are subject to the same inspection as passenger ships registered in the United Kingdom unless they belong to countries whose Governments have agreements with the United Kingdom with regard to the mutual

recognition of passenger certificates. The International Convention for the Safety of Life at Sea, 1929, is the operative agreement in the case of most countries. Agreements may be made with countries which are not parties to the Convention and in such cases passenger certificates may be accepted under Section 363 of the Merchant Shipping Act, 1894, as being equivalent to a Board of Trade passenger certificate. These two cases are referred to separately below:—

- (a) Passenger ships belonging to countries which have adopted the Safety Convention.—At the date of these Instructions the following foreign countries have either ratified or acceded to the Convention, viz. Argentina, Belgium, Brazil, Bulgaria, China, Danzig, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Italy, Japan (including Chosen, Taiwan and Kwantung), the Netherlands (including the Netherlands East Indies), Poland. Portugal, Spain, Sweden Norway. A valid Safety Certificate produced U.S.S.R. ship belonging to these passenger any of countries is to be accepted as covering lifesaving appliances and, in accordance with Section 17 of the Merchant Shipping (Safety and Load Line Conventions) Act, 1932, no further inspection of the ship is necessary, though a Surveyor is entitled to go on board for the purpose of ascertaining that the conditions as regards lifesaving appliances correspond with the particulars shown in the certificate. The ship may not, however, be deemed to be unsafe on account of defective lifesaving appliances for the purposes of Section 459 or 462 of the Merchant Shipping Act, 1894, unless by reason of the deficiencies the ship cannot proceed to sea without danger to the passengers or crew.
- (b) Passenger ships belonging to other foreign countries.—In the case of a country which is not a party to the Safety Convention but whose passenger certificates are accepted under Section 363 of the Merchant Shipping Act, 1894, as equivalent to a Board of Trade Passenger Certificate, the acceptance of the certificate includes the approval of the lifesaving appliances. The only country at present falling into this category is the U.S.A., and a Surveyor, when inspecting a U.S. ship which holds a valid national passenger certificate should satisfy himself merely that the appliances on board are as shown on the passenger certificate and are in good condition.

Foreign passenger steamers belonging to countries which are neither parties to the Safety Convention nor have other agreements with the United Kingdom for the acceptance

of passenger certificates will usually require a Board of Trade Passenger Certificate which can be issued only after the appropriate survey. In such cases the requirements of the Lifesaving Appliances Rules must be complied with before a Passenger Certificate can be granted, and after the vessel has been granted a Passenger Certificate she should be treated exactly as if she were a United Kingdom ship holding a Board of Trade Passenger Certificate.

(ii) Foreign cargo ships.—Arrangements are in force under Section 4 of the Merchant Shipping Act, 1906, under which the Lifesaving Appliances Rules of certain foreign countries are regarded as equally effective with the Lifesaving Appliances Rules in force in the United Kingdom. Formal recognition of such foreign rules is accorded by the issue of Orders in Council. The countries whose rules have been so recognised are Belgium, Denmark, France, Germany, the Netherlands, Norway, Portugal and Sweden.

No question should be raised in the case of vessels belonging to any of these countries where the master produces a national certificate or record of inspection relating to lifesaving appliances and those appliances are found to be in good condition. In the case of a ship belonging to any of these countries where the master is unable to produce the required certificate or record of inspection, no action need be taken if the Surveyor is satisfied that the appliances carried are substantially equivalent to those which would be required in a similar British ship and are in good condition. If the appliances are in good condition but are not considered by the Surveyor to be substantially equivalent to the corresponding appliances required on a similar British ship, the Surveyor should report full particulars of the case to the Board of Trade and await instructions before taking any action.

If in any case a Surveyor finds that the appliances on a foreign cargo ship are in a defective condition, even though the ship may produce a national certificate or record of inspection, he should point out the defects to the master and give him an opportunity of making them good before the vessel leaves. The master should also be informed that it is only by strict compliance with his own national rules that exemption from the British rules can be secured.

Formal detention of a ship belonging to any of the countries whose lifesaving appliances rules have been recognised as equivalent to our own should be resorted to only in cases in which serious deficiencies in the lifesaving appliances or defects in their condition are found, and in all such cases the matter should first be referred for instructions to the Board with an indication of the port to

which the ship is bound after leaving the United Kingdom. If the ship is bound to one of its home ports, and the master makes such additions or repairs to the appliances as a Surveyor considers sufficient for the voyage and undertakes to have the appliances brought up to the national standard before he returns to the United Kingdom, the ship need not be detained but full details of the case should be reported to the Board of Trade.

In the case of cargo ships belonging to countries whose lifesaving appliances rules have not been formally recognised, the requirements of the Board of Trade statutory lifesawing appliances rules must be applied and the ships should be treated in exactly the same way as if they were cargo ships registered in the United Kingdom.

- (iii) Treatment of foreign ships generally.—Every case of a foreign ship in which difficulties arise or which is attended by special circumstances should be reported at once to the Board of Trade for instructions. Care should be taken to carry out the requirements with as little inconvenience and delay to the ship as possible. Surveyors should also bear in mind that foreign ships not bound to a port of the United Kingdom but which come into any port of the United Kingdom for any purpose (usually under stress of weather) other than the purpose of embarking or landing passengers or taking in or discharging cargo or taking in bunker fuel are, under Section 6 of the Merchant Shipping Act, 1906, not subject to the Lifesaving Appliances Rules.
- 8. Procedure before inspection.—Before an inspection is commenced the master or mate should be asked to produce a report of any previous recent inspection by a Board of Trade Surveyor (i.e. Form Surveys 123: see para. 9). The certificate contained on this form is normally regarded as valid for a period of twelve months, and if the certificate shows that an inspection has been made within that time and that the appliances were then satisfactory, report should be returned to the master or mate and no new inspection need be made by the Surveyor unless he has reason to believe that the equipment is no longer in the same condition as when the certificate was granted or the last inspection made. Should the lifesaving appliances have been materially altered since the issue of the certificate on Form Surveys 123, or its last endorsement, or should the Surveyor have reason to believe that the appliances are deficient in amount or are defective in any respect, the Form Surveys 123 should be withdrawn and a new inspection made. Such an inspection should always be made if the certificate was issued or, in the case of an endorsed

certificate, if the last endorsement on Form Surveys 123 was made more than two years previously. When a Form Surveys 123 is withdrawn, the Principal Officer of the district in which the form was originally issued should be notified of its withdrawal. If the new inspection shows that the lifesaving appliances are in order, a new certificate on Form Surveys 123 should be issued.

Any defects or deficiencies in the lifesaving appliances which may be found during an inspection should be dealt with in accordance with the instructions in paragraphs 10 and 11.

9. Issue of report on completion of inspection.—A report on Form Surveys 123 or 123A is a statement of fact that on a certain date the lifesaving appliances were examined and found to comply with the rules. The reports given by a Surveyor should therefore be confined to those matters which he has examined himself, and in every case of inspection a report of the inspection should be entered in the Office Lifesaving Appliances Book. In no circumstances is a report on Form Surveys 123 or 123A to be given unless the lifesaving appliances concerned comply fully with the rules or unless any deficiency is covered by a definite exemption granted by the Board.

When an inspection has been completed and the lifesaving appliances are found to comply fully with the rules, a report of the inspection on Form Surveys 123 should be given to the owner, master or agent if he requires it, or, should a Form Surveys 123 already be on board, the necessary entry should be made in the record of subsequent inspections on page 2 of the Form.

A report on Form Surveys 123 should always be issued when a new ship is inspected during construction. A new Form Surveys 123 should also be issued in all cases where a Form previously held is withdrawn provided that the life-saving appliances have been brought fully into compliance with the rules. Any deficiency covered by a formal exemption granted by the Board should be noted on the Certificate.

When a lifeboat is certified on completion at a boat builder's yard or when buoyant apparatus for use on foreign-going passenger ships is certified on completion at the makers' works, a report on Form Surveys 1234 should be issued.

10. Procedure when Lifesaving Appliances Rules have not been complied with:—(1) Ships registered in the United Kingdom.—If the lifesaving appliances on any ship registered in the United Kingdom are found in any respect not to comply with the statutory rules, notice in writing is to be handed to or sent to the owner, master or agent of Form

Surveys 70 pointing out the deficiency and indicating what is required in order to remedy it. All defects must be made good to the satisfaction of the Surveyor, but every endeavour should be made to prevent unnecessary delay or inconvenience to the ship. It is probable that detention will be necessary only in exceptional cases, but a ship should be detained if it is clear that the rules are not being complied with and that compliance cannot be obtained by any other The Surveyor must act very largely on his own responsibility. In doing so he must use his discretion and relate his course of action to the magnitude and importance of any defects in the equipment as well as to all the other circumstances of the case. For example, he may allow a ship to depart for another port in the United Kingdom if, in his opinion, any defects which there may be in the lifesaving appliances are not so serious as to make the voyage unsafe and if he has no reason to apprehend delay or to doubt the good faith of the owner or the master in complying with the rules. The statutory procedure on finding the lifesaving appliances defective is set out in Section 431 of the Merchant Shipping Act, 1894 (see Appendix A).

In all cases in which the lifesaving appliances of a ship registered in the United Kingdom are found not to comply with the statutory rules a full report of the case should be forwarded immediately to the Board of Trade, and the ship should be, if necessary, detained pending instructions.

If a vessel is permitted to proceed to another port in the United Kingdom before the requirements are complied with, the Surveyors at that port should be informed as to the nature of the defects to be made good and they, in turn, should report to the Board of Trade what action is taken in the matter.

- (2) Ships registered outside the United Kingdom.—Surveyors should be guided by the instructions in paragraph 7.
- 11. Detention.—When it is necessary to resort to detention a notice on Form Surveys 67 should be sent to the Collector of Customs requesting him to detain the vessel. As soon as the statutory rules for lifesaving appliances have been complied with, a notice to release the vessel should be sent to the Collector of Customs on Form Surveys 68.

Whenever detention of a foreign ship takes place or is likely, the nearest Consular Officer of the country to which the ship belongs should be notified of the circumstances.

12. Fees.—The fees in respect of inspections of lifesaving appliances either during construction or on board ship, are contained in the List of Fees and Expenses.

- 13. General.—(1) Acceptance of alternative appliances or arrangements.-The Board of Trade have power to accept an appliance or arrangement in place of one required in these Instructions provided that it is equally effective. case in which it is proposed to substitute a different arrangement or appliance for the one specified in these Instructions should be submitted to the Board of Trade for consideration. In this connection the Board do not intend to enforce rigid adherence to these Instructions in matters of detail provided that the required standards of strength, safety, efficiency and durability are fully maintained. Where, however, any material departure from the arrangements indicated in these Instructions is proposed, full particulars should be submitted to the Board's Surveyors at as early a date as possible in order that the proposals may be considered before any work is put in hand. Neglect of this precaution may entail expense and delay, and its observance is particularly important in relation to the appliances of new ships and to boat stowage arrangements.
- (2) Alterations in approved appliances.—If a boatbuilder or shipbuilder or maker of special davits or shipowner desires to make any alteration in any appliance after it has been surveyed, tested and approved by a Board of Trade Surveyor, he must first submit details of the proposed alteration through the Surveyor to the Board of Trade for approval.
- (3) Testing of lifesaving appliances.—It is to be clearly understood that where these Instructions require a boat or other lifesaving appliance to be submitted to tests in the presence of a Board of Trade Surveyor, the responsibility for taking the necessary measures to ensure the safety of the persons present, as well as that of the boat or appliance, rests with the boatbuilder or shipowner.
- (4) Musters and boat drills.—Attention is drawn to the fact that under the Merchant Shipping (Musters) Rules, 1933 (S.R. & O., 1933, No. 1202), arrangements must be made on all sea-going British passenger steamships registered in the United Kingdom, other than steamships carrying passengers in pursuance of a passenger certificate entitled "Passenger Certificate for a vessel plying for short distances to sea ", for musters of the crew to take place weekly, when practicable, to ensure that the crew understand and are practised in the duties allotted to them for the event of an emergency. The master of every ship to which the Muster Rules apply must prepare a muster list showing in respect of each member of the crew the special duties which are allotted to him and the station to which he shall go in the event of an emergency. The muster list must also specify the signals to be used for calling the crew to their stations

in an emergency. Further, under Section 9 of the Merchant Shipping Act, 1906, the master of every British ship must keep a record in the Official Log Book of every occasion on which boat drill is practised and the lifesaving appliances examined. Under Section 5 of the Merchant Shipping (Safety and Load Line Conventions) Act, 1932, the master must also make an entry in the log if, in the case of a passenger steamer, boat drill is not practised on board the ship in any week. There are no statutory requirements as to the manner in which the periodical boat drill must be carried out, but standard regulations for the guidance of masters as to musters and drills have been issued by the Board of Trade as follows:—

Notice No. 133.—Standard Regulations as to Musters and Drills on Passenger Ships (including modified regulations applicable to passenger ships on restricted voyages as well as the regulations for ocean-going passenger steamers).

No. 133A.—Standard Regulations as to Musters and Drills on Cargo Ships.

These regulations are printed in Appendix B to these Instructions. Surveyors should take such opportunities as occur to satisfy themselves that the requirements in respect of musters and boat drills and the periodic inspection of lifesaving appliances are being observed.

CHAPTER II.—BOATS.

PART I.—GENERAL.

14. Large Lifeboats.—The instructions contained in this Chapter, except where otherwise expressly indicated, are to be regarded as applying to boats constructed to carry not more than 85 persons.

The construction of boats to accommodate more than this number of persons is a recent development, and it is not at present considered desirable to specify the constructional requirements of these boats in detail. It is, therefore, necessary that full particulars of any proposals in respect of boats which are to be constructed to accommodate more than 85 persons should be submitted for approval before their construction is commenced.

Paragraphs 19, 28, 35, 68, 107, 129, 130, 134 contain references to large lifeboats. It is strongly recommended that all boats constructed to carry 85 to 100 persons should be fitted with some approved auxiliary means of propulsion. All boats constructed to accommodate 100 or more persons must be motor-boats (Rule 32 (2)).

- 15. Construction.—When inspecting lifeboats during construction or repair, Surveyors are to see that all the statutory requirements affecting the construction of lifeboats are complied with or that any departures from those requirements have been approved by the Board of Trade.
- 16. Survey during Construction.—All lifeboats under construction, whether for passenger or for non-passenger vessels, should be inspected at the boatbuilders' works on the shipowner's or boatbuilder's application.

Surveyors should impress upon shipowners and boatbuilders the importance of making applications for survey in good time, as boats cannot be certified unless adequately inspected in bright condition. If for any reason whatever a boat, which has not been fully surveyed and certified on the boatbuilders' premises, is completed and placed on a ship, Surveyors are to require the paint to be scraped off and air cases and cleading removed in order that the boat may be thoroughly examined before being certified.

In carrying out the survey, Surveyors should be careful to see that only seasoned materials are used and that the fastenings are satisfactory.

The proper fastening of the planking of ships lifeboats is a matter of great importance and special attention should be n id to the character of the fastenings. The practice of fastening off the timbers and planking wherein the nail roove is so driven and the nail point cut off in such a manner that the nail is crippled and bent in the comparatively soft wood is not to be permitted. It is difficult to keep tight the seams of boats so fastened, and hardening up the nails is only a temporary palliative. Surveyors should see that the rooves are only driven on by means of a roove punch held in the direction of the length of the nail and that the surplus length of nail is cut off by means of pliers or nippers. Builders should understand that boats cannot be passed where the rooving, cutting and clenching of the nails is carried out in such a manner as must inevitably yield crippled fastenings. All short nails, unclenched and badly clenched nails for fastening the planking are to be replaced by efficient fastenings.

The term "through fastenings" as used throughout these instructions means that such fastenings are to be clenched or nutted. The use of screws is to be permitted only when specifically authorised by these Instructions. They are to be allowed as an alternative to through fastening only where the use of through fastenings is not practicable or desirable. Fastenings into end grain timber are to be avoided.

Surveyors should make as many inspections of boats during construction as practicable, four such inspections being

regarded as the minimum.

When a boat is certified on completion at a boatbuilders' yard, a report of the inspection on Form Surveys 123a should be issued. When a boat is unduly retained in stock after the issue of Form Surveys 123a, measures should be taken by the builders or owners to keep the boat in good condition. Surveyors when visiting boatbuilders' yards are to call attention to this matter if they see any boats that appear to have been in stock for a long time.

17. Marking of Lifeboats.—When the Surveyor has satisfied himself that the construction of a new lifeboat is in accordance with these Instructions and is in all respects satisfactory, he is to see that the boat is permanently marked by the boatbuilder as required by Rule 31 (1). When this is done the marking should be completed, for purposes of identification, by addition of the Surveyor's initials, the date and T. The complete marking should be cut on the stem or sheerstrake on one side of the boat, and the number of persons should also be cut on the other side.

PART II .- OPEN LIFEBOATS.

18. Form and Proportions.—Lifeboats of unusual form or proportions should receive special attention, and if the Surveyor is in doubt as to the stability, the sufficiency of the freeboard, or the seating accommodation of any boat, he should require it to be tested affoat with the full complement of persons and equipment on board to satisfy himself that it complies with Rule 21 (2) (b).

If the freeboard is sufficient, the thwarts and side seats comply with Rule 21 (3), portable lower seats are provided as required by paragraph 25 and Appendix C, and if the proportions and form of the boat are in accordance with the following Sections (a) and (b), ample stability will, in general, be assured and no stability test need be made. provided the Surveyor is personally satisfied that the boat is built in accordance with the Rules and the Board's Instructions.

(a) Proportions.—For a boat of standard form and dimensions, measured in accordance with the Fifth Schedule of the Rules, the breadth should not be less than as follows:-

For boats 24 feet in length or over-

For boats 22 feet in length or under-

Breadth in feet = $\frac{Length \ in \ feet + 7}{4}$

For boats between 22 feet and 24 feet in length— Breadth = 7 feet 6 inches.

The breadth, measured in accordance with the Fifth Schedule of the Rules, may exceed that given by the preceding formulæ by not more than 3 inches for boats under 24 feet in length or 6 inches for boats 24 feet in length and over.

If, however, it is proposed to construct a lifeboat of abnormal breadth, i.e., if the breadth measured under the Fifth Schedule of the Rules is to exceed the minimum breadth as obtained by the above formulæ by more than the above allowances, the proposed dimensions should be submitted for the Board's approval, with the owner's reasons for adopting them, before work is commenced on the boat.

The depth should not be greater than as follows:-

For boats 24 feet in length or over-

Depth in feet = .42B

For boats under 24 feet in length-

Depth in feet = .40B

where B equals the breadth measured in accordance with the Fifth Schedule.

The depth used in calculating cubic capacity must not in any case exceed 45 per cent. of the breadth (see Part I (2) of Fifth Schedule).

(b) Form.—The breadth of boat measured to outside of planking at a waterplane situated at a height of one-half the depth of the boat (see Part I of the Fifth Schedule), above the inside of the planking, should be equal to the breadth measured under the Fifth Schedule multiplied by factors within the following limits:—

Breadth of waterplane amidships .96 to 1.00.

Mean breadth of waterplane at one-fourth the boat's length forward and abaft of amidships .77 to .86.

All boats should be constructed with a rise of floor of 6 inches in 4 feet.

When the proportions of any Class 1 or Class 3 boat do not comply with these conditions, and the Surveyor is in doubt whether the boat has ample stability as required by the Rules, he should refuse to certify the boat unless and until it is tested affoat with weights corresponding to the full complement of persons and equipment. In all such cases full particulars of the test are to be reported to the Chief Ship Surveyor.

With a view to improving the speed and handiness in a seaway of lifeboats which are specially intended to serve also as accident boats under Paragraph 209 such boats may be built of somewhat finer form than that determined by the above factors and rise of floor, provided the proportions approximately conform to those set out in the preceding Section (a) and reasonable stability is assured. When certifying such lifeboats, the Surveyor should add the words "Accident Boat" on the form Surveys 123a.

For the convenience of shipowners, boatbuilders and surveyors, the following Table has been prepared indicating suitable dimensions for boats varying from 16 feet to 30 feet in length. It will be observed that in this Table the breadth proportion follows the Rule exactly, whilst the depth proportion gives a suitable margin below the maximum proportion of depth to breadth laid down in the Rule. The capacity shown is that ascertained by the Rule L \times B \times D \times 6.

L		В		D	c. ft.
30.0	×	9.0	X	3.75	= 607
29.0	×	8.75	×	3.6	= 546
28.0	×	8.5	×	3,5	= 500
27.0	×	8.25	×	3.4	= 454
26.0	×	8.0 -	×	3.25	= 405
25.0	×	7.75	X	3.15	= 366
24.0	×	7.5	×	3.0	= 324
23.0	×	7.5	X	2.9	= 300
22.0	×	7.25	×	2.75	= 263
21.0	×	7.0	X	2.7	= 238
20.0	×	6.75	×	2.6	= 210
19.0	×	6.5	×	2.5	= 182
18.0	×	6.25	×	2.4	= 162
17.0	×	6.0	×	2.35	= 143
16.0	•×	5.75	X	2.3	= 127

A. WOODEN OPEN BOATS OF CLASSES 1 AND 3.

19. Structural requirements.—In order that the requirements of the Rules may be complied with, a specification relating to the construction of wooden open boats of Classes 1 and 3 up to 30 feet in length has been drawn up for the guidance of the Surveyors and is set out in paragraphs 20-42.

The requirements of the specification and the Table of Scantlings, Appendix C, are to be complied with in all new wooden open boats unless some other arrangements are approved by the Board of Trade as being equally efficient.

When wooden lifeboats are designed to be certified for more than 85 persons they should be carvel built with planking worked on the diagonal system and fitted in two thicknesses. In lifeboats for more than 60 but not more than 85 persons the foregoing system of construction is also recommended, but, where it is desired to adopt the clincher system of construction, additional transverse and longitudinal stiffening, particulars of which should be submitted for the Board's approval, should be introduced to compensate for the increased weight of persons.

In all cases of boats of unusual type or proportions full particulars of the construction and scantlings must also be submitted for approval.

- 20. Quality of Materials.—The whole of the timber is to be of the best quality, well seasoned, free from sapwood, shakes and objectionable knots. Surveyors should impress upon boat builders that, where decay is present in a log or plank, any timber used in the construction of a boat should be cut not less than 12 inches in the direction of the grain beyond all visible evidence of decay in order to eliminate the fungus strings which extend beyond this area.
- 21. Stems, Sternposts, Keels, Hogs, &c.—Stems, sternposts, aprons, deadwoods and knees are to be of materials specified in Appendix C with no short grain or shakes, and any part having considerable curvature must be grown to form. The stem and sternpost are to be rabbeted to take plank ends and form an efficient stop for the caulk. The length of the rabbet must not exceed the thickness of the plank.

Aprons must be moulded in accordance with the tables in Appendix C and must be of sufficient siding to ensure a 3-inch faying surface and to receive the double fastenings of the hooded ends.

The deadwoods are to be of the scantlings shown in the table in Appendix C and are to scafph properly with the apron and keelson. The timbers are to be checked into the deadwoods and cavities filled with marine glue to form a watercourse. See also Appendices E (1) and E (2).

The keel and hog piece must be oak, teak or American elm, and the keel is required to be in one length.

The scarphs connecting the stem and sternpost to the keel may be either vertical or horizontal. The vertical scarphs should be secured by five clenched nails, and the horizontal or flat scarphs properly lipped and secured by at least two through fastenings. Ordinary tenons must not be accepted as equivalent to scarphs. The heads of stems and sternposts should not project above the gunwale more than is necessary to take properly the through fastening in the upper breasthook, and they should be so shaped as to facilitate clearance should the boat be fouled by a rope or wreckage.

Stem bands must be of galvanised wrought iron and should extend from the breasthook over the stem head to the keel plate or 2 feet abaft the scarph. See Table of Scantlings, Appendix C.

22. Planking.—In clincher-built boats the extreme breadth of the plank is not to exceed 5½ inches except in the four strakes next to the keel, which may be as follows:—Two at 7 inches, one at 6½ inches, and one at 6 inches. In boats 18 feet in length and under, these breadths may require to be reduced about an inch.

The planks should be in as long lengths as possible, with an efficient shift of butts and there must be at least two passing strakes between butts in the same timber space.

The landings must not be less than # inch in breadth.

In carvel built boats having two thicknesses of planking the requirements of paragraph 46 so far as they are applicable are to be complied with. The planking should be of teak, Honduras mahogany, oak or other approved hardwood. The width of the hog piece is to be suitably increased above the requirements of Appendix C, where diagonal planking is fitted, to ensure efficient fastening of the plank ends.

- 23. Timbers.—Timbers should be of materials as specified in Appendix C, bent to shape and fitted in one length from gunwale to gunwale, except at the extreme ends of the boats. The spacing of timbers must not exceed 6 inches centre to centre, except where the scantlings of the timbers or the thickness of the planking is in excess of the requirements of Appendix C, or additional transverse binding is fitted, in either of which cases full particulars are to be submitted for the Board's approval. The spacing of the fastenings in the edges of the planks in clincher built boats should not exceed 34 inches and in carvel built boats 3 inches. Where the Surveyor is not satisfied with the transverse binding across the keel he should require a sufficient number of floors to be fitted and properly secured. No timbers broken in the grain should be allowed, and in the event of a timber being found broken or sprung, the Surveyor should require it to be taken out and renewed.
- 24. Keelsons, Bilge Stringers, Risings, Gunwales, &c.—Keelsons must be in one length and overlap the deadwoods so as to take the sling plates. A substantial hardwood chock should be well secured to the keelson to form a mast step; the keelson must not be cut for this purpose.

The bilge stringers and risings should be in one length wherever possible, and either through fastened at each timber or fastened at each timber with a brass screw. Where fitted in more than one length they should be scarphed at the butts and secured by clenched fastenings

through filling pieces and the outside planking.

In boats 25 feet in length and over, the heads of the timbers are to be carried up and connected through the sheer-strake and gunwale to form a "box gunwale" which should be fitted with a capping as shown by the sketch, Appendix E (2), well screwed into the gunwale and sheerstrake.

Provision should be made for double banking the oars at

each rowing thwart in all boats.

Chocks or iron knees fitted to take the steering oar should be through fastened to the gunwale.

25. Thwarts, gangboards, sidebenches, lower cross seats, stretchers, stanchions, bottom boards, plugs, &c.—The number of thwarts must not be less than the number given by the following table, viz.:—

No. of thwarts. Lifeboats, 18 feet in length and under Lifeboats, over 18 feet and not above 24 feet in length Lifeboats, over 24 feet and not above 28 feet in ••• length ... • • • • • • ... Lifeboats, over 28 feet and not above 30 feet in length

Rule 21 (3) requires that all thwart and side seats shall be fitted as low in the boat as practicable and that the bottom boards shall be fitted so that the thwarts shall not be more than 2 feet 9 inches above them. Rule 28 (2) requires that proper seating accommodation shall be provided for all persons the boat is deemed fit to carry.

The distance of the top of the thwarts below the top of the gunwale should be at least as follows:—

Lifeboats, 22 feet in length and under ... 9
Lifeboats, over 22 feet and not above 28 feet ... 10
Lifeboats, over 28 feet and not above 30 feet ... 11

The thwarts should be scored over the timbers and directly attached to the rising by means of two screws at each end. Gangboards are to be of the same dimensions and materials as the thwarts and to be through fastened to the thwarts and cross pieces.

Mast clasps are to be secured to thwarts by through fastenings.

The casing enclosing the internal buoyancy tanks should be fitted in short gates between the thwarts, and must be of sufficient strength under the thwarts to support the latter efficiently. In all boats where the unsupported length of the thwarts exceeds five feet, stanchions well connected to the thwart and to the side of the keelson should be fitted. (For thwart knees and their fastenings see paragraph 26.)

The side benches should be continuous and fitted in as long lengths as possible; they should not be removable, but should form part of the permanent structure of the boat.

Where alternative arrangements for the inspection of the buoyancy tanks are proposed, the longitudinal strength should not be less than that obtained by the foregoing arrangements.

In boats of Class 3 seating must also be provided by side benches in addition to the thwarts and stern sheets in order that the occupants may be distributed throughout the boat.

In boats over 20 feet in length where lower cross or side seats are required to be fitted, such seats must be well secured and supported. They should be placed as low as practicable. (See Appendix C.)

Stretchers or lower cross seats of sufficient size and strength are to be fitted in suitable positions for the efficient rowing of all boats.

In boats 24 feet in length and above, lower cross seats are to be so placed that the oarsmen can use them as stretchers, and they must be portable to enable injured persons to be laid on the bottom of the boat. All lower seats and bottom boards are to be made readily portable, and so arranged that the plugs are at all times directly accessible without removing any fitting.

The plugs are to fit the plug hole properly, and the lanyards or chains to be securely attached to the boat by means of screws.

26. Thwart Knees.—The knees are to be of wrought or stamped iron, galvanised, 11 inches thick at the throat, of the siding shown in Appendix C, and fitted to the satisfaction of the Surveyor.

In boats over 24 feet in length, the knees should be double, or, in lieu thereof, iron knees of special design may be adopted, the same being hooked over and well fitted to the gunwale and secured by double palms to the thwarts.

In boats 24 feet in length and under, knees of convex iron may be fitted of the scantlings shown in Appendix C, the radius of the curvature at back of knee being not less than 3 inches. (See Appendix E (3).)

The knees are to be connected to the side of the boat and to the thwarts by at least two through fastenings in each arm. Nut and screw bolts are recommended for this purpose. The bolts should be cupheaded, and the nuts securing the

horizontal arm of the knee hove up on plate washers on the under side of the thwarts.

In boats 26 feet in length and under bolts are to be inches diameter, in boats over 26 feet in length they are to be inches diameter. Any additional fastenings may be stout screws but spike or wire nails are not to be allowed. A hardwood chock 3 inches wide is to be fitted between knee and side of boat to receive knees and fastenings of sheerstrake.

27. Breasthooks.—The sides of the boats at the ends must be well bound together across the middle line, the breasthooks being of sufficient number and size, having regard to the dimensions and form of the boat.

The arms are to extend along the sides of the boat for at least two timber spaces and are to be through fastened by two bolts in each arm and one through the throat.

The breasthooks must be of galvanised iron, or British oak grown to form.

28. Rubbers, Filling Pieces, Fenders, Bilge Keels and Keel Rails.—Fore and aft rubbers are to be fitted to all boats and are to be of the scantlings specified in the table of scantlings (Appendix C) and through fastened at alternate timbers.

All clincher-built wood boats are to have filling pieces for about one-third of the boat's length amidships fitted against the projecting plank edges from the gunwale to the bilge to prevent the plank edges from fouling the plate edges of the ship or similar projections when the boat is being lowered.

As an alternative vertical rubbing pieces may be fitted.

In all boats intended to accommodate more than 85 persons, vertical fenders, extending from the gunwale down to the bilge, are to be fitted to facilitate launching on the high side of a listed ship. These fenders are to be sufficient in number to prevent damage to the boats when being lowered. If the fenders are of wood they are to have cope iron fitted to the outside edges.

Particulars of any proposed arrangements, including alternatives such as skates or rollers temporarily secured to the boat to prevent it from being damaged and to facilitate launching, are to be submitted for the Board's approval.

A useful addition to open boats to enable persons to cling to an upturned boat is to fit hardwood bilge keels, having holes cut at intervals to form suitable hand grips, under the turn of the bilges, or suitable keel rails or other equally satisfactory appliances of an approved type. These bilge keels or keel rails are to be fitted in all new boats, the hand grips being suitably placed in each case having regard to the dimensions of the boat.

Bilge keels should extend from amidships to, but clear of, the chocks and should be secured to a doubling plank well fastened to the bottom planking and timbers, care being taken that the bilge keels will clear all obstructions when the boat is swung out. The bilge keel fastenings must not penetrate the bottom planking.

29. Middle line and gunwale fastenings.—Fastenings of the keel, stem and sternpost, aprons, knees, keelsons or deadwoods must be through fastenings wherever practicable, and, where not practicable, long screws. There should not be less than four through fastenings in the deadwood at each end of the boat. Dump fastenings are not to be used.

The hog is to be secured to the keel by galvanized screws 6 inches apart, and the keelson to the keel by through fastenings 24 inches apart. Through bolts are to be 1 inch diameter for boats 24 feet in length or under and 1 inch diameter for boats above 24 feet in length. In boats over 24 feet in length the hog may be in two pieces provided it is scarphed to the satisfaction of the Surveyor.

Box gunwales are to be through fastened at every timber and solid gunwales are to be secured with at least five through fastenings between each pair of thwart knees and strengthened by check pieces in way of the rowlocks. All gunwales when not fitted in one length must either have lipped or table scarphs, and the scarphs of gunwale should be kept, if possible, beyond the midship half length of the boat and well clear of the scarphs of the sheerstrake planks. Filling pieces are to be fitted behind the scarphs of box gunwales and the scarphs fastened through the outside planking.

- 30. Plank Fastenings.—All plank fastenings in wooden boats are to be of the best wrought copper of sufficient length and gauge (Appendix C), and those in the plank edges, scarphs and timbers properly clenched on rooves. One fastening is required between the timbers in each edge of each plank, subject to a maximum spacing of 3½ inches in clincher built boats. The hooded ends and scarphs of planking are to be double fastened, the former as shown in the Table of Scantlings, Appendix C, and the latter by not less than five clench-nails in each row.
- 31. Lifting Hooks, General.—All lifting hooks fitted in open boats must be of the fixed type unless an approved disengaging gear is fitted. If some other type of hook is desired special application for approval must be made. (See Chapter III.)

The hooks are to face amidships and the hook bolts are to be fitted square to the keel, so that they will be in a vertical line with the falls when the boat is slung on an even keel. Means are to be provided to prevent the hooks from turning.

In cases where, owing to difficulties in stowage, the lifting hooks are considerably out of alignment with the falls when the boat is in the chocks, or where turning out gear is fitted, and the securings of the hook and gangboard are subjected to undue stresses, type A keel plates (see Appendix D) should be used and the gangboard plate slotted sufficiently to allow the lifting hook to adjust itself to the oblique position of the falls.

When lifting hooks are required to be so near the ends of the boat that they cannot be substantially connected to the keelson and keel, the base of keel plate should be curved to fit the deadwood and keelson and be secured by not less than four bolts. The combination of stem, apron, deadwood and breasthook should of such strength as will prevent the boat from being strained when it is lifted, and details of the arrangements in such cases are to be submitted to the Board for approval.

When an arrangement of sling bars, with attachments to the keel stem and stern post, and lifting hooks, is fitted in lieu of hooks formed from single bars, the proportions of all parts taking the weight of the boat must be such as to provide a factor of safety of five and the arrangement must be strong enough to carry the weight of the boat, equipment and full complement of persons with that factor.

The arrangement of slings and attachments must be such that each part will bear its appropriate proportion of the load and that the boat will not be strained when it is lifted. The sling rods, etc., are to be proof-tested to 2½ times their working load, and the hooks are to be in accordance with the requirements of paragraph 32. Details of such arrangements are to be submitted to the Board for approval.

Surveyors are to impress upon shipowners and boatbuilders the necessity for taking reasonable precautions to ensure that the lifting hooks and arrangements provided in all boats, including working dinghies, etc., not forming part of the statutory life-saving equipment, are of ample strength for the purpose intended. Further, shipowners and boatbuilders should be advised to fit all lifting hooks in boats to the standard laid down in Appendix D.

- 32. Dimensions and tests of lifting hooks.—(1) Lifting hooks are to conform to the requirements of Appendix D, according to the total weight of the boat, its occupants and equipment.
- (2) The Tables in Appendix D have been framed for hooks of circular section, but independent designs of hooks and keel plates may be submitted for approval with a drawing

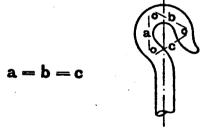
of the proposed hooks and a table of dimensions for boats of different sizes provided two specimens of each size of hook have been tested at an approved testing house in the presence of a Surveyor as follows:—

Each sample hook is to be tested by small increments and the deflections measured with the load on and off, so that the elastic limit of strength or yield point can be accurately obtained. The load must then be increased gradually until the ultimate strength is reached. The factor of safety between the dead working load and the ultimate strength must not be less than five

(3) Lifting hooks are to be of "best-cable" quality iron or mild steel of suitable quality.

Each lifting hook is to be tested to a proof load equal to 11 times the total weight of the boat for which it is intended, including equipment and full complement of persons, and must show no sign of permanent deflection or injury under this load. The test should, normally, be witnessed by a Surveyor, but the certificate of testing of the Superintendent of an approved testing house may be accepted provided it indicates the actual load applied, particulars of the identification marks, and certifies that the hook on examination after testing did not show any defect or permanent deformation.

As there is some difference in practice as regards the measurement of deflection in the hook, for the sake of uniformity Surveyors are to place their gauge marks as illustrated below.



The test load is to be stamped on the toe of each hook and the Surveyor's initials are to be added. When the tests have been carried out at an approved testing house and have not been witnessed by a Surveyor he is to ascertain the test load from the certificate produced by the boatbuilders and have it stamped on the hook after verifying that the identification number is the same as that on the certificate. He must then add his initials to the marking.

The bars from which steel hooks are formed are to be of mild steel and stamped with the maker's name and brand. The Surveyors are to require occasional tensile and bend tests to be made from such steel bars to ensure that the material is of sufficient strength and ductility.

No part of any lifting hook, whether of iron or steel, is to be welded unless the Board's approval has been first obtained, and approval will be subject to an incremental test of every such hook and an increase in the factor of safety. All lifting hooks, whether of iron or steel, are to be carefully annealed after forging.

Drop forged iron lifting hooks are frequently found not to have sufficient ductility and tensile strength due to the comparatively high temperature of the material during the process of forging. Where this type of hook is to be fitted, in addition to the usual proof load test to which each hook is subjected sample hooks are occasionally to be selected from stock and subjected to a destructive test as required by sub-paragraph (2) above. If the results are not satisfactory or do not show a factor of safety of five they are to be reported to the Chief Ship Surveyor for consideration.

As a rule drop forged mild steel hooks which are satisfactorily proof tested may be accepted, but if the Surveyor has any doubt as to the duetility and tensile strength of such hooks he may require an occasional test to be carried out on a sample hook in the manner indicated by subparagraph (2) above.

33. Connections of lifting hooks to keel.—The keel connections are to comply strictly with the types shown in Appendix D for boats of different sizes unless other equally efficient arrangements are provided. The heads of the keel plate securing bolts are to be forged with ample bearing surfaces, and must bear on a substantial plate fitted to, but not let into, the underside of the keel.

Keel plates which are built up by welding are not to be accepted. As these plates are the means of attachment of the lifting hooks to the keel they are subject to like strain and must be of equal efficiency.

Sling hooks depending for their security upon a clenched head alone are not to be passed in future, nor is any existing boat to be accepted in which the scantlings of the keel plates and connections are so far below the standard of these instructions as to jeopardise the safety of the boat and its occupants.

34. Sling Arrangements.—If chain slings are fitted they are to be in accordance with the instructions in paragraph 50.

35. Internal Buoyancy.—Air cases forming internal buoyancy of lifeboats are to be constructed of best quality copper or yellow metal of not less than 18 oz. to the superficial foot, or of other durable material approved by the Board of Trade.

In lifeboats of Class 1 the air cases are required to be so placed in the boat as to secure stability when fully laden under adverse weather conditions. To comply with this requirement the whole of the air cases are as a general rule to be placed along the sides of the boat and are to be as wide as practicable in order to secure the maximum stability possible when the boat is partially swamped. If, however, it is not practicable to fit all the air cases required along the sides a proportion may be fitted in the ends, but not in the bottom of the boat. In large lifeboats there may be some difficulty in obtaining the most favourable disposition of the air cases, and such cases are to be referred with full particulars to the Chief Ship Surveyor.

Copper and yellow metal air cases are to be made with proper hook joints not less than § in. in width, hammered well down and soldered, and no other joint is to be passed unless specially approved by the Board of Trade. Double hook joints must be fitted to the longitudinal seams of air cases, but single hook joints may be passed for the ends.

When sheets of corrugated copper or yellow metal are used, these are to be carefully annealed before being made into air cases as a precaution against cracks developing in the way of corrugations at the seams or edges of the air cases where the metal is likely to be unduly distressed.

When yellow metal is used the Surveyor is to take whatever steps are practicable to satisfy himself that the material is of satisfactory quality, free from cracks and other defects, and of the required weight per superficial foot. The sheets from which air cases are made are to be stamped with the maker's name or mark and weight per superficial foot.

It is advantageous to coat copper and yellow metal air cases with boiled linseed oil or a good varnish, but the metal should be thoroughly cleaned before applying the coating (see para. 43).

Zinc and galvanised iron are not considered durable material for air cases and are not to be passed, nor are iron or steel plates having a copper deposit on their surfaces.

No air case may exceed a length of four feet, and metal air cases exceeding 3 feet 3 inches in length, if not constructed of corrugated sheets, are to be strengthened by fitting an internal disphragm at the middle of the length. An internal diaphragm should also be fitted at the middle of the length of each air case where the perimeter exceeds 5 feet.

The diaphragm should, preferably, be of metal, like the cases, suitably flanged and soldered at the sides, but a wooden framework may be fitted provided it is secured in place by angle lugs soldered to the casing. In no case are the air cases to be pierced in order to fasten the diaphragm or for any other purpose.

36. Measuring and Testing of Air Cases.—It is the practice in many ship and boat-building yards to ascertain the volume of air cases and at the same time test them for watertightness by submerging them in a specially constructed tank of water. The tank is of rectangular shape. The horizontal internal area is usually 12 sq. ft. (4 ft. by 3 ft.), and a brass sliding scale marked in inches, decimally divided, is attached vertically on the inside near the water level. The volume of an air case is ascertained as follows:—

A wooden grating with pig-iron weights is suspended from a crane and immersed in the water. The zero mark on the scale is placed at the new water level and the grating removed. The air case to be tested is then placed in the tank and the weighted grating again lowered until the air case, grating, and pig-iron weights are all submerged. The scale reading at the water level then represents the volume of the air case in cubic feet.

Where such tanks and facilities are provided, no objection need be taken to this method of ascertaining the volume of air cases, subject to the following:

- (a) The horizontal area of the testing tank is not to be unduly large, otherwise the scale marks will not be sufficiently open.
- (b) The Surveyor must satisfy himself by testing a rectangular body of known volume, or in some other manner, that the scale divisions are correct, and take the precaution at each experiment of wetting the scale to prevent the formation of the capillary curve and to enable correct readings of the water level to be made.
- (c) The mean dimensions, length, breadth, and depth, and the ascertained volume of each air case, are to be recorded for reference purposes.

Air cases may also be tested for tightness by air pressure and in such cases the test holes are to be filled up and soldered over after completion of the tests. The use of screwed plugs in test holes is not permitted. 37. External Buoyancy.—The external buoyancy of Class 1 (b) lifeboats is to be of the volume required by Part I of the Fourth Schedule to the Rules, and should be secured to the boat in such a position that its lower edge amidships is a few inches above the load water-line of the boat. It should be in three-lengths on each side of the boat and made portable, and should be made of slabs of cork as large as possible, well pinned to each other and to a backboard. Its form in section should be such that it will not be liable to be torn away by contact with the ship's side when the boat is being lowered, and its shape should be maintained and the fender strengthened by means of wood sectional diaphragms.

The cork or other buoyant material must be covered with a good quality waterproof canvas and well painted. 'The external buoyancy should be secured by means of galvanised iron straps about 3 inches by inch, with strong hinges at the top and bottom, and spaced not more than 2 feet 6 inches, and so arranged as to support properly the butts of the several lengths. The hinges should be secured to battens on the boat by at least two screws, in such a manner as to allow an air space between the boat's side and the buoyancy, but care must be taken to prevent the skin of the boat from being pierced by the hinge fastenings. Any other equally efficient means of securing the buoyancy will be allowed provided it has first been submitted for the Board's. approval.

- 38. Caulking.—The garboard seams and hood ends are to be properly caulked with at least two threads of cotton, and the seams well filled with the best white lead.putty. Stopwaters must be fitted where necessary.
- 39. Iron fittings, etc.—All necessary bands, travellers, tack hooks, steps, eyeplates, eyebolts, cleats, etc., are to be fitted for the mast and sail, rudder, oars, grab lines, painter, etc., and with the exception of lifting hooks all exposed ironwork is to be properly galvanised, unless made of approved non-corrodible material. Galvanising of thwart knees and breasthooks need not be insisted upon provided those fittings are well bedded and coated with thick red lead paint.
- 40. Painting.—After inspection and approval all wood boats are to have at least two coats of the best lead paint inside and three coats outside. Those parts of the boat which are not readily accessible after construction such as deadwoods, hogpiece, filling pieces, etc., should be either impregnated or thoroughly treated by brush applications with creosote, or other suitable timber preservative.

41. Strength and flotation tests.—If scantlings are adopted which, in the opinion of the Surveyor, fall below those shown in Appendix C, and there is any doubt as to the strength of the boat, the Surveyor is to require the boat to be suitably tested for strength and flotation, as indicated in paragraph 56 (1) (a) and (b), whether the boat is intended for a passenger ship or not.

If the boat when tested shows signs of weakness or of leakage when affoat in the loaded condition, the Surveyor is to refuse to pass the boat until it is sufficiently strengthened and made entirely satisfactory.

42. Boats' Covers.—If boats' covers are provided they are to be of canvas supported by suitable ridge poles stayed to the gunwale on each side. Lacing buttons of brass should be fitted at the underside of the rubber, or other satisfactory means for securing the covers provided.

Wood covers are not to be accepted in passenger ships. If it is proposed to fit them in cargo ships full particulars showing the arrangements for fitting, securing, and releasing them are to be submitted for approval.

43. Periodical Inspection.—The Surveyors should impress on masters and owners of ships the necessity of frequently inspecting and hose testing boats with a view to keeping them in a sound, seaworthy condition. Advantage should be taken of any long stay in port to put the boats afloat in order to test their watertightness.

When carrying out the boat lowering tests prescribed by paragraph 221 in connection with the issue of a passenger certificate, or, as regards a cargo ship, in connection with the issue of a report of inspection of life saving appliances on Form Surveys 123, the Surveyor should examine the lifeboats for deficiency in watertightness arising from structural defects or from damage.

In the case of ships under survey for a passenger certificate, or for the issue or renewal of a report of inspection of life-saving appliances (Form Surveys 123), all the boats must be lifted clear of the chocks and the inside and outside of each carefully examined.

For the purpose of this examination in ships being surveyed for St. 1 or St. 2 passenger certificates (whether or not in conjunction with a Safety Certificate) the air cases need not as a rule be removed at each survey from more than half of the number of boats, provided that the Surveyor is otherwise satisfied and that a complete examination of the air cases of all the boats is made at intervals of not more than two years. If, however, the Surveyor

considers it necessary he should require a larger proportion of the boats to be opened out and the air cases removed at any survey.

In the case of ships being surveyed for St. 3, 4 or 5 passenger certificates the air cases are to be removed at each survey from all the boats carried.

In the case of an inspection of the life-saving appliances where the issue, renewal or endorsement of the Form Surveys 123 is required, the air cases are to be removed from all the boats. On a ship which is to resume service after having been laid up, particular attention is to be given to the boats, which may have deteriorated by neglect, and the Surveyor should in such cases use his discretion as to the removal of air cases or the taking of any other steps which he may consider necessary to satisfy himself as to the condition of the boats.

If any portion of the hull of a boat is found defective it must be renewed or repaired and the boat made thoroughly watertight, the fastenings being hardened up if necessary, and the inside seams payed with a thin paint. In the case of new boats which have been inspected during construction the Surveyor should exercise his discretion as to the necessity of removing the air cases and fittings at the next annual survey of a ship for a passenger certificate. In such cases the boats need not be opened up if the Surveyor is satisfied by inspection that they are in good condition. In the case of emigrant ships the Principal Officer should make arrangements to obviate any unnecessary opening out for purposes of emigration clearance of new lifeboats or of lifeboats which have recently been opened out and inspected for the purposes of the passenger certificate.

Surveyors should pay special attention to air cases of yellow metal when inspecting ships' lifeboats.

During the periodical inspection of certain lifeboats it was discovered that a large number of the yellow metal air cases in the lifeboats were holed or cracked although the cases showed no signs of rough handling or distortion. Under certain conditions, brass has the power of absorbing and of occluding gases, with the ultimate effect of destroying the zinc and rendering the yellow metal brittle. It has, however, been shown practically that benefit is obtained by coating brass and copper tanks with boiled linseed oil or with a good varnish, thereby preventing the action of sea water or deleterious gases.

The attention of masters or owners should be drawn to the benefit to be derived from coating with linseed oil or varnish, if this is not already done. As air cases are often found damaged at the lower edge, attention should be drawn to the necessity of taking great care to prevent injury to tanks when replacing them after inspection.

B. WOODEN OPEN BOATS OF CLASS 2 (a).

44. General conditions of approval.—Designs and detailed specifications of all new Class 2 (a) lifeboats should be submitted to the Board before work on the boats is commenced.

Approval will be subject to the boats complying in all respects with the requirements of the Statutory Life-Saving Appliances Rules, and with the instructions herein, unless other arrangements are made, which, in the opinion of the Board of Trade, are at least of equal efficiency.

In general, it will be necessary to submit sample boats of a new design to tests for strength, flotation, stability, erection of bulwarks, seating and rowing, as detailed in paragraph 56, before final approval.

When a sample boat built to an approved design has been subjected to trials, and is finally accepted, the Surveyor should be careful when surveying subsequent boats of the type not to sanction any deviation from the approved design without the Board's authority. He should satisfy himself that in subsequent boats the drawings and specifications, and any approved amendments to the same, have been strictly adhered to, and, if on the final survey he finds that any deviations have been made, he should report the full particulars to the Chief Ship Surveyor for instructions before passing the boat.

- 45. Quality of materials (para. 20) stem, sternpost keel and hog (para. 21), bottom planking and fastenings (paras. 22 and 30), timbers (para. 23), keelson (para. 24), stretchers, bottom boards and plugs (para. 25), breasthooks (para. 27), fenders (para. 28), middle line fastenings (para. 29), caulking (para. 38), iron fittings, etc. (para. 39), painting (para. 40), boats' covers (para. 42), and periodical inspection (para. 43).—The requirements for open lifeboats of Class 1, so far as they apply, are to be complied with as regards these details. Stems, sternposts, aprons, breasthooks or other parts, having considerable curvature, are to be of British oak grown to form with no short grain or shakes.
- 46. Bottom planking in two thicknesses.—When the planking is worked in two thicknesses, it is to be of oak, Honduras mahogany, teak or other approved hardwood. The total thickness is to be at least # inch in boats under 28 feet in length and # inch in boats 28 to 30 feet. The planks are

not to exceed 5½ inches in width. The seams, if longitudinal, are to break joint with one another and there is to be a good shift of butts.

A layer of textile material of approved quality bedded in thick white lead paint, marine glue, or other approved composition, is to be laid upon the inner thickness of the bottom planking, and another coating of approved composition applied, before the outer thickness of planking is worked.

The hooded ends of the bottom planking and the plank edges at the hog piece and gunwale are to bear on a wide faying surface and are to be made watertight by textile material properly bedded in approved composition and secured by closely spaced brass screws.

The fastenings are to be clenched on rooves, wherever practicable, or closely spaced brass screws, substituted where through fastenings cannot be fitted. No fastenings are to be fitted into end grain, and tafted points will not be allowed. All plank edge and timber fastenings are to be of the best wrought copper of sufficient length and gauge, and the spacing of plank edge fastenings is not to exceed 3 inches.

- 47. Lower Gunwals.—The lower gunwale is to be of oak or elm composed of not more than two pieces in length with properly fastened scarphs which should be kept beyond the midship half length of the boat. It must be well secured to the timbers and form a good faying surface to the deck, tie beams, and side planking.
- 48. Decks.—The deck over the air cases must not be less than 1 inch thick suitably stiffened by carlings, supported by the gunwale and the longitudinal bulkheads and secured by brass screws. The arrangements are to be such that the air cases can be readily removed.
- 49. Bulkheads.—In order to provide sufficient longitudinal strength, it has been found necessary to fit continuous longitudinal bulkheads extending in height from the top of the timbers to the level of the fixed thwarts and extending in length from aling bulkhead to sling bulkhead.

Transverse strength and rigidity are to be obtained by fitting fixed thwarts or tie beams associated with complete transverse bulkheads and partial bulkheads in the wings. A complete transverse bulkhead is to be fitted at 1th length from each end, i.e., in way of the chocks, and the arrangements must be such as to secure a clear space in the bottom of the boat where injured persons may be laid.

The transverse and partial bulkheads are to be connected to the longitudinal bulkheads by galvanised steel angles three-sixteenths of an inch thick secured by galvanised nut and screw bolts not less than § inch diameter, hove up tightly, and the points of the bolts then upset. All the bulkheads are to be well secured to the bottom planking by brass screws. The fixed thwarts are to be well secured by through fastenings to the gunwale and by screws to the bulkheads.

In order to avoid end grain fastenings, the transverse bulkheads are to be securely fastened to oak fashion timbers grown to form, to which the bottom planking should be secured by brass screws or clenched copper fastenings.

Drainage holes are to be cut in the transverse bulkheads near the middle line of the boats. The longitudinal bulkheads and the wing transverse bulkheads are to be suitably perforated to provide efficient ventilation and drainage as a precaution against dry rot. English elm is not considered a suitable wood for use in enclosed and badly ventilated spaces and should not be used for these bulkheads.

The air cases are to be kept as high as practicable and fitted between the longitudinal bulkheads and the sides of the boat; the spaces between the timbers in way of the longitudinal bulkheads are to be left open for draining the wing compartments.

50. Sling arrangements.—Chain bridle or tie bar alings fitted transversely and having suitable hooks to engage with the lower blocks are to be fitted in accordance with approved plans.

The ring connecting the hook to the chain slings is to be at such a height above the common centre of gravity of the boat equipment and complement that the stability of the boat when suspended by the falls is satisfactory; it should, therefore, be well above the top of the rowing thwarts when the topsides are erected.

The form and scantlings of the lifting hooks must conform to the requirements of Appendix D for lifting hooks of round section appropriate for the total weight of the boat and occupants, unless independent designs are submitted and strength tests made as described in paragraph 32 (2).

The proportions of all parts taking the weight of the boat are to be such as to provide a factor of safety not less than five, and the arrangements are to be strong enough to carry the weight of the boat, equipment and full load of persons with that factor.

The rings and component parts of the slings are to be proof tested to 21 times the dead working load to which they

would be subjected under the conditions in the foregoing subparagraph. All parts of the slings are to be annealed after forging, and, if any part is altered after testing, it is to be again annealed and tested. The provisions of this paragraph also apply to lifeboats of other classes in which chain slings are fitted.

Sling attachments of forged eyeplates or angles are to be secured to the transverse sling bulkheads, and the longitudinal bulkheads if necessary, by a suitable number of nut and screw bolts; the points of the bolts should be upset after the nuts are hove up.

The sling bulkheads should be fitted in one piece and be well secured by angles and nut and screw bolts to the longitudinal bulkheads and strongly connected to the bottom plank as described in paragraph 49.

Special strengthening arrangements will be necessary when the lifting hooks are required to be fitted very near to the ends of the boat, and a drawing is to be submitted for approval in such cases. All parts of the slings are to be annealed after forging and if any part is altered after testing it is to be again annealed and re-tested.

- 51. Bilge Keels.—Bilge keels are to be fitted in all cases in the manner described in paragraph 28.
- 52. Air cases and external buoyancy.—Class 2 (a) boats are required by the Rules to be fitted with watertight air cases and external buoyancy. The former are required to have a volume of not less than 1.5 cubic feet, and the latter, if of cork, a volume of not less than .2 cubic feet for each person for which the boat is certified. The construction of the air cases and the arrangement of the external buoyancy are to conform to the requirements of paragraphs 35, 36 and 37.
- 53. Condition for dispensing with external buoyancy.—External buoyancy may be dispensed with provided the volume of the internal air cases is increased to 1.7 cubic feet for each person, the minimum freeboard required by the Rules is increased by 15 per cent., and fore and aft fenders are fitted in accordance with paragraph 28.
- 54. Collapsible bulwarks.—The strength, construction and means of raising and supporting the collapsible bulwarks are to receive special consideration, and builders are to forward specifications accompanied by plans or a model of any new arrangement for which the Board's approval is desired.

The height of the top of the upper gunwale at its lowest point above the load waterline when the topsides are raised is not to be less than 1/2 the length of the boat plus three inches.

Lifeboats are required to be readily available in an emergency, and, with this object in view, all the operations required for preparing the boat for service are to be as simple and self-evident as possible and capable of being speedily performed by unskilled persons. The raising and securing of the bulwarks and the preparation of the boat for sea must be capable of being completed within two minutes by not more than four men.

The number of joints and working parts are to be as few as possible and non-corrodible metal is to be used where considered necessary. The use of locking pins and similar appliances is to be avoided where possible and the bulwarks must lock themselves automatically when they are raised to the full height. Where toggle joints are depended on for the topside supports, however, a locking arrangement is to be fitted to prevent them from giving way accidentally when the boat is in a seaway and the toggle joint is to be so devised as to avoid accidental injury to any person erecting the bulwarks.

Where canvas bulwarks are fitted, the material must not be of less efficiency than No. 1 hurricane canvas water-proofed. They should be fitted sufficiently slack to allow of the material being taut only when thoroughly wet. The canvas should be doubled at the lower part and elsewhere where liable to chafe, etc., and well fastened to the hull by copper nails closely spaced.

Where wood bulwarks are fitted they should be arranged preferably in two thicknesses with textile material between them and should be properly stiffened and supported. The hinges are to be carefully fitted in proper alignment.

The collapsible bulwarks and thwarts must be strong enough to support a mast and sail and to take the stresses due to rowing. Cast iron is not to be passed for the bulwark supports of new boats.

The hinge fastenings to the deck, bulwarks and supports must be substantial; ordinary wood screws into deck planking or bulwarks are insufficient. Nut and screw bolts hove up on chocks beneath the deck, or some equally efficient plan, should be adopted.

The joint or connection between the hull of the boat and the collapsible bulwarks must be efficient in excluding water when the boat is heeled over.

55. Seats and rowing thwarts.—Accommodation must be provided for seating all the occupants of the boat without interfering with the proper use of the oars. The thwarts must not be less than 7½ inches wide, and should be well

raised above the level of the deck and properly supported. If side benches are fitted their breadth is not to be less than 9 inches.

- 56. Tests.—(1) Class 2 (a) lifeboats must be subjected to the following tests before acceptance:—
 - (a) Strength.—A sample of each new type of boat is to be subjected to a strength test as follows: The unloaded boat is to be placed on blocks and sights adjusted. The boat is then to be loaded with weights evenly distributed and representing the full complement of persons at 165 lbs. per person, and the equipment, plus 25 per cent. of the total weight of the boat, persons and equipment.

The boat thus loaded is to be supported entirely by means of the sling attachments, and sighted for deflection. The latter should not as a rule exceed $\frac{1}{400}$ part of the boat's length. The transverse deflection must also be measured. The boat and sling attachments are to be carefully examined and any permanent set is to be recorded by the Surveyor.

In general only one in ten of the boats built to the same design and specification need be subjected to a strength test provided that the Surveyor is satisfied that the materials, workmanship and scantlings are in all respects as efficient as in the boats already tested and accepted. At least one boat for each vessel to which boats are supplied should, however, be tested.

- (b) Flotation.—The boat is to be put afloat and loaded with weights representing the full load of persons at 165 lbs. per person, and the equipment. The free-board is to be carefully measured and compared with that required in fresh water by Part II of the Fourth Schedule to the Rules. The boat is to remain afloat for two hours and the leakage, if any, is to be noted.
- (c) Stability.—A sample boat of each standard size should be subjected to a stability test in the flooded condition. For this purpose the boat should be loaded afloat with iron weights, representing the full complement of seated persons and the equipment, the centre of gravity of the persons being taken at one foot above the seats which they occupy. The weight of water should not be less than two tons in a 28-foot boat, and in boats of greater or less length than 28 feet, in proportion to the length.

Weights are then to be transferred in succession to a known horizontal distance across the boat and the successive angles of heel carefully observed and recorded, the experiment being continued as far as is safe and practicable.

- (d) Erection of bulwarks.—A trial should be made of the time taken in erecting the bulwarks by not more than four men, and the joint or connection between hull and topsides should be tested by heeling the boat and submerging the joint for ten minutes; alternatively, the joint may be tested by listing and trimming the flooded boat.
- (e) Seating and rowing tests.—In these tests the boat should be loaded with the equipment and the full number of persons each wearing a lifejacket.
- (2) Any application from a boat-builder for exemption from strength and stability tests on the ground that the scantlings are identical with and the form and dimensions are similar to those of boats already tested and found satisfactory, should be addressed to the local Surveyor and should be forwarded with his recommendation to the Chief Ship Surveyor for consideration.
- 57. Stowage in tiers.—The stowage of one boat upon another will be sanctioned only when satisfactory arrangements are made for distributing and supporting the weight and for preventing injury to either boat when the upper boat is being swung out.

Details of the proposed arrangements must be submitted by boatbuilders when forwarding plans and specifications of the boats. (See paragraph 206.)

C. METAL OPEN BOATS OF CLASSES 1 AND 3.

- 58. General.—The following instructions apply to lifeboats constructed of steel, and are to be strictly complied with unless other arrangements not less efficient have been approved by the Board of Trade.
- 59. Materials.—In metal boats the thwarts, side benches, internal buoyancy casings, lower cross or side seats, stretchers, stanchions, sheets and bottom boards must be of wood; all other parts of the structure should be of steel, wrought iron or other approved metal.

The keel, gunwale and sternpost are to be equal in standard of strength and quality to mild steel plates and sections (or wrought iron or other approved metal as the case may be), as used in the construction of the hulls of ships in the United Kingdom.

Mild steel sheets used in the construction of other parts of the hull should be of good ship quality made by the open hearth process and should have a tensile strength of 26-32 tons per square inch, and be free from cracks, surface flaws and laminations. The Surveyor is to examine carefully the material being worked in the hull so as to satisfy himself

that it is suitable for its purpose, and, if he considers it necessary, he should require test pieces to be cut from the plates or section and subjected to cold bending or other tests. Any cases where the material appears to be of inferior quality or fails while being worked are to be reported to the Chief Ship Surveyor.

- 60. Thwarts, side benches, internal buoyancy casings, lower cross or side seats, stretchers, stanchions, sheets and bottom boards (para. 25), external buoyancy (para. 37), iron fittings, etc. (para. 39), and boats covers (para. 42).—The requirements for wooden open lifeboats of Class 1 are to be complied with so far as they are applicable to these items fitted in steel boats.
- 61. Stem, Keel and Sternpost.—These are to be of suitable bulb section in one length not less than ½ inch thick in the web, and of sufficient depth to take the shell riveting and the sling plate connections.
- 62. Shell Plating and Framing.—When, the shell plating is not stiffened throughout by an approved system of metal framework, or where the galvanising is carried out by the electrical, and not by the hot, process, the steel plates are not to be of less gauge than 12 S.W.G. (10 th inch). Where an approved system of transverse metal frames, spaced not more than 24 inches apart, is worked, the thickness of shell may be reduced to 16 S.W.G. (16 th inch), provided the plates are galvanised by the hot process.

The frames where cut at the middle line should be connected on each side by transverse angle ties above the level

of the top of the keel or by floor plates.

The foregoing requirements and those set out in paragraph 61 apply to boats not exceeding 28 feet in length. For boats over 28 feet in length or having unusual proportions, plans showing fully the arrangement and scantlings of the gunwale, keel and other longitudinal girders, the floors, webs, partial bulkheads, transverse framing, and shell plating are to be submitted to the Chief Ship Surveyor for consideration.

The method of connecting the shell plating by means of riveting involves the use of oiled or painted fabric in the seams to ensure watertightness. In many cases this system has proved unsatisfactory and it is strongly recommended that the riveting of shell plating shall be reduced to a minimum and that all seams and butts shall be secured by electrical or other approved process of welding. Effective arrangements must be made by the makers to ensure that the welding is skilfully and efficiently performed and to detect and remedy any defects which might adversely affect

the strength, watertightness and durability of the boat. All welding must be carried out before the material is galvanised.

The whole of the shell plating and other structural material having a thickness of 1 inch or less is to be galvanised. All material is to be thoroughly cleaned before galvanising.

Faying surfaces of plates, seams and angles should be well coated with a protective covering to exclude moisture and, in addition, where watertightness is necessary, an insertion of painted water-excluding material is to be fitted between the faying surfaces of riveted seams.

Rivets are to be of charcoal iron knocked up cold with large heads and full points and closely spaced. All joints of the shell plating must be thoroughly watertight, and in case of doubt the boat is to be loaded and tested affoat. Doubling plates of suitable size should be fitted in all steel boats where the shell is liable to corrosion from contact with the boat's chocks; alternatively, steel liners may be fitted to the chocks.

- 63. Gurwales.—Gunwales are to be of suitable section and scantlings and pierced for the reception of the row-locks, provision being made in all boats for double banking the oars, and also for a steering oar. The shell plating must be carried up close into the throat of the gunwale and be well secured to it. If gunwales are fitted in two lengths the butts should be kept beyond the midship half length of the boat and at opposite ends on the two sides. The butts should be efficiently strapped.
- 64. Rubbers, fenders, bilge keels and keel rails.—The requirements of paragraph 28 as to the fitting of rubbers, fenders, and bilge rails (or other means of clinging to the boat when upturned) are to be complied with. These fittings should preferably be of steel or iron and should be so connected to the hull that if they are damaged during launching the possibility of watertightness being impaired will be reduced to a minimum. If of wood they should be connected to angles or lugs riveted or welded to the shell plating.
- 65. Lifting hooks.—All lifting hooks are to comply with the requirements of paragraphs 31 and 32 so far as these are applicable. They are to be efficiently connected to sling plates securely rivetted to the keel or centre girder.

When designs of steel boats are sent to the Chief Ship Surveyor for consideration particulars of the lifting hooks and slipg attachments with their connections to the hull are

to be included.

- 66. Protective Coating of Interior.—The whole of the interior of the steel work should be efficiently protected by two coats of approved composition, and the keel should be well covered to prevent moisture finding its way between the keel and the plating. Care should be taken to ensure that water will be completely drained from the boat in way of the plug hole. Portland cement is not to be used.
- 67. Painting.—All steel boats are to have at least three coats of best lead paint outside, and all portions of the inside structure and fittings not required to be protectively coated in accordance with paragraph 66 should have at least two coats of best lead paint. Special attention is to be paid to the painting of the plating in way of all wood fittings such as fenders, rubbers, thwarts, etc., which are to be well bedded when being fitted. All steel work should receive its first coat of paint when in a clean condition and as soon after galvanising as practicable.
- 68. Internal buoyancy.—Part I of the Fourth Schedule to the Rules requires that in a metal boat of Class 1 (a) or 1 (b), an addition shall be made to the cubic capacity of the airtight compartments so as to give the metal boat buoyancy equal to that of a wooden boat. The additional capacity in cubic feet is to be ascertained by multiplying the weight of the steel hull in hundredweights, exclusive of fittings, equipment and air cases, by 12.

In boats certified to carry 100 or more persons the volume of the buoyancy is to be suitably increased as required by Rule 27 and full particulars of the proposed capacity and disposition of the air cases are to be submitted to the Board for approval in such cases.

The air cases are to be constructed and placed as described in paragraph 35, and are to be properly insulated from the steel shell or framing by wood packing: rope grummets are not to be used for this purpose.

69. Buoyancy to be provided in Meta! Boats of Class 3 — Metal boats of Class 3 must be provided with buoyancy to compensate for the loss of floating power as compared with wooden boats.

In the case of a steel boat the volume of the internal air cases in cubic feet required to provide the buoyancy should be ascertained by multiplying the weight of the hull in hundredweights by 2.

The internal buoyancy should be fitted along the sides of the boat immediately below the thwarts but not in the ends or bottom of the boat. 70. Strength and Flotation Tests.—A sample boat built to each approved design is to be subjected to strength and flotation tests as laid down in paragraph 56 (1) (a) and (b) so far as the requirements indicated therein are applicable. Boats subsequently built to the same design need not as a rule be subjected to strength tests provided the surveyor is satisfied that the scantlings are identical with those approved and that the material and workmanship are satisfactory, but he should satisfy himself that the boats are watertight.

71. Periodical inspection.—Surveyors should impress upon owners and masters of ships the necessity of frequently inspecting the inside of steel boats, of removing any rust that may have formed, and of keeping all steel surfaces well coated with paint or other protective composition. In the case of ships under survey for the issue of renewal of a report of inspection of life saving appliances (Form Surveys 123) the Surveyor must carefully examine the inside and outside of all steel boats, and for that purpose the air cases and wood fittings are to be removed. The boat is to be lifted clear of the chocks and the plating carefully examined. All rust should be removed, and any portion of the hull found defective should be renewed or doubled to the satisfaction of the Surveyor. The doublings are to be not less than the thickness of the shell plating and be properly secured with closely spaced rivets and made thoroughly watertight.

For the purpose of examination of the boats and air cases in ships being surveyed for St. 1 or St. 2 passenger certificates, provided the Surveyor is otherwise satisfied, the air cases need not as a rule be removed at each survey from more than half of the number of boats. Should, however, the removal of these air cases disclose signs of corrosion or any other defects detrimental to the preservation of the hull structure or air cases the Surveyor should require the air cases to be removed from all the boats.

Ships being surveyed for St. 3, 4 and 5 passenger certificates are to have the air cases removed at each survey from all the boats carried.

It is desirable that steel boats in cargo ships should be examined in the foregoing manner by a Surveyor at intervals not exceeding two years, due regard being had to any reports of inspection on Form Surveys 123.

D. METAL OPEN LIFEBOATS OF CLASS 2 (a).

72. Plans and specifications to be submitted.—Designs and detailed specifications of new steel boats of this type are

to be submitted to the Board before work on the boats is commenced.

73. Steel hull.—The construction of the steel hull is to conform to the requirements for metal lifeboats of Class 1 so far as these are applicable. In all other respects the requirements laid down for wooden lifeboats of Class 2 (a) are to be fulfilled.

74. Periodical inspection.—The requirements of paragraph 71 are to be complied with.

PART III.-DECKED LIFEBOATS.

75. General conditions of approval.—Designs and detailed specifications of all new decked lifeboats are to be submitted to the Board before work on the boats is commenced.

Approval will be subject to the boats complying in all respects with the requirements of the Rules and with the Instructions herein, unless other arrangements are made which, in the opinion of the Board of Trade, are at least of equal efficiency.

In general it will be necessary to submit sample boats of a new design to tests for strength, flotation, stability, erection of bulwarks, seating, rowing, and freeing the deck of water, as detailed in paragraph 91 (1) and (2) before final approval.

In the case of decked lifeboats having a well deck the builders are to submit, in addition to the above, a lines plan and displacement scale for fresh water immersion to the top of the buoyant structure. In constructing the scale, allowance is to be made for the loss of buoyancy due to the well and to recesses, if any, in the watertight part of the boat. The Surveyor should verify the lines plan and displacement by a comparison with the sample boat when built.

When a sample boat built to an approved design has been subjected to trials and is finally accepted, the Surveyor is to be careful when surveying subsequent boats not to sanction any deviation from the approved design without the Board's authority. He should satisfy himself that, in subsequent boats, the drawings and specifications, with any approved amendments, have been strictly adhered to, and if, on the final survey, he finds that any deviations have been made, he is to report full particulars to the Chief Ship Surveyor for instructions before passing the boat.

76. Boats with well decks.—In boats of this type the area of the well deck, the height of the well deck above the water line and the freeboard in fresh water are to comply with the

requirements of the Fourth Schedule of the Rules, Part II, paragraph 17.

77. Boats with flush decks.—In boats of this type the freeboard is to be in accordance with the requirements of the Fourth Schedule of the Rules, Part II, paragraph 18.

A. WOODEN DECKED LIFEBOATS OF CLASS 2 (b).

78. Quality of materials (para. 20), construction and fastenings of stem, sternpost, aprons, deadwoods, breasthooks, rubbers, fenders (paras. 21, 27 and 28), iron fittings, etc. (para. 39), and boats' covers (para. 42).—The requirements for open lifeboats of Class I are to be complied with as regards these details so far as they apply to decked lifeboats. Stems, sternposts, aprons, breasthooks, or other parts having considerable curvature are to be British oak grown to form with no short grain or shakes.

79. Keels and bilge keels.—It is recommended that in order to avoid having garboard seams and to admit of the textile material being worked continuously, decked boats should be built without a centre keel. Bilge keels are, however, to be fitted in the manner indicated in paragraph 28.

All through-bolts or sling fastenings which would pierce the watertight parts of the hull should be avoided as far as possible.

80. Bottom planking and deck.—The bottom planking and deck are to be of oak, teak, Honduras mahogany or other approved hardwood.

The outside planking is to be worked double ply. The planks forming the inner and outer skins should be arranged diagonally, at right-angles to each other and should extend, wherever practicable, from gunwale to gunwale in one length except at the extreme ends. The planks are not to exceed 51 inches in width.

The deck is also to be worked double ply, the two thicknesses breaking joint.

A layer of textile material of approved quality bedded in thick white lead paint, marine glue, or other approved composition, is to be laid upon the inner thickness of the bottom planking and the deck and another coating of approved composition applied before the outer thickness of planking is wrought.

The inner and outer bottom planking at the stems, deadwoods and gunwale, and the deck planking at gunwale, etc., is to fay on a wide rabbet, textile material properly bedded in approved composition being used to ensure watertightness and the planking fastened by closely spaced brass screws in each rabbet. The fastenings in all double planking are to be clenched on rooves wherever practicable, or closely spaced brass screws substituted where through fastenings cannot be fitted. No fastenings are to be fitted into end grain, and tafted points will not be allowed.

All plank edge and timber fastenings are to be of the best wrought copper of sufficient length and gauge, and the spacing of plank edge fastenings is not to exceed 24 inches.

- 81. Gunwales.—The gunwales are to be of hard wood in not more than two pieces in the length with properly fastened lipped scarphs, which are to be kept beyond the midship half length of the boat.
- 82. Timbers and beams.—Frame timbers and beams are to be of hardwood, sufficient in size and number to stiffen the structure properly. The timbers must be of rock elm, oak, or ash, bent to shape and fitted in one length from gunwale to gunwale, except at the extreme ends of the boat. They are to be checked into and well attached to the gunwales. No timbers broken in the grain are to be allowed, and in the event of a timber being found broken or sprung the Surveyor should require it to be taken out and renewed.
- 83. Bulkheads.—In these boats longitudinal bulkheads will generally require to be fitted for strength purposes; they may have lightening holes cut if desired, but must in any case be fitted with efficient drainage and air holes in each transverse compartment. The longitudinal bulkheads must be well connected to the bottom and deck, and they are to be connected to the transverse bulkheads by means of suitable galvanised angles of steel not less than three-sixteenths of an inch in thickness with wide flanges. The fastenings are to be galvanised nuts, and screw bolts, not less than inch diameter, closely spaced, hove up tightly and the points of the bolts then upset.

In order to avoid end grain fastenings the transverse bulkheads are to be securely fastened to oak fashioned timbers grown to form to which the bottom planking should be secured by brass screws or clenched copper fastenings.

Home grown elm (with the exception of wych elm) is not considered suitable for use in confined spaces, and is not to be used for bulkheads, timbers, beams, etc., in such spaces.

84. Hatchways.—The only openings allowable in the deck are hatchways necessary for the examination of the interior of the boat at the periodical surveys, and for the pump connections and drain valves, if fitted.

The hatchways must be so arranged as to enable every part of the interior of the boat to be examined. The hatch covers are to be in two thicknesses, at least as strong as the deck, and worked similarly.

The hatchways are to be properly framed with either a double or single rabbet at least 1½ inches wide. Fearnought soaked in tallow or some equally efficient and durable jointing material should be used to ensure water-tightness. The hatch covers are to be secured by closely spaced screws fitted with brass washers or sockets under their heads.

- 85. Caulking.—The garboard seams and hood ends are to be properly caulked with at least two threads of cotton and the planking seams well filled with best white putty. Stopwaters must be fitted where necessary.
- 86. Sling arrangements and collapsible bulwarks.—The arrangement of slings and collapsible bulwarks are to be in accordance with the requirements for Class 2 (a) boats, paragraphs 50 and 54. Care must be taken to maintain the water-tightness of the deck in way of the sling bolts and plates.
- 87. Seats and rowing thwarts.—Accommodation must be provided for seating all the occupants of the boat without interfering with the proper use of the oars. In decked boats the thwarts must be well raised above the level of the deck and properly supported. The side benches must not be less than 9 inches in breadth.
- 88. Arrangements for quickly clearing the deck of water.— These must comply with the conditions of Part II of the Fourth Schedule (paragraph 20) to the Rules and be effective in preventing water from entering the boat when intermittently submerged up to the height of the bulwark rail. If drain pipes are led from the deck through the bottom of the boat for this purpose, the connections to the deck and bottom must be thoroughly efficient in preventing leakage either through the deck or the bottom, and the pipes must be fitted with the necessary automatic valves. balanced valves of Royal National Lifeboat Institution type are adopted they are to be fitted with the axis of the valve athwartships. When the pipes are of lead the material is to be at least 7 lbs. per square foot, the lower end being turned over on the outside planking bedded in thick red lead, and covered by a brass ring well secured with closely spaced brass screws.

A pad of hard wood 1 inch thick is to be fitted on the inside of the planking and closely around the tube, care being taken that the holes for the screw fastenings are not bored through to the interior of the boat.

The flanges of the valves are to be fastened to the deck in a similar manner, the valve box being set in red lead within the tube and the latter being made thoroughly watertight in way of the deck and the pad piece. The valves are to be protected by gratings.

Where canvas sleeve freeing ports are fitted the material is to be equal in quality to that used for the bulwarks, and the floats are to be ample for their purpose and well secured to the lower parts of the sleeves.

89. Pumping arrangements.—Two portable pumps of an approved pattern are to be supplied and means are to be provided for pumping out each compartment. The suction and discharge pipes are to be at least 11 inches in diameter and the pumps are to draw from the lowest part of each compartment.

The deck plate of each pump connection is to stand 3 to 4 inches above the deck and be plainly marked in raised letters "Pump." The screwed cap must be watertight and be attached by a short length of jack chain and must not require a tool to unscrew it. The end of the pump should screw into the deck plate, and an air inlet is to be fitted to each compartment.

Plug holes and plugs are in no circumstances to be fitted in the interior of decked boats.

90. Painting, Ventilation, and precautions against dry rot.

—After inspection and approval all wood boats are to have at least three good coats of the best lead paint outside, and proper precautions are to be taken against decay in the enclosed spaces under the deck.

Each compartment below deck is to be fitted with two brass ball valve ventilators of gooseneck type not less than one inch diameter. They are to be fitted one on each side of the boat close up under the gunwales.

After the work is completed the interior of the boat is to be cleared of shavings and dirt and the whole of the inside surfaces, when thoroughly dry, is to be treated with two coats of best quality lead paint or an approved composition of equal efficiency.

- 91. Tests.—(1) Strength, flotation, stability, erection of bulwarks, seating and rowing.—These tests are to be carried out as described in paragraph 56, with the exception that the stability test is to be conducted with a loaded boat in the unflooded condition.
- (2) Freeing the deck of water.—This test is to be carried out under the conditions specified in Part II of the Fourth Schedule (paragraph 21) to the Rules. The boat is to be held in the upright position by means of a spar until the

deck is flooded with the required amount of water, when all lashings are to be cut simultaneously, the ports or valves freed, and the time which elapses before the boat is cleared of water carefully observed. If drain pipes are fitted, the boat must be rolled to test the action of the valves during the intermittent submersion.

92. Stowage in tiers.—The stowage of one boat upon another will be sanctioned only when satisfactory arrangements are made for distributing and supporting the weight, and for preventing injury to either boat when the upper boat is being swung out:

Details of the proposed arrangements are to be submitted by the boat builders when forwarding plans and specifica tions of the boats. (See paragraph 206.)

93. Periodical inspection.—All decked boats irrespective of type or construction, are to be inspected at each annual survey, and at least one in every four on the ship is to be tested affoat for watertightness without previous preparation. The boats are to be sounded, and if any water is found the cause of the leakage is to be ascertained and the water removed as far as practicable before the boats are placed in the water. One of these boats is to be loaded with weights corresponding to the total weight of equipment and complement at 165 lbs. per person. If the deck is watertight, and the amount of water entering the boat during a period of three hours is small, it may be passed after it has been well painted and the seams filled with good white lead putty, provided the Surveyor is satisfied in all other respects. If a dangerous amount of water enters, the boat is not to be accepted until satisfactory repairs have been made to render it safe. If, however, in the opinion of the Surveyor, the condition of the boat after being repaired is such that watertightness cannot be fully ensured for the period for which the passenger declaration is issued, the boat is to be fitted with efficient air cases, and the number of persons is to be regulated by the total capacity of the air cases, allowing 3 cubic feet of air case for each person, subject to the further condition that the freeboard of the loaded boat is not less than that hitherto allowed for that particular type.

Any boat tested in the unloaded condition and found after floating for 3 hours to have leaked, is to be loaded and treated as described above.

A record of all flotation tests is to be made in the docking book, and the result of the tests when completed is to be reported to the Chief Ship Surveyor on Form Surveys 149.

At each annual or other survey, the Surveyors are to examine carefully the exterior of the boats, including the landings and butts of planking, and, as the airtight spaces favour the development and spread of dry-rot, Surveyors must also take every opportunity of making a thorough Should any signs of dry-rot be internal inspection. observed, the boat must be opened up and cleared for a thorough examination inside and out. All parts affected by dry-rot must be removed and renewed with sound material, and when these and any other necessary repairs are complete and the boat is thoroughly dry inside, the interior is to be well coated with best quality lead paint or some other equally effective composition with a view to guarding against a repetition of the trouble. If practicable, ventilators are to be fitted. See paragraph 90.

The efficiency of decked boats depends upon the strength and watertightness of the topsides. The topsides should, therefore, be erected and special attention directed to the condition of the canvas and of the doubling of the lower part and its connection to the hull.

Where wood bulwarks are fitted, special attention should be given to the hinges and the efficiency of joints. See paragraph 54.

The arrangements for freeing the deck of water must comply with Part II of the Fourth Schedule (paragraph 20) to the Rules, and if there is any doubt as to their efficiency a test is to be made in accordance with paragraph 91 (2).

B. Metal Decked Lifeboats of Class 2 (b).

- 94. Watertight compartments.—These boats are required by Part II of the Fourth Schedule (paragraph 19) to the Rules to be divided into watertight compartments with means of access to each compartment and to be provided with at least two bilge pumps. The requirements set out in paragraphs 95-97 are to be observed unless some other arrangements, which are not less efficient, have been submitted to and approved by the Board.
- 95. Fenders (paragraph 28), iron fittings, etc. (paragraph 39), sling arrangements (paragraph 50), collapsible bulwarks (paragraph 54), seats and rowing thwarts (paragraph 87), arrangements for quickly clearing the deck of water (paragraph 88), pumping arrangements (paragraph 89), testing (paragraph 91), and stowage in tiers (paragraph 92).—As regards these details, the requirements of the foregoing paragraphs relating to wooden decked lifeboats of the same class are to be complied with.

- 96. Plating of shell, deck and bulkheads.—The quality of the material used in the construction of Class 2 (b) boats is to be in accordance with the requirements of paragraph 59 for steel boats of open type. The steel shell plating is not to be less than 12 S.W.G. (1-10th inch), and the deck plating not less than 14 S.W.G. (1-12th inch), and the bulkheads not less than 16 S.W.G. (1-16th inch). The whole of the plating, the bulkheads and connecting angles is to be galvanised by the hot process. The shell and deck plating may be wrought either on the seamless principle or with riveted joints under similar conditions to those laid down in paragraph 62 for the shell plating of steel boats of open type. The requirements of paragraph 62 are also to be complied with in other respects so far as they are applicable.
- 97. Protective coating of interior and painting.—The requirements of paragraphs 66 and 67 apply equally to steel decked lifeboats.
- 98. Periodical inspection.—The requirements of paragraph 71 are to be complied with, so far as they are applicable.

PART IV .-- MOTOR LIFEBOATS.

99. Detailed plans and specifications of the hull and plans and particulars of the machinery and fuel tanks are to be submitted through the Board's Surveyors to the Board for approval.

Details of the lifting arrangements are similarly to be sub mitted for approval in all cases.

100. General.—A motor lifeboat carried as part of the statutory life-saving appliances of a vessel, whether required by Rules 4 (6) or 5 (5) or not, is to comply with the requirements of paragraphs 101 to 112.

A motor lifeboat provided in compliance with Rules 4 (6) or 5 (5) is to be not less than 26 feet in length.

101. Construction of hull.—The details of construction and scantlings are to comply with the requirements for Class 1 lifeboats, or to be at least as efficient. Any deviation from such requirements must be submitted to the Board for approval. In wooden boats, if a continuous keelson is not fitted, compensation is to be provided by means of side keelsons combined with a number of suitably spaced floors of oak grown to shape.

The motor bearers in wooden motor boats should be of hardwood, pitch pine or best quality Douglas fir well bolted to the hull and supported by transverse bearers, and all fastenings in way of the wireless earthing plate should be of copper or yellow metal. In steel boats the bearers are to be of steel and rigidly constructed.

Where cabins are fitted, special attention is to be given to the form and proportions of the boat in order to ensure ample stability in a seaway and sufficient freeboard when loaded with the full complement of persons and equipment.

102. Lifting arrangements.—If it is not practicable to fit fixed lifting hooks, double-legged cabin clings may be allowed, provided that the hook attachments are of sufficient height to give stability in lowering the loaded hoat, that steadying chains are fitted, and that the arrangements comply with the requirements of paragraphs 31 to 33 and 50.

When chain slings are fitted, eyeplates with wire lashings or other suitable means for taking the weight of the slings are to be fitted whenever practicable in order to facilitate the detachment of the lower fall blocks from the hooks, an operation which might otherwise be difficult in a seaway. Care is, however, to be taken to ensure that the slings are not in any way bound by such fittings, but are free to take up their normal position when the boat is suspended. Means are to be provided to prevent water from entering the space beneath when appropriated for the wireless apparatus.

103. Bulkheads.—If the space occupied by the motor, fuel tanks, etc., is at the after end of the boat, it is to be separated from the space to be occupied by the passengers and crew by a watertight bulkhead. If it is desired to place the motor amidships a watertight bulkhead is to be fitted at each end of the motor space.

The bulkheads are to extend at least to the height of the seats, and if constructed of wood are to be worked in two thicknesses with painted canvas between. In steel boats the bulkheads are to be of steel suitably stiffened.

Alternative arrangements for preventing the spread of oil throughout the boat by way of the bilges will be considered by the Board, but before they can be accepted they must be of equal efficiency.

104. Cubic capacity.—The cubic capacity of a motor boat is the gross capacity measured as prescribed by Rule 28 less the volume occupied by the motor and its accessories and, when carried, the wireless installation and the searchlight with their accessories (Rule 26).

The volume of the wireless cabin below the level of the gunwale is also to be deducted.

105. Buoyancy.—The buoyancy is to be provided either by internal air cases, as in a Class 1 (a) boat, or by internal air

cases and external buoyancy, as in a Class 1 (b) boat. In either case the volume is to be fixed in conformity with Rule 26 and the Fifth Schedule (para. 3) to the Rules, and is to be calculated as shown in the following worked examples:—

```
Wooden Motor Boat, Class 1 (a).
                                L
                                        В
         Dimensions o boat = 28.0 \times 8.6 \times 3.85
                                                  Persons.
 Capacity by Rule L \times B \times D \times \cdot 6 = 556 cu. ft. =
 space ∫ 129.9 cu. ft
 Wireless 3.2 × 3.5 × 4
  room ∫ 47.0 cu. ft.
                    Net capacity
                                   = 379 cu. ft.
 Maximum number of persons allowable
                                                      18
     Number of persons displaced
 Minimum internal buoyancy required ...
                                            = 55.6 cu. ft.
 Weight of motor and accessories
                                  = 17.6 cwts.
   (including weight of fuel tanks
   but not fuel) ...
Weight of wireless and search-
   light appliances and accessories
   such as batteries, &c. ...
                                      21 • 1
 Buoyancy per cwt. = 1.75 cu. ft. : \frac{1}{2} = 36.9 cu. ft.
   21·1 × 1·75 ... ...
 Less—Buoyancy for 18 persons
   displaced at 1 cu. ft. each
                                                18.9 cu. ft.
 Internal buoyancy required for 37 persons \ =74.5
   subject to a seating test ...
```

Internal buoyancy required for 32 persons

test (para. 111)

being the number determined by seating \ = 69.5

```
Wooden Motor Boat, Class 1 (b).
                             L
                                     B
            Dimensions = 28.0 \times 8.6 \times 3.85
                                                     Persons.
Capacity by Rule L \times B \times D \times \cdot 6 = 556 cu. ft. =
                                                        61
Motor \ \ 7 \cdot 5 \times 4 \cdot 5 \times 3 \cdot 85 =
space ∫ 129.9 cu. ft.
Wireless 2 3.2 × 3.5 × 4
 room ∫ 47.0 cu. ft.
                  Net capacity
Maximum number of persons allowable
           Number of persons displaced
                       buoyancy
Minimum internal
  required
Weight of motor and accessories
  (including weight of fuel tanks
  but not fuel) ...
Weight of wireless and search-
  light appliances and accessories } ==
  such as batteries, &c. ...
Buoyancy per cwt.=1.75 cu. ft.:
  21·1×1·75 ...
Less-Internal buoyancy for 19
  persons displaced at .9 cu. ft.
Internal buoyancy required for 42 persons ?
  subject to a seating test ...
Internal buoyancy required for 36 persons
  being the number determined by the seat-
  ing test (para. 111)... ...
External buoyancy of solid cork = \cdot 033 \times 556 = \cdot 18
```

In steel motor boats of Class I additional internal buoyancy is required at the rate of 1½ cubic feet for every 112 lbs. of

metal hull.

The air cases and external buoyancy of motor boats are to be constructed, fitted and arranged in the manner detailed for Class 1 (a) and 1 (b) open boats in paragraphs 35 and 37. The internal buoyancy required is to be fitted along the sides of the boat immediately below the thwarts, but not in the ends or the bottom of the boat.

106. Towing.—Provision for towing should be made, preferably by bitts fitted as low as possible at the quarters.

107. Draining.—Motor boats certified for 100 or more persons are to be fitted with at least two bilge pumps, one of which is to be an efficient hand pump. The bilge pumps are to be capable of pumping from each compartment.

Motor boats certified for less than 100 persons are to be fitted with a bilge pump, either hand or power, having suitable suctions to the different parts of the boat. When a hand bilge pump is not provided a plug hole with plugs and chains (or equally suitable arrangement) is to be fitted for properly draining each watertight compartment. Plugs and bottom boards are to be fitted in accordance with paragraph 25.

108. Machinery.—The requirements of the Instructions as to the Survey of Passenger Steamships are to be substantially complied with, but each case will be considered by the Board of Trade when the particulars are submitted.

The engines must be capable of being readily started by hand and of running reliably in cold weather. If the engines are not reversible suitable reversing gear for going astern is to be provided.

With engines requiring carburetters and ignition fittings, these parts are to be placed as high as possible and the ignition fittings and wires are to be protected against damp.

The engines and their accessories, including the fuel tanks, pipes and fittings, must be adequately protected to ensure reliable operation under conditions likely to arise at sea during heavy weather. The motor casings should preferably be of steel; if of wood they must be insulated on the inside with asbestos covered with sheet steel. If the boat is of wood, a metal tray must be fitted under the motor. The shafting and other moving parts are to be fenced where necessary in order to prevent injury to the persons in the boat.

It is essential that the machinery should be maintained in an efficient condition and be ready for immediate operation at all times when the vessel is in service.

109. Fuel.—The engine may be driven by heavy oil or paraffin, but not by petrol. When necessary to facilitate starting, a small quantity of petrol may, however, be carried

in a tank fitted for the purpose. Where heavy oil is used it must be demonstrated that the motor can be started readily and reliably from a cold condition. Adequate precautions must be taken against the risk of fire and explosion. The fuel carried is to be sufficient to propel the boat at least 100 miles and a full supply of fuel is to be kept in the boat whenever the vessel is at sea.

- 110. Fire-extinguishers and equipment.—At least two fire-extinguishers of a type specially suitable for use against oil fires, a sufficient quantity of sand and a scoop for use with the sand are to be provided.
- 111. Strength, stability, seating and manoeuvring tests.—Before certifying a motor boat as part of the statutory lifesaving appliances of a ship, the Surveyor must satisfy himself that the strength of the boat is sufficient, the stability ample, and the seating and rowing arrangements satisfactory. A reduction in numbers is to be made for those persons, if any, who might have to be displaced in order to allow of the oars being used when the motor is not working.

The steering arrangements are to be such that the steersman has a clear view over the bows to within a reasonable distance of the stem.

The boat is to be tried for handiness in manoeuvring, going ahead, stopping, and going astern.

- 112. Speed.—Motor boats are to have a speed when fully laden in smooth water of at least 6 knots.
- 113. Class 3 boats fitted with motors.—If it is desired by an owner to fit a motor in a boat of Class 3 forming part of the statutory life-saving appliances of a ship not holding a passenger certificate, full particulars of the boat and machinery are to be submitted for the Board's consideration. In such cases the conditions applicable to motor lifeboats of Class 1 are to be generally complied with, but the internal air cases may be limited to the buoyancy necessary to float the machinery and its accessories (and also the hull in the case of a steel boat) and some relaxation may be permitted as regards the standard fuel capacity and speed.
- 114. Periodical inspection.—The requirements of paragraphs 43 or 71 for lifeboats of Class 1 are to be complied with, and in addition the machinery is to be inspected with special reference to reliability in starting and running.

PART V.—LIFEBOATS FITTED WITH MECHANICAL MEANS OF PROPULSION OTHER THAN A MOTOR,

115. General conditions of approval.—Designs and detailed specifications of all new lifeboats fitted with propelling gear are to be submitted to the Board before work on the boats

is commenced. Approval will be subject to the boats complying in all respects with the requirements of the Rules and with the instructions herein, unless other arrangements are made which, in the opinion of the Board of Trade, are at least of equal efficiency.

The propelling gear is to be such that the boat can be readily manoeuvred away from the ship's side after being launched and that steerage way can be maintained under adverse weather conditions.

To meet the requirements of Rule 3 that lifeboats are to be readily available in case of emergency the propelling gear is to be so arranged that it will be ready for service with the least possible preparation and will not interfere with the rapid embarkation of passengers in the boats.

The propelling gear is to be substantially constructed and fitted to the boat in an efficient manner. It is to be of such a character that it may be operated satisfactorily by persons untrained in its use, and that no adjustment is necessary to enable it to be worked by persons of different stature. It is to be such that it can be operated satisfactorily when the boat is partially flooded, and will be effective in propelling the boat fully or partially loaded. Where the conditions of approval of the propelling gear require the provision of a number of oars in addition to the gear a reduction in numbers is to be made for those persons, if any, who may have to be displaced in order to allow of the oars being used when the propelling gear is not being worked.

The internal buoyancy of lifeboats fitted with propelling gear is to be increased on the basis of 1½ cubic feet of buoyancy per cwt. of gear.

It will be necessary to submit a sample boat, or a sample boat of each size if more than one size of boat is to be fitted with the gear, to tests for flotation, seating and manoeuvring.

Tests for strength, stability and seaworthiness may also be required, but the necessity for these additional tests will be considered in each case on its merits.

CHAPTER III

DISENGAGING GEARS AND SIMILAR ARRANGEMENTS.

116. Requirements of the Rules.—When inspecting boats on board ship, the Surveyors are to see that the requirements of Rule 36 (11) regarding means for speedily detaching the boats from the falls, are complied with.

117. Means for detaching by hand.—It is not necessary for compliance with the Rules that boats shall be fitted with disengaging gears for releasing the falls mechanically when proper means are provided for detaching each fall by hand.

In order to provide for speedily detaching the falls by hand when the boat is waterborne, all lower fall blocks must be fitted with a suitable ring or long link for attachment to the sling hooks fitted in the boat, unless some approved form of disengaging gear is adopted.

The sling hooks are to face towards the midship part of the boat.

The eye on the block and the ring or link are to comply with the requirements of paragraph 216 of these Instructions.

- 118. General Conditions of Approval of Disengaging Gears.—If a disengaging gear is fitted it must comply with the following conditions and must receive the Board's approval before being used as part of the statutory equipment of a ship:—
 - (1) All disengaging gears must be so arranged as to ensure simultaneous release of both ends of the boat
 - (2) The means of effecting release must be placed aft so as to be under the personal control of the coxewain in charge of the boat.
 - (3) The gear may be of a type which will enable those in charge to release the boat, at their discretion, either before or after it is waterborne; alternatively, it may be of a type affording release only when the boat is waterborne. In either case it must be safe, speedy and reliable in action.

Note.—Disengaging gears of the type affording release before the boat's keel touches the water are useful appliances in the accident boats of passenger steamers, but are not suitable for general use in lifeboats unless special arrangements are made to secure that the boats shall always be in charge of a skilled person. (See paragraph 209.) Except in the case of accident boats, it is not permitted to fit more than one type of disengaging year in the lifeboats of a ship without the special sanction of the Board of Trade.

- (4) When the gear is of a type which effects release after the boat's keel enters the water, the action should be such that the hook offers no resistance to release should there be a towing strain on the falls.
- (5) The books must be suitable for instant unhooking by hand.

- (6) The point of attachment of the hook to the eye, ring or link of the block must not be lower than when ordinary fixed hooks are fitted, unless the stability of the loaded boat when suspended from it is shown to be satisfactory by a test.
- (7) The gear and mechanism for effecting release must be so constructed and arranged as to ensure the safety of the boat independently of any "safety pins".
- (8) The means for effecting release may be by hauling on or letting go a line, or by using a lever. If release is effected by a pull upon a line, the line must be properly cased in. Rods or other connections between hooks must also be cased in whenever this is necessary for the safety or the efficient action of the gear or for the protection of persons from injury.

The fairleads must be properly arranged to prevent the lines from jamming or nipping, and must be strongly attached to permanent parts of the boat. The lines should be fitted with chains where necessary for efficiency.

- (9) Such parts of the gear as would otherwise be likely to be set fast by rust or corrosion must be made of non-corrodible metal.
- (10) No part of the gear taking the weight of the boat is to be made of cast metal.
- (11) The scantlings and proportions of all parts which support the weight of the boat are to be designed to provide an elastic limit of strength or yield point proportionate to a load of from 1½ to 1½ times, and a breaking strength proportionate to a load of at least 2½ times the weight of the heaviest loaded boat in which the gear is intended to be fitted. The exact factor of safety used for each part of the gear will depend upon its design. (See paragraph 119.)

(12) All disengaging gears must satisfy the strength, lowering and disengaging tests with a loaded boat laid down in paragraph 119 before they can be finally accepted.

119. Tests.—(1) A sample gear of each size is to be subjected to the following strength tests:—

A sample hook is to be subjected to tests in the manner described in paragraph 32 (2) to ascertain the elastic limit as well as the ultimate strength.

The gear must then be assembled, each component part bearing the weight of the loaded boat being properly marked for ascertaining deflections and, if practicable, the whole subjected to tests by graduated loads until a load 1½ times the maximum weight of the loaded boat for which the gear is intended is reached, provided, however, that the elastic limit as ascertained for the hook is not exceeded. The gear when taken to pieces must show no deflection or injury at any part. The pins and bearing surfaces should also be carefully examined to ensure their strength and fitness. If the complete gear cannot be so tested, each part should be proved independently to the proportionate load to which it would be subjected in the foregoing test.

All parts of the gear bearing the weight of the boat are to be annealed after forging. Each duplicate hook and gear is to be proof tested in accordance with the requirements of paragraphs 32 (3) and 50, and the requirements of these paragraphs in other respects are to be complied with so far as they are applicable. Occasional tests to destruction are to be made on test pieces cut from material employed in the manufacture of the gear.

The keel plates are to comply with the standard for ordinary hook bolts. (See Appendix D.)

- (2) Lowering and disengaging tests with a loaded boat are to be carried out. The trials are to include tests made under the following conditions:—
 - (a) Boat fully waterborne.
 - (b) Boat partially waterborne, one end being out of the water.
 - (c) In the case of gear which can be released before the boat is waterborne, additional tests with the keel of the boat just clear of the water.
 - (d) The efficiency of the hooks and gear must also be tested by well jerking the boat in the tests (b) and (c).

When an inclining test is necessary under paragraph 118 (6), the weights representing the occupants are to be placed with their centres of gravity one foot above the seats.

- 120. New Sets of Disengaging Gears.—Surveyors must satisfy themselves that such gears comply in all respects with the specification attached to the certificate and that each set has been tested to the proof load as required by paragraph 119 (1).
- 121. Existing Disengaging Gears.—Disengaging gears already approved and fitted may continue to be passed by the Surveyors so long as they remain in good condition and are efficient.
- 122. Certificates of Approval.—If a disengaging gear fulfils the conditions specified in paragraph 118 and has been tested in the manner indicated in paragraph 119 with satisfactory results, the maker, if he wishes, may be granted a certificate of approval of the gear.

The maker will be required to submit a detailed specification and drawings, which, subject to the Board's approval, will be annexed to the certificate. He will also be required to furnish the Board with 300 copies of the certificate, including the specification and drawings, for distribution to the Board's Surveyors.

For the guidance of officers and lifeboatmen, a card of simple instructions as to the handling of the gear is to be supplied to every ship fitted with the gear.

CHAPTER IV.

WIRELESS TELEGRAPHY INSTALLATIONS AND SEARCHLIGHTS FOR SHIPS' LIFE-BOATS.

123. General requirements.—Rule 33 (1) of the Statutory Rules relating to Life Saving Appliances requires that the wireless installation to be carried on a motor boat in pursuance of paragraph (6) of Rule 4 or paragraph (5) of Rule 5 shall be capable of transmission and reception on a frequency of 500 kilocycles (wavelength 600 metres) and shall be provided with a source of power sufficient to give a minimum of 10 metre amperes (the number of metre amperes being determined by multiplying the current in amperes measured at the base of the aerial by the maximum height in metres of the aerial above the water line) and to maintain the installation in operation, allowing for intermittent use, for a total period of six running hours.

The searchlight to be carried must include a lamp of at least 80 watts, an efficient reflector and a source of power which will give effective illumination of a light-coloured object over a width of about 60 feet at a distance of 200 yards for a total period of six hours, and shall be capable of working for three hours continuously.

The Rule also requires that where power for the wireless installation and the searchlight is derived from the same source that source shall be of sufficient power to provide for the adequate working of both appliances simultaneously.

124. Wireless telegraphy installations.—(1) Aerial and earth.—Suitable arrangements are to be provided to the satisfaction of the Surveyor for the carrying of the aerial at a minimum height of 22 feet above water level and giving the maximum length of aerial practicable. The aerial, and the arrangement for carrying it, must be so designed as to be capable of quick and easy erection while the boat is under way.

An efficient earth connection must be provided and in no case must it be painted over.

(2) Power.—Provision should be made by means of an internal combustion engine (which may be either the boat's means of propulsion or a separate engine), secondary batteries, or a combination of the two, or otherwise, for sufficient power to be available to provide without undue stress the power output of the electrical generator associated with the radio transmitter as specified in sub-paragraph (4) for a period of six running hours divided into short periods: for example, for ten minutes in every hour, over a total period of 36 hours.

When the power required for any particular wireless installation has been determined, additional capacity of at least 30 ampere-hours should be provided for the searchlight.

If any part of the power is provided by an internal combustion engine the fuel and lubricating oil necessary to maintain as much of the power output specified above as is to be supplied by the engine, is to be provided. The fuel is to be stored in a suitable tank of such design as to ensure that the fuel is kept free from contamination under all weather conditions. A fire extinguisher of a type approved by the Board of Trade as suitable for extinguishing oil fires is to be provided. If a motor boat is fitted with a separate motor for generating power for the wireless installation and searchlight and is already provided with approved fire extinguishers in compliance with paragraph 110 no additional fire extintinguisher need be provided in respect of the wireless motor.

If the dynamo is driven by a propelling motor direct, a suitable governor should be fitted to give approximately a constant speed. If, however, the motor is arranged to drive a direct current generator and the current from this is used to run a motor-alternator for the wireless apparatus, or if the propelling motor is used only for running a dynamo for battery charging or for the searchlight, a governor need not be fitted. If power for the wireless installation is obtained from an independent internal combustion engine it is essential that the engine should be of a type that will start up readily, as it will only be used intermittently.

(3) Batteries.—If power is provided by secondary batteries or a combination of secondary batteries and an internal combustion engine, or otherwise, provision must be made to the satisfaction of the Surveyor for as much of the power output specified in sub-paragraphs (2) and (4) as is to be supplied by this arrangement.

When secondary batteries only are used they should give current at 20 volts and have a discharge rate of at least 25 amperes. If used solely for wireless telegraphy they should have a capacity of at least 100 ampere-hours, or a capacity of at least 130 ampere-hours if the same batteries are used also for the searchlight.

A battery with a voltage other than 20 may be accepted provided that the Surveyor is satisfied that its maximum discharge rate is adequate and that the ampere-hour capacity of the battery provides total energy available equivalent to that indicated for a battery of 20 volts.

When a combination of batteries and dynamo driven by the main motor is used for wireless telegraphy and for the searchlight, with provision for automatically "cutting in" and "cutting out" current to the batteries, the capacity of the batteries need not be more than four-fifths of that which would be required if batteries only were used; a minimum of 80 ampere-hours must, however, be provided.

- (4) Transmitter.—The transmitter may be of the spark or other approved type. It must be designed for transmitting with the aerial provided on a frequency of 500 kilocycles (wavelength 600 metres). The power of the transmitter must be such as to give a minimum metre-ampere figure of 10, that is to say, the product of the aerial current in amperes measured at the base of the aerial and the maximum height in metres of the aerial above the water line must not be less than 10.
- (5) Receiver.—The receiver must be designed for reception on a frequency of 500 k/cs. (wavelength 600 metres) but must be capable of receiving frequencies from 461.5 to 545.5 (wavelengths 650-550 metres); the normal receiver must be a valve receiver and crystal reception must be provided as an alternative method of reception. A buzzer testing set should be provided for the receiver.
- (6) Accommodation and care of plant, etc.—The whole of the plant, transmitter and receiver are to be housed and secured on the lifeboat in such positions as to afford reasonably adequate protection under all conditions and in such a manner that they will not interfere in any way with the stowage of the other equipment or with the handling of the boat (see paragraph 102). The terminals of the apparatus should be placed as high up as possible in the boat and in no case should they be less than 9 inches above the top of the keel.

A light should be available in the wireless cabinet.

The batteries should be sufficiently protected from salt water spray; they should not be spillable when the boat is tossed about in a seaway and the terminals should be kept well coated with vaseline.

Batteries such as those of the alkaline type with a metal container connected to one pole of the cell and held in open crates must in addition be placed in such a position that risk of short-circuiting by water in the bottom of the lifeboat is reduced to a minimum. If such a battery is placed in the open it must be enclosed in a container so constructed that there is no risk of spray lodging on the containing case or getting into the electrolyte. If placed in a compartment or cabinet which is reasonably well built, an open crate may be accepted provided the battery is placed as high as the Surveyor thinks necessary.

In no case, whether the battery is in a cabinet or in the open, should the bottom of a crate or any of the terminals of a battery be less than 9 inches above the top of the keel:

Acid batteries should be discharged and recharged in port at the end of each voyage and at least once a month when the ship is lying in port. Care must be taken when at sea to test the batteries at least once a week by voltmeter and hydrometer.

If any loss of charge or other defect is detected the cause should at once be investigated and the defect made good.

When alkaline batteries are supplied the maximum period during which they may remain without charge or discharge shall be three months. For periodical testing, an alkaline battery should be put on discharge at its normal rate for a period of one minute and voltage per cell taken, the precise condition of the battery being obtained from this voltage and the discharge curve. There should be included with each wireless telegraphy installation which embodies alkaline batteries as part of its equipment a discharge curve, which should be placed in some permanent position for reference during "condition" tests on any particular battery.

- (7) Tools and spare parts.—(a) A kit of tools sufficient to make all necessary minor adjustments should be provided.
- (b) When a petrol engine forms part of the power unit of an installation, a spare sparking plug must be provided. Spare brushes for any generator or motor must also be included.
- (c) One spare valve should form part of the receiver equipment, and, if the high tension supply to the receiver is of the dry battery type, a spare H.T. battery should be carried.
- (d) The necessary fittings, such as switches, voltmeters, ammeters, hydrometers, etc., should be supplied according to the system adopted. A suitable voltmeter should also be available for testing the individual cells of alkaline batteries when the latter are supplied.

(e) Spare serial insulators should be carried as required for the type of apparatus in use.

125. Maintenance of installation.—Under Section 430 of the Merchant Shipping Act, 1894, shipowners and shipmasters are responsible for keeping the life-saving appliances, including the lifeboat wireless installations, on board their ships in such a condition as to be at all times fit and ready for use. It is essential, in order to ensure that the lifeboat installations are kept in good working order, that they should be periodically inspected and tested. Arrangements should accordingly be made for tests of the installations by ships' wireless operators once a week while the ship is at sea, and once a month while the ship is in port, the aerial being placed in position whenever possible for the purpose of the tests.

In cases where a supplying company undertakes the maintenance of the lifeboat wireless installations as well as of the ship's main installation, the company should arrange a regular system of testing in order to keep the installations in efficient condition. Shipowners and shipmasters in such cases will, however, still be responsible for seeing that the installations are properly maintained.

When the tests by the wireless operator reveal faults or loss of efficiency which he himself is unable to remedy, he should report to the master in writing and the master should take the necessary steps to have the installation put in order.

In this connection attention is drawn to Section 9 of the Merchant Shipping Act, 1906, under which the master of every British ship is required to keep a record in the official log-book of every occasion on which boat-drill is practised and on which the life-saving appliances are examined. Such entries in the official log-book are to be taken as including the periodical tests of the lifeboat wireless installations required by this paragraph.

Normally the inspection of a ship's lifeboat wireless installation will be made by the Surveyor when the main installation of the parent ship is inspected. In addition check inspections will be carried out as suitable opportunities occur.

126. Searchlights. — (1) Construction. — The searchlight should be of substantial construction. The light should be supplied by a gas-filled electric incandescent lamp of at least 80 watts. The lamp and electrical connections must be waterproof. An efficient reflector should be provided so that the searchlight can produce a beam of divergence of about 6° and the apparatus must be capable of giving effective illumination of a light-coloured object over a width

of about 60 feet at a distance of 200 yards for a total period of 6 hours. There should be a focussing arrangement to increase the divergency to about 30°.

- (2) Mounting.—If the searchlight is mounted, the mounting should permit of an all-round horizontal movement and a vertical movement enabling the searchlight to be pointed directly overhead. As an alternative the searchlight may be held by a seaman, and in that case a substantial strap should be fitted to hang round the man's neck and assist in supporting the weight of the searchlight.
- (3) Power.—Sufficient power should be available to enable the searchlight to be worked for a total period of six hours, and it should be capable of working for three hours continuously. The source of power may be either a petrol engine, accumulator batteries, or may consist of batteries and a dynamo worked from the main engine of the motor boat. As indicated in paragraph 124 (2) capacity of at least 30 ampere-hours should be provided for the searchlight after allowance has been made for the power required for the wireless installation of the boat.
- (4) Spares.—At least one spare bulb should be provided for each searchlight.
- (5) Approved designs.—Designs of searchlights may be submitted for consideration for approval as standard designs on payment of the fees prescribed in the List of Fees and Expenses. The Board of Trade have approved for use on motor lifeboats searchlights constructed by the makers enumerated below:—

Messrs. Siemens Bros. and Co., 8-inch searchlight, in which electric bulbs of 100 and 150 watts at voltages of 20 and 12 respectively are to be used.

Messrs. C. A. Vandervell and Co., Ltd., 8-inch and 11-inch searchlight in which an 80 watt bulb at 20 volts is to be used.

The Marconi International Marine Communication Co., Ltd., 10-inch searchlight in which a 100 watt bulb at . 100 volts is to be used.

The Edison Swan Electric Co., Ltd., 10-inch searchlight in which the electric bulb employed is of special design and manufactured by the makers of the searchlight. It is of 90 watts power and uses current at 24 volts.

Messrs. Butlers, Ltd., 8-inch searchlight ("The Atlantic"), in which an 80 watt bulb at 20 volts is to be used. 9-inch searchlight ("The Atlantic") in which a 100 watt bulb at 20 volts is to be used.

The approvals are in respect of searchlights only and have no reference to the source of power, which should comply with the requirements of sub-paragraph (3) above.

CHAPTER V.

EQUIPMENT FOR BOATS.

127.—General.—The equipment required for boats is setout in Rule 32.

The materials of which the articles of equipment are made, including timber, must be of good quality. The articles are to be efficient for their intended service and are to be kept in good condition.

123. Stowage.—Rule 35 requires that all boats shall be fully equipped before the ship leaves harbour, and that the equipment shall remain in the boat throughout the voyage while the ship is at sea, or shall be stowed in some convenient place where it will be immediately available in case of emergency.

On those ships where it is proposed to stow certain of the lifeboat stores and equipment elsewhere than in the boats, Surveyors should satisfy themselves that the places of stowage are such that the stores can easily be transferred to the boats and that a sufficient number of the crew are told off for the transference of the stores and equipment to the boats in case of need.

In no case is any article of equipment or stores to be stowed below the bulkhead deck.

The following paragraphs 129 to 140 apply to all boats.

129. Oars.—The gunwales in all boats are to be pierced on both sides of the boat just abaft each thwart for the reception of thole pins or crutches.

Boats propelled solely by oars must be provided with rowing oars in number and length in accordance with the following scale. A steering oar must also be provided in all cases. Oars are to be of ash or hickory and free from short grain or other defects.

Length of boat.		Number and length of	Length of steering
		oars.	oat.
16 ft. and under 18 ft.		5-12 ft.	14 ft.
18 ft. and under 24 ft.		6-12 ft.	14 ft.
24 ft. and under 26 ft.		6-14 ft.	15 ft.
26 ft. and under 28 ft.		8-14 ft.	15 ft.
28 ft. and over	•••	10-15 ft.	16 ft.

The length of the rowing oars in any boat exceeding 28 feet in length need not exceed 15 feet nor the length of the steering oar 16 feet.

A motor boat need not carry more than half the complement of rowing oars required by the foregoing scale, in addition to a steering oar. In motor boats carrying 100 or more persons two rowing oars in addition to the number which would be required under the preceding sub-paragraph should be carried.

Where boats are fitted with propelling gear other than a motor the Board may allow a reduction in the number of oars to be carried, but each case will be dealt with on its merits.

The length of the blade must be one-third the length of the oar and the breadth at the extreme end not less than twice the diameter. The minimum diameter of the oars are to be as follows:—

Length of oar.		Diameter.
12 ft.	•	21"
14 ft. to 15 ft.		2┋"
16 ft.		21"

The steering oar should be distinguished from the other

oars by painting the blade.

Provision must be made for housing the steering oar. In boats of the whale boat type the fitting should consist either of a wire grummet served over with marlin or spun yarn and secured to the stern post, or of a crutch of suitable pattern supported in chocks bolted to the sheerstrake and gunwale at about 18 inches from the sternpost. Square sterned boats must be fitted with a crutch or rowlock and grummet combined.

The crutches should be of wrought iron galvanised; they must be securely attached to the boat by lanyards or chains. Three crutches should be provided for each rowing thwart (Rule 32 (1) (b)).

130. Boat Hooks.—At least one boat hook must be carried in every boat. Shafts of boat hooks must be of good quality ash or hickory, not less than 8 feet in length and 2 inches in diameter at the mid length. In large lifeboats boat hooks of larger dimensions may be necessary. A motor boat must carry two boat hooks.

131. Plugs.—In open boats there must be two plugs for each plug hole, securely attached with lanyards or chains; automatic plugs or automatic valves may be accepted if of a pattern approved by the Board of Trade. In decked lifeboats plug holes in bottom or deck are not allowed, but automatic relieving valves or other approved means are to be fitted above the deck for freeing the boats of water (see paras. 88 and 89). (For drainage in motor boats see paragraph 107.)

In boats other than motor boats certified to carry more than 85 persons, an efficient hand pump should be fitted and arrangements made for satisfactory drainage to the pump suction. 132. Sea Anchor.—A sea anchor must be provided. It should be constructed of No. 1 best flax canvas or other equally satisfactory material and be not less than 2 feet in diameter if circular, or of equivalent size if not circular, for boats 26 feet in length and under.

In larger boats the sea anchor is to comply with the following or other approved specification:—

It should be made of No. 1 best flax canvas (which may be tanned if desired). Its diameter at mouth should be not less than 27 inches. At the extremity of the sea anchor a ring of § inches galvanised or non-corrodible metal and of 5 inches diameter should be tabled in.

It is to be not less than 4 feet in length from mouth to bottom ring and to be made of three sections of canvas strongly sewn together and roped at the seams with 1½ inches bolt rope, the three ropes then being formed into a bridle with a 4 inches heart thimble seized in the connecting end. The bridle is to be not less than 2 feet 6 inches long. A wooden hoop of ash of 1½ inches by ¼ inches section should be tabled in the mouth of the sea anchor.

If preferred the hoop may be made of I inches galvanised iron served over with spun yarn or marlin before being tabled in, or of non-corrodible metal of equal strength.

The riding line or hawser is to be attached to the sea anchor by means of a shackle of suitable size to take the heart thimble.

If it is proposed to carry sea anchors other than of the circular pattern they should be equally effective and made in accordance with a specification approved by the Board.

Sea anchors are to be fitted with a hawser of manilla rope and a tripping line 2 fathoms longer than the hawser. All boats of 30 feet in length or over are to be fitted with a suitable fair lead, fixed on the gunwale close to the stem, to take the hawser.

The sizes and lengths of the hawsers are to be as follows:--

Length of boat.	Length and circumference of hawser.		
•	Boat lengths.	Inches.	
26 feet and under	. 3	21	
Exceeding 26 feet but not	t		
exceeding 30 feet	•	3	
Exceeding 30 feet	. 4	3 }	

Tripping lines are to be of at least 1½ inch and 2 inch rope for sea anchors 2 feet and 2 feet 6 inches diameter respectively. That portion of the hawser which would lie over the gunwale of the boat when riding to the sea anchor is to be protected by parcelling.

In every case the hawser is to be provided in addition to the boat's painter.

133. Painter.—A painter must be provided of not less than 20 fathoms in length, except in the case of small vessels, where the Surveyor may exercise his discretion as to the length.

The sizes of the rope are to be as follows:-

For boats 26 feet and under in length-21 inch.

For boats exceeding 26 feet in length but not exceeding 30 feet—3 inch.

For boats exceeding 30 feet in length-31 inch.

134. Bucket and Bailer.—A bucket and bailer of good quality, made of galvanised iron must be provided. The bucket should hold about two gallons and the diameter of the bailer should be not less than eight inches. In boats over 30 feet in length two bailers are to be provided.

135. Rudders and Tillers.—Rudders must be of suitable form and strength for the size of the boat. They are to be of home grown elm, from 1 inch to 1½ inches thick, fitted with cheeks § inch to ½ inch thick, well secured by copper clenched nails at the upper ends and by spikes at the lower or tapered end. The breadth at the bottom is not to be less than 12 inches for a 16 foot boat and 20 inches for a 30 foot boat. The breadth for boats of intermediate lengths should be found by interpolation. Two sets of braces and pintles are to be fitted to the sternpost and rudder, the arms to be well secured by screws or copper rivets clenched on countersunk holes in arms.

The tiller is to be of oak, ash, or pitch pine.

136. Drinking Water.—It is desirable that two tanks or breakers should be supplied to hold the quantity of water required, the smaller size being more convenient for stowage and handling and less likely to be damaged. The tanks or breakers must be kept filled with fresh water, sufficient to provide one quart for each person that the boat is deemed fit to carry. The water must be changed periodically. The water tanks should, in general, be of galvanised iron, and the cover should be such as will not become fast with rust or require a special tool or appliance for opening it. An enamelled dipper of a size suitable for entering the hole

in the tank or breaker is to be provided and is to have a lanyard attached to it. Cocks or valves are not to be allowed.

137. Hatchets.—Two single edged hatchets having good cutting edges must be provided, attached by lanyards and readily available, one at each end of the boat.

138. Grab Line.—A grab line must be provided. It must be of 2 inch manilla or sisal rope of good quality having full loops reaching within a short distance of the waterline. The loops must be strongly secured to ringbolts well clenched through the timbers below the rubber at intervals of not more than 24 inches.

The ringbolts are to be made of wrought iron or steel.

139. Lamps and Matches.—A lamp must be provided for each boat. Lamps are to be constructed of brass, copper or other suitable metal and must show an all round white light, and of a size that would fit conveniently in the galvanised bucket so that the bucket could be used to protect the lamp when not in use and enable it to be used for signalling purposes if required. Lamps are to be capable of burning in a strong wind and must be provided with oil sufficient to burn eight hours.

Any other type of lamp or light which it is proposed to substitute as being equally efficient should be submitted for the special approval of the Board of Trade as provided by the rules.*

A large box of reliable matches in a watertight container is to be provided.

- 140. Locker.—A locker constructed so as to preserve the small items of equipment from deterioration should be provided. When the locker is situated in the end of the boat portable bottom boards are to be fitted.
- 141. Mast and Sails.—All boats, other than motor boats, are to be equipped with a mast and sails. The length of the mast is not to be greater than two-thirds of the length of the boat. The mast is to be fitted with the necessary arrangements to take the stays and the jib and mainsail halyards. For this purpose an iron band of sufficient

When motor lifeboats are used at night for purposes other than life-saving, e.g. when conveying passengers between ship and shore, they must comply with the Collision Regulations, i.e. they must, as required by Article 7 (1) and (2), carry a properly constructed masthead lantern above red and green sidelights which may be in the form of a combined lantern. A tricoloured lantern does not fulfil the requirements of the Collision Regulations in respect of these boats.

strength is to be fitted with eyes to take the halyard blocks and, if necessary, the rigging, in such a position as to allow ample hoist for the mainsail. See also Appendix F.

The following table provides a general guide to the minimum standards of material that should be regarded as satisfactory for lifeboat sails:—

	Boats under 24 ft. in Length.		Boats over 24 ft. in Length.			
Width :	27 ins.	No. 7 24 ins.	}	27 ins.	No. 6 24 ins.	24 ins.
Weight per yard			10 oz.			

All to be of best quality and free from jute or other foreign matter.

The sails are to be fitted for reefing and should be of the sizes shown on the sail plans, Appendix F. At each inspection the mast is to be stepped and the sails set to the Surveyor's satisfaction.

An approved motor boat is not required to be equipped with a mast and sail.

In a ship which carries passengers in the North Atlantic, on a voyage not proceeding South of 35° North Latitude, only a proportion of the boats, to be fixed by the Board, need be equipped with mast and sails. If in any such ship it is proposed to dispense with sails in a proportion of the boats full particulars are to be submitted to the Board of Trade for consideration.

142. Biscuit Cases.—Air-tight cases must be provided. They are to be strong, tight, and durable. The screw cap is to be of non-corrodible metal, fitted with a coarse thread and suitable jointing material and is to be easily accessible.

A single case is not to contain more than 75 pounds of biscuits and a key is to be provided for opening it.

143. Condensed Milk.—Boats are to be equipped with 1 lb. of Condensed Milk for each person the boat is certified to carry. The Condensed Milk must be of a brand approved by the Board of Trade.

In a ship which carries passengers in the North Atlantic, on a voyage not proceeding south of 35° North Latitude, the quantity of Condensed Milk to be carried in each boat may be reduced by one-half.

- 144. Oil Distributing Apparatus or Vessel.—An oil distributing arrangement, capable of distributing oil evenly and gradually on the surface of the water, must be provided. It must be such that it can be attached to the sea anchor.
- 145. Red Lights.—Twelve red pyrotechnic lights are to be provided for each lifeboat. These lights are to be of a satisfactory kind, self-igniting, capable of burning at least 40 seconds, and contained in a watertight canister.
- 146. Compasses.—Subject to the provisions of paragraph 147 of these instructions, no compass should be accepted unless it complies with the following specification:—
 - (1) The compass must be of the "liquid" type. The liquid must be a mixture consisting of a minimum of two parts of unpotable methylated spirits and three parts of distilled water and must be perfectly clear and free from impurities.
 - (2) The magnet must have ample directive force. In the United Kingdom a period of 18 to 22 seconds after a deflection of 40° at a temperature of about 60° F. would be satisfactory.
 - (3) The weight on the pivot of the card when submerged in liquid should be between 4 and 6 grammes.
 - (4) The card must be not less than 4 inches in diameter and must have a clearance from the bowl of at least \(\frac{1}{2}\) inch. It should be marked to half points, the eight principal points being distinctively marked.
 - (5) The centre must be of sapphire or equally hard jewel. The jewel should be removable from the float.
 - (6) The pivot must be of iridium or equally suitable hard material.
 - (7) The arrangement made to allow for the expansion and contraction of the liquid must be efficient and capable of functioning over a range of 100° F.
 - (8) The bowl must be adequately weighted and properly poised in the gimbals which should give a fore and aft and thwartship action. The gimballing must be in the same horizontal plane as the point of suspension of the card and preferably the outer gimbal pins should be placed fore and aft. The bowl must be placed in a binnacle or box of non-magnetic material and the compass must be efficiently lit by an oil lamp capable of burning for 10 hours.

[•] The "period" is the time of a complete oscillation of the card after deflection, i.e., after a deflection of 40°, a swing past the position of rest and back again to the completion of its swing on the side to which it was originally deflected.

(9) The minimum thickness of the metal used in the construction should be as follows:—

Compass bowl 21 S.W.G. Binnacle 24 S.W.G. Lamp 24 S.W.G.

The compass bowl should be efficiently stiffened to take gimbal pins. The binnacle shell should be swaged or spun into the base ring and soldered all round. A binnacle made of wood will not be accepted.

The gimbal ring is to be of naval brass or other rigid non-magnetic metal § inch by § inch. Gimbal pins are to be of naval brass or other hard non-magnetic material of § inch diameter; both they and the bearings in which they engage should be perfectly smooth.

- (10) The materials and workmanship must be good throughout and the compass must be such as will remain efficient under sea-going conditions.
- (11) The paint inside the bowl must be such that it shows no sign of blistering.
- (12) The bowl of each compass must be engraved or stamped with the maker's name or other approved identification mark.
- 147. Existing Compasses.—Any compasses passed before the 1st January, 1931, which are still in good condition may continue to be accepted; but all new compasses, and all compasses fitted in boats for new ships, or in new boats for existing ships, must comply with the requirements of paragraph 146.
- 148. Testing Compasses.—Compasses should be periodically tested, and experience has shown that it is essential that they should be overhauled, and repaired where necessary, at regular intervals, if they are to be kept in reasonably efficient condition. The Director, Admiralty Compass Observatory, is prepared to test compasses and to advise on technical points. Application should be made to the Director, Admiralty Compass Observatory, Ditton Park, Slough.
- 149. Exemptions in certain Home Trade ships.—Under Rule 32 (6) home trade ships are relieved of the obligation to carry certain items of lifeboat equipment as follows:—
 - (a) Ships in classes III to VIII and classes X, XII, XIV and XVI: mast and sails, biscuits and condensed milk.
 - (b) Ships in classes IV to VIII and XIV: compass, oil distributing apparatus, self-igniting red lights and locker in addition to the items under (a).

CHAPTER VI.

LIFE-RAFTS.

150. Life-rafts.—Under the Rules provision is made for the acceptance of life-rafts in certain circumstances. It is not anticipated that it will be desired to carry life-rafts to any extent as part of the statutory life-saving appliances on ships registered in the United Kingdom. If any such cases should arise full particulars of the life-rafts which it may be proposed to carry should be submitted to the Board of Trade for consideration.

CHAPTER VII.

BUOYANT APPARATUS, INCLUDING BUOYANT DECK SEATS.

151. Approved Buoyant Apparatus is defined in Rule 30 and the instructions set out in paragraphs 152-171 have been prepared for the guidance of Surveyors in giving effect to this Rule.

All approved buoyant apparatus must comply with the following conditions:—

- (a) It must be of approved material and construction;
- (b) It must be effective and stable when floating either way up;
- (c) It must be of such size, strength and weight that it can be handled without mechanical appliances, and, if necessary, thrown without damage from the ship's deck on which it is stowed;
- (d) If it depends for its buoyancy on air it must not be so constructed as to require inflation before use in an emergency:
- (e) The air cases or equivalent buoyancy appliances must be placed as near as possible to the sides of the apparatus;
- (f) It must have a line securely becketed round the outside of the apparatus.

Before approval can be given, detailed drawings and full particulars must be submitted, together with the results of the tests for flotation, stability and strength, and such other test as the Board may deem necessary.

If any apparatus proposed to be made or installed on a ship coming under Board of Trade Survey is not of a type that has previously been approved, a full report on its design and construction must be submitted to the Board for instructions before the apparatus is accepted.

- approved by a certificate of approval granted subsequently to the issue of these Instructions, and apparatus of a type named in the list given in paragraph 171, may be passed if the Surveyor is satisfied that it complies in all respects with the specification annexed to the certificate and that the materials and workmanship are satisfactory. Samples of such apparatus are, however, to be occasionally tested for strength, flotation, and stability as opportunities occur.
- 153. Survey of Buoyant Apparatus under construction.—In many types of buoyant apparatus the air cases are completely encased, and in order to secure a uniformly high standard in regard to materials, construction and workmanship, a similar procedure is to be adopted in respect of survey during construction as in the case of wooden lifeboats, so that these appliances may be certified at the makers' works.

When the buoyant apparatus is retained unusually long in stock, after the issue of the Form Surveys 123a, measures are to be taken by the makers or owners to keep the buoyant apparatus in good condition. Surveyors when visiting makers' works should call attention to this matter and take such steps as seem appropriate in the circumstances if they see any buoyant apparatus that appears to have been in stock for a long time.

154. Material and Workmanship.—The materials used in and workmanship applied to the construction of all buoyant apparatus are to be of the best quality, and the Surveyor must satisfy himself by frequent inspection during construction that these conditions are fulfilled.

In any cases of doubtful efficiency the Surveyor is to require such tests as he may consider necessary to ensure that the apparatus shall be reliable.

- 155. Apparatus which requires adjustment.—Buoyant apparatus must be such that it is always ready for immediate use. No apparatus which requires adjustment is to be accepted.
- 156. Automatic locking devices.—Apparatus which is intended to open out automatically when placed in the water is liable to the objection that the hinges or other working parts are likely to become inefficient. Special tests will be required of such apparatus which is not to be passed unless the Board's special sanction has first been received.
- 157. Framework, &c.—The framework of the apparatus is to be of suitable hard wood well connected at the corners, but the wood casing or sparring required by paragraph 158

may be of soft wood of suitable quality. The method of securing the corners should avoid any fastening into end grain timber.

As a precaution against dry rot in the material of the framework and sparring, the interior of the apparatus is to be well ventilated by holes cut in the framework and divisions. The sparring should preferably not be fitted edge to edge but there should be space between the battens unless other adequate ventilating arrangements are adopted.

158. Construction of air cases.—If the buoyancy is provided by metal air cases, these are to be constructed as described in paragraph 35. Air cases are not to be more than 4 ft. in length, and, when more than 2 ft. 6 ins. in length or breadth, they are to be efficiently stiffened by divisions or stays. The cases are not to be pierced for the attachment of wood divisions or stays or for any other purpose.

The air cases must be protected from injury by properly fitted wood casing or sparring, easily removable for the periodical inspection of the air cases by the Surveyor, and are to be secured against movement within the casing.

No iron work is to be placed in contact with metal air cases.

If it is desired to provide the buoyancy otherwise than by metal air cases as above described, full particulars of the proposal are to be submitted and the Board's approval obtained before any apparatus so fitted is passed by the Surveyor.

159. Weight.—Rule 30 requires that buoyant apparatus shall be of such size, strength and weight that it can be handled without mechanical appliances and, if necessary, can be thrown into the sea from the vessel's deck on which it is stowed. When the weight of the apparatus exceeds 300 lbs. suitable handles or rungs are to be fitted to facilitate the handling of the apparatus. In general the weight of a single piece of apparatus is not to exceed 400 lbs. but where the apparatus is of a special type or is of a size which enables increased lifting facilities to be provided, the question of approving apparatus exceeding 400 lbs. in weight will be considered.

There must be no projections from the buoyant apparatus which would prevent the apparatus from sliding easily over the rail in launching.

160. Stability.—It is important that buoyant apparatus should have sufficient stability in any position in which it is capable of floating, and no new buoyant apparatus supplied to a vessel is to be accepted unless it is capable of supporting a weight of iron, suspended in the water from the grab-

lines, of 15 lbs. per foot of length, along any edge, without immersing any part of the upper surface of the apparatus. The minimum weight of iron suspended from any edge should be 64 lbs. even if the length of the edge is 4 ft. 3 ins., or less. When reporting the result of a stability test, the Surveyor is to state the freeboard and the angle to which the apparatus inclined when loaded as above. The conditions of this test will be subject to modification in the case of an apparatus intended to support a much smaller number of persons than that represented by the perimeter of the apparatus measured in feet.

The standard of minimum stability prescribed above has been adopted with due regard to the difficulty of stowing apparatus of considerable breadth in small vessels without unduly encumbering the deck space. It is recommended that in large Home Trade passenger steamers and in all cases where sufficient deck space is available, buoyant apparatus should be provided having a margin of stability in excess of the minimum requirements prescribed.

The minimum breadth of buoyant apparatus intended for a foreign-going passenger steamer is not to be less than 3 feet 6 inches. In addition to the buoyancy tanks along the sides, it will usually be necessary, in order to obtain sufficient longitudinal stability, to place some of the buoyancy tanks along the ends of the appliance.

161. Strength tests.—Each new type of buoyant apparatus is to be subjected to a test of strength by dropping a sample into the water, and it must have sufficient strength to emerge from the test with its efficiency in no way impaired. If the buoyant apparatus is for a specific ship it is to be dropped from a height equivalent to that of the deck on which it is stowed above the light water line.

For the purpose of general approval of buoyant apparatus not allocated to a specific ship, samples are to be dropped into the water from the following heights:—

Apparatus intended for ships of Class I ... 60 feet. Apparatus intended for ships of Class II ... 35 feet. Apparatus intended for ships of Class III ... 20 feet.

If in a specific ship it is proposed to carry the apparatus on a deck the height of which above the light water line is greater than the foregoing, the necessity for a drop test from the deck height should be submitted to the Chief Ship Surveyor for consideration.

162. Number of persons.—The number of persons for which any buoyant apparatus will be deemed suitable will be the

lesser of the two numbers given by the following formulæ (a) and (b) subject to the result of the stability test required by para. 160.

- (a) The number of lbs. of iron which it is capable of supporting in fresh water divided by 32.
- (b) The number of feet in the perimeter of the apparatus measured along the line of the points of attachment of the grablines.

If, however, the apparatus is designed to support persons in such a manner that they are only partially immersed in the water, or if facilities exist for climbing on to the top of the apparatus, the divisor in sub-paragraph (a) may require to be increased.

163. Marking.—When the Surveyor has satisfied himself that a new buoyant apparatus complies with the foregoing conditions, he is to require it to be marked in accordance with Rule 31. The marking must be on a side or end of the apparatus exposed to the view of passengers and should be as follows: Buoyant Apparatus . . . Persons.

In the case of buoyant apparatus intended for use on a foreign-going passenger steamer the words "Foreign-going Ship" is to be added to the marking after the words "Buoyant Apparatus". This marking denotes general approval for use in foreign-going passenger steamers; if the apparatus is passed for a specific ship, this must be so stated in the marking.

The figures and letters denoting the number of persons are to be permanently cut or branded into the woodwork of the apparatus. The Surveyor is to complete the marking by adding his initials, the date and B. T., which must in every case be stamped immediately below the figure denoting the number of persons.

164. Painting.—The materials forming the framing and sparring of all buoyant apparatus are to receive two good coats of best lead paint inside and outside. When buoyant apparatus is carried on a foreign-going ship the outside is to be painted white and red.

The inside of the apparatus may be coated with an approved preservative in lieu of paint.

165. Painter and Grablines.—A painter is to be provided strong enough and secured to the buoyant apparatus in such a way as to enable it to be lowered from the deck to the water. It should, as a rule, be of 2½-inch rope of good quality, and in length must be equal to the height of the deck above the light water line, plus six feet. When the apparatus weighs less than 300 pounds 2-inch rope will be sufficient.

Grablines are to be fitted all round the apparatus having a number of equal loops corresponding to the number of persons for whom the apparatus is certified. Each loop is to have a cork or light wood float, and the depth of the loop when wet should not be less than 6 ins. and not more than 8 ins.

Where the apparatus is 12 ins. or less in overall depth, one row of grablines may be attached along the line of the middle of the depth but in apparatus of greater depth two rows of grablines are to be fitted, one having its points of attachment a little below the top of the air cases and the other a little above the bottom of the air cases and as close to the sides of the air cases as is practicable. Jackstays or handrails are not to be substituted for grablines.

The grablines must be of rope of not less than 11 in. circumference. Each of the attachments is to be strong enough to support the weight of the apparatus in view of the possible need for lifting or dragging the apparatus along the deck to the launching station. The attachments are to be made of wrought iron, steel or other equally suitable material, and must be through fastened or other equally strong method of attachment must be adopted.

The grablines may be attached to the apparatus by passing them through holes in the framing and inter-lacing them to prevent undue movement, but in such cases the edges of the holes are to be well rounded to prevent chafing and deterioration of the lines.

The grablines and attachments must be subjected to severe testing by the Surveyor before any buoyant apparatus is passed.

167. Existing Buoyant Apparatus.—Apparatus of a type mentioned in the list given in paragraph 171 of these Instructions which bears an approval plate issued by the Board of Trade or has been marked with a Surveyor's initials (see paragraph 163), may be passed so long as it remains in good condition.

Apparatus of types which are not included in the lists but which have previously been approved and which bear an approval plate issued by the Board of Trade or are marked in accordance with paragraph 163 may be accepted as part of the statutory life-saving appliances of the ships for which they were originally approved provided that (i) the Surveyor is satisfied after inspection that the apparatus is in all respects in good condition; and (ii) that the apparatus, or a precisely similar apparatus, has been subjected with

satisfactory results to the stability test specified in paragraph 160 of these Instructions.

In cases where the foregoing requirements are not complied with the Surveyor must make a report to the Board giving full particulars as to the construction, stability, etc., of the apparatus.

168. Stowage.—For stowage of buoyant apparatus see paragraph 210.

169. Periodical Inspection of Buoyant Apparatus.—The buoyant apparatus is to be carefully inspected by the Surveyors at every annual survey of a passenger steamer which is equipped with these appliances, in order to ascertain that they are in good condition and in all respects efficient. Special attention is to be given to those forms of apparatus in which there are hinges, joints, mechanical contrivances or working parts of any description, and the Surveyor should report to the Board any failure or defect which may be found at a periodical survey.

The air cases of buoyant apparatus are to be periodically tested for watertightness, and, in general, the cases of not less than one-fifth of the total number of apparatus in the vessel are to be removed at each annual survey. If on examination the Surveyor considers that the condition of the apparatus warrants it he may require a higher proportion of the apparatus to be opened out in order to satisfy himself as to its general condition. If evidence of dry rot or other defect is discovered in the material of the framework or sparring the affected material is to be removed and replaced by sound material and the apparatus well coated with best lead paint or other equally suitable preservative.

170. Certificates of Approval.—The makers of a new type of buoyant apparatus which is found to comply fully with the requirements indicated in these Instructions may, if they desire it, be granted a Certificate of Approval in respect of such apparatus.

If such a Certificate is desired, the makers will be required to submit a full and detailed specification of the apparatus, illustrated, if necessary, by drawings or photographs. In the event of a Certificate of Approval being granted, the makers will be required to furnish the Board with 300 copies of the Certificate and specification for circulation to Surveyors.

171. List of Approved Buoyant Apparatus.—Buoyant apparatus of the types named in the following list may be regarded as complying with these Instructions, and are to be dealt with in the manner indicated in paragraph 152.

The name of any buoyant apparatus in respect of which a Certificate of Approval is issued subsequent to the issue of these Instructions will be notified to Surveyors and should be added to the list:—

- A .- For use on Home Trade passenger steamers only.
 - (1) Adams' Patent Buoyant Apparatus.
 - (2) "C. & H." Deck Seat.
 - (3) Carley Life Float.
 - (4) Carley "New Austin" Life Float.
 - (5) Crichton's "Unit" Buoyancy Apparatus.
 - (6) Day, Summers, & Co.'s Buoyant Deck Seats (E.1 and E.2).
 - (7) Iron's Deck Seat.
 - (8) Linkleter's Buoyant Deck Seats (Types C. and D.).
 - (9) Linkleter's Buoyant Apparatus.
 - (10) Linkleter's "Twin Lifebuoy."
 - (11) MacTavish Patent Automatic Buoyant Deck Seat.
 - (12) Nott's Life Float "Carley" Type.
 - (13) Perry & Chambers Single and Double Deck Seats and Buoyant Apparatus (W. Gradwell & Co.).
 - (14) Rogers' Buoyant Apparatus.
 - (15) Philip & Sons' Buoyant Apparatus.
 - (16) Rogers & Co.'s Combined deck seat and buoyant apparatus.
 - (17) Mashford Buoyant Sests (Types A., B., C. and D.).
 - (18) "Neptune" Buoyant Seats.
 - (19) "Blackmore" Buoyant Seats.
 - (20) Perry & Chambers Single and Double Buoy and Deck Seats (H. L. Perry, Barrow).
- B.—For use on Foreign-going or Home Trade passenger, steamers.
 - (1) Arbuthnott's Buoyant Apparatus.
 - (2) Carley New Austin Apparatus.
 - (3) Hamblin's "Perfectax" Buoyant Apparatus.
 - (4) Hill's "Acme" Buoyant Apparatus.
 - (5) Linkleter's "Simplex" Buoyant Apparatus.
 - (c) Nott's Life Float (Types "P.T." and "B").
 - (7) "Perry & Chambers" Buoyant Apparatus (W. Gradwell & Co.).
 - (8) "Perry & Chambers" Buoyant Deck Seats and Buoyant Apparatus for decks not exceeding 40 feet above the light water line (W. Gradwell & Co.).
 - (9) Rogers' Buoyant Apparatus.
 - (10) Rutherford's "Neptune" Buoyant Apparatus.
 - (11) Linkleter's "Simplex II" Buoyant Apparatus.

- (12) Linkleter's "Simplex III" Buoyant Apparatus.
- (13) "Seagull" Life Float Buoyant Apparatus (Types B., C., D. and E.).
- (14) "Seagull" Life Float Buoyant Apparatus (Type A.).
 - (15) Linkleter's "Simplex IV" Buoyant Apparatus.
- (16) "Light Buoyant Lifefloat" Buoyant Apparatus (Type B.B.).
 - (17) "Mechans" Lifefloat.
- (18) "Flotanet" Buoyant Apparatus (Types A., B., C. and D.).
 - (19) Nott's "A" Type Buoyant Apparatus.

CHAPTER VIII.

LINE THROWING APPLIANCES.

172. General.—Passenger Ships coming under Classes I or II of the rules and all ships of Classes III, IV, V, IX, X, XI and XII of 500 tons gross tonnage or upwards when proceeding on a voyage or excursion from a port in the United Kingdom are required to carry an approved line-throwing appliance. Such appliance is defined as one consisting of:—

- (a) Four 2-lb. line-throwing rockets with suitable sticks, or other approved apparatus, capable of throwing a line faths inch in circumference a distance of 120 yards in calm weather: and
- (b) Two such lines, fiths inch in circumference, each not less than 240 yards in length, having a breaking strain of not less than 150 lbs.
- 173. Conditions of Acceptance of Line-Throwing Apparatus.—In deciding whether the apparatus complies with the requirements, Surveyors should be guided by the following considerations:—
 - (1) Rockets.—These should be specially made for line-throwing (i.e., without stars or detonating composition) by manufacturers approved by the Roard. They should have a watertight outer case and should be marked with the date of manufacture. The means of ignition should be either by (i) a slow-burning fuse at the base ignited by portfire or by (ii) a frictional striker applied to slow-burning composition at the base or side of rocket. In either case the arrangement should allow for a delay of not less than three seconds before the rocket commences its flight. In the case of a frictional ignition, its striker should be carried, ready for use, in a small sheath on the rocket. Rockets should be replaced every two years.

- (2) Sticks.—To be attached to the rocket, when required for use, by a spring clip engaging in a slot.
- (3) Lines.—Each line should be not less than 240 yards in length and Ath inch in circumference, with a breaking strain of not less than 150 lbs.
- (4) Gontainer.—Rockets, lines and portfires (if used), with a copy of directions for use of the appliance, should be stowed together in a case which is sufficiently weathertight and watertight to keep the rockets available for use at any time.

When inspecting ships, Surveyors should see that the apparatus is generally in good condition, that the rockets are not more than two years old and that the directions for use are clear and legible. Out-of-date rockets should never be used for testing or practice purposes.

174. Certificates of Approval.—The makers of a new type of line-throwing appliance may apply for a Certificate of Approval in respect of such apparatus. If such a Certificate is desired, the makers will be required to submit a full and detailed specification of the appliance, illustrated if necessary, by drawings and photographs. Such tests as may then be required by the Board will be carried out at the maker's expense and, in the event of a Certificate of Approval being granted, the makers will be required to furnish the Board with 300 copies of the Certificate and specification for circulation to Surveyors.

175. Approved Line-Throwing Appliances.—Lists will be issued from time to time of approved makes of line-throwing appliances. Appliances which have been accepted as equivalent to the rocket apparatus described in para. 173 are of the following types:—

- (1) A Line-throwing gun with a line carried in a container on the muzzle;
- (2) Rocket Line-throwing Pistol by means of which a rocket carrying a line is fired from a pistol with a small impulse charge, the line being placed on the deck alongside the firer; and
- (3) Rocket Apparatus (i.e., a trough on a stand or on legs), with rocketa, etc.

176. List of Approved Line-Throwing Appliances.—The following is a list of appliances approved by Certificates of

Approval in force at the date of issue of these Instructions:—

Name of Manufacturer.	Designation. Schermuly Pistol Rocket Line-Throwing Apparatus.		
Messrs. The Schermuly Pistol Rocket Apparatus, Ltd., Spra Works,			
Newdigate, Surrey. do. do. do.	Schermuly "Spra" Dis- charger Line-Throwing Apparatus.		
Messrs. James Pain & Sons, Ltd.,	Portable Rocket Line- Throwing Appliance.		
9, St. Mary Axe,	,		
London, E.C.3. Messrs. Joseph Wells & Sons, Ltd., Honor Oak Park,	"Britannia" Portable Rocket Line-Throwing Appliance.		
London, S.E.23. Messrs. J. Chapman, 46-48, Great Eastern	Knight Line - Throwing Gear.		
Street, London, E.C.2. Messrs. L. Le Personne & Co., 99, Cannon Street, London, E.C.4.	"Lepco" Line-Throwing Equipment.		

CHAPTER IX.

177. General.—All lifebuoys must comply with the requirements of Rule 38 in regard to construction, buoyancy, and the provision of beckets and lifelines.

If it is desired to manufacture lifebuoys of material other than cork, the proposed specification must be forwarded to the Board of Trade for approval.

178. Circular Lifebuoys. —Lifebuoys of circular form are to comply with the following specification:—

(1) Size.—The inside diameter to be 18 inches and the outside diameter 30 inches.

Major axis of cork section, 6 inches-Minor axis of cork section, 4 inches.

(2) Material.—Good quality cork, securely plugged together.

Outside diameter 291 inches, inside diameter 181 inches, diameter of tube (elliptical) 51 inches × 41 inches (over corrugations).

A circular lifebuoy known as the "Sankey Corrugated Lifebuoy" has been approved by the Board of Trade. This lifebuoy is constructed of corrugated copper sheet of 24 gauge and the dimensions are as follows:—

(3) Covering.—To be of suitable material, well coated with paint.

(4) Sewing.—To be of not less than 25A five-cord

Whittemore cord.

(5) Grab Lines.—To be of good quality, unkinkable line, well secured to the cover by sewing or seizing and, in addition, by bands of a double thickness of the covering material 3 inches wide, around the section of the buoy at four equi-distant points, providing four loops of line, each not less than 2 feet 4 inches long.

(6) Buoyancy.—Capable of floating in fresh water for

24 hours with 32 lbs. of iron suspended from it.

(7) Weight.—Not to exceed 131 lbs. when new.

- (8) General.—To be well and evenly formed, no metal fastenings to be used in the manufacture.
- 179. Horseshoe Lifebuoys. —A cork lifebuoy of this type must comply with the requirements of sub-paragraphs (2) to (4) and (6) to (8) relating to circular lifebuoys.

Dimensions are to be as follows:--

Length of straight part of each leg ... 1 foot.

Inside radius of semi-circular part ... 8 inches.

Major axis of cork section ... 6 inches.

Minor axis of cork section ... 4 inches

A grab line is to be becketed round the outside of the buoy and is to be of the same quality and secured in the same manner as is required for circular buoys. It is to consist of three loops not less than 2 feet 4 inches long and securely seized, one end to extend round the leg and to be secured to the inside in such a way as to form a loop 4 inches in length. On the other leg a free end of 18 inches of line must be left in order that a person may, if he wishes, secure himself in the buoy.

- 180. Painting.—Lifebuoys should be painted in good distinguishable colours, such as alternate sectors of white and red. Lifebuoys painted in this manner are more suitable for use in varying conditions than if painted with one colour only, as by day the red sectors are very conspicuous, while at night, especially in moonlight, the two colours are more easily distinguishable than white only.
- 181. Lifebuoy Lights, Stowage of Lifebuoys, Etc.—All lifebuoy lights must open automatically by the release of the lifebuoy, be self-igniting in water and be capable of burning brightly for at least 40 minutes. Those fitted with

[•] It is necessary with this shape of buoy to adopt some method of strengthening to prevent breaking. To this end, a light metal baror tube of the required curvature is usually built into the appliance.

prickers cannot be accepted. The lights must be attached by the ring to the rails or other permanent fitting of the ship by means of a small shackle or wire seizing, and to the lifebuoys by a length of good line sufficient to allow a direct drop of at least 12 feet to release the light, and they must also be encased in such a manner that they will be protected from the violence of the wind and weather, so that they will be kept at all times efficient. On small ships where it is not possible to arrange a sufficient drop to operate an automatic lifebuoy light, approved lights fitted with tear-off strips may be accepted.

Every sea-going vessel fitted with a bridge must carry a lifebuoy on or adjoining each side of the navigating bridge in such a manner that they can be released instantaneously so as to drop clear of the ship's side (by some method other than lifting the lifebuoy and throwing it overboard). Each of these lifebuoys must have a self-igniting lifebuoy light attached to it as above described. Where four or more lifebuoys are required by the rules, two of them must be carried in beckets or cleats attached to the deck rails or other convenient place at the stern of the ship. The remainder must be carried in a similar manner but well distributed around the forecastle, poop, bridge, and weather deck rails.

In small vessels in the Home Trade the Surveyor may if he considers it impracticable or inadvisable to stow lifebuoys at the stern of the ship permit them to be carried on the deck rails in suitable positions. He may, also, in the case of paddle steamers, or small coasters, where there is difficulty in arranging for the instantaneous release of the lifebuoys on the navigating bridge waive this requirement.

Where a vessel is required to carry more than two lifebuoy lights, the remainder, after two have been attached to the lifebuoys on the bridge as above, must be distributed among and attached to the other lifebuoys to the Surveyor's satisfaction.

Rule 38 (2) requires at least one lifebuoy on each side of the ship to be fitted with a lifeline 15 fathoms in length; these lifelines are not to be fitted to the lifebuoys which are arranged for instantaneous release. The lines must always be kept attached to the lifebuoys when the ship is at sea, and the beckets of the lifebuoys are to hang free.

On tank steamers the two bridge lifebuoy lights are to be carried in position, but the remainder of the lights may be carried either in the Chart House or the Wheel House in such a position that they will be readily accessible when required.

Makers of lifebuoy lights who desire tests to be made with a view to obtaining the Board's approval should apply to the Board, submitting a specification.

The following is a list of the Lifebuoy lights which have been tested and approved by the Board of Trade:—

Name of Light.	Manufacturer.		
"Flag Brand" Lifebuoy Light.	J. R. Holmes (Holmes Light Company), 10, Idol Lane, E.C.3.		
"Flag Brand" Slipway Automatic Lifebuoy Light.	do. do.		
"Handy Man's" Lifebuoy Light	Holmes Marine Life Pro- tection Association, 8, Great Winchester Street, E.C.2.		
"Save-U-Lite" Lifebuoy Light.	The Automatic Light Company, Baltimore, U.S.A.		
"Carl Fleming" Lifebuoy Light.	Stevedoring and General Agencies, Limited, 22, Billiter Street, E.C.2.		

CHAPTER X.

LIFEJACKETS.

- 182. Conditions of Acceptance of Lifejackets.—No lifejacket may be passed as part of the statutory equipment of a vessel unless it—
 - (1) is of an approved type (see paragraphs 192 and 194);
 - (2) complies in all respects with the approved specification;
 - (3) is in good condition and fit for the service intended; and
 - (4) bears the initials and date stamp of the Surveyor as required by paragraph 195.

Not more than two types (as regards methods of adjustment) of lifejacket are to be allowed on any ship.

183. Approved Lifejackets.—When a type of lifejacket has been approved by the Board of Trade, a certificate of approval, to which the specification is annexed, is issued. Copies of the certificate and specification are distributed to all Board of Trade Surveyors for reference in cases of doubt.

A list of lifejackets for which certificates of approval are still in force is given in paragraphs 192 and 194. Particulars of any lifejackets that may be approved after the issue of these Instructions will be communicated to Surveyors.

In order to facilitate compliance with these Instructions, two complete specimen specifications of lifejackets are given in Appendix H.

184. Buoyancy.—The required buoyancy may be supplied by cork, kapok, or other approved substance, but no life-jackets which depend on air compartments for their buoyancy will be accepted.

A lifejacket whose buoyancy is derived from cork must be capable of supporting 16½ lbs. of iron in fresh water for 24 hours. A lifejacket whose buoyancy is derived from kapok must be capable of supporting at least 20 lbs. of iron after floating in fresh water for 24 hours with 16½ lbs. of iron attached.

The cork used in the manufacture of lifejackets must not weigh more than 12 lbs. per cubic foot, and must be of good quality, cleaned,; and in pieces the size of which must not be less than 10 cubic inches.

Kapok must be pure Java kapok of the best quality, or other approved grade, well teased, evenly packed, and free from seeds or other foreign matter. At least 24 ozs. of kapok must be in each lifejacket which derives its buoyancy from this material.

- 185. Distribution of buoyancy.—The buoyancy must be so distributed in the lifejacket that when worn by a person in the water it will comply with the following conditions:—
 - (a) When the wearer is inert the position of the body should be as near the vertical as possible.
 - (b) The buoyancy of the jacket should be so arranged that it will keep the wearer's head clear of the water when he is floating inert.
 - (c) The head must be so supported that if the wearer becomes unconscious it cannot fall forward and the face become submerged.

The jacket must be reversible, i.e., it must satisfy the above conditions, even if it is worn back to front or inside out.

Lifejackets are generally tested on an adult weighing from 10½ to 11 stone, and on an average-sized boy about 8 years of age. It must, however, be clearly understood that lifejackets are expected to comply with the above requirements when worn by persons of all sizes down to small children.

- 186. Lifejacket Covers.—The covers may be of cotton, linen, or other approved material, subject to the following conditions:—
 - (1) Linen.—Covers of all linen Tecklenburg with no admixture of other material must weigh not less than 6 ozs. to the yard with a width of 27 inches, and in proportion for other widths. They must have at least 28 threads to the inch in the warp and weft, and must be unglazed and unmangled, and free from all dressing. Strength tests of the linen should be made on strips 2 inches wide by 7 inches between the jaws, of not less than warp 160 lbs., weft 220 lbs. The linen may be bleached or unbleached, but no dyed or coloured material is to be used without the special permission of the Board of Trade. Linen Tecklenburg may be used for covering cork; it may not be used for covering kapok.
 - (2) Cotton Material.—The minimum standard for covers of all cotton will be grey cotton duck, with no admixture of any sizing or other foreign matter, complying with the following requirements:—(a) for kapok, the weight per lineal yard should be 5 ozs. for a width of 27 inches and in proportion for other widths; threads per inch: warp, 38 twofold threads; web, 54 single threads. Strength tests of the material should be made on strips 3 inches wide by 7 inches between the jaws, warp 260 lbs., weft 230 lbs. No dved or coloured material is to be used without the special permission of the Board of Trade. Cotton material of this specification may be used for covering kapok only: (b) for cork. The weight per lineal yard must be not less than 71 ozs. for a width of 27 inches and in proportion for other widths: threads per inch; warp, 42 two-fold threads; weft, 29 two-fold threads. Strength tests of the material should be made on strips 3 inches wide by 7 inches between the jaws, warp 500 lbs., weft 400 lbs.
 - (3) Other Material.—Any other material for lifejacket covers which lifejacket makers propose to use must be specially submitted for approval.
 - (4) Submission of Samples.—Where the material which lifejacket makers propose to use has not been previously approved, a sample of at least one yard must be submitted to the Board of Trade before an order is placed with the manufacturer of the material.
- 187. Testing material for covers.—The sample of the material submitted under paragraph 186 (4) above should be sent to the Principal Officer, Board of Trade Surveyors' Office, 79, Mark Lane, London, E.C.3, who will have it ex-

amined and reported upon by the Manchester Chamber of Commerce Testing House and Laboratory.

The material will be tested in order to determine whether it complies with the requisite standard in respect of weight of material, number of threads per inch, warp and weft strength, and purity. The expense connected with the tests will be payable by lifejacket makers.

The lifejacket maker must assure himself that the material supplied to order is at least as good as the sample which has been tested and approved, and he must obtain from the manufacturer of the material a guarantee to that effect.

188. Lifejacket Tapes.—The tapes must be of linen thread web 1½ inches wide capable of bearing a strain of 200 lbs., and must be securely attached to the cover; the ends of the tapes where they are attached to the cover must be doubled and the ends displayed.

The method of affixing and tying the tapes must be simple and easily understood and capable of being rapidly carried out.

189. Sawing of Lifejackets.—The ends of the pockets of cork jackets which are left open for packing must be sewn with doubled material, which must be at least as strong as No. 25a five-cord Whittemore cord.

All other sewing is to be made with linen thread not less strong that No. 25.

All machine stitching must be continued up to the extreme edge of the cover and must be securely finished off.

190. Marking.—All jackets must be marked indelibly on one side with the distinctive name of the lifejacket in letters not less than 1 inch in depth, and on the other side with the maker's name or trade mark in smaller letters.

191. Applications for approval of proprietary lifejackets.—Application for test and approval of lifejackets should be made to the Board of Trade, London, S.W.1, by the makers or by shipowners desirous of adopting any special type of lifejacket. On receipt of a sample jacket, arrangements for the test will be made, the makers or their representatives being notified so that they may be present.

When the test is completed, a full specification must be correctly filled in and duly signed by the maker, who must also submit sample photographs in various positions of adjustment, with instructions for adjustment.

The specification and photographs, and report on the test by the Board's Surveyors, will then be submitted for the Board's consideration, the result of which will be communicated to the makers. If the jacket is approved, the makers will be required to supply 300 copies of the specification and photographs for distribution amongst the Board's Surveyors and to undertake to provide with all jackets supplied a specified number of photographs showing adjustment. They will also be required to supply nine specimen jackets for retention by the Board's Principal District Officers for purposes of reference.

The Board of Trade reserve the power at any time to withdraw their approval of an approved lifejacket. In particular, approval may be withdrawn if any approved proprietary lifejackets found on board ship do not comply with the approved specification.

192. List of approved proprietary lifejackets.—The following is a list of proprietary lifejackets which have been approved by the Board of Trade together with the name of the manufacturer.

Name of Manufacturer.	Designation and Kind of Buoyant Material.	Identification Mark.	
Messrs. Speedings, Ltd., Sail Works, Sunderland.	" Reverso" (Cork).	Trade mark.	
Messrs. Fosbery & Co., Barking Wharf, Barking.	"Star" (Cork with neck pads of Kapok).	"Star" Life- jacket.	
Messrs. Fosbery & Co., Barking Wharf, Barking.	"Boddy- Finch" (Kapok). "Boddy"(Cork and Kapok). "Boddy" (Kapok). "Salvus Pat- tern."	"Boddy." "Boddy." "Boddy." "Salvus Pattern" and name or Trade mark of firm.	
Messrs. Wm. Hart & Co., Duke Street, Liverpool.	New Zealand "Salvus" (Kapok).	New Zealand "Salvus."	

Name of Manufacturer.	Designation and Kind of Buoyant Material.	Identification Mark.
Messrs. Steedman & McAllister, Halley Street, Yoker, Glasgow.	"Steemac Comfort" (Cork and Kapok). Boddy-Finch pattern (Kapok).	" Steemac Comfort." Trade mark.
Messrs. Fosbery & Co., Barking Wharf, Barking.	"Saphtye" (Cork). "Saphtye" (Kapok).	" Saphtye."

193. Standard lifejackets.—The Board of Trade have approved two standard lifejackets (cork and kapok). Specifications of these jackets are given in Appendix H, and samples of each jacket and also of empty covers complete with tapes and markings, and illustrated directions for adjustment, may be seen at any Board of Trade Surveyer's Office. A maker who desires to manufacture jackets of either or both of these types should make application to the Board of Trade, London, S.W.1. If permission is granted the maker will be required to stamp his name or trade mark on each jacket in accordance with the specification. It is essential that every jacket should comply in all respects with the specification. If jackets of any of these types found on board ship do not comply with the specification, permission to manufacture may be withdrawn from the maker of the iackets.

The maker will be required to provide illustrated directions for adjustment in accordance with the approved samples, and to undertake to supply, with each batch of lifejackets sold, a number of copies of the directions equivalent to at least 5 per cent, of the number of jackets.

194. List of Manufacturers of "Standard" Lifejackets.— The following is a list of firms who have received the Board's

permission to manufacture the Board's "Standard" Lifejacket;—

Name of Firm.	Туре.	Identification Mark.	
Messrs. Fosbery & Co., Barking Wharf, Barking, Essex.	Cork and Kapok.	"Fosco."	
Messrs. Wm. Hart & Co., Duke Street, Liverpool.	Cork and Kapok.	Trade mark.	
Messrs. McFadyen Bros. & Co., 114, Great Wellington Street, Glasgow.	Cork and Kapok,	"Alpha."	
Messrs. Speedings, Ltd., Sail Works, Sunderland.	Cork and Kapok.	Trade mark,	
Messrs. Steedman & McAllister, Halley Street, Yoker, Glasgow.	Cork and Kapok	"Steemac."	
J. C. E. Milree & Co. (In orp. J. Wilson & Co.), 43-47, Fairley Street, Govan, Glasgow.	Cork and Kapok.	"Milreco"	
Anchor Line (Messra. Henderson Bros.), St. Vincent Place, Glasgow.	Cork	"Anchor."	
Messra. John Deighton & Co., 10/12, Saviourgate, York.	Cork	" Deto."	
Messra. Vickers, Ltd., Barrow-in-Furness.	Cork and Kapok.	Name of Firm.	

Name of Firm.	Туре.	Identification Mark.	
London Midland & Scottish Railway, Goole.	Cork	L.M.S., Goole.	
Messra Queen's Stores Co., 41, Castle Street, Liverpool.	Cork	"Turbine."	
Messrs. F Leyland & Co., James Street, Liverpool.	Cork	Name of Firm	

195. Inspection at maker's works, etc.—All lifejackets must be tested, before delivery to a ship, at the maker's works or warehouse, or elsewhere, by a Surveyor, when a percentage of each batch will be tested by floating them in fresh water with the required amount of iron suspended from them. If they are found to be satisfactory the whole of the batch from which the lifejackets so tested have been taken should be stamped with the Surveyor's initials or number, and the date of examination.

When marking lifejackets, a Surveyor should place his stamp on the shoulder strap of each jacket, that is, on that part of the covering material which lies between the front and back pockets. In this position a much more satisfactory impression can be obtained than on the curved or irregular surface of the pockets, and Surveyors when carrying out periodical examinations of lifejackets on board ships are assisted by knowing exactly where the stamp is to be found.

196. Re-covering of Lifejackets.—The re-covering of lifejackets is to be carried out only by makers having the Board's permission to manufacture lifejackets. Lifejackets that have been re-covered are to be dealt with in the same way as new lifejackets as regards inspection and stamping.

197. Stowage of Lifejackets.—In foreign-going passenger ships, in order that each person may know where to find his or her particular lifejacket, the lifejackets are to be distributed, the appropriate number being stowed in racks in each cabin, or, in the case of open berths, in racks attached to the berths. They are to be kept in good condition. Each rack is to have the number of its particular berth attached,

and is also to be marked "Lifejackets" in bold letters, and cards with photographs of adjustment of the particular jacket carried are to be hung in prominent places in each compartment.

In home trade passenger ships the lifejackets are to be stowed in suitably protected racks in accessible positions above the weather decks, and so arranged that the lifejackets can be rapidly distributed in an emergency.

Crew's lifejackets may be stowed in a similar manner to those intended for the use of passengers, or, as they are often more liable to be damaged than those in the passenger accommodation, they may be kept in boxes or racks at all times accessible and close to the crew's quarters so that there should be no excuse for seamen taking lifejackets out of the passenger accommodation. Notices should be placed in crew's quarters indicating where the lifejackets are kept, and the boxes or lockers should be marked to indicate the nature of the contents and the number.

The illustrated directions for adjustment supplied by the lifejacket makers are to be placed in suitable positions about the ship.

198. Periodical inspection.—All lifejackets found on board ship may be examined by the Board's Surveyors as to condition or tested to ascertain what weight of iron they will support. If the jackets are found to be unsatisfactory a report is to be made to the Board of Trade.

When carrying out periodical inspections of lifejackets. Surveyors should pay particular attention to kapok lifejackets, especially on ships carrying Lascar or Chinese crews. Cases have come to notice in which the Kapok had been abstracted from kapok lifejackets and replaced by cotton waste, oakum and flocks, thus rendering them useless as a life-saving appliance. The substitution, as a rule, can be detected only by careful examination. Copies of Notice No. 92 warning Shipowners, Masters and Ships' Officers against the use of chunam and other substances of an alkaline nature for cleaning kapok lifejackets, have been distributed, and Surveyors should, so far as possible, satisfy themselves that Masters and Officers of Ships on which kapok lifejackets are carried are aware of the injurious effect on kapok of such substances and the consequent loss of buoyancy in the lifejackets. Surveyors should also impress upon masters the need for systematic and frequent inspections of lifejackets. Lifejackets which do not bear the Board of Trade stamp should be rejected.

CHAPTER XI.

STOWAGE OF BOATS, LIFERAFTS, AND BUOYANT APPARATUS, TRANSPORTING AND LAUNCHING ARRANGEMENTS.

Part I .- General.

199. Submission of Plans.—Plans showing the stowage of boats, liferafts and buoyant apparatus, and plans of transporting and launching arrangements must be submitted to the Board's Surveyors by owners or builders for all new passenger steamers and cargo ships.

In the case of passenger steamers the plans are to be examined by the Surveyors in the first place in order to ascertain whether they are in accordance with the Rules and the Board's Instructions. Any points of divergence should be taken up with the owners or builders concerned and cleared up as far as possible before being sent to the Board for consideration. Reports and drawings relating to methods of stowing, transporting and launching boats, liferafts and buoyant apparatus, should be sent direct to the Chief Ship Surveyor, while those relating to the design and construction of davits, blocks and falls, turning out gear, cranes, winches and similar mechanism, should be sent to the Engineer Surveyor-in-Chief.

In the case of cargo ships the plans are to be examined by the Surveyors at the ports. If the plans indicate arrangements complying in all respects with the requirements of the Statutory Rules and the Board's Instructions, the builders are to be at once informed to that effect in writing by the Surveyor, and the plans need not be sent to the Chief Ship Surveyor or Engineer Surveyor-in-Chief, as the case may be, until the ship is completed, when they should be sent with a full report to the Board to be kept with the other records of the ship. If the Surveyor is in any doubt as to the arrangements, or if any difficulty arises in securing compliance with the requirements, he should, in the first instance, consult the Principal Officer who will, if necessary, refer the plans and the Surveyor's report to the Board.

The Surveyor should impress on the builders the desirability of submitting plans at an early stage in the construction of the vessel.

Part II.—Stowage and Handling of Boats, Liferafts, and Buoyant Apparatus.

200. General.—The requirements with regard to stowage are to be found in Rule 36. Sub-paragraphs 8, 9 (a) and 9 (b), which relate to the strength of davits, falls, blocks and

other gear, turning out gear, and alternative appliances to davits, are dealt with in Part III of this Chapter.

Subject to the provisions of Rule 36, sub-paragraph (3), the lifeboats may be stowed one above the other, or they may, subject to such conditions as the Board of Trade may impose, be fitted one within another, but where boats so fitted require lifting before being launched they shall be permitted only if mechanical power appliances for lifting are provided.

Where the terms mechanical power appliances or mechanical appliances are used in Rule 36 or in this Part of this Chapter, power appliances other than hand-operated appliances are meant.

201. Arrangement of Boat and Embarkation Decks.—In arranging the boat decks of new passenger steamships care must be taken to provide not only sufficient stowing space for all the boats, liferafts and buoyant apparatus required, but also sufficient working space for turning out the boats on either side of the ship expeditiously, and for controlling the lowering of the boats or liferafts. Wherever possible a clear space or spaces should be provided and arrangements made for launching boats which are not stowed under davits, or liferafts, on either side of the ship. Wherever practicable, the embarkation deck should be a different deck from the boat deck.

Rule 3 (2) (b) and Rules 41 (1) and 42 (1) require that proper arrangements are to be made for ingress to and egress from different compartments, decks, etc., and for embarking the passengers in the boats at an embarkation deck rapidly and in good order. To comply with these requirements proper provision, similar to that specified in paragraph 33 of the "Instructions relating to Emigrant Ships", must be made by ladderways and stairways for the access of all classes of passengers to the embarkation decks under emergency conditions and for controlling and marshalling them and finally embarking them through gateways in the side rails, bulwarks or sideplating into the boats. Such gateways should be arranged to open inward. To enable embarkation to take place rapidly and in good order the minimum width of the gateways should be 4 feet.

Plans showing arrangements of ladderways above the bulkhead deck which provide access to embarkation decks and of embarkation gateways are to be submitted to the Board for approval.

Surveyors are to satisfy themselves that means which are independent of the davit turning out gear, and are suitable having regard to the size and weight of the loaded boats, are provided for keeping the boats close to the ship's side while the passengers are embarking and for releasing them

under control when they are loaded preparatory to lowering. Where it is necessary to lower the loaded boats past overhanging decks, satisfactory arrangements are to be made by the provision of fending bars, or other equally effective means, to prevent the boats from being damaged or the passengers from being injured owing to the boat swinging under the overhang when the vessel is listed.

Wood boats should be stowed well clear of the boiler casings, the heat from which may easily warp the planking and open the landings.

202. Boat Platforms.—Where boats are stowed on platforms, the skid beams and their connections are to be of ample strength and rigidity and the davit collars are to be strongly secured to substantial corner brackets. Platforms are to extend to the ship's side and the length fore and aft must be at least the length of the boat plus 2½ feet. Platforms are to be so fitted as to provide good foothold for the men handling the falls, and easy access at one end to the outboard side of the boats.

If the platforms are sparred, the planks, which are to be laid fore and aft, are to be not less than 21 inches thick, and not more than 2 inches apart. All platforms should be fitted with a stop-foot batten, 2 inches thick and 3 inches high, at the outer edge for the whole length of each boat.

203. Boats attached to Davits.—All boats attached to davits are to be so stowed that they can be swung out with facility and launched in the shortest possible time. Where boats are required by the Rules to be attached to davits in order that the falls may be at all times ready for service, the falls are to be kept attached to the davits and to the lifting hooks of the boats; they are to be properly rove and led to lowering bollards, winches or other lowering devices in such a manner as to be immediately available for launching the boats. Davits for handling boats forming part of the statutory lifesaving equipment must in all cases be fitted and used solely for that purpose.

204. Additional Boats.—Additional boats provided in order to comply with the Rules must be so stowed as to fulfil strictly all the requirements of Rule 36. They are to be distributed as follows:—

- (1) One additional lifeboat must in the first place be stowed under each of the boats attached to davits;
- (2) After these have been fitted other boats should be carried inboard, stowed across a deck, bridge or poop, and so secured that they will have the best chance of floating free of the ship if there is no time to launch

them. As large a number of these boats as possible must be capable of being launched on either side of the ship by means of approved appliances for transferring them from one side of the deck to the other.

Where it is proposed to place an additional boat under a boat attached to davits the two boats may be stowed one above the other, subject to the requirements of paragraph 206, or they may be fitted one within the other, subject to the requirements of paragraph 206. The stowage arrangements of boats additional to those placed under boats attached to davits must be submitted to the Board for special consideration in each case.

205. Boats under davits stowed one above the other.—The stowage of one boat directly upon another is to be allowed only when the arrangement and construction of the boats admit of stowage in this way without detriment to the condition of either boat over long periods of service.

When a Class 1 boat is stowed over a Class 1 boat, the upper boat is to be supported on chocks and pedestals of suitable strength properly stayed and arranged so that they will not interfere in any way with the launching of either boat. If the boats are of wood the pedestals and chocks supporting the upper boat are to be fitted at points distant one-quarter of the boat's length from stem and stern post respectively, or as near thereto as practicable. The spacing of the chocks for the lower boats may be increased provided the keel is additionally supported. The upper Class 1 boat is, as a general principle, to be attached to the davits and to be the first boat launched. Therefore this boat should. as a rule, accommodate a number of persons at least equal to that accommodated in the lower boat. In circumstances when this is not possible and where it is proposed that the lower boat is to be appeciably larger than the upper boat. the whole boat stowage arrangements must be submitted to the Board for special consideration.

When a Class 1 boat is stowed over a Class 2 boat, it is to be attached to the davits and be the first boat launched. It may be supported in the manner described above, or it may be carried on skids independently supported from the deck by portable stanchions which slip into metal deck sockets, and are rigidly stayed and secured to the deck. The securing pins to the stays, &c., are to be of gunmetal with either drop nose points or butterfly securing nuts.

The heads of the stanchions should be shaped to receive the ends of the skids, which are to be loosely fitted. The skids are to be of wood checked at, but not secured to, the stanchions. In all cases the boats which are attached to davits and intended to be launched first are to have the falls attached to them ready for service in the manner indicated in paragraph 206. If rope falls are used a separate set of falls is to be provided to serve the second boat. The additional falls are to be kept in position attached to the davits but need not necessarily be attached to the boat provided the lower block is taken to a suitable ring bolt on deck or to a strop on the davit frame or is otherwise disposed of in such a way that the falls will not interfere with the launching of the first boat and will be ready for immediate attachment to the second boat.

Where wire falls are used with mechanical power appliances and also with efficient hand gear for recovering them, separate falls need not be provided. (See paragraph 216 regarding the requirements for blocks in such cases.)

In all cases where boats are to be stowed one above the other, full detailed drawings of the supports proposed, and of the method of stowage, are to be submitted to the Board for approval.

206. Stowage under davits of boats fitted one within the other.—Rule 36 (3) and (4) permits the stowage of one boat within another, subject to such conditions as the Board of Trade may impose.

In all cases where boats are to be stowed one within the other full details of the proposed method of stowing and launching the boats are to be submitted to the Board for approval at an early stage.

The conditions which must be complied with are as follows:—

- (1) The boats must fulfil the requirements for ready availability laid down in Rule 3 (1) and, so that as large a number of persons as possible may be got away from the ship rapidly in an emergency, the arrangements should in general provide for the launching of the lower boat first.
- (2) The boats are to be constructed to an approved specification and design, in accordance with the provisions of Rule 20 and Part I, Fourth schedule, applicable to Class 1 boats.
- (3) The method of supporting the upper boat is to be such as to distribute as evenly as possible its weight over the lower boat. The lower boat is to be specially strengthened in way of the chocks. The method of griping the inner boat must not impose any stress on the outer boat liable to cause spreading of the gunwales or any other distortion, and the stowage in general must

not be detrimental to the good condition of the boats over a long period of service.

- (4) The appliances used for lowering must be in compliance with the requirements of Rule 36 (3), and where the upper boat requires lifting before being launched, approved mechanical power appliances must be provided for lifting it satisfactorily and promptly clear of the outer boat.
- (5) The efficiency of the stowage and launching arrangements of the boats in each nest, and of the power appliances for lifting the inner boat and recovering the falls, is to be tested, before the passenger declaration is issued, by putting the boats into the water and noting the time taken to perform each operation. The time should approximate to that taken in lowering by similar davits similar boats stowed one above the other.

Condition (1) implies that the method of construction must be such as will permit the full equipment to remain in each boat while the ship is at sea as required by Rule 35, and that it must not be necessary to make any adjustment of the permanent structure (such as thwarts) which would involve the removal and replacement of any of the equipment or would affect in any other way the ready availability of the boat for embarking passengers.

There must be adequate clearance between the boats while passengers are embarking in the outer boat, and also when it has been loaded and released from the ship's side preparatory to lowering.

The falls are to be kept attached to the outer boat and ready for service in the manner indicated in paragraph 203. If separate rope falls are provided for operating the inner boat they are to be kept attached to the davits and to the lifting hooks of the lifeboat. When wire falls are used for operating both boats, independent means of supporting the inner boat are to be provided to ensure that the inner boat will not be lowered inadvertently on top of the outer boat.

207. Boat Chocks.—In all sea-going vessels the boats, when swung inboard and stowed, must be properly supported in chocks resting on skids securely fastened to the deck or platforms.

Chocks are to be of simple construction, properly formed to suit the shape of the boat, and so fitted that the boat can be put overboard without requiring to be lifted by the tackles: it should not be necessary to do more than support the weight of the boat. To this end the upper surface of the skids should be stepped 3 inches at the side of the boat's keel, and the chocks so hinged that when turned down they fall below the boat's keel.

Handy tackles or similar appliances for lifting a boat by hand are not to be accepted in lieu of chocks properly formed as described above.

The chocks should, as a rule, be fitted on each side of the keel to support properly the bilges of the boat and prevent sagging and straining. In particular, half-chocks are not to be fitted in exposed positions on poops or elsewhere where the boat may be struck by the sea, nor are they to be allowed unless the keel is properly supported at the middle of the length between the chocks and the boat is stowed and griped to the satisfaction of the Surveyor. Chocks should be fitted at points distant one-quarter of the boat's length from stem and sternpost respectively, or as near to those positions as possible. Where the chocks cannot be placed approximately in this position the keel is to be supported by additional chocks, with a view to preventing hogging or sagging which is likely to develop if the chocks are improperly placed.

With a view to enabling the boats to be quickly turned out with the minimum of risk to those engaged in the operation, the outboard chocks and gripes are to be so fitted and arranged in new ships that they can be quickly released without its being necessary for a man to go to the outboard side of the boat.

The chocks of Class 2 boats are to extend from the keel to the bilge on each side of the boat, and the keels should be supported throughout the length of the boat.

Transverse chocks fitted with grooves, or keel chocks of such length as will prevent the immediate freeing of the boat, are not to be passed without being submitted for approval. The hinges, slides, and joints of chocks are to be kept free of paint to prevent the chocks from becoming set fast, and the hinges are to be kept well lubricated. Where, in the case of patent chocks, pins have to be removed, the pins are to be of non-corrodible metal, attached to the chocks by jack chains, and they must have drop nose points so that they can be easily withdrawn by hand and without the use of tools. (See paragraph 62 regarding the lining of chocks for steel boats.) Where davits of the gravity or "overhead quadrant" types are fitted, approved means for supporting and griping the boats are to be provided.

208. Gripes and Lashings.—When the boats are stowed they are to be secured by gripes which can be easily and quickly released from inboard. The chafing plates should properly fit the gunwale, and the gripes should be fitted with slip links and be secured with hemp lashings to eyebolts or rings in the deck as near to the chocks as possible to prevent the boat from being unduly strained. When boats

are stowed one above the other, each boat is to be independently griped. Lifeboats stowed one within the other are to be efficiently griped together, and the outer boat griped to the deck or other permanent structure. See also paragraph 207.

209. Stowage of Accident Boats.—All sea-going passenger vessels shall have on each side of the ship a boat of suitable size equipped with proper appliances for carrying them outboard as accident boats. The equipment of each of these boats should consist of a griping spar of suitable diameter fitted with pudding fenders and with means of slinging or securing in position, and griping bands or belts from each of the davit heads to the rail or other secure position, fitted with slip hooks or toggles. Where boats are stowed under gravity davits the foregoing equipment need not be provided.

Means should be provided for expeditious entry into the boat. At least four lifelines of sufficient length to reach the water with the ship at her lightest seagoing draught and listed to 15 degrees either way are to be fitted to the davit spars. The painters of the boats are to be fitted with a long eye, strop and toggle in the boat.

210. Stowage of Buoyant Apparatus.—In accordance with Rules 3 (1) and 36 (7) special care is to be taken that each unit of buoyant apparatus is so stowed as to ensure that it will be readily available in an emergency and will not interfere with the operation of boats or other buoyant apparatus, nor with the marshalling of the persons on board at the embarkation stations or their embarkation in the boats.

Buoyant apparatus is to be distributed in suitable positions about the ship. It is not to be stowed on top of deck houses or in other isolated positions from which it could not be lanched directly into the water, nor is it to be stowed below deck or in any deck erection, or on any deck which has another deck over it.

Buoyant apparatus must not be secured to the deck, except by lashings which can be easily slipped. It may be stowed in tiers one appliance above the other, but the units must, in that case, be kept apart sufficiently to prevent any possibility of their being stuck together by paint or varnish, and must be supported on brass or hard wood distance pieces. There must not be more than five units of apparatus in any one tier.

Means are to be provided, in the form of cants fastened to the deck or some other equally efficient arrangement, to prevent buoyant apparatus from sliding across the deck, in the event of the vessel taking a list, or moving forward or aft if the vessel takes a heavy trim by the bow or stern.

Buoyant apparatus which is stowed in tiers must also be fitted with dowels and sockets or some other efficient means for preventing apparatus in an upper tier from sliding off that in a lower tier.

Care is to be taken that the buoyant apparatus is stowed in such a manner that the grab lines and floats are not liable to be damaged or to deteriorate and that the apparatus receives adequate ventilation.

(See paragraph 199 as to submission of plans of stowage arrangements.)

Part III.—Davits and other Appliances for Lowering Boats.

211. General.—In the case of passenger ships of Classes I, II and III, Rule 36 (9) requires that the davits, falls, blocks, etc., shall be of such strength that the boats can be safely lowered with the full complement of persons and equipment with the ship listed 15 degrees either way. This requirement does not, however, apply to any passenger ship in Classes II or III where the height of the boat deck above the water line at the vessel's lightest sea-going draught does not exceed 15 feet. (See Rule 36 (14).)

212. Davits.—The load on a set of davits, where only one boat is stowed under it, is the sum of the weights of (1) the boat, (2) the equipment as specified in Rule 32, (3) the maximum number of persons with which the boat is required to be launched, and (4) the blocks and falls.

If more boats than one are served by the same set of davits the scantlings of the davits are to be governed by the maximum load that may be imposed on them.

In any particular case the actual weights of the boat's equipment, blocks and falls are to be ascertained and, in estimating the load on the davits, a weight of 165 lbs. is to be allowed for each person.

Surveyors need raise no objection to radial davits of dimensions not less than are obtained from the following formulae (2), (3) or (4), provided that: (i) the relative strength along the tapered parts is fully maintained, and (ii) the total weight of the boat, equipment, maximum number of persons for which it measures, and blocks and falls does not exceed 2 cwts. per person, as ascertained by the formula:—

$$\frac{\mathbf{W}}{\mathbf{N}} = \mathbf{w} \tag{1}$$

where W - Total load on davits in cwts.

N = Maximum number of persons for which the boat measures.

w - Load on davits in cwts. per person carried.

(a) Solid radial davits.—If the davits proposed are solid:-

$$d = \sqrt[3]{\frac{L \times B \times D (H + 4S)}{C}}....(2)$$

Where L = Length of boat, in feet As laid down in the B = Breadth of boat, in feet Fifth Schedule to

D = Depth of boat, in feet

the Rules.

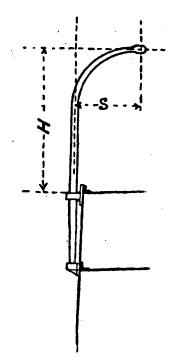
H = Height of davit, in feet, above upper support.

S = Spread of davit, in feet.

C = Constant, to be taken as 86 for iron davits, and 104 for either solid or hollow ingot steel davits of from 26 to 32 tons tensile strength.

d = Diameter, in inches.

(Note.—If wire falls having a gun tackle purchase are used with the davits, the diameter d as found by this formula (2) should be increased to $d \times 9/8$.)



(b) Hollow radial davits. - In dealing with hollow davits the equivalent sections may be found by the usual formula, after the cube of the required diameter of solid davits has been ascertained by formula (2):—

$$d^{\bullet} = \frac{D^{\bullet} - d^{\bullet}}{D^{\bullet}} \qquad (3)$$

$$D_{b} = \sqrt[3]{\left(\frac{1}{d} \times \frac{m^{4}}{m^{4} - 1}\right)}....(4)$$

Where d = Diameter, in inches of solid davit.

D_a = Outside diameter, in inches, of hollow davit.
 d_a = Inside diameter, in inches, of hollow davit.

$$m = the ratio \frac{D_h}{d_h}$$

(c) Variations in formulae.—Boats vary considerably in weight and frequently a modification of the constant C, formula (2), will be required. This can be made when the maximum weight to be imposed on the davits is known and the quantity w has been found by formula (1). Should w be about 2.1 cwts. the modification of the constant C in formula (2) will be:—

$$\frac{C \times 2}{2 \cdot 1}$$
 = modified constant.

In the case of solid iron davits, the constant, modified as above, will be:-

$$\frac{86 \times 2}{2 \cdot 1} = 82$$

and for steel davits

$$\frac{104 \times 2}{2 \cdot 1} = 99$$

Formula (2) applies to boats of Classes 1 or 3, in which the entire cubic capacity is measured for the persons carried; the constant C being reduced as w in formula (1) is shown to be greater than 2 cwts.

In dealing with davits for decked boats, the L, B, D, dimensions of the boat, as measured, may not be applicable for use in formula (2), as the deck area governs the number of persons for which the boat measures, and not the cubic capacity as in the case of open boats.

An equivalent L \times B \times D quantity can, however, be obtained when the total weight of boat, equipments, blocks, etc., and persons is known.

Assuming a decked boat to measure, by deck area, for 68 persons, and the total weight, as described above, to be 146 cwts., then

 $\frac{146}{2}$ number of persons at 2 cwts. per person = 73, and

the equivalent L × B × D =
$$\frac{73 \times 10}{\cdot 6}$$
 =1216.

The formula for the davits for the above boat will then be

$$d = \sqrt[3]{\frac{1216 (H + 4S)}{C}}$$

C being 86 or 104 as the material is iron or steel.

The formula can be thus modified to suit any boat when the total weight is known.

In the case of davits, which are only required to be strong enough to carry the boat and equipment and a sufficient number of men to launch it, no objection need be raised if the diameter is not less than that found by formula (2), using a constant, C, of 144 for davits of untested iron or steel, and 174 for tested steel material of the quality laid down in that formula.

Where davits are made of cast steel, or of wrought steel built up by a welding process, or are of unusual form to which the formulae, given above, are not applicable, the design will receive special consideration, but in every case each davit arm should, after completion, and preferably before being fitted on board ship, be subjected to a static load test of an amount suitable to the design, but which should not be less than 2.2 times the working load. The davits after being fitted on board will also be subjected to the load lowering tests required by paragraph 221 of these Instructions.

The davit head bolts from which the blocks are suspended must be of ample strength and should be subjected to a proof load of not less than 2½ times the working load.

- (d) Special types of davits.—When it is proposed to fit a special type of davit, details should be submitted through the Surveyor to the Board for approval.
- 213. Testing of stock davits.—Davits intended for stock purposes may be inspected at the maker's works and the material tested, subject to the payment of the appropriate fees.

All tested davits should be stamped for the purpose of identification.

- 214. Deck Sockets and Columns must be of ample strength and should be made of cast steel, except for davits of less diameter than seven inches.
- 215. Collars and Heel brackets for supporting radial arm davits must be made of steel if outside the ship's skin. The material, if of cast steel, must be tested for tensile strength and ductility.
- 216. Blocks and Falls.—The following requirements apply to all new ships, whether passenger or cargo, and are also to be complied with as far as practicable in existing ships:—
 - (1) Boat blocks must be of ample strength for the working load. They are to be tested on completion by a proof load, applied over the sheaves, appropriate to their dimensions and strength, and they should be certified accordingly. The blocks are to be clearly marked so that they can be readily identified by the particulars given on the certificate, upon which are to be entered also the proof load and address of the premises at which the proof test was made. The certificate is to be signed by the person responsible for the accuracy of the test and of the particulars given on the certificate. The certificate, or a copy of it, is to be included in the records on completion of the ship.
 - (2) There is to be ample clearance between the cheeks of blocks in which Manila rope is used. The width between the cheeks is to be half an inch greater than the diameter of new ropes when those ropes are 3½ inches in circumference and less, in proportion to the circumference of the ropes, when they are smaller.
 - (3) If metal blocks are used, the material is to be of ductile quality and suitable strength. No part of gear intended to bear the weight of a boat may be of cast metal unless the Board's permission has been obtained.

Metal blocks are to be tested by a proof load of not less than 2½ times the maximum working load on the davit head.

(4) Blocks of ordinary wooden frame types, with the links and swivels, are also to be proof tested. The table given below gives reasonable average proportions for important parts of blocks which are suitable for the proof loads stated, provided the legs, swivels and links are at least of good quality wrought iron, and the sheave pins

are of a tough quality of steel and are supported between the sheaves.

Nominal size of block.	Diameter of sheave.	Diameter of sheave pin.	Diameter of swivel eye and pin, and link.	Binding leg.	Proof load.
Inches.			Inches.	Inches.	
13	8	1	11	21×1	10.3
12	7	7	11	2×1/8	7.7
11	7	1 1	1	2×i	5.5
10	61] ‡	7	12×8	4
9	5] {	18	13×25	3-1
8	42	1 8	1 1	18×16	2.3

The binding crown is to be of such strength as to resist the proof load without set.

The sheaves should be lignum-vitae or other suitable

material, and should run freely on the pins.

The dimensions of the block and lower part of the binding should be such that the riveted end of the swivel can be lifted sufficiently for inspection when the block is assembled. The countersinking should be not less than \(\frac{1}{2} \) inch in depth for bolts \(\frac{1}{2} \) or less in diameter, and \(\frac{1}{2} \) inch for bolts exceeding \(\frac{1}{2} \) inch. The angle of the countersink should be about 30° from the vertical.

(5) Lower fall blocks should be fitted with a suitable loose ring or long link for attaching to the sling hooks unless an approved disengaging gear is adopted. The links should be of ample size, so that they may be easily detached from the sling hooks on the boats. All hooks, links, and swivels should work freely and bed fairly together without wedging action.

The dimensions of hooks for the different sizes of boats are

given in Appendix D.

(6) The ropes used for falls should be unkinkable, firm laid yet very pliable. They should be guaranteed to pass freely under any condition (new, wet, etc.) through a hole # inch larger than the nominal diameter of the rope.

The breaking loads of ropes should be:-

Size of Rope.	Breaking Load.		
31 inches	6 tons		
31 ,,	5·25 "		
3	4.5 ,		
3 ,,	3.85		
21 ,,	3-25 "		
5	2.7 "		
21	3.2		
(ordinary quality).	, , "		

Where Manila ropes of a particular size are required by sub-paragraph (7), ropes of smaller size may be used only provided they have at least the breaking strength specified for the larger rope. Ropes of less than 2} inches should not be used for boat falls.

The Rules require that the appliances for launching the boats must be kept so as to be at all times fit and ready for use. The stowing of boat falls in the lifeboats when at sea should therefore be discouraged by Surveyors, and the fitting of winding reels or flaking boxes for the falls is strongly recommended in all classes of sea-going ships. (See also paragraph 224.)

(7) Blocks and falls for lifeboats of ordinary proportions should be as follows: —

Length of boat not over.	Passenger Ships.			Cargo Ships.		
	Block.	Purchase of falls.†	Size of Manila rope.	Block.	Purchase of falls.†	Size of Manila rope.
Feet.	Ins.		Ins.	Ins.		Ins.
30	13	T&T	31	12	T&T	31
29	13		31	12	,,	3 1
28	13	,,	31	12	,,	31
27	12	,,	31	11		3
26	12	,,	31	11	T&D.	3
25	12	,,	31	11	,	3
24	11		3	10	,,	22
23	11	T&D	3	10	",	21
22	10	"	21	9	D&D	21
21	10	,,	21	9	,,	21
20	9	D&D	21	8	,,	210
· 19	9	,,	21/2	8	D&S	21*
18	9	,,	21	8	,,	21
. 17	8	,,	21*	8	99	21.
16	8	,	210	8	,,	21

[†] T = Triple. D = Double. 8 = Single.

^{*} Ordinary quality, breaking load 22 tons.

Visc falls.—Wire rones used for lowering

⁽⁸⁾ Wire falls.—Wire ropes used for lowering boats are to be tested for tensile breaking strength, and the maximum working load is not to exceed one-sixth of the breaking tensile load. A test certificate on the Home Office form prescribed by the Secretary of State for certifying the test

of a wire rope may be accepted. The wire ropes are to be securely attached to the drum of the boat winch, and the end attachments of the wires and other parts from which the boat is suspended are to be subjected to a proof load of not less than 2½ time the working load on the respective parts. Where wire splices are used they should be proof tested to not less than 2½ times the working load unless sample splices of each size are tested to destruction and give a factor of safety at the splice of not less than 5. The winch drums are to be arranged to keep the two falls separate and to enable them to be paid out at the same rate. The leads of the wires are to be such that they will wind evenly on the drums.

217. Bollards.—Suitable bollards or other equally effective appliances for lowering boats are to be provided in all cases where rope falls are used. For boats not exceeding 20 feet in length, horn cleats attached to the davits may be fitted in lieu of bollards. For boats above 20 feet and up to about 25 feet in length, a double bollard may be fixed to each davit in the manner indicated in Appendix G. Figs. 1 and 2, and in such a position that it will be conveniently placed for lowering and will not foul the boat when being swung out. This arrangement allows the men tending the falls to keep the boat well in view while it is being lowered. For larger boats bollards of the cruciform type are to be attached to the deck. and in the case of boats not exceeding 27 feet in length the horizontal arms are to be not less than 5 inches in diameter. and sufficiently long to take at least four turns of the largest rope with which they will be used. In the case of boats of 27 feet and over, the arms are to be 6 inches in diameter, and not less than 6 inches in length from the side of the column. Ample lips or flanges are to be provided at the ends of the arms to prevent the fall from jumping off. With these bollards suitable fair-leads are to be fitted and so arranged that the boat is not lifted in swinging out.

218. Boat Lowering Winches.—When a winch is fitted for launching a boat the brakes are to afford complete control in the operation of lowering. The brakes are to be so arranged that normally they are in the "On" position and return to the "On" position when the control handle is not being operated. The brake gear of a winch serving a boat for which wire falls are used to launch the boat in a fully laden condition should include means for automatically controlling the speed of lowering, so as to ensure that the maximum rate of lowering consistent with safety is not exceeded. Details of the proposed arrangements should be submitted to the Board for consideration.

Brakes exposed to the weather are to be tested under maximum load lowering conditions with the braking surfaces wetted. Wherever practicable the brake gear is to be so situated that the man operating it should have the boats under observation during the whole process of launching them into the water. Where more than one boat is served by the same wire falls the winches are to be fitted with quick return hand gear so that the falls may be rapidly recovered. (See also paragraph 216.)

219. Turning-out Gear.-In the case of passenger ships of Classes I, II and III, Rule 36 (10) requires that the davits shall be fitted with gear of sufficient power to ensure that the boats, fully equipped and manned, but not otherwise loaded with passengers, can be turned out against the maximum list at which the lowering of the boats is possible. This requirement does not, however, apply to any passenger ships in Classes II or III where the height of the boat deck above the water line at the vessel's lightest sea-going draught does not exceed 15 feet. (See Rule 36 (14).)

The list may as a rule be taken as 7° and the gear is to be capable of turning the davits and boats out expeditiously without other aid. When considered necessary, the vessel is to be heeled for turning out tests to be made. At such tests the boats are to contain the full equipment

and four men.

The spread of the davits is to be such and the points of suspension of the boats are to be so arranged that in being turned out against a list of 7° the boat will swing clear of the davits.

The bearings of the gear are to be fitted with brass bushes and means for efficient lubrication are to be provided. When worm gear is used the worm and worm wheel are to be machine cut.

- 220. Life Lines.—Life lines should be fixed at least one foot away from the davit heads, so as not to foul the top Four life lines are to be fitted to the spans of accident boats. (See paragraph 209.)
- 221. Testing Boat Lowering Appliances.—(1) Surveyors should test the boat lowering appliances on all new vessels and each boat must be lowered into the water before the vessel leaves the builders' works.
- (2) In passenger vessels where davits are required to lower boats fully loaded (Rule 36 (9) (b)) the davits and lowering gear are to be subjected to a 10 per cent. overload lowering test as follows:--
- (a) Where rope falls are used and not more than one boat is suspended from the davits when in the outboard position the heavier boat under each set of davits is to be

selected for the test and lowered into the water loaded with the usual equipment and a distributed weight equal to that of the full number of persons for which it measures plus 10 per cent. of the total load, including blocks and The weight of an adult person is to be taken as If, however, it is not practicable to test each set of davits in this manner, at least two sets of davits of each size are to be so tested, and the others may be load-tested in any other manner satisfactory to the Surveyor, but with a load in each case equivalent to that stated above. For instance, one of the fully loaded boats referred to above, after being lowered into the water, may be taken round to the other davits in succession and hoisted clear of the water. The whole of the davits and falls are to be subjected to the maximum load they may have to bear plus 10 per cent.

- (b) Where rope falls are used and two boats are suspended from the davits when in the outboard position, the heavier boat, loaded as indicated in sub-paragraph (1), is to be lowered (or hoisted) while the other boat, with its blocks and falls and loaded with its equipment plus 10 per cent. of the weight of the boat and equipment, is suspended from the davits.
- (c) Where wire falls are used, arrangements are to be made to subject each set of davits, the necessary boat winches and their brakes to a thorough 10 per cent. overload lowering test. If not more than one boat is suspended from the davits when in the out-board position the heavier boat served by each set of davits, loaded as indicated in sub-paragraph (1), is to be lowered from the embarkation deck to the water. If two boats are suspended from the davits when in the outboard position, the heavier boat, loaded as indicated in sub-paragraph (1), is to be lowered from the embarkation deck to the water while the other boat, loaded as indicated in sub-paragraph (2), is suspended from the davits.
- (3) In those passenger vessels whose davits are not required to lower boats fully loaded, and in cargo vessels, each boat loaded with the usual equipment and a weight equivalent to that of its crew is to be lowered into the water, or alternatively, each boat loaded in this manner may be hoisted from the water, by means of its own davits and falls.
- 222. Special Transporting and Launching Arrangements for Additional Boats.—Boats additional to those carried under davits, or liferafts, are to be readily available in an emergency as required by Rule 3 (1) and they are to be stowed as required by Rule 36 (2) (a). Rule 36 (2) (b) requires

that as large a number as possible of such boats shall be capable of being launched on either side of the ship by means of approved appliances for transferring them from one side of the deck to the other. The lowering appliances are to be in accordance with the requirements of Rule 36 (9). Under Rule 4 (4) (c) the Board may, if in their opinion liferafts will be more readily available and otherwise more satisfactory in case of emergency than the additional lifeboats mentioned above, allow liferafts to be carried in lieu of such lifeboats, sufficient for those persons for whom there is not accommodation in lifeboats, provided that the total capacity of the boats on the ship is at least up to the minimum capacity required by Column C of the Table in the First Schedule to the Rules.

The Board are prepared to accept installations which include liferafts only on condition that the foregoing requirements are complied with.

223. Special Launching Appliances.—Special arrangements for transporting the boats to the davits, rapidly lowering them into the water, and recovering the falls are to be subjected to tests to prove that the arrangements are efficient and the speed of launching satisfactory.

The conditions of this test are to be as follows:--

- (i) The ship is to be upright and in smooth water.
- (ii) The time is the time required from the beginning of the first operation necessary to prepare the boats for lowering (usually the removal of the boat covers) until the last boat is affoat.
- (iii) The number of men employed in the whole operation must not exceed the total number of boat hands that will be carried on the vessel under normal service conditions.
- (iv) Each boat when being lowered must have on board at least two men and its full equipment as required by these Rules.

The transporting arrangements are to be such as will enable the boats on either side of the deck to be moved up to their respective davits against a list of 7 degrees. The boats must be fully under control during all transporting operations, and the arrangements must be such as to eliminate any possibility of a boat taking charge when the vessel is rolling in a seaway. The boats at the middle line are to be considered as launching always on the lower side. Designs of launching and transporting appliances or of davits of unusual design are to be submitted for the Board's consideration. If they are to be worked by power the source of power is to be provided above the bulkhead deck and

is to be available at all times. Power is not to be used in complete substitution for hand gear, but may be used in addition to it.

224. Timing test for Davits serving more than one Boat.—When surveying a passenger steamship for the first issue of a Passenger Certificate in cases where more than one boat is served by the same set of davits, the Surveyor is to see all the boats lowered in succession and to report to the Board the time taken to carry out each of the necessary operations in the case of each set of davits.

The falls, blocks, lowering bollards, winches and brake gear are to be in accordance with the requirements of paragraphs 216 to 218. Where wire rope falls are to be recovered, lower blocks, when fitted, are to be non-toppling, and, where necessary, provision is to be made to prevent the falls from cabling.

225. Periodical Inspection and Testing of Boat Lowering and Transporting Arrangements.—When surveying a passenger steamship for the renewal of a passenger certificate the Surveyor is to satisfy himself as to the efficiency of the lowering and transporting arrangements for the boats, if necessary, by seeing a number of the boats lowered into the water.

226. Launching Arrangements on Small Ships not fitted with Davits.—Where any steamship is required by the Rules to carry only one boat, there must be proper provision for putting it readily into the water on either side of the ship. No launching arrangement is to be considered satisfactory that requires the use of mechanical power appliances.

The following conditions are to be complied with:

- (1) The boat is to be stowed at or near to the middle line of the ship.
- (2) The boat is to be provided with a painter at each end and is to be kept attached to a rigged derrick or other satisfactory appliance, ready for service at all times. The derrick or lowering appliance is to be of sufficient strength for the purpose. The lifting hook is to be attached to the bridle and kept engaged to a ring on the fall. Permanent and efficient guys must be attached to the derrick and cleats fitted in suitable positions for belaying the derrick guys when the boat is being swung outboard. The topping lift lead block is to be properly attached to the eye on the mast by a suitable ring, long link, or other effective device, adapted for allowing the shackle attached to the block to adjust itself in the direct line of the topping lead.

Where, however, the dimensions and weight of the boat are such that it can, in the Surveyor's opinion, be easily handled by the crew without the use of a derrick, the foregoing requirement as to attachment to a rigged derrick does not apply.

- (3) To prevent excessive stresses on the structure of the boat the bridle slings are to be of such length that the angle between the legs when the boat is supported does not exceed 120 degrees. (See Appendix D (5).)
- (4) The height of the boat when stowed is to be sufficient to enable it to be swung out over the rail or bulwarks without it being necessary to lift it or to top the derrick.
- (5) The boat is to be properly stowed in checks and to be efficiently supported and griped on skids or beams well secured to the ship's structure. If it is stowed over a hatchway, no part of the weight is to be borne on hatch covers. If portable stanchions are fitted to the hatch coamings to support the skids, they are to be secured to their sockets by drop-nose pins or by other equally efficient means.

The Surveyor is required to witness a test and record the time taken in putting the boat out on either side by hand, and must personally satisfy himself of the efficiency of the whole arrangement. The number of men employed should not be greater than that of the crew of the vessel.

- 227. Launching Arrangements on Sailing Ships not fitted with Davits.—When, in the opinion of the Surveyor, it is impracticable to fit the davits required by the Rules, full particulars of the case with aketches are to be submitted to the Chief Ship Surveyor together with a report on the suggested alternative. If it is impracticable to adopt a derrick arrangement similar to that for steamers, as aet out in paragraph 226, boats may be launched by means of mast head pendants and tackles subject to the following conditions:—
 - (1) The pendants and tackles are to be maintained in their proper positions ready for service at all times.
 - (2) The pendants and tackles must be so arranged that the boat can be readily put out on either side, and to this end should be duplicated if necessary.
 - (3) The boat is to be stowed at or near the middle line of the ship, and, if over a hatchway, no part of the weight is to be borne on hatch covers.
 - (4) A test in putting the boat out is to be made under the conditions set out in paragraph 221.

Part IV.—Arrangements to secure Safety of the Boats in Lowering.

228. Boat and Davit positions to be clear of the Propellers.

—Rule 36 (6) requires that boats shall not be placed in any positions in which they would be brought into dangerous proximity to the propellers at the time of launching.

In order to prevent the risk of damage to the aftermost boats by the propellers when the boats are launched under emergency conditions, and also to obviate the possibility of boats being brought under the overhanging part of a ship's hull, boats carried on a poop deck or near the stern of a ship should, wherever practicable, be stowed in such a position that, when launched, they will clear the foremost propeller by a longitudinal horizontal distance equal at least to their own length and in any case by a distance of not less than 10 feet. Boats stowed in closer proximity to a propeller than the foregoing longitudinal horizontal distance. must have their painters led forward and belayed to cleats fixed to the decks or the bulwarks in suitable positions which must be indicated on a plan and profile submitted to the Board for consideration, and the owners will be required to furnish a guarantee that the painters will be kept in this position whilst the ship is at sea.

The position of the propeller is in all cases to be inserted or figured on the boat stowage plan and, when submitting proposals for consideration under this paragraph, a drawing of a section of the vessel indicating the launching position of the boat relative to the foremost propeller when the vessel is floating on her light draught is also to be forwarded accompanied by a Surveyor's report whether it is practicable to transport the aftermost boats so that they can be launched on either side of the ship.

229. Clearance between Ship's Side and Boats when being lowered.—The everhang of davits must be such as will ensure, when the vessel is upright, a minimum clearance in lowering of 12 inches between the ship's side and that of the boat, such clearance to be measured from the permanent structure of the lifeboat at its widest part irrespective of any skate or vertical fender. Where skates or vertical fenders are fitted there should be, in addition to this minimum clearance. a clearance of at least three inches between the ship's side and outer edge of either skate or When beltings or heavy rubbers are fitted to the ship's side, the clearance between the boat and the belting should not be less than 6 inches, and two tapered chocks or fending bars should be fitted on the upper and lower sides of the belting in way of the midship half length of each boat to fend the boat off when being lowered and to prevent the gunwale from being caught underneath the belting when the vessel rolls. See paragraph 201 with reference to overhanging decks.

230. Boats' positions in relation to Pump Discharges.—When the orifices of pump discharges are near to or below the position of the load waterline corresponding to the centre of the disc, or where the pumps are used in connection with the main propelling machinery and are out of action when the engines are stopped, no objection need be raised to the stowage of boats abreast such discharges.

When, however, the discharge orifices of independent pumps which are likely to be discharging under emergency conditions are situated higher up the ship's side, boats are only to be stowed abreast of them when means are provided for stopping the pumps from positions which would be accessible with the engine room partially flooded or when other satisfactory precautions are taken to ensure that when the boats are being lowered there shall be no danger of their being swamped by water from the discharges. The positions of pump discharges are to be indicated on the plans of boat stowage when these are submitted for approval.

231. Projections on Ship's Side below Boat Positions.—As projections on a ship's side below boat positions are a source of great danger to boats when being lowered, Surveyors should pay special attention to all side fittings with a view to seeing that projections are reduced to a minimum, or that such modifications in the fittings are made as will render dangerous projections unnecessary.

Side-scuttles which pivot on a vertical axis should not be fitted under boat positions unless they are specially devised and arranged to obviate the danger referred to, and are approved by the Board. Rigols or eyebrows are to be made as small as possible, and gangway cargo and coaling doors, ash shoots and discharges from scuppers and soil pipes should be designed without dangerous lugs, hinges, or other projections likely to foul or damage the boats when being lowered. (See paragraph 229.)

Where, however, the Surveyor is satisfied that it is not practicable to avoid such projections, the boat or boats stowed above the projections are to be fitted with efficient vertical fenders, as described in paragraphs 28 or 64, which will prevent the planking of the boat from coming into contact with such projections when the boat is lowered against a moderate adverse list.

232. Boat Fenders, Rubbers and Filling Pieces.—It is important that efficient arrangements should be made to prevent damage to boats while being lowered owing to the boats coming in contact with the ship's sides. This is

especially necessary in passenger steamers having the boats carried at a great height above the water, having regard to the fact that it may be necessary to lower the boats against an adverse list.

The provisions of paragraph 28 (or 64 in the case of metal boats) with regard to the fitting of vertical fenders are to be complied with.

The fitting of such fenders is strongly recommended in the case of all foreign-going ships, it being desirable that some protection should be afforded to a boat should it be thrown against the ship's side.

Part V.—Side Ladders and Illumination of Boat Decks, etc.

233. Side Ladders. -Rule 41 (2) requires that all passenger ships except those in Classes V, VI, VII and VIII, shall carry a ladder of an approved type for each set of davits. Non-passenger ships, except those in Classes XIII or XIV are required to carry not less than one ladder for each two sets of davits. The ladders should be of sufficient length to reach the waterline with the ship at her lightest sea-going draught and listed 15 degrees either way, and must be carried in such a manner as to be always available for use in embarking persons in the boats. The ladders should be at least 18 inches wide with steps of hard wood having a tread at least 4 inches wide and not less than 2 inch thick for ladders up to 30 feet in length and 1 inch thick for ladders exceeding 30 feet in length. The steps should not be more than 12 inches apart and they must be secured in such a manner as to prevent them from tripping.

In large passenger ships the ladders should be stowed at the embarkation decks or at positions below these decks where embarkation into the boats by means of the ladders is practicable from such positions.

In cases where there may be difficulty in securing satisfactory compliance with the requirements of Rule 41 (2), owing to overhanging decks or other structural arrangements, the Surveyor, if in doubt, should submit details of the proposed arrangements to the Board for consideration.

In non-passenger ships the ladders should, as a rule, be secured to eyeplates on the boat deck but other arrangements which the Surveyor considers to be satisfactory may be accepted.

234. Safety Lighting for Embarkation and Boat Launching Operations.—All passenger ships of Classes I. II. III and IV

are to be provided with a safety lighting system for illuminating:—

- (1) The exits and passages from every main compartment occupied by passengers or crew to the embarkation and boat decks. Each exit is to be lighted continuously by an emergency lamp.
- (2) The decks on which the boats and their launching gear, life rafts and buoyant apparatus are stowed. The lights are to be arranged to illuminate sufficiently the interior of the boats so that they may be readily prepared for launching.
- (3) The lifeboats when alongside in process of being launched and immediately after launching. The requirements of this sub-paragraph do not apply to vessels on which the height of the boat deck above the waterline at the lightest sea-going draught does not exceed 30 feet.

The safety lighting system is to include a self-contained source of power situated above the bulkhead deck and is to be connected also to the main generating plant. An emergency generating set supplied for emergency bilge pumping, etc., may be utilised in connection with the safety lighting system if it is of sufficient power to meet fully the demands of all the emergency services.

The safety lighting system, whether supplied by an independent source of power, by the emergency bilge pumping plant or by any other approved means, must be capable of being switched on instantly and must be reliable. It must give satisfactory illumination for a period of at least three hours if more boats than one are operated by any one set of davits or for two hours if single boats only are stowed under davits. Full particulars of the safety lighting system are to be submitted to the Engineer Surveyor-in-Chief.

APPENDIX A

SECTIONS OF THE MERCHANT SHIPPING ACTS DEALING WITH LIFE-SAVING APPLIANCES.

Norn.—The provisions printed in heavy type are the amendments made by the Merchant Shipping. (Line-Throwing Appliances) Act, 1928, and Section 5 of the Merchant Shipping (Safety and Loadline Conventions) Act, 1932.

MERCHANT SHIPPING ACT, 1894.

As amended by the Merchant Shipping (Line Throwing Appliances) Act, 1928, and Merchant Shipping (Safety and Loadline Conventions) Act, 1932.

Rules as to Life-Saving Appliances.

- 427.—(1) The Board of Trade may make rules (in this Act called rules for life-saving appliances) with respect to all or any of the following matters, namely:-
 - (a) the arranging of British ships into classes, having regard to the services in which they are employed, to the nature and duration of the voyage, and to the number of persons carried:
 - (b) the number and description of the boats, life-boats, life-rafts, line-threwing appliances, life-jackets, and life-buoys to be carried by British ships, according to the class in which they are arranged, and the mode of their construction; also the equipments to be carried by the boats and rafts, and the methods to be provided to get the boats and other . life-saving appliances into the water which methods may include oil for use in stormy weather;

the marking of boats, life-boats, life-rafts and buoyant apparatus so as to show the dimensions thereof and the number of persons authorised to be carried thereon; the manning of boats and lifeboats and the qualifications

and certificates of lifeboat men:

(c) the quantity, quality, and description of buoyant apparatus to be carried on board British ships carrying passengers, either in addition to or in substitution for boats, life-boats, life-rafts, life-jackets, and life-buoys;

the provision to be made for mustering the passengers and crew and for embarking them in the boats and lifeboats (including provision as to the lighting of, and as to the means of ingress to, and egress from, different parts of the ship);

- (d) the practising of boat drills;
- (e) the assignment of specific duties to each member of the erew in the event of emergency;
- (2) Repealed by Section 35 (5) of the Merchant Shipping (Safety and Load Line Conventions) Act, 1932.
- (3) Rules under this section shall not apply to any fishing boat for the time being entered in the fishing boat register under Part IV of this Act.

Penalty for Breach of Rules.

430.--(1) In the case of any ship-

(a) if the ship is required by the rules for life-saving appliances to be provided with such appliances and proceeds on any voyage or excursion without being so provided in accordance with the rules applicable to the ship; or

(b) if any of the appliances with which the ship is so provided are lost or rendered unfit for service in the course of the voyage or excursion through the wilful fault or

negligence of the owner or master; or

(c) if the master wilfully neglects to replace or repair on the first opportunity any such appliances lost or injured in the course of the voyage or excursion; or

(d) if such appliances are not kept so as to be at all times

fit and ready for use;

- (e) if any provision of the rules for life-saving appliances applicable to the ship is contravened or not complied with, then the owner of the ship (if in fault) shall for each offence be liable to a fine not exceeding one hundred pounds, and the master of the ship (if in fault) shall for each offence be liable to a fine not exceeding fifty pounds.
- (2) Nothing in the foregoing enactments with respect to lifesaving appliances shall prevent any person from being liable under any other provision of this Act, or otherwise, to any other or higher fine or punishment than is provided by those enactments, provided that a person shall not be punished twice for the same offence.
- (3) If the court before whom a person is charged with an offence punishable under those enactments thinks that proceedings ought to be taken against him for the offence under any other provision of this Act, or otherwise, the court may adjourn the case to enable such proceedings to be taken.

Survey of Ship with respect to Life-saving Appliances.

- 431.—(1) A surveyor of ships may inspect any ship for the purpose of seeing that the rules for life-saving appliances have been complied with in her case, and for the purpose of any such inspection shall have the powers of a Board of Trade Inspector under this Act.
- (2) If the surveyor finds that the rules for life-saving appliances have not been complied with, he shall give written notice to the owner or master stating in what respect the said rules have not been complied with, and what, in his opinion, is required to rectify the matter.
- (3) Every notice so given shall be communicated in manner directed by the Board of Trade to the Chief Officer of Customs of any port at which the ship may seek to obtain a clearance or transire, and a clearance or transire shall not be granted to the ship and the ship shall be detained until a certificate under the hand of a surveyor of ships is produced to the effect that the matter has been rectified.

MERCHANT SHIPPING ACT, 1906, AS AMENDED BY THE MERCHANT SHIPPING (SARSTY AND LOADLINE CONVENTIONS) ACT, 1932.

Power to apply Rules as to Life-saving Appliances to Foreign Ships in Certain Cases.

4. Sections four hundred and twenty-seven to four hundred and thirty-one of the principal Act relating to life-saving appliances

shall, after the appointed day, apply to all foreign ships while they are within any port of the United Kingdom as they apply to British Ships;

Provided that His Majesty may by Order in Council direct that those provisions shall not apply to any ship of a foreign country in which the provisions in force relating to life-saving appliances appear to His Majesty to be as effective as the provisions of Part V. of the principal Act, on proof that those provisions are complied with in the case of that ship.

Appointed Day.

5. For the purposes of this Part of this Act the appointed day shall be the first day of January nineteen hundred and nine, or such other day not being more than twelve months later, as the Board of Trade may appoint; and different days may be appointed for different provisions of this Part of this Act and for different foreign countries.

Saving for Ship coming in under stress of weather, &c.

6. Nothing in the foregoing provisions of this Part of this Act shall affect any foreign ship not bound to a port of the United Kingdom which comes into any port of the United Kingdom for any purpose other than the purpose of embarking or landing passengers, or taking in or discharging cargo or taking in bunker coal.

Entry in log-book of Boat Drill, &c.

- 9.—(1) The master of every British ship shall enter or cause to be entered in the official log-book, a statement, or if there is no official log-book, cause a record to be kept, of every occasion on which boat drill is practised on board the ship, and on which the life-saving appliances on board the ship have been examined for the purpose of seeing that those appliances are fit and ready for use, and if, in the case of a passenger steamer, boat drill is not practised on board the ship in any week, the Master shall enter a statement of the reasons why boat drill was not practised in that week.
- (2) The master shall, if and when required by any officer of the Board of Trade, produce for inspection any record kept by him for the purposes of this section.
- (3) If the master of a ship fails to comply with any requirement of this section, he shall be liable on summary conviction for each offence to a fine not exceeding ten pounds.

MERCHANT SHIPPING (LINE-THROWING APPLIANCES) ACT, 1928.

Line-throwing Appliances to be carried.

1. The power of the Board of Trade, under section four hundred and twenty-seven of the Merchant Shipping Act, 1894, to make rules for life-saving appliances, shall include power to make rules with respect to the number, description, and mode of construction of line-throwing appliances to be carried by British ships according to the class in which they are arranged; and accordingly paragraph (b) of subsection (1) of the said section shall have effect as if there were therein inserted after the word "life-rafts" the words "line-throwing appliances."

MERCHANT SHIPPING (SAPETY AND LOADLINE CONVENTIONS) ACT, 1932.

Amendments of Merchant Shipping Acts as to life-saving appliances.

- 5.—(1) The power of the Board of Trade under section four hundred and twenty-seven of the principal Act to make rules for life-saving appliances shall include power to make rules with respect to all or any of the following matters, namely:—
 - (a) the marking of boats, lifeboats, life-rafts and buoyant apparatus so as to show the dimensions thereof and the number of persons authorised to be carried thereon;
 - (b) the manning of boats and lifeboats and the qualifications and certificates of lifeboat men;
 - (c) the provisions to be made for mustering the passengers and crew and for embarking them in the boats and lifeboats (including provision as to the lighting of, and as to the means of ingress to, and egress from, different parts of the ship);
 - (d) the practising of boat drills;
 - (c) the assignment of specific duties to each member of the crew in the event of emergency;
 - (f) the methods to be adopted and the appliances to be carried for the prevention, detection and extinction of fire.
- (2) Subsection (1) of section four hundred and thirty of the principal Act (which imposes penalties for failure to comply with the rules for life-saving appliances) shall be amended by inserting after paragraph (d) thereof the following paragraph:—
 - "(e) if any provision of the rules for life-saving appliances applicable to the ship is contravened or not complied with."
- (3) The following section shall be substituted for section four hundred and thirty-one of the principal Act:--
 - "431.—(1) A surveyor of ships may inspect any ship for the purpose of seeing that the rules for life-saving appliances have been complied with in her case, and for the purpose of any such inspection shall have all the powers of a Board of Trade Inspector under this Act.
 - (2) If the surveyor finds that the rules for life-saving appliances have not been complied with, he shall give written notice to the owner or master stating in what respect the said rules have not been complied with, and what, in his opinion, is required to rectify the matter.
 - (3) Every notice so given shall be communicated in manner directed by the Board of Trade to the Chief Officer of Customs of any port at which the ship may seek to obtain a clearance or transire, and a clearance or transire shall not be granted to the ship and the ship shall be detained until a certificate under the hand of a surveyor of ships is produced to the effect that the matter has been rectified."
- (4) Subsection (4) of section two hundred and seventy-two of the principal Act (which relates to the statements to be made in the declaration of survey made by an engineer surveyor) shall be amended by substituting in paragraph (c) thereof the words "appliances for the prevention, detection and extinction of fire" for the words "fire hose" and subsection (2) of section two hundred and eighty-five of the principal Act shall cease to have effect.

(5) Subsection (1) of section nine of the Merchant Shipping Act, 1906 (which requires the master of every British ship to enter in the official log-book a statement of every occasion on which boat drill is practised on board the ship) thall be amended by inserting at the end thereof the words " and if, in the case of a passenger steamer, boat drill is not practised on board the ship in any week, the master shall enter a statement of the reasons why boat drill was not practised in that week."

APPENDIX B (1)

STANDARD REGULATIONS AS TO MUSTERS AND DRILLS ON PASSENGER STEAMERS.

Note by the Board of Trade.

- 1. The object of these Standard Regulations is to provide the outlines of a uniform scheme for training the members of crews of passenger steamers in the duties that they would be required to undertake in the event of any accident to the ship which may, if not successfully combated, involve the abandonment of the ship. The scheme is based on the practices generally adopted on British passenger ships. It includes the requirements of the Merchant Shipping (Musters) Rules, 1933, and other statutory obligations under the Merchant Shipping (Safety and Loadline Conventions) Act, 1932, and it gives effect to the provisions of the International Convention for the Safety of Life at Sea, 1929, relating to musters and drills.
- 2. The scheme of the regulations contemplates an organisation in each ship under which, in an actual emergency such as fire, stranding or collision, the appropriate members of the crew will, immediately on receipt of the necessary warning signal or instructions:—
 - (a) Proceed to their allotted stations and carry out the duties assigned to them with a view to combating the emergency, and
 - (b) Should the abandonment of the ship become necessary, take the requisite action for preparing the boats and other life-eaving appliances for use, warning the passengers and controlling their movements in the interests of safety.
- 3. There are two sets of Regulations namely (i) the General Standard Regulations and (ii) the Regulations intended for application to passenger steamers which are restricted to voyages within limits defined on their certificates, i.e., in the case of vessels plying to and from ports in the United Kingdom, passenger steamers holding home trade (St.2) passenger certificates whether with or without short voyage safety certificates, and passenger steamers holding excursion (St.3) passenger certificates. In view of the great variety of conditions found on passenger steamers and especially on those included under (ii) above in respect of such matters as the length of voyage, the number of passengers, the accommodation provided for passengers, the nature of the life-saving appliances, etc., the Regulations are capable of modification in detail as the circumstances of particular lines or trades or vessels may require.
- 4. The present edition of the Regulations, which has been approved by the Merchant Shipping Advisory Committee, supersedes the Regulations for passenger ships contained in Notice

No. 100 published by the Board of Trade in January, 1929. The Regulations have been entirely re-arranged and re-written and cover a number of points not included in the previous Regulations.

Board of Trade, December, 1933. Notice No. 133.

I.-GENERAL STANDARD REGULATIONS.

Muster List.

- 1. The Muster List is required to show in respect of each member of the crew* the special duties for the event of an emergency which are allotted to him, and is to indicate in particular the station to which he has to go when the pre-arranged signal or warning of emergency is given.
- 2. To meet the possibility of a fire the Muster List must assign a sufficient number of the crew to the duties connected with the extinction of fire and the evacuation of passengers from their accommodation, so far as this may become necessary. To meet the situation likely to arise as a result of a collision or other accident which may result in water entering the vessel, members of the crew should be assigned to the duties of closing bulkhead doors, side scuttles, ash-shoots, rubbish shoots, lavatory and bath discharges and other similar valves giving access to the sea. Men should also be assigned to such other posts and duties as may be considered desirable for combating the results of accidents.
- 3. To meet the possibility that the emergency may become so serious as to necessitate the abandonment of the ship, the Muster List must provide for the allocation of members of the crew to the duties connected with the preparation of the boats and other lifesaving appliances for use, and the marshalling of passengers at suitable assembly stations with a view to their being drafted from those stations to the boats as circumstances require. The duties connected with the boats and lifesaving appliances will include the completion of the equipment of the boats, their preparation for launching, and the actual launching and lowering to embarkation stations, as well as any operations required to ensure that the buoyant apparatus shall be available.
- 4. In order that the duties referred to in the last sentence of the preceding paragraph may, if necessary, be carried out without delay as soon as the accident occurs, it is desirable that if practicable the men to whom these duties are assigned in the Muster List should not have any other emergency duties assigned to them.
- 5. The Muster List must also contain full particulars of the signals which will be used on the ship for calling the crew to their stations for emergency duties.
- 6. The boat stations of each member of the crew are also to be shown on the Muster List (or on a separate List if this is considered preferable) so that all the members of the crew

^{*}In the case of ships carrying Lascar or other native crews who are unable to read English, special arrangements will be necessary for notifying them of emergency duties allotted to them.

(including those to whom emergency duties not connected with the preparation of boats are assigned) may know their stations in the event of their having to take to the boats.

- 7. When making out the Muster List* the Master should bear the following points in mind:—
 - (1) The crew assigned to each lifeboat should include, according to the size of the boat, at least the number of certificated lifeboatmen specified in Rule 43 of the Life Saving Appliances Rules, 1932. The allocation of other certificated lifeboatmen remains within the Master's discretion.
 - (2) A Deck Officer or certificated lifeboatman must be assigned to take charge of each lifeboat, and a second-incommand is also to be nominated.
 - (3) A man capable of working the motor is to be assigned to each motor boat carried.
 - (4) A man capable of working the wireless and searchlight installations is to be assigned to boats carrying these equipments.
 - (5) The duties connected with the marshalling of passengers to their assembly stations are normally to be assigned to members of the Stewards' Department.
- 8. The preparation of the Muster List may, if desired, be supplemented by the issue, to each member of the crew, of a card showing (among other particulars) his boat station, his emergency station or stations and duties, and any signals connected therewith.
- 9. The Master will be responsible for the preparation of the Muster List, which should be signed and dated by him. The Muster List should be prepared, or, if a new list is not necessary, should be revised, before the ship puts to sea for the first time after the agreement with the crew has been signed; and if after the Muster List has been prepared any change takes place in the crew which necessitates an alteration in the Muster List, the Master must either revise the list, or prepare a new list.
- 10. The Muster List is to be posted conspicuously in such parts of the ship as will ensure that it is readily available for the crew to read. In particular, it must be exhibited throughout the crew's quarters. It must be posted before the ship proceeds to sea and kept so posted while the ship is at sea. The responsible officers should ascertain that the persons under their supervision are fully acquainted with the requirements of the Muster List which affect them and with the meaning of the various signals which will be used for emergency purposes on the ship, and also that they know the boats to which they are assigned.

SIGNALS.

11. The general emergency signal shall be a succession of more than six short blasts followed by one long blast on the whistle or siren. In ships holding General Safety Certificates this signal is required to be supplemented by electrically operated signals throughout the ship controlled from the bridge, but this requirement is not obligatory in the case of existing ships hold-

In this and other paragraphs, the expression "Muster List" is to be understood as including the Boat Stations List.

ing such certificates and carrying passengers on not more than two decks. In existing ships where a non-electrical system has been provided, it may be accepted if efficient.

- 12. The general emergency signal must be used only on the Master's responsibility. Its use in emergencies should be confined to occasions in which it is considered necessary for the passengers to be collected at the passenger assembly stations with a view to the possible evacuation of the ship.
- 13. The nature of the signals or other means to be used for calling the crew to emergency duties (other than a general emergency), or to crew practices remains within the discretion of the Master. Such aignals should be distinct from navigational signals and if given on the ship's whistle or siren should be distinct from the general emergency signal.
- 14. It is desirable that arrangements should be made for speedy communication between the bridge and the crew's quarters so that in the event of a fire or other emergency necessitating immediate action no delay may occur in summoning the members of the crew whose services may be required.

CREW EMERGENCY PRACTICES.

15. In order that the crew emergency practices may make the crew familiar with the action they would be called on to take in the event of an emergency, they should include: -

firedrill (see paragraphs 18 and 19);

drill in the closing of doors, side scuttles, valves, etc. (see paragraph 20);

boat drill (see paragraphs 21 to 24); and drill in the duties connected with the marshalling of passengers (see paragraph 25).

The practices should be so arranged that the crew thoroughly understand the duties they have to perform, and are exercised in those duties so far as practicable.

- 16. Crew emergency practices are required to be held weekly 16. Crew emergency practices are required to be held weekly when practicable, and, in ships in which the voyage exceeds one week, before leaving port. At practices held in port all the drills referred to in the preceding paragraph should be combined in one comprehensive practice. At practices held at sea, the same method may be followed, or the different drills may be held either separately or partly combined with one another as the Master may consider most effective in the circumstances, provided always that all the drills are practised weekly.
- 17. At the time appointed for a practice, all members of the crew (or in the case of a sectional practice the members of the crew concerned), with the exception of those who cannot be relieved from immediate duties, should muster with their life jackets with a view to performing or being instructed in the duties assigned to them. The officers or other persons in charge of particular sections of emergency duties should have a list of the persons under their orders and should see that they are acquainted with their several duties.

Fire Drill.

18. For the purposes of this drill an outbreak of fire should be assumed to have occurred in a part of the ship (not the engine room) selected by the officer in charge of the drill and a mock attack on the supposed fire should be made. On receipt of the signal or other warning in the engine room the fire pumps should be prepared for operation. The members of the crew forming the fire party or parties should be sent to the seat of the assumed fire. The hoses in that neighbourhood should be laid out and the fire extinguishers unshipped, and occasionally one of the extin-guishers should be discharged. Water should be played through a proportion of the fire hoses selected by the officer in charge of In addition, the hydrants should be tested under Men should be exercised in the closing of doors, the drill. pressure. ventilating shafts and other openings in the vicinity of the space affected by the supposed fire so as to reduce the supply of air to the fire and isolate it as far as practicable from other parts The fire party of the ship, especially stairways and lift shafts. should be exercised in the use of smoke helmets or any other breathing apparatus carried on the ship and should also be instructed in the use of all other descriptions of fire fighting appliances on the ship.

19. The fire appliances in other parts of the ship, including the engine room and machinery spaces, should be examined, so as to ensure that they are in good order and readily available for use in an emergency; and fire alarms and fire detecting apparatus, where fitted, should, so far as possible, be inspected to see that they are in sufficient working order. If this is not done on the occasion of each successive fire drill, arrangements should be made to secure that it shall be carried out within the same intervals, i.e., weekly.

Drill in closing of doors, side-scuttles, etc.

20. The drill for practising the closing of water-tight and fire resisting doors, side-scuttles, ash shoots, rubbish shoots, lavatory and bath discharges, and other similar valves giving access to the sea should be so arranged as to secure compliance with the relevant requirements of Section 22 and the Third Schedule of the Merchant Shipping Act, 1932. Under this enactment the opening and closing of

(i) all water-tight doors in main transverse bulkheads,

(ii) side-scuttles in certain positions,
(iii) the covers and valves of all ash shoots, rubbish shoots or other similar contrivances having their inboard openings below the margin line, and

(iv) the closing mechanism of all scuppers having their in-

board openings below the margin line,

must be practised once a week, and also before the steamer proceeds to see on any voyage which is likely to last more than a week: and every valve, the closing of which is necessary to make any compartment water-tight, and every water-tight door in the main transverse bulkheads and the mechanism and indicators connected therewith are to be inspected at least once a week.

Boat drill.

21. The crew of each boat (other than the men who cannot be relieved from their normal duties or who are simultaneously engaged in practising other emergency duties elsewhere) should muster at their boat stations with their lifejackets. The person

[•] The practices held at sea do not include those doors and side scuttles which the Schedule requires to be closed before the steamer proceeds to sea and to be kept closed at sea.

in charge of each boat should have a list of its crew and should see that the men placed under his orders are acquainted with their several duties. The boats to be used in the drill are to be selected by the officer in charge. They should include some from each side of the ship and should be so distributed as to enable the crews of the other boats to watch the operations. Different groups of boats should be used in turn at successive drills.

- 22. When the drill is held at sea, at least a quarter of the total number of boats attached to davits should, if weather and other circumstances permit, be cleared and swung out. The equipment of these boats should be checked and the side ladders and embarkation arrangements should also be prepared.
- 23. All the boats not used in the drills should be examined to ensure that the boats themselves, their lowering appliances and equipment are in order. If motor boats are carried the engines and the wireless and the searchight equipment should be examined and tested. Similarly, if boats fitted with Fleming gear are carried, this gear should be examined and tested. In ships where inboard boats are carried, the arrangements for transporting these boats to the side of the ship should be tested. The buoyant apparatus and other life-saving appliances carried should be inspected in order to see that they are in good condition and readily available in case of an emergency. If the operations specified in this paragraph are not done on the occasion of each successive boat drill, arrangements should be made to ensure that they are carried out within the same intervals, i.e., weekly.
- 24. When the drill is held in port, it should be carried out in the same manner as at sea, except that as many as possible of the boats attached to davits should be cleared and swung out. They should also, so far as practicable, be lowered into the water and the crews exercised in pulling and sailing. On ships where more than one boat is served by the same set of davits and the first boat is lowered into the water, the other should, so far as practicable, be prepared and swung out and as many as possible of these boats should also be lowered into the water and the crews exercised as indicated above.

Drill in duties connected with marshalling of passengers.

- 25. For the purpose of drill in the marshalling of passengers those members of the crew who have been assigned to this duty should take up their places in the stairways and passage ways leading to the passenger assembly stations and also at the assembly stations. The officers in charge should ascertain that they are acquainted with their duties which include:—
 - (a) warning all passengers and impressing on them the importance of securing suitable covering and of donning their life-jackets in a proper manner;
 - (b) marshalling the passengers to the assembly stations, keeping order in the stairways and passages and doorways and generally controlling the movements of passengers;
 - (c) impressing on passengers the risk of injury from jumping overboard, and the importance of using the side ladders provided for the purpose of entering the boats should it prove necessary to embark in them after they have been lowered into the water.

PRACTICE MUSTER OF PASSENGERS.

- 26. A practice muster of passengers is required to be held within twenty-four hours of the commencement of each voyage. In the event of passengers being embarked at ports of call after the practice has been held, it will rest with the Master to decide what steps should be taken to ensure that they shall be made acquainted with the procedure to be followed in an emergency.
- 27. The time at which a practice muster of passengers is to take place must in all cases be notified to the passengers in advance.
- 28. On the occasion of a practice muster of passengers, those members of the crew who have been assigned the duties mentioned in paragraph 25 should be careful to satisfy themselves that the sections of the passenger accommodation for which they are responsible are completely clear of passengers. When the passengers are assembled at the passenger assembly stations they should be instructed in the manner of putting on lifejackets and in the matters referred to in sub-paragraphs (a) and (c) of paragraph 25. Before the passengers are dismissed the officers in charge should explain the process of embarkation to them and should emphasise that the general emergency signal is not in itself a signal for the abandonment of the ship, but is intended to secure the orderly marshalling of passengers to the appointed assembly stations should the occurrence of a serious accident make this advisable.
- 29. The passenger assembly stations are to be so selected and arranged that the passengers can readily be drafted from them to the required positions on the embarkation deck as circumstances may necessitate.

NOTICES TO PASSENGERS.

- 30. The following information should be shown conspicuously on cards in all spaces which provide sleeping accommodation for passengers:—
 - (1) The passenger assembly station of the occupants.
 - (2) The nature and meaning of the general emergency signal,
 - (3) Illustrated instructions of the method of putting on the lifejackets provided.

Information under (2) and (3) should also be posted conspicuously in other suitable positions in the passenger accommomodation. The information should be worded in English and such other language or languages as may be considered necessary having regard to the nationality of the passengers normally carried on the voyage.

ENTRIES IN OFFICIAL LOG BOOK.

31. Particulars of all the practices specified in the preceding paragraphs should be recorded in the official log book and if, in any week, a practice is not held, an entry should be made stating the reasons for the omission.

ADDITIONAL PRACTICES.

32. When emergency boats are carried, the crews of these boats should, weather permitting, be mustered at least three times a week while the vessel is at sea. The full equipment of the boats should be overhauled each day, and each night a lighted lamp should be placed in position in each boat.

33. The opening and closing of all hinged or power operated watertight doors in main transverse bulkheads which are in use at sea are required to be practised daily while the steamer is at sea, and the practice recorded in the official log book.

MISCELLANBOUS.

- 34. To avoid any delay in sending out the ship's position in the event of a sudden accident, the position of the ship and the true course and speed should be posted up in the chart room and the wireless room every two hours.
- 35. Officers and others in charge of lifeboats should be cautioned that it is advisable for boats after launching to remain as much as possible in the vicinity of the accident and not to attempt to pull any distance unless there are special reasons for doing so.
- 36. Where motor boats are carried the crews should be instructed that it is a part of their duty to cruise about shepherding the oared boats.
- 37. In view of the fact that the general emergency signal is not in itself a signal for the abandonment of the ship and that after the signal has been given members of the crew may be required to remain on duty below deck (for example in the engine room), definite arrangements should be made on all ships and should be notified to all members of the crew as part of the arrangements for dealing with emergencies, to ensure that, in the event of the abandonment of the ship being decided on, those members of the crew working below deck would be effectively warned by signals or other means in time to enable them to get away.

II.—MODIFIED REGULATIONS APPLICABLE TO PASSENGER SHIPS ON RESTRICTED VOYAGES.

MUSTER LIST.

- 1. The Muster List is required to show in respect of each member of the crew the special duties for the event of an emergency which are allotted to him, and is to indicate in particular the station to which he has to go when the prearranged signal or warning of emergency is given.
- 2. To meet the possibility of a fire the Muster List must assign a sufficient number of the crew to the duties connected with the extinction of fire and the evacuation of passengers from their accommodation, so far as this may become necessary. To meet the situation likely to arise as a result of a collision or other accident which may result in water entering the vessel, members of the crew should be assigned to the duties of closing bulkhead doors, side scuttles, ash-shoots, rubbish shoots, lavatory and bath discharges and other similar valves giving access to the sea. Men should also be assigned to such other posts and duties as may be considered desirable for combating the results of accidents.
- 3. To meet the possibility that the emergency may become so serious as to necessitate the abandonment of the ship, the Muster List must provide for the allocation of members of the crew to the duties connected with the preparation and launching of the boats and buoyant apparatus, and the distribution of life-jackets to the passengers. In addition to showing the boat stations to

which members of the crew should proceed for the purpose of preparing the boats for launching, the Muster List should allot members of the crew to go away in the boats with the passengers (see paragraph 5 (1)). In the case of vessels having enclosed passenger accommodation from which the passengers would have to be marshalled in the event of an emergency (e.g. sleeping accommodation for passengers on vessels which proceed by night), the Muster List must assign members of the crew to the duties connected with the marshalling of the passengers at assembly stations situated at suitable positions for the purpose of abandoning the ship.

- 4. The Muster List must also contain full particulars of the signals which will be used on the ship for calling the crew to their stations for emergency duties.
- 5. When making out the Muster List the Master should bear the following points in mind:—
 - (i) There should be assigned to each lifeboat according to its size at least the number of certificated lifeboatmen specified in Rule 43 of the Life Saving Appliances Rules, 1932.
 - (ii) A deck officer or certificated lifeboatman should be assigned to take charge of each lifeboat and a second in command is also to be nominated.
 - (iii) The duties connected with the assisting and controlling of passengers should normally be assigned to members of the Stewards' Department.
 - (iv) In vessels where the boats do not provide accommodation for the total number of persons allowed to be carried, the allocation of members of the crew to the duties of distributing the lifejackets to the passengers in various parts of the vessel and preparing and launching the buoyant apparatus should receive special attention.
- 6. The preparation of the Muster List may, in the case of some ships, be facilitated if the List shows the bunk or berth numbers (instead of the names) of the individual members of the crew with the emergency duties assigned to them, a card being fixed to each bunk showing the emergency duties and station of the occupant and any signals connected with those duties.
- 7. The Master will be responsible for the preparation of the Muster List, which should be signed and dated by him. The Muster List should be prepared, or if a new list is not necessary should be revised, before the ship puts to see for the first time after the agreement with the crew has been signed; and if after the Muster List has been prepared any change takes place in the crew which necessitates an alteration in the Muster List, the Master must either revise the list, or prepare a new list.
- 8. The Muster List is to be posted conspicuously in such parts of the ship as will ensure that it is readily available for the crew to read. In particular, it must be exhibited throughout the crew's quarters. It must be posted before the ship proceeds to sea and kept so posted while the ship is at sea. The responsible officers should ascertain that the persons under their supervision are fully acquainted with the requirements of the Muster List which affect them and with the meaning of the various signals which will be used for emergency purposes on the ship.

SIGNALS.

- 9. The general emergency signal shall be a succession of more than six short blasts followed by one long blast on the whistle or siren. This may be supplemented by other signals throughout the ship at the discretion of the Master.
- 10. The general emergency signal must be used only on the Master's responsibility. Its use in emergencies should be confined to occasions in which it is considered necessary for the passengers to be warned with a view to the possible evacuation of the ship.
- 11. The nature of the signals or other means to be need for calling the crew to emergency duties (other than a general emergency) or to crew practices remains within the discretion of the Master. Such signals should be distinct from navigational signals and if given on the ship's whistle or siren should be distinct from the general emergency signal.

Crew Emergency Practices.

12. In order that the crew emergency practices may make the crew familiar with the action they would be called on to take in the event of an emergency, they should include:—

firedrill (see paragraphs 14 and 15);

drill in the closing of doors, side scuttles, valves, etc. (see paragraph 16);

boat drill and drill in the other duties connected with the abandonment of the ship (see paragraphs 17 to 20).

The practices should be so arranged that the crew thoroughly understand the duties they have to perform, and are exercised in those duties so far as practicable.

13. Crew emergency practices are required to be held weekly when practicable, either in port or at sea. At the time appointed for a practice, all members of the crew, with the exception of those who cannot be relieved from immediate duties, should muster with their lifejackets with a view to performing or being instructed in the duties assigned to them. The officers or other persons in charge of particular sections of emergency duties should have a list of the persons under their orders and should see that they are acquainted with their several duties.

Fire Drill.

14. For the purposes of this drill an outbreak of fire should be assumed to have occurred in a part of the ship (not the engine room) selected by the officer in charge of the drill and a mock attack on the supposed fire should be made. On receipt of the signal or other warning in the engine room the fire pumps should be prepared for operation. The members of the crew forming the fire party or parties should be sent to the seat of the assumed fire. The hoses in that neighbourhood should be laid out and the fire extinguishers unshipped, and occasionally one of the extinguishers should be discharged. Water should be played through a proportion of the fire hoses selected by the officer in charge of the drill. In addition, the hydrants should be tested under pressure. Men should be exercised in the closing of doors, ventilating shafts and other openings in the vicinity of the space affected by the supposed fire so as to reduce the supply of air to the fire and isolate it as far as practicable

from other parts of the ship, especially stairways and lift shafts. The fire party should be exercised in the use of smoke helmets or other breathing apparatus if carried, and should also be instructed in the use of all other descriptions of fire fighting appliances on the ship.

15. The fire appliances in other parts of the ship, including the engine room and machinery spaces, should be examined, so as to ensure that they are in good order and readily available for use in an emergency; and fire alarms and fire detecting apparatus, where fitted, should, so far as possible, be inspected to see that they are in efficient working order. If this is not done on the occasion of each successive fire drill, arrangements should be made to secure that it shall be carried out within the same intervals, i.e., weekly.

Drill in closing of doors, side-scuttles, etc.

- 16. The drill for practising the closing of water-tight and fire resisting doors, side-scuttles, ash shoots, rubbish shoots, lavatory and bath discharges, and other similar valves giving access to the sea should be so arranged as to secure complance with the relevant requirements of Section 22 and the Third Schedule of the Merchant Shipping Act, 1932. Under this enactment the opening and closing of
 - (i) all watertight doors in main transverse bulkheads,

(ii) side-scuttles in certain positions,

(iii) the covers and valves of all ash shoots, rubbish shoots or other similar contrivances having their inboard openings below the margin line, and

below the margin line, and
(iv) the closing mechanism of all scuppers having their inboard openings below the margin line,

must be practised once a week, and also before the steamer proceeds to sea on any voyage which is likely to last more than a week; and every valve, the closing of which is necessary to make any compartment watertight, and every watertight door in the main transverse bulkheads and the mechanism and indicators connected therewith are to be inspected at least once a week.

Boat drill.

- 17. The members of the crew responsible for the preparation of the boats (other than those who cannot be relieved from their normal duties) should muster at their boat stations with their life-jackets. The person in charge of each boat should see that the men placed under his orders are acquainted with their several duties. All the boats or, if this is not practicable, as many as possible of them should be cleared and swung out. They should also, so far as practicable, be lowered into the water and the crews exercised in pulling. The equipment of the boats should be checked and the side ladders and embarkation arrangements should also be examined and prepared for use. The boats used at successive drills should be selected in such manner as to secure that all the boats on the ship are lowered into the water and the crews exercised at least once a month.
- 18. The boats not used in the drill should be examined to ensure that the boats themselves, their lowering appliances and equipment are in order. The buoyant apparatus and other life-

The practices held at sea do not include those doors and side scuttles which the Schedule requires to be closed before the steamer proceeds to sea and to be kept closed at sea.

saving appliances carried should be inspected in order to see that they are in good condition and readily available in case of an emergency. The buoyant apparatus should be cleared for use and the arrangements for distributing life-jackets to passengers should be rehearsed.

19. If a drill is held at sea it should be carried out so far as possible in the same manner as in port, at least a quarter of the total number of boats being cleared and also being swung out if weather and other circumstances permit.

Drill in duties connected with marshalling of passengers.

20. In ships in which duties connected with the marshalling of passengers are provided for in the Muster List, the stewards or other members of the crew assigned to these duties should take up the places allotted to them, and the officers in charge should ascertain that they are acquainted with their duties which include:—

(a) Warning all passengers and assisting them to obtain and put on life-jackets and explaining to them the use of the buoyant apparatus.

(b) Keeping order in the stairways and passages and doorways and generally controlling the movements of the

passengers.

(c) Impressing on passengers the risk of injury from jumping overboard, and the importance of using the side ladders provided for the purpose of entering the boats should it prove necessary to embark in them after they have been lowered into the water.

PRACTICE MUSTER OF PASSENGERS.

- 21. In ships where, having regard to the length of the voyage and the conditions under which the passengers are carried, a practice muster of passengers is considered by the Master to be practicable and desirable, it should generally be held at an early period of the voyage. The time at which a practice muster of passengers is to take place must in all cases be notified to the passengers in advance.
- 22. On the occasion of a practice muster of passengers those members of the crew assigned to the duty should carry out the duties mentioned in paragraph 20, being careful to satisfy themselves that the sections of the passenger accommodation for which they are responsible are completely clear of passengers. When the passengers are assembled at the passenger assembly stations they should be instructed in the manner of putting on lifejackets and in the matters referred to in sub-paragraphs (a) and (c) of paragraph 20. Before the passengers are dismissed the officers in charge abould explain the process of abandonment to them and should emphasise that the general emergency signal is not in itself a signal for the abandonment of the ship, but is intended to secure the orderly marshalling of passengers to the appointed assembly stations should the occurrence of a serious accident make this advisable.

NOTICES TO PASSENGERS.

23. The following information should be shown conspicuously on cards exhibited throughout the passenger accommodation:—

(i) The nature and meaning of the general emergency signal.

(ii) Illustrated instructions of the method of putting on the life-jackets provided. In vessels in which assembly stations have been appointed for the passengers, cards should be exhibited in each cabin or section of the passenger accommodation showing the position of the

assembly stations.

It is desirable that the notices relating to the nature and meaning of the general emergency signal should also contain information and guidance for the event of an emergency, e.g., that when the emergency signal is made, each passenger should obtain a life-jacket and adjust it in accordance with the illustrated instructions which are posted throughout the ship, and should proceed in a quiet and orderly manner as may be directed (or to the appropriate passenger assembly station, if such stations have been appointed). The notices might further state that life-jackets are distributed widely throughout the ship in stowage places clearly marked with the word "Life-jackets," and might advise passengers to familiarise themselves with the positions of those stowage places and the method of adjustment of life-jackets.

The notices referred to in this paragraph should be worded in English and such other language or languages (if any) as may be considered necessary having regard to the nationality of the

passengers normally carried on the vessel.

ENTRIES IN OFFICIAL LOG BOOK.

24. Particulars of all the practices specified in the preceding paragraphs should be recorded in the official log book and if, in any week, a practice is not held, an entry should be made stating the reasons for the omission.

Additional Practices.

25. The opening and closing of all hinged or power-operated water-tight doors in main transverse bulkheads which are in use at sea are required to be practised daily while the steamer is at sea, and the practice recorded in the official log book.

MISCELLANEOUS.

- 26. To avoid any delay in sending out the ship's position in the event of a sudden accident, the position of the ship and the true course and speed should be posted up in the chart room and, if the ship is fitted with wireless, in the wireless room every two hours.
- 27. Officers and others in charge of lifeboats should be cautioned that it is advisable for boats after launching to remain as much as possible in the vicinity of the accident and not to attempt to pull any distance unless there are special reasons for doing so.
- 28. In view of the fact that the General Emergency Signal is not in itself a signal for the abandonment of the ship and that after the signal has been given members of the crew may be required to remain on duty below deck (for example in the engine room), definite arrangements should be made on all ships and should be notified to all members of the crew as part of the arrangements for dealing with emergencies, to ensure that, in the event of the abandonment of the ship being decided on, those members of the crew working below deck would be effectively warned by signals or other means in time to enable them to get away.
- 29. The crew should be instructed that great care is necessary when launching heavy pieces of buoyant apparatus to avoid damage or injury to other pieces of the apparatus, boats or persons that may be in the vicinity.

APPENDIX B (2)

STANDARD REGULATIONS AS TO MUSTERS AND DRILLS ON CARGO SHIPS.

NOTE BY THE BOARD OF TRADE.

- 1. In December, 1933, Standard Regulations as to Musters and Drills on Passenger Steamers were issued by the Board of Trade (Notice No. 133), which Regulations took the place of the Passenger Steamer Muster Regulations formerly contained in Notice No. 100 issued in 1929. The latter Notice, however, also contained cartain Muster Regulations applicable to Cargo Ships. These particular Regulations have now been revised and are being issued as a separate Notice though at the first suitable opportunity they will be incorporated in Notice No. 133. With the issue of these revised Cargo Ship Regulations, Notice No. 100 is completely superseded.
- 2. As in the case of passenger steamers, the Standard Regulations applicable to cargo ships are intended to provide the outlines of a uniform scheme for training the members of crews of cargo ships in the duties that they would be required to undertake in an emergency or in the event of an accident to the ship which, in the absence of successful counter measures, might involve the abandonment of the ship. In view, however, of the greatly differing conditions on board cargo ships, the varying sizes of crew carried and the different nature of the voyages undertaken, the regulations are capable of modification in details as the circumstances of particular vessels or trades may require.

STANDARD REGULATIONS APPLICABLE TO CARGO SHIPS.

MUSTER LIST.

- 1. A Muster List should be prepared in respect of each cargo ship. The Master is responsible for the preparation of this List, which should be prepared, or, if a new List is not necessary should be revised, before the ship puts to sea for the first time after the Agreement with the crew has been signed. If, after the Muster List has been prepared, any change takes place in the orew which necessitates an alteration in the Muster List, the Master should revise the List or prepare a new List. On the occasion of the preparation or revision of a Muster List it should be signed and dated by the Master.
- 2. The Muster List should show the special duties for the event of an emergency which are allotted to each member of the crew and the station to which he is to go when the pre-arranged signal or warning of emergency is given.

3. The duties provided for in the Muster List should include:—

(1) those connected with the extinction of fire;
(2) those connected with the closing of bulkhead doors
(if any), scuppers and other openings in the ship's side
which would have to be closed in the event of a collision
or other sceident involving the possibility of water entering the ship;

[•] In the case of ships carrying Lascar or native crews who are unable to read English special arrangements will be necessary for notifying them of the emergency duties allotted to them

- (3) those connected with the abandonment of the ship, i.e., the preparation of the boats and other life-caving appliances for use, including the completion of the equipment of the boats, their preparation for launching, and the actual swinging out.
- 4. The Muster List should also show (i) the boat stations of each member of the crew, and (ii) full particulars of the signal or signals which will be used on the ship for calling the crew to their stations for emergency duties.
- 5. The preparation of the Muster List may, in the case of some ships, be facilitated if the List shows the bunk or berth numbers (instead of the names) of the individual members of the crew with the emergency duties assigned to them, a card being fixed to each bunk showing the emergency duties and station of the occupant and any signals connected with those duties.
- 6. The Muster List should be posted conspicuously in such parts of the ship as will ensure that it is readily available for the crew to read. In particular, it should be exhibited throughout the crew's quarters. It should be posted before the ship proceeds to see and kept so posted while the ship is at sea. The responsible officers should ascertain that the persons under their supervision are fully acquainted with the requirements of the Muster List which affect them and with the meaning of the special signals which will be used for emergency purposes on the ship, and also that the various members of the crew know their boat stations.

SIGNALS.

- 7. The general emergency signal shall be a succession of more than aix short blasts followed by one long blast on the whistle or siren. This signal should only be used on the Master's responsibility. If any signals in addition to the general emergency signal are adopted for calling the crew to emergency duties or to crew practices, they should be distinct from navigational signals.
- 8. Arrangements should be made for speedy communication between the bridge and the crew's quarters so that in the event of a fire or other emergency necessitating immediate action no delay should occur in summoning those members of the crew whose services may be required.

EMBRGENCY PRACTICES.

- 9. Emergency practices should, as a general rule, be held fortnightly and should include:—
 - (1) fire drill;
 - (2) drill in closing of watertight doors, side scuttles and all openings in the ship's sides;
 - (3) boat drill.
- At practices held in port all three drills should follow one another, if possible, in the order given. At practices held at sea the same routine should be followed, if possible, or the different drills may be carried out separately as opportunity offers, provided always that the different drills are practised at least once a fortnight.
- 10. At the time appointed for a practice all members of the crew (or in the case of a sectional practice those members concerned) with the exception of those who cannot be relieved from

their immediate duties should muster with their life-jackets with a view to performing or being instructed in the duties assigned to them. Officers or other persons in charge of particular sections of emergency duties should have a list of the persons under their orders and should see that they are acquainted with their several duties.

Fire Drill.

- 11. For the purpose of this drill an outbreak of fire should be assumed to have occurred in a part of the ship, not the engine room, selected by the Officer in charge of the drill and a mock attack on the supposed fire should be made. On receipt of the signal or other warning in the engine room the fire pumps should be prepared for operation. The members of the crew forming the fire party or parties should be sent to the seat of the assumed fire, the hoses in that neighbourhood should be laid out and the fire extinguishers (if any) unshipped. Water should be played through a proportion of the fire hoses selected by the Officer in charge of the drill and the hydrants tested under pressure. Men should be exercised in the closing of any openings in the vicinity of the space affected by the supposed fire so as to reduce the supply of air to the fire and isolate it as far as practicable from other parts of the ship. Where smoke helmets or other breathing apparatus are carried the fire party should be exercised in their use, and should also be instructed in the use of any other descriptions of fire fighting appliances in the ship.
- 12. The fire appliances in the other parts of the ship, including the engine room and machinery spaces, should be examined so as to ensure that they are in good order and readily available for use in an emergency.

Drill in Closing of Doors, Side Scuttles, etc.

13. This drill should include practice in the closing of water-tight doors (if any), side scuttles and any other openings in the ship's aide which, if not closed, might facilitate the admission of water to the holds or other compartments in the event of a collision or other accident affecting the hull of the vessel.

Boat Drill.

- 14. The crew, other than the men who cannot be relieved from their normal duties, should muster at their boat stations with their life-jackets. The person in charge of each boat should have a list of its crew and should see that the men under his orders are acquainted with their several duties. The boat or boats to be used in the drills should be selected by the Officer in charge. In the case of ships having not more than two boats, the crew should be exercised in the use of each boat at each practice. In ships having more than one boat on each side, the boats selected for the practice should, wherever practicable, include at least one on each side of the ship, and different boats should, as far as practicable, be used in turn at successive drills, thus ensuring that all the boats are used within a short period.
- 15. When the drill is held at sea, the boats used at the practice should, if weather and other circumstances permit, be cleared and swung out. The equipment of the boats should

be checked and the crew instructed as necessary in its use. The boat-lowering appliances and checks should be examined to ensure that they are in working order.

- 16. Every opportunity should be taken when in port or at anchor to carry out the drill. When so carried out the same procedure should be followed as at sea except that as many boats as possible should be cleared and swung out, and, so far as practicable, lowered into the water and the crews exercised in pulling and sailing.
- 17. On every occasion when boat drill is practised the lifebuoys, life-jackets, line-throwing apparatus (if carried) and any other life-saving appliances on board should be inspected in order to see that they are in good condition and readily available in case of an emergency.

Entries in Official Log.

18. Particulars of practices specified in the preceding paragraphs should be recorded in the Official Log Book and if in any fortnight a practice is not held an entry should be made stating the reasons for the omission.

MISCELLANEOUS.

- 19. To avoid any delay in sending out the ship's position in the case of a sudden accident to a vessel fitted with wireless telegraphy, the position of the ship and the true course and speed should be posted up in the chart room and the wireless room at regular intervals, if practicable, once every two hours.
- 20. Officers and others in charge of lifeboats should be told that it is advisable for boats after launching to remain as much as possible in the vicinity of the accident and not to attempt to pull any distance unless there are special reasons for so doing.
- 21. Definite arrangements should be made on all ships to ensure that in the event of the abandonment of the ship being decided on those members of the crew working below deck will be effectively warned by signals or other means in time to enable them to get away.

APPEN STANDARD SCANTLINGS FOR WOOD

No	ľ	TEM.	, , , , , , , , , , , , , , , , , , ,		MATERIAL	
1	Keel		•••	•••	American elm, teak, oak, or spotted gum.	
!				OTE	Full thickness of keel to be pro	served from
2	Stem and S	sternj	post	•••	British oak, teak, American elm or Australian spotted gum.	Head
	Nora.—S	iom be	nd to	be fo	orged to suit siding of keel and provided the b	
3	Hog piece	•••		•••	Teak, oak or Australian spotts	od gum
					Yellow pine, larch or Kauri pi	ne
4	Planking				Teak or mahogany	
-	- 12021119	•••	***	•••	Landings and butte as worked good cost of	to be coated
					Security of hood ends	paint before
-5	Gunwales	•••	•••	400	American elm; teak, oak or ash.	If solid
6	Sheerstrake	ə	•••	•••	Mahogany, teak or elm	
7	Timbers	~• .	•••	•••	American elm, ash, oak or teal	
8	Aprons	•••		***	Oak, teak or ash, moulded at h	esd
9	Deadwoods		***	•••	Oak or ash	
10	Keelson	•••	•••	•••	Oak, teak, Oregon pine, pitcl pine er Douglas fir.	5 +5"+
11	Thwarts	•••	•••	•••	Teak, oak, red or pitch pine, larch, Douglas fir, or other imported fir of suitable quality.	Number
		Noti	L—If	the n	nast thwart is cut to take the m cent	ast the size re is not less
25	Gangboard	to be	of M	rme q	imensions and materials as thu	arts and to

DIX C. BOATS OF CLASSES 1 AND 5

		LE	ENGTH C	F BOAT	s.†			No.
0 & 29ft.	28 & 27 ft.	26 & 25 ft.	2 4 & 23ft.	22 & 21 ft.	20 & 19ft _:	18 & 17 ft.	16 ft.	
6" ×3"	5 <u>1</u> "×3"	5]"×2]"	5" ×2}"	44"×23"	4"×2₹"	4"×2}"	4"×2½"	1
ront of s	tem to ba	ck of ster	npost.					
5]" ×2]	5"×23"	43"×23"	4}"×2}"	4" ×23"	4"×2 <u>1</u> "	4"×2"	4"×2"	,
·7}"×3"	7"×8"	7"×23"	6½" ×2½"	6"×23"	6"×2}"	6"×2½"	5 <u>1</u> " ×2 <u>1</u> "	
t the for	e edge of Irds the	stem, or s full siding	lternative g of stem.	ely conve	t iron ma	y be ased		
5}"×1}"	51"×11"	51"×11"	5"×1"	5"×1"	5"×1"	4 ! "×1"	41"×1"	8
-1	* E *	§ "		tom strak		14"	3"	Ī
Re	mainder -	 	→4 bot	tom strak emainder	es 17"→	3 ″	1	4
with good working	d oil pain timbers.	t. Inside	of planki	ng to hav	e one			
23 to 30	ft., one ro	w of brace f copper i	s screws	16 to 22 f	t., two ro	ws of copp	er nails.	
_	-	_	2\frac{1}{2}" × 2"	2}"×2"	2"×2"	2"×12"	2"×1}"	
1"×8 1 "	1"×3\	1,×37,	1"×3"	_	_	_	_	
2 "	<u>‡</u> "	ŧ,	2 "	#"	11"	11'	ŧ"	1
11,×1,	14"×1"	18"×1"	11"×1"	13"×3"	11"×1"	11"×1"	11"×1"	7
31,	84"	3"	3"	2}*	21	21,"	2}"	8
The mo	ulding at t	throat to l	e not less	than dept	h of keel p	lus 1 inch sive of th	, the sid- e rabbet.	8
5}"×3"	5' ×3"	41"×3"	41"×3" acreased	4}"×3"	4"×3"	34"×24"	31"×21"	10
7	6	6	5	5	5	4	4	
I	9"×1}"	9"×1}"	9"×1}"	8'×14'	8"×1}"	8"×11"	8"×1}"	11
than giv	thwart m en in the	ust be inc table.	creased so	that its	width at			
be stron	gly secure	d.				-,		u
			A C.	· · · · · · · · · · · · · · · · · · ·				

APPEN STANDARD SCANTLINGS FOR WOOD

No.	ITEM.	MATERIAL.
13	Side Benches	Yellow, red or pitch pine, teak, larch, silver spruce, Douglas fir, or other imported fir of suitable quality.
14	Thwart Knees	Oak, grown to form Siding Iron (wrought or stamped) Siding Convex iron (alternative method) Section
15	Lower cross seats (portable)	Teak, larch, fir, elm, cypress, red, white or pitch pine, silver spruce, Douglas fir, or other imported fir of suitable quality.
16	Rubbers	American elm, oak, teak or ash
17	Risings*	American elm, oak, teak, larch or pitch pine.
18	Bilge stringer	American elm, teak, larch or pitch pine.
19	Bottom boards	Teak, elm, larch, silver spruce, Douglas fir, or other imported fir of suitable quality.
20	Tank cleading	Red or white pine (veed), teak, silver spruce, Douglas fir or other imported fir of suitable quality.
21	Transoms	English elm or teak
	Rudder	English elm, teak or mahogany Thickness
22	Thickness and width to be	naintained to level of top of keel Cheek- pieces
23	Gauge of fastenings	Plank landings Stringers, hood ends, timbers and garboards.
	Note.—A	Risings and gunwales
24	Ringbolts	Wrought iron (2 in number)
25	Length of mast	Norway spar
26	Diameter of mast at clasp	and head

^{*} See page 184,

DIX C-cont.
BOATS OF CLASSES 1 AND 3-cont.

		LE	NGTH C	F BOAT	S.†		-	No.
30 & 29 ft.	28 & 27 ft.	26 & 25 ft.	24 & 23ft	22 & 21 ft.	20 & 19ft.	18 & 17 ft.	16 ft.	T
11"	11	1"	1"	1	1"	1"	1"	13
la" double	l}" double l}" double	13" double	2" single	2" single	13" single	14" single	12" single	9
- double	- double	11 double	1½"×§" double	$\begin{array}{c c} 1\frac{1}{3}'' \times \frac{5}{3}'' \\ \hline & single \end{array}$	$\begin{array}{c c} 1_{\frac{1}{2}}^{2} & \text{single} \\ \hline 1_{\frac{1}{2}}^{2} & \times \frac{6}{8}^{2} \\ & \text{single} \end{array}$	11 X X X X X X X X X X X X X X X X X X	[1] X } " X } "	14
Sufficient modation	in number on in boat.	-8" × 1½" - to provide Also to a		ng accom-	-Hardy	wood stre		15
1¾"×1¾"	1½"×1½"	1½"×1½"	1¾"×1¾"	1½"×1¼"	1½"×1½"	1 <u>}</u> "×1 <u>}</u> "	11 × 11 "	16
4" ×1" A	4"×1" reduction	3\frac{1}{2} \times 1\frac{1}{2} \times 1 \times	3½"×1" epth may	3"×1" be made a	3"×1" at the end	3"×1" s of boats	23"×1"	17
4" × 14	4" × }"	3"×3"	3"×¾"	3″ ×₹″	3"×₹"	3"×¾"	3"×{1"	18
\$"	.	8 "	5" 8	\$"	8 "	5"	<u>\$</u> "	19
f" else	thwarts-≻ where. .—Cleadin			t under	where.	rt to the	rts.	20
If not in	one piece t woll see	o be rabbe cured.	ted and	13"	13"	11/4"	18"	21
	eces to be			1	-]			1
11"	117"	11/	11"	1"	1"	1"	1"	_
1 ″	₹"	₹"	₹"	£"	ŧ"	§ ″	6 "	22
	12 S.W.G.		4	·	3 S.W.G			
	10 S.W.G.	_ •			1 8.W.G.			23
ess than	8 S.W.G.	S.W.G. for	13 S.W.G	fastening	9 S.W.G.			<u> </u>
and i dia	.×17 8 W.	G. for 9—8	S.W.G. fa	stenings.	1	1		!
1 "	₹"	₹"	£ "	ŧ"	1 "	<u>3</u> "	<u>}</u> "	21
19 ft.	18 ft.	16 ft.	15 ft.	14 ft.	12} ft.	11 ft.	10 ft.	25
	1				i			_

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APPENDIX C-continued.

Nors 1.—An additional length of boat not exceeding 6 inches beyond the standard lengths 28 ft., 26 ft., 24 ft., etc., shown in the columns of the Tables, pp. 181 and 183, is allowable before scantlings of a higher grade are required.

Nors 2.—The risings are in no case to be less in thickness than one inch. But, if desired, the thickness may be increased and the breadth slightly decreased provided the required sectional area of material is fully maintained.

2

APPENDIX D (1) LIFTING HOOKS FOR LIFEBOATS.

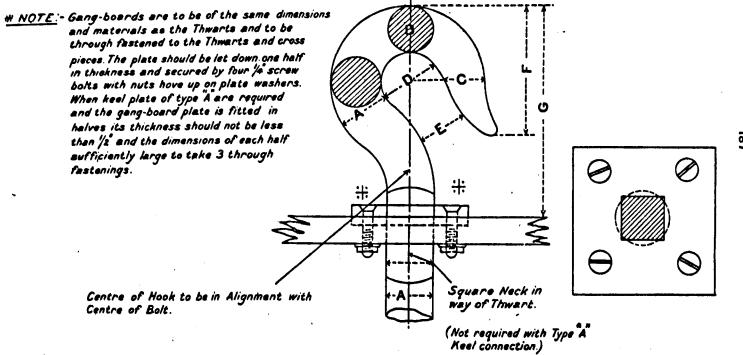
STANDARD SIZES FOR LIFTING HOOKS OF ROUND SECTION, AND KEEL PLATES.

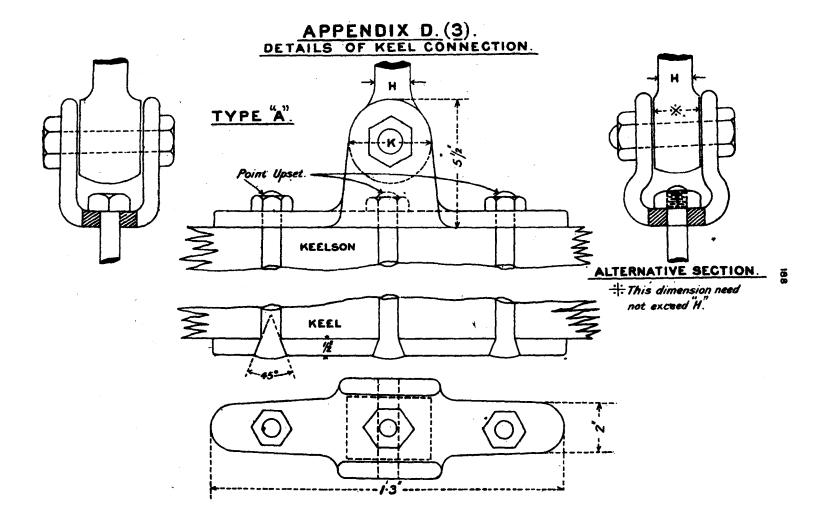
*Length of Boat	in Feet.	30	& 29	, 28	& 27	26	& 25	24	& 23·	22	& 21	20	& 19	18	& 17	1	16
Maximum dead los weight of boat (at 8 li weight of persons (a person) and equi	s. per cu. ft.) t 165 lbs. per		tons. Note:-		tons. nterme		tons. lead lo		tons. e dimer		tons. A & D		tons. e obtai		tons.		tons. n.
Type of Keel con	nection.	Ty	ре А	Typ	ое А	Typ	е А	Ту	ое В	Ty	ре В	1 y	ре С	Ty	ре С	Ty	ре С
Material.		Iron	Steel		Steel	Iron	Steel	Iron	Steel	Iron	Steel	Iron	Steel	Iron	Steel		Btee
Size at	" A·"	23"	21"	21"	144"	17"	144"	111"	1 1 1 1	13"	13"	13"	11	117	14"	11/	11,"
	"B"	2"	2"	12"	12"	11/2"	1}"	13"	13"	18"	11/4"	11/	11/	11/	178"	11	11"
	"C"	12"	12"	14"	14"	1#"	14"	11/2"	11/	11/	11/	11"	14"	11"	114"	11	1"
	" D "	31"	27"	27"	21"	21"	21"	21"	21"	2"	17"	12"	15"	13"	14"	17"	14"
	"E"	2"	2"	17"	17"	13"	13"	1#"	14"	11/	11/1	11/	11/	11/	11/	11/	11
	"F"	68"	6}"	6"	6"	53"	51/	δ <u>Ι</u> "	51"	43"	43"	41	43"	41	41"	41"	41"
	" G "	10"	10"	9}"	9}"	9"	9″	81/	81/	8"	8"	71/	73"	7"	7"	63"	63"
	"H"	14"	13"	18"	13"	11/	11/	11"	14"	1"	1"	1"	1	₹"	₹"	₹"	3"
	"K"	33"	38"	31"	31/	3"	3"	_					_	_		_	
Thickness of Kee	l Plate.	1	18"		<u>\$"</u>		€ "		<u>}</u> "		3"		₹"		1 "	!	1 "
Size of Securing	Pin.	1	1"	1	1"	1	#	_	_	_	-	Screw	ed into	plate	and cle	nched.	
No. of Securing	Bolta.	3	1	3		3	3	2		2							
Size of "	,,		at]"	8 8	at 2"		t "	2 s	t ‡"	2 8	t ("	Lengt	h of pl	ato 3 <u>1</u> "	breadt	h as K	ee).

^{*} The lengths given are for standard boats accommodating a normal number of persons. In other cases the sizes of the lifting hooks are to be determined by the maximum dead loads irrespective of the lengths of boats (see para. 33 (1)).

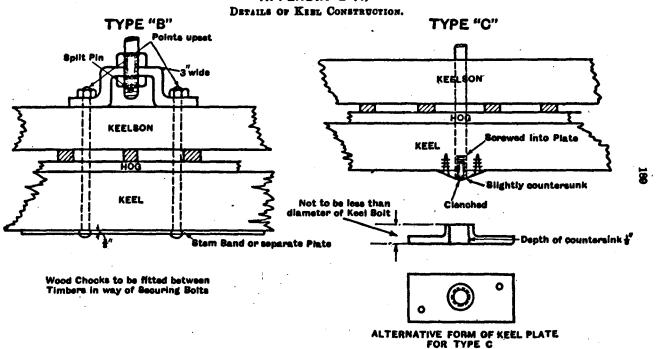
Hooks to be of Best Cable Iron or Mild Steel and without welds. Keel Plates to be of Mild Steel and without welds.

APPENDIX D. (2). DETAILS LIFTING HOOKS.





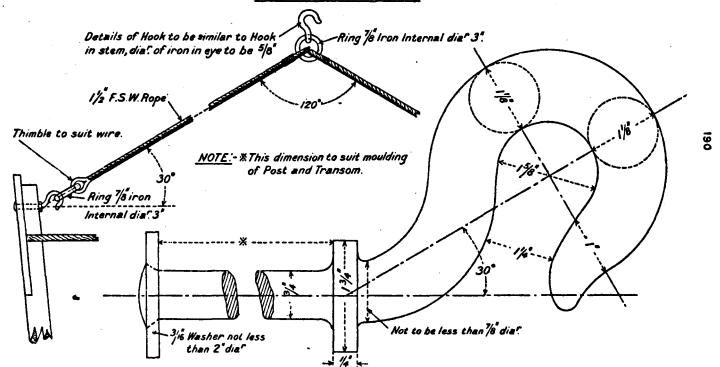
APPENDIX D (4)



APPENDIX D.(5).

LIFTING HOOKS FOR SQUARE STERNED BOATS.

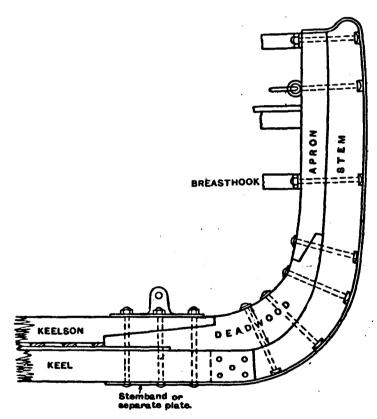
16 FEET AND UNDER.



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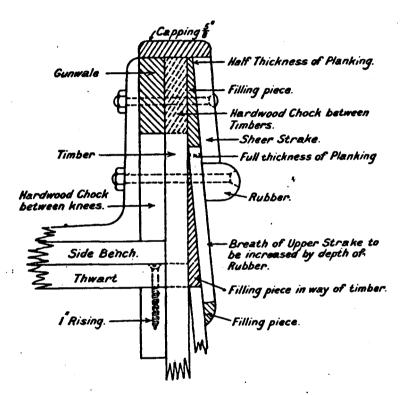
APPENDIX E (1)

ARRANGEMENT OF STEM, APRON, &C.

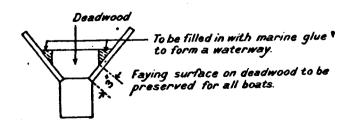


The moulding at throat to be not less than the depth of keel plus 1 inch.

APPENDIX E.(2). SECTION THROUGH BOX GUNWALE.

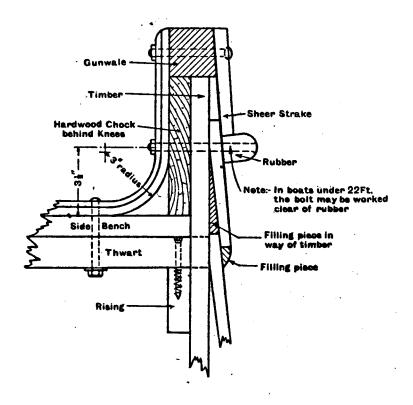


SECTION THROUGH DEADWOOD IN LARGE BOATS.

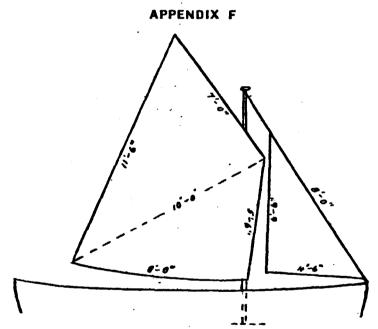


APPENDIX E (3)

SECTION TEROUGH GUNWALE SHOWING ALTERNATIVE KNEE OF CONVEX IRON.



SECTION OF CONVEX IRON

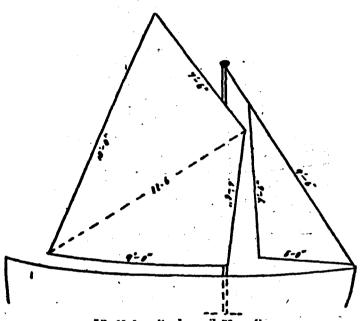


Jib, 15 sq. ft.; lug sail, 58 sq. ft.

Fig. 1. 16 ft. boat.

Note.—The mast should be stepped between the first and second thwarts and properly supported.

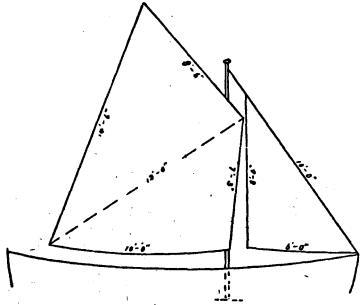
APPENDIX F-cont.



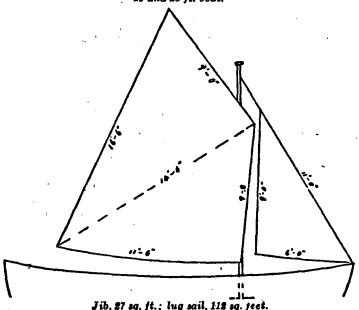
Jib, 18-6 sq. ft.; lug sail, 72 sq. ft. Fro. 2 17 and 18 ft. boat.

Norz.—The mast should be stepped between the first and second thwarts and properly supported.

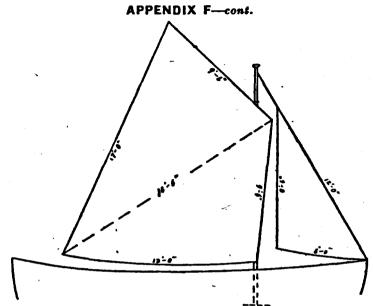




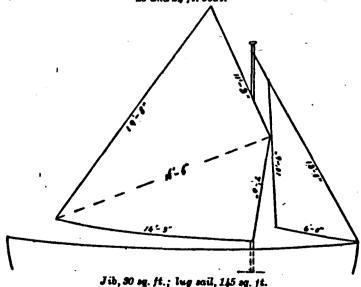
Jib. 24 sq. ft.: lug sail, 91 sq. ft. Fro. 3. 19 and 20 ft. boat.



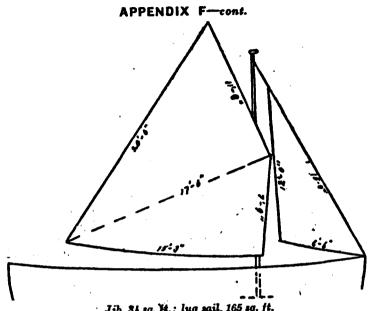
Jib, 27 sq. ft.; lug sail, 112 sq. feet. F10. 4. 21 and 22 ft. boat.



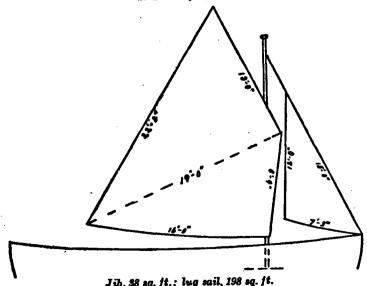
Jib, 28 sq. ft.; lug sail, 158 sq. ft. Fro. 5. 23 and 24 ft. boat.



Jib, 30 sq. ft.; lug sail, 145 sq. ft. Fra. 6. 85 and 26 ft. boat.



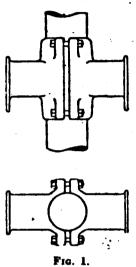
Jib, 34 sq. H.; lug sail, 165 sq. ft. F10. 7. 27 and 28 ft. boat.



Jib, 38 sq. ft.; lug sail, 198 sq. ft. Fig. 8. 29 and 30 ft. boat.

APPENDIX G

Sketches of lowering bollards for attachment to davit.



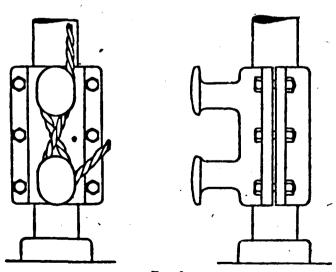


Fig. 2.

APPENDIX H

SPECIFICATION OF STANDARD LIFEJACKETS.

I.—Specification of Standard Liperacent (Kapok).

Typs.—Circular overhead lifejacket for adult or child.

BUOYANCY.—To consist of not less than 24 cms. of the best quality Java or other approved kapok, well teased, evenly packed and free from foreign matter. The jacket must be capable of supporting at least 20 lbs. of iron after floating in fresh water for 24 hours with 164 lbs. of iron attached.

MATERIAL.

Cover.—To be of good quality grey cotton duck in accordance with paragraph 186 of these Instructions; the bands on the shoulders joining the front and back pockets must be 3-ply and 4-ply at the extremes of the armholes.

Tapes.—Two in number, to be of linen thread web 11 inches wide, not less than 96 inches long, and capable of bearing a strain of 200 lbs. in accordance with the Manchester Chamber of Commerce test.

The tapes to be rove through a 2-inch hem encircling the jacket and to be sewn in the form of an oblong 3 inches long and across from corner to corner, the sewing to be at the middle length of each tape and through the tapes and both parts of the hem at the middle and bottom of each pair of pockets. The ends of the tapes to protrude front and back in a line with the outside corners of the pockets, and to have an overhand knot in each to prevent unreeving; the hem here to be strongly crossed-stitched to prevent the stitching of the hem from giving way.

Sewing.—To be with thread of not less quality than No. 25, the seams round the neck opening of the pockets to be flat. The ends of all machine stitching to be securely finished off.

NUMBER OF POCKETS.—One in front and one at the back.

EXTREME BLOCK DIMENSIONS WHEN COMPLETED: -

Front pocket, top 11 inches, bottom 16 inches
by 8½ inches by 4½ inches, containing ... 12 cs. kapok
Back pocket, top 11 inches, bottom 16 inches
by 8½ inches by 4½ inches, containing ... 12 ,, ,,
Length, fully extended, 28½ inches.
Breadth, 23 inches.
Curve of pockets for neck, 5½ inches by 1½ inches deep.
Outer circumference of hem encircling jacket, 102 inches.
Depth of hem, 2 inches.
Neck opening, when completed, 7½ inches by 7½ inches.
Armholes of empty cover 20 inches by 3½ inches at shoulder,
2 inches at bottom.

WRIGHT OF JACKET .---

Weight of kapok, not less than Approximate weight of covering and tapes	 mada	of	24	023.
material of the minimum standard			9}	"
Approximate total weight	•••		331	,,

MARKING.

"Board of Trade Standard Lifejacket" in letters 1 inch deep on one side and maker's name or trade mark in smaller lettering on the other side of jacket. All marking to be indelible.

GENERAL.—The material, workmanship, packing and marking to be good, sound and equal to the original sample approved.

ADJUSTMENT.—Place the jacket over the head and pass the arms through the armholes. The jacket will slip over the head more easily if the hollow shape of the back pocket is first placed against the neck and the jacket is then drawn down over the head. The a half knot with the tapes in front. draw them well tight, then complete the knot.

II.—Specification of Standard Lifejacket (Cork).

Typs.—Circular overhead lifejacket for adult or child.

BUOYANCY.—To consist of pieces of good quality cleaned cork of not less than 10 cubic inches each and weighing not more than 12 lbs. per cubic foot, and to be capable of supporting 164 lbs. of iron in fresh water for 24 hours.

MATERIAL --

Cover.—To be of all linen Tecklenburg or cotton duck in accordance with paragraph 186 of these instructions. The material must be of 3-ply at the extremes of the armholes.

Tapes.—Two in number to be of linen thread web 1½ inches wide and not less than 96 inches long, and capable of bearing a strain of 200 lbs. in accordance with the Manchester Chamber of Commerce test.

The tapes to be rove through a 2-inch hem encircling the jacket, and to be sewn in the form of an oblong 3 inches long and across from corner to corner, the sewing to be at the middle-length of each tape and through the tapes and both parts of the hem, at the middle and bottom of each pair of pockets. The ends of the tapes to protrude front and back in a line with the outside corners of the pockets and to have an overhand knot in each to prevent unreeving; the hem here to be strongly cross-stitched to prevent the stitching of the hem from giving way.

Sewing.—The exterior ends of the pockets and hem in line with same to be sewn with double linen thread which must be at least as strong as No. 25a five-cord Whittemore cord.

All other sewing is to be made with linen thread of not less quality than No. 25.

The ends of all machine stitching to be securely finished off.

No. or Pockers.—Two in front and two at the back.

EXTREME BLOCK DIMENSIONS WHEN COMPLETED .-

Each pocket 74 inches by 5 inches by 44 inches with a curve 1 inch deep on the neck side.

Pockets to be so sewn that each is 91 inches wide before filling.

All corners and edges of the cork to be well rounded off, especially at both inside and outside at the neck opening.

Length fully extended 30 inches.

Breadth ,, 22 ,.

Outer circumference of hem encircling jacket 102 inches.

Depth of hem 2 inches.

Neck opening of completed jacket 84 inches by 5 inches.

Armholes of empty cover, each 20 by 2 inches at ends,

5 inches at shoulder.

WEIGHT OF JACKET.

	lb	s.	ozs.
Weight of cork not to exceed Approximate weight of linen covering and tapes	. 4	4	4
Approximate weight of linen covering and taper made of material of the minimum standard	. (0	14}
Approximate total weight when dry	. }	5	21

MARKING.-

"Board of Trade Standard Lifejacket" in letters 1 inch deep on one side and maker's name or trade mark in smaller lettering on the other side of jacket.

All marking to be indelible.

General.—The material, workmanship, packing, and marking to be good, sound, and equal to the original sample approved.

ADJUSTMENT.—Place the jacket over the head and pass the arms through the armholes. The jacket will slip over the head more easily if the hollow shape of the back pocket is first placed against the neck and the jacket is then drawn down over the head. Tie a half knot with the tapes in front, draw them well tight, then complete the knot.

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