LONDON COUNTY COUNCIL.

LONDON FIRE BRIGADE.

QUESTIONS & ANSWERS
ON
FIRE BRIGADE WORK.

PREPARED UNDER THE DIRECTION OF THE
CHIEF OFFICER OF THE BRIGADE.

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Chapter I.—FIRE ESCAPES.

1. Q.—Name the different types of escape vans in use in the Brigade. A.—(a) Petrol-driven motor escape vans; (b) electrically-driven escape vans.

2. Q.—What are the lengths, fully extended, of escapes used in the Brigade? A.—50 and 55 feet.

3. Q.—How often are fire-escapes tested? Describe the test. A.—They are tested every month in the following manner. The escape is pitched to its full working height and a line is made fast to the strings at any two adjacent rounds at the centre of the middle extension. The weight of two men is then placed on either line and when released the ladder should resume its normal position. A man is then sent up and the rounds are jumped down from top to bottom. The ladder is then lowered and placed horizontally, its head resting on a trestle. The extension ladders are then taken adrift, all cogs and running gear (including sheaves) thoroughly cleaned and overhauled, oiled and put together again. The ladders, after being cleaned, are replaced. The machine is then pitched to a building and again extended, to make certain that everything is in working order, then lowered and placed in its position ready for running, and an entry made to that effect in the station occurrence book.

4. Q.—How many extensions are there to escapes? Name them. A.—In addition to the main ladder there are two extensions—middle and upper.

5. Q.—How are the rounds fitted to the strings? A.—They are let into gunmetal sockets which are screwed to the insides of the strings.

6. Q.—By what means are the ladders extended? A.—By wires led through sheaves and wound on drums.

7. Q.—What is the difference between the carriage gear of a 50 ft. and a 55 ft. escape? A.—The brackets on the levers for the carriage gear of a 50 ft. escape are fitted with two sets of bearings, one for the spindle of the drums and one for the spindle on which the winch handle is shipped, this being geared by means of a small cog wheel into a larger cog wheel, which is fixed to

* Not to be committed to memory.
the side of the drum. The brackets on a 55 ft. escape are single. As the drum in this case, not being geared, is small in circumference, the winch handle shipping direct on to the spindle of the drum.

Note.—The above should be followed through at the escape.

8. Q.—How are the wires of the extending gear fitted? Describe the lead. A.—*The extending wires for both 50 ft. and 55 ft. escapes are fitted as a single wire with a heart thimble spliced into each end. They are centred and a copper wire seizing is put on round the wire and the spindle of the drum. Each side is then led through a cut-away part on the inner face of the drum, and secured by a staple. From the drum the wires lead through sheaves bolted to the heel-board, up to the under side of the rounds, through a sheave at the top cross bar of the main ladder, down, and hooked on to a hook at the bottom cross bar of the middle extension and moused. The wires for the upper extension ladder lead through a fitting on the upper side of the top cross bar of the main ladder, up through a sheave on the under side of the top cross bar of the middle extension, and hooked to a hook on the bottom cross bar of top or middle extension, the hook being moused.

Note.—The above should be traced out at the escapes.

9. Q.—How are the wires of the carriage gear fitted? Describe the lead. A.—*The wires for the carriage gear of a 50 ft. escape are secured to the drums in a similar manner to the extending gear; from the drums, they lead through sheaves bolted to the heel-board and are secured by a standing eye to plates bolted to the front cross bar of the carriage frame. A 55 ft. escape has a single wire with a standing eye, secured to a metal eye screwed on to a single drum from which it leads through a sheave, bolted to the heel-board, up through a sheave bolted to the front cross bar of the carriage frame, and hooked over a hook bolted to the heelboard, the hook being moused.

Note.—The above should be traced out at the escapes.

10. Q.—What is a good precaution to prevent the levers falling down when stowing the ladders against a wall? A.—After the levers are folded the carriage gear should be made moderately taut.

11. Q.—What keeps the sheaves attached to the top cross bar of the main ladder off the wall when stowed in the above

* Not to be committed to memory.
12. Q. What wood is used in the construction of the carriages, wheels, etc.? A. The wood is made of Oregon pine, the carriage, covers, wheels, and doors being made of oak.

13. Q. What other woods are there in addition to those for the carriages and doors? A. There are also Fir, Ash, and Maple woods.

14. Q. What are the dimensions of the carriages? A. The carriage and doors are 4 feet, 10 inches wide, 9 feet, 6 inches long, and 5 feet, 4 inches high.

15. Q. Why are the two rollers on the front part of the carriage suspended? A. To take the weight of the carriages, making them easier to maneuver.

16. Q. What is the difference in the build of the carriage and the frame of the carriage? A. The carriage frame is made of timber, while the carriage body is made of metal.

17. Q. What is the difference between the upper and lower plates of the carriage sides? A. The upper plates are made of metal, while the lower plates are made of wood.

18. Q. What is the difference between the front and back sections of the carriage? A. The front section has a door, while the back section is open.

19. Q. What is the difference between the upper and lower sides of the carriage? A. The upper sides have windows, while the lower sides have doors.

20. Q. Are there any means of using the escape at the front and back of the carriage? A. Yes, there are escape doors on the front and back of the carriage, allowing for easy entry and exit.
too small to allow the machine to be wheeled in?  A.—Yes, by unshipping the extension ladders, and, if required to extend, by bending a line to the extending wire of the upper extension.

21. Q.—Where are the stop or preventer seizings on an escape situated?  A.—About 5 feet from the bottom cross bar of the middle extension. Both wires are seized together, jamming against the sheaves and thus preventing the ladders being hove out of the clamps.

22. Q.—Where are the head iron and rollers situated, and what is their use?  A.—The head iron and rollers are situated at the head of the top extension, and are designed to enable the ladder to travel freely up a building.

23. Q.—What other rollers are there on an escape in addition to those previously mentioned?  A.—There are two rollers fitted on the inside of the strings of the main ladder by the cross bar and two in a similar position on the middle extension. These are to assist the extensions which travel on them, when the ladders are being extended or lowered.

24. Q.—On what part of an escape is the official number to be found?  A.—On the inside of the string of the main ladder, near the heelboard.

25. Q.—How can it be ascertained when an escape was last painted?  A.—By observing the date which is painted just above the official number of the escape.

26. Q.—What is a large tool box in connection with fire escapes?  A.—A box suspended from the axle of an escape which is run by hand.

27. Q.—What is carried in a large tool box?  A.—"Three lengths of 2½ in. hose (one lined, two unlined), turncock's key and bar, jumping sheet, long and short lines, 3 canvas buckets, large axe, hand pump, 6 lapping leathers, 6 lapping lines, hand control branch, key for hydrant cover, crowbar, wheel spanner and spare which handle.

28. Q.—At what stations are large tool boxes to be found?  A.—Only at Nos. 51 and 58 stations.

29. Q.—How can a 50 ft. and 55 ft. escape be distinguished in the dark?  A.—The 55 ft. escape has one large and one small drum for the carriage gear. The 50 ft. escape has two large drums.

* Not to be committed to memory.
30. Q.—Which is the more modern escape, the 50 ft. or the 35 ft.? A.—The 50 ft. is the more up-to-date. The 35 ft. escape was principally used for street duties and was originally a 40 ft. ladder.

Chapter II.—MOTOR PUMPS.

1. Q.—How many gallons of water per minute can be delivered by a motor pump? A.—From three hundred to five hundred gallons per minute.

2. Q.—How many delivery outlets are there? How are they designated? A.—Two: near and offside.

3. Q.—How many lengths of suction are carried on a motor pump? A.—Two: one a 15 ft. 6 in. length and the other a 6 ft. or 8 ft. length.

4. Q.—What gear is carried for getting to work direct from a hydrant? A.—A direct suction adaptor, fitted with two female couplings, one a V-shaped thread to take the 4 1/4 in. suction and the other a round thread to connect to the hydrant head. The diameter is 2 3/4 in.

5. Q.—Describe a suction breaching. A.—A gunmetal casting fitted with three female couplings, one with a V-shaped thread to connect to the suction inlet, and two 2 1/4 in. round threads to which hose may be connected.

6. Q.—What is the use of a suction breaching? A.—To enable pumps to be got to work in series. If the suction hose were damaged, or too short to reach the hydrant, the pump could obtain its water through 2 1/2 in. hose connected up to the breaching after the 4 1/4 in. blank cap had been screwed on. Further, if the supply of water from one hydrant through the suction hose was insufficient, the supply of water could be augmented by connecting the breaching to another hydrant using 2 1/4 in. hose.

7. Q.—Could a pump, using 2 3/4 in. hose and the breaching, draw water from a pond? A.—No, because the action of the vacuum pump would draw the hose flat and prevent water passing up it.
8. Q.—What is understood by pumps working in series? A.—Where water has to be pumped long distances owing to bad water supply in the vicinity of the fire, fracture of water mains, etc., water is pumped from one motor pump to another, the number of pumps employed depending on the distance of the fire from the water supply.

9. Q.—How many nozzles are carried on a motor pump? A.—Seven: one 4 in., two 1 in., two 1 1/4 in., one 1 1/2 in., and one 1 3/4 in.


11. Q.—How many lengths of hose are carried in a motor pump? A.—Eight 100 ft. lengths of 2 1/2 in. rubber lined hose.

Note.—The smaller pumps carry six.

12. Q.—How should hose be stowed in an appliance? A.—In flat flakes, fore and aft. It has been found that there is less risk of damage by chafing due to the vibration of a moving appliance, when stowed in this manner, and short nips are avoided as far as possible. Crosswise stowing is forbidden.

13. Q.—In getting to work from a large dam, what precautions should the motor man take? A.—He should be careful not to throw his suction strainer into the dam and so cut the canvas. If working singly out of a dam, the suction strainer should be slung by means of a short line to keep it from chafing the dam sack, the line being made fast on either side to the strays of the dam frame.

14. Q.—What should the motor man do after being at work from a street hydrant? A.—He should make a note of the number and position of the hydrant, and the time his pump has been at work. This is required when making out the water report.

15. Q.—How many branches are carried on a motor pump? How are they designated? A.—Three, namely: Ajax, Hand-controlled and Metal branches.

16. Q.—What lines are carried on a motor pump? A.—Lowering line, long and short lines.

17. Q.—What would be the effect of a small leak or pin hole in a motor pump’s suction? A.—Some delay might be caused in lifting water owing to difficulty in obtaining a vacuum.

18. Q.—Why do the men at the branch have to exert a forward pressure when at work? A.—Water issuing from the nozzle
exerts a back pressure which is taken partly by the men holding
the branch and partly by the hose acting as a strut. With a
pressure of 120 lbs. at the pump, and a 1½ in. nozzle, the back
pressure exerted is about 180 lbs. This example illustrates the
danger of letting a branch take charge.

19. Q.—What precaution should be taken with a motor
pump’s suction when getting to work from docks, canals, etc. ?
A.—Take the weight of the suction with a line (two lines if
using the second length of suction).

20. Q.—When working from hydrants what precaution
is necessary to prevent damage to the suction? A.—The
delivery of the appliance should be opened before the hydrant
is turned on and not closed until the hydrant is shut off. Suctions
are not designed to withstand internal pressure.

21. Q.—What gear suitable for clearing away wreckage is
carried on a motor-pump? A.—Crowbar, saw, large axe, limes,
mattock, shovels, and a screw-jack.

22. Q.—What is the approximate loss of pressure due to
friction when water passes through 2½ in. hose? A.—5, 14 or
25 lbs. loss of pressure should be allowed for each 100 ft. length
of hose when delivering water at the rate of 150, 200 and 400
gallons per minute respectively.

23. Q.—What is the approximate loss of pressure due to the
branch being at a height above the ground? A.—½ lb. pressure
is lost for every foot the branch is above the ground.

24. Q.—What would be the pressure at the nozzle in the
following circumstances? The pressure at the gauge on the
pump shows 120 lbs., six lengths of hose are laid out and the
branch is on a roof 90 feet from the ground. The pump is
delivering 150 gallons per minute. A.—Loss of pressure due to
friction is 5 × 6 lbs., 30; loss for height is 90 × ½, 45; total loss,
75. 120 lbs. pressure at the pump, less 75 loss, results in 45 lbs.
pressure at the nozzle.
Chapter III.—TURNTABLE LADDERS.

1. Q.—How many different types of turntable ladders are there in use in the Brigade? A.—Four: (a) petrol electric; (b) electric; (c) electrically propelled chassis carrying ladders operated by a carbonic acid gas engine; (d) horse-drawn vehicle carrying ladders operated by a carbonic acid gas engine.

2. Q.—What is the length of the ladders when extended? A.—82 feet is the height to which they may be extended by power, but an additional 3 feet can be added by extending with the hand gear.

3. Q.—How many extensions are there to the ladder? A.—Three in addition to the main ladder.

4. Q.—How are the individual ladders strengthened? A.—By means of steel rails and stays.

5. Q.—How is the ladder revolved when extended? A.—By means of a winch and chain drive in combination with a worm which is geared into a fixed worm wheel in the centre, the turntable revolving on two sets of rollers, 8 top and 8 bottom, which travel on a circular path.

6. Q.—When trained the required distance, how are the ladders kept in position? A.—By means of the training clump, situated on the fore part of the turntable.

7. Q.—What are the cements and how many are there? A.—There are two, and their duty is to take the weight off the springs and put it on the axle.

8. Q.—What are the side jacks? A.—Screw jacks designed to assist to take the weight at the centre of the chassis, when at work. They are not supplied with the Tilling-Stevens T.T. chassis.

9. Q.—Where are the side jacks carried and where are they shipped when in use? A.—They are carried in receptacles fitted on either side of the foot board. They are fixed in slots on the underside when in use, and screwed down hand taut.

10. Q.—How is the gas used in connection with certain of the turntable ladders? A.—The gas is carried in cylinders, from which it passes to the expansion chamber, thence to the engine.

11. Q.—How many cylinders are carried and how are they
stoved? A.—There are three, carried in racks fitted on the underside of the rear end of the cradle, and connected to the expansion chamber.

12. Q.—What branch is used at the head of the ladders? A.—A fixed swivel branch, known as the water tower branch; it has a handle in rear to enable the man in charge to direct his jet.

13. Q.—What elevation and degree of training can be obtained with the water tower branch? A.—The branch can be trained 15 degrees either side, and may be elevated to throw the jet almost in a direct line with the ladders.

14. Q.—How does the fireman at the branch secure himself? A.—By means of a special pattern hook belt hooked by the man to the top stay of the upper extension ladder.

15. Q.—What is the most important thing to remember in connection with the working of the ladders? A.—The plumbing gear.

16. Q.—Why is this so important? A.—Because if the ladders are not plumb before they are extended there is always a danger of their falling over, especially in a high wind, and this may entail loss of life, particularly if a man is working a branch at the top of the ladders.

17. Q.—What is the right time to plumb the ladders? A.—After they have been elevated and are pointing in the direction in which it is desired to extend them, but before they are extended.

18. Q.—What precaution must be taken when the ladders are extended and on an incline, before training in any other direction? A.—Whilst the ladder is being trained round, a man must be specially detailed to work the plumbing gear.

19. Q.—What is the extreme height at which a turntable ladder may be used as a water tower? A.—The ladder should never be used as a water tower above 60 feet without special permission. Under no circumstances should an extension greater than 70 feet be used when working as a water tower.

20. Q.—How is the safe load known when working at an angle? A.—The markings of height, angle of elevation, projection and load are indicated on the side of the ladder in view of the man in charge.

21. Q.—When should guy lines be used? A.—When working at a height exceeding 60 feet, unless the weather is quite calm.
22. Q.—Explain how the guy lines are used? A.—Guy lines are carried on rollers secured to the main ladder, the end being hooked to a spur at the top of this ladder. This end can be shifted to a similar spur at the head of the first extension when required.

23. Q.—If working as a water tower and, through a high wind or other cause, the ladders were in danger of capsizing, what steps should be taken? A.—A knife is supplied, which is either strapped to the cradle or worn on the belt, by means of which the man working the engine could cut the hose and free the ladder of the weight of water.

24. Q.—When at work, what means are provided for communicating with the man aloft? A.—Megaphones are carried, one at the head of the ladders, and one on the chassis.

25. Q.—When using the guy lines, what precaution must be taken? A.—If possible, the guy lines should be attended all the time the ladders are in use. If this is not possible, and a turn has to be taken, care must be taken that no pressure is brought to bear on the ladders when taking the turn, and that the ladders are not trained without the guys being tended.

26. Q.—How many lengths of hose are carried on a turntable ladder? A.—Four: one 50 ft. length of 3¾ in. rubber lined; two 100 ft. lengths of 2¾ in. rubber lined; one 100 ft. length 2½ in. unlined.

27. Q.—How are road ramps used when working turntable ladders, apart from their original use? A.—They are used as scotch blocks.

28. Q.—What nozzles are carried on a turntable ladder? A.—Eight: one 1 in., two 1½ in., two 1¾ in., one 1¾ in., one 1¾ in.

29. Q.—What takes the weight of the ladders when extended? A.—The weight is taken by paws, which are fitted on the bottom string of each extension, resting on the round below.

30. Q.—If the weight is taken by the paws resting on the round below, how are the ladders lowered? A.—When the ladders are being extended, the paws are so fitted that they trip for resting each time they pass over a round. To lower, the ladders are raised sufficiently far to clear the paws, but not far enough to carry them above the next round, which would trip them for resting.

* Not to be committed to memory.
31. Q.—What wood is used in the construction of turntable ladders? A.—With the exception of the ladders attached to Headquarters, the strings of which are made of Oregon pine, the strings of turntable ladders are made of larch or spruce. The rounds are of ash.

32. Q.—Should a turntable ladder be permitted to rest against a building when extended? A.—No, or it may get strained.

33. Q.—Why may it get strained? A.—Because the ladders are so designed that they are stronger and safer when supporting their own weight than when leaning against a building, etc. The various rods running along the length of each ladder are so designed as to take any strain due to the weight of the ladders, tending to bend forward as they are extended. These iron rods are what is known as "in tension" and in that condition are functioning correctly. When, however, the ladders are resting against a building, the bend on the ladders places these rods "in compression" which may very easily cause them to buckle and bend.

Chapter IV.—FLOATS.

1. Q.—How many fire floats are used by the London Fire Brigade? A.—Four: Alpha II., Beta II., Gamma II. and Delta II.

2. Q.—To what stations are the floats attached? A.—The floats are attached to the following river stations, all of which are in the "F" District: No. 58 Station, Cherry Garden Pier; No. 65 Station, Blackfriars Bridge; No. 96, Station, Battersea Bridge. There is a repair depot for floats at Charing Cross Pier.


4. Q.—What is the horse power of each float? A.—"A": Two engines of 220 h.p. each. "B": Two engines of 150 h.p. each. "G": Two engines of 80 h.p. each. "D": Three engines of 50 h.p. each.

5. Q.—What is the pumping capacity in gallons per minute? * Not to be committed to memory.
A.—“A.” : 1,200 gallons per minute. “B.” : 3,000 gallons per minute. “C.” : 1,200 gallons per minute. “D.” : 1,600 gallons per minute.

6. Q.—What number of deliveries can be got to work? A.—“A.” : Four and one monitor. “B.” : Eight and three monitors.
   “C.” : Eight and one monitor. “D.” : Eight and one monitor.

7. Q.—What is the speed of the floats when under way? A.—About 10 knots.

8. Q.—What hose is carried on board the floats? A.—3½ in. unlined and a small quantity of 2½ in. unlined.

9. Q.—How are the deliveries numbered? A.—From one to eight; they are situated four on either side. In the case of Alpha II, there are four only, situated in the fore part of the vessel, amidships.

10. Q.—How are the various floats’ deliveries denoted when at work at a fire? A.—By means of brass or wooden tallies, bearing on one side the name of the float, and on the other the number of the delivery. These tallies are made fast to the branches.

11. Q.—How many branch holders are carried on board the floats? A.—“A.” 4; “B.” 8; “C.” 8; “D.” 8.

12. Q.—How many breechings do the floats carry? A.—“A.” 4; “B.” 8; “C.” 8; “D.” 8.


14. Q.—How is a line of hose conveyed ashore from the floats? A.—By means of the rocket apparatus or by boat.

15. Q.—What are the signals for getting a line ashore when using the rocket apparatus? A.—(i.) Red flag by day, or red light by night—“Line coming ashore.” (ii.) Flag lowered and raised, or intermittent flashes—“Haul away.” (iii.) Flag lowered or light extinguished—“Avast hauling.”

16. Q.—How is the line secured to the rocket stick? A.—A short length of wire with a loop in either end is fastened to the stick by means of staples, the rocket being held in place by two setings, the rear one passing over the front loop of the wire and assisting to hold it in position. To the loop or eye at the end of the stick, is made fast another length of wire about 3 feet in length, to which the rocket line is attached.

* Not to be committed to memory.
17. Q.—What is the weight of the rocket? A.—1½ lbs.
18. Q.—What is the length of the rocket line? A.—300 feet.
19. Q.—How is the rocket placed in the trough for fixing? A.—It is placed with the line leading out over the front end of the trough, the box containing the line being placed clear as convenient.
20. Q.—How is the line made up for running out when the rocket is fired? A.—It is made up in a box on pegs, which are attached to a false bottom and protrude up through the box when clipped in position and are removed with the false bottom when the rocket is about to be fired.
21. Q.—What line is bent to the rocket line? A.—A 2½ in. grass line about 120 fathoms in length, which in turn is made fast to the hose.
22. Q.—What is a monitor? A.—A large branch fixed on the upper deck of the floats which can be trained and elevated in any direction as required. It can be easily manipulated and the whole of the power of the pumps can be concentrated in the one jet.
23. Q.—What is the working nozzle for the monitors? A.—From 1½ in. to 3½ in.
24. Q.—Who is responsible for placing the float in position? A.—The pilot, under the direction of the officer in charge of the float.
25. Q.—Why is it necessary to employ pilots on fire floats? A.—No person is allowed to handle craft on the River Thames unless he is a properly certificated waterman.
26. Q.—What stations do the floats watch for orders when proceeding up or down the river? A.—No. 35 Millwall, No. 50 Pageant’s Wharf and No. 88 Wandsworth are provided with megaphones and signal lamps to enable them to communicate with the floats and these vessels do not pass down the river beyond Millwall, or up the river beyond Putney Railway Bridge, until they have received orders to do so from the station concerned.
28. Q.—What is the draught and gross tonnage of each float? A.—“A.”: Forward, 2 ft. 9 in.; aft, 3 ft. 8 in.; tonnage, *Not to be committed to memory
-65 11 tons; "B": Forward, 3 ft. 2 in.; aft, 4 ft.; tonnage,
76 tons. "C": Forward, 3 ft. 6 in.; aft, 3 ft. 6 in.; tonnage,
30 tons. "D": Forward, 1 ft. 6 in.; aft, 2 ft.; tonnage,
91 tons.
29. Q.—How many pumps are the floats fitted with? A.—
* "A.": one; "B.": three; "C.": two; "D.": three.
30. Q.—What searchlights are carried on board the floats?
Give diameter of projector and candle-power in each case.
A.—* "Alpha." does not carry a searchlight. "Beta II." has one
18 in. of 1,000 candle-power. "Gamma II." has one 18 in. of
750 candle-power. "Delta II." has one 18 in. of 1,200 candle-
power.
31. Q.—What other lights are carried on board the floats
for use at fires? A.—"A.": none. "B.": one Imperial large,
two clusters 100 and 128 candle-power. "G.": two clusters,
500 candle-power each. "D.": two clusters, 250 candle-power
each.
32. Q.—What other gear is carried on board the floats? A.—* "A.": 1 hook ladder, 2 scaling ladders and 2 extinteurs.
"B.": 4 hook ladders, 4 scaling ladders, 4 extinteurs, 1 bellows
smoke helmet. "G.": 2 hook ladders, 2 scaling ladders, 4
extinteurs, 1 bellows smoke helmet. "D.": 1 hook ladder,
5 extinteurs.
33. Q.—What means of communication are employed between
floats and the shore when at fires? A.—(a) Semaphore. (b)
Telephone. The superintendent of the "F" District's car and
each float (except "Alpha") carries a telephone and battery.
The superintendent's car also carries 500 feet of submarine
cable to be connected to the float.

Chapter V.—HOOK LADDERS.

1. Q.—What is the difference between the old and the new
standard pattern hook ladder? A.—The old pattern hook
ladder had a standing hook and the centre of balance was at the
second round from the top; the new pattern hook ladder has a
folding hook and the centre of balance is just below the top round.

* Not to be committed to memory.
2. Q.—What is the weight of the hook ladder? A.—From 24 to 28 lbs.

3. Q.—Of what is the ladder made? A.—Best selected well-seasoned English ash, straight in grain and free from knots and sap.

4. Q.—What is the length of the ladder? A.—18 ft. 5 in. over all.

5. Q.—How is the ladder strengthened? A.—† By steel pianoforte wire stretched tightly along the inside of each string, secured by a small screw top and bottom and by a staple between each round. A round turn taken round the top round and the second from the bottom. It is further strengthened by three wrought iron rods ½ in. diameter passing through both strings under the second, fifth and eighth rounds and riveted on the outside with a copper washer.

6. Q.—What is the hook made of? Describe it. A.—* The hook is made of the best forged steel. It is 2 ft. 2 in. in length, has a bill 6 in. long from crown to point and is fitted on the underside with eight jagged teeth.

7. Q.—How is the hook kept in place when opened out? A.—* By a small spring catch which travels over an incline on the shoulder of the hook and drops into a slot thereby keeping the hook rigid.

8. Q.—What keeps the ladders from lying flush with the building when hooked on? A.—Mild steel toe pieces fitted on the underside of the strings, opposite the second round.

9. Q.—What prevents the strings from splitting if lowered too heavily to the ground after descending the last flight? A.—The strings are fitted with mild steel shoes.

10. Q.—What is the maker’s test for hook ladders? A.—Before the ladder is accepted by the Brigade it is subjected to the following tests: (1) Hung on a wall with the extreme point of the hook only resting, it must carry two men weighing together 23 stone without crippling the ladder. (2) Laid on trestles 13 ft. apart, hook downward, the ladder must bear the weight of 11½ stone at the middle.

11. Q.—What is the station test for hook ladders? A.—(1) Place the ladder against the wall, hook down and towards the wall as close in as the hook will allow. Lash the head to prevent

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† The complete answer is not to be committed to memory.

‡ A ¼ in. piano wire is also used.
it springing off and jump each round in succession as far as possible, then change ends and jump the remaining rounds down.

(2) Hook the ladder on a wall, laying a piece of wood 3½ in. square under the extreme end of the hook, the ladder being drawn out as far as the hook will allow. In this position the ladder should carry two men, the weight being applied gradually.

12. Q.—How often are hook ladders tested? A.—At least once a month.

13. Q.—What precautions are taken to ensure that the hook belts are in good condition? A.—The belts are examined monthly by the station officer, particular attention being given to the state of the webbing near the hook, which may become worn or perished. An entry is made in the station occurrence book to the effect that this inspection has been made.


15. Q.—What are used in connection with hook ladders for life-saving purposes? A.—Hook belts and lines.

16. Q.—Describe the general method adopted for one man to scale a building? A.—Hook the ladder on the lower part of the window above, ascend as high as possible, smash the window frame and sit astride the sill to throw the ladder the next flight.

17. Q.—What other methods are available for one man to scale a building? A.—(a) By sitting astride both windows after lowering the top one. (b) By using two hook ladders, wearing a hook belt, mounting one ladder and carrying the other.

18. Q.—Which is the best method for two men to scale a building? A.—Using two hook ladders, No. 1 wearing the hook belt, No. 2 sitting astride the window.

19. Q.—Describe a hook belt. A.—*A hook belt is made of saddle girth webbing about 3 in. wide and 3 ft. 4 in. long, lined with canvas and partially so with leather. It is fitted with two straps and buckles and a buckle in rear to which is attached a pouch to carry an axe. A leather reel to carry a bobbin line is also attached by means of a small brass swivel hook to a D eye stitched to the belt.

20. Q.—What is the eyebolt on the hook ladder made of and how is it secured? A.—It is made of the best forged steel and secured by the bolt which hinges the hook.

* Not to be committed to memory.
21. **Q.**—By what means can a man, using a hook ladder and line, descend quickly in an emergency? **A.**—Make the line fast by placing a bowline over the head of the hook ladder, then by taking a round turn with the upper or standing part of the line round the bill of the hook attached to his belt, passing the slack line round behind his back at full arm’s length and using his hand as a check, the descent may be undertaken.

22. **Q.**—What must be remembered when taking the turn? **A.**—To see that the upper part is on the outside when the turn is complete.

23. **Q.**—What is the danger should the turn be taken with the other part of the line? **A.**—The danger is that the line is liable to travel down the hook towards the spring and bearing on this, the first part of the turn becomes detached from the hook leaving only one part of the line rove, in which position the man would be unable to control his descent.

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Chapter VI.—FIRST FLOOR AND SCALING LADDERS.

1. **Q.**—What is a first floor ladder made of? **A.**—The strings or sides are made of best Swedish fir and the rounds of cleft oak.

2. **Q.**—What is the length of the first floor ladder? **A.**—15 ft. 6 in.


4. **Q.**—Where would a first floor ladder be used? **A.**—To enter the first floor of a building where it was inconvenient to pitch an escape. Also to negotiate a parapet. (See Question 9.)

5. **Q.**—How is the ladder strengthened? **A.**—It is strengthened by a bolt under the top and bottom rounds rivetted on the outside of the strings.

6. **Q.**—How are the rounds secured to the strings? **A.**—The rounds are let into gunmetal sockets, which are secured to the strings of the ladder with three screws.
7. Q.—How and where are the hooks fitted? A.—They are bolted to the strings on the underside, opposite the bottom round.

8. Q.—What are the hooks for? A.—To enable the ladder to be hooked on to the rounds of the escape.

9. Q.—How would the ladder be used in connection with a 50 ft. escape? A.—As an extra extension, by raising the ladder above the escape, shipping the hooks on a convenient round, and lashing it with the life line.

10. Q.—What machines carry the first floor ladder clear of the escape? A.—Some electric escape vans carry first floor ladders under the body of the van.

11. Q.—What is the length of a scaling ladder? A.—6 ft. 6 in.

12. Q.—Of what material is it made? Describe all parts. A.—It is made of the best spruce, with rounds of cleft oak in gunmetal sockets, and with steel sockets outside at the top of the strings and inside at the bottom, four in number, for the purpose of shipping another length.

13. Q.—How are scaling ladders strengthened? A.—By means of a wrought-iron rod, \( \frac{1}{2} \) in. diameter, passed through the first, third and sixth rounds, and secured on the outside of the strings, with round gunmetal tapered nuts, screwed on over iron washers and countersunk flush with the strings.


16. Q.—How are the rounds secured to the strings? A.—By being fitted into gunmetal sockets, which are secured to the strings by three screws.


18. Q.—What methods are available for one man to raise, say, up to four lengths? A.—Two methods are available: first by shipping the ladders on the ground and then under-running them; secondly, in a confined space one man can raise up to four lengths by facing the ladders and shipping the outside ladder first, but this requires extreme caution.

* Not to be committed to memory.
19. Q.—Where are scaling ladders used? A.—Anywhere inside or outside buildings, down ships' holds and sewers, etc.

20. Q.—When raising two or more lengths of ladder what additional height is gained with each length added? A.—5 ft. 7 in.

21. Q.—How are the ladders placed for bridging purposes and how are they secured? A.—The ladders are placed together and other lengths are placed on top of the centre of the span, the whole being securely lashed.

22. Q.—What is the safe limit for bridging with scaling ladders? A.—With the ladders properly strengthened, distances up to 12 ft. may be safely negotiated.

23. Q.—How are the ladders lashed for lowering down into a ship's hold or sewer? A.—The ladders are placed together as they are lowered, a line being passed over and under each consecutive round and secured to the bottom round of the lower length. A round turn is also taken round the top and bottom rounds of each ladder and the line is made fast to the top of the last length.

24. Q.—When working at the rear of premises it is found necessary to get a line of hose to work on five lengths of scaling ladder, it being impossible to use an escape, what means are there of strengthening the ladders? A.—By using a long line. One end is taken up and made fast by a clove hitch to the top round of the top length. A long bight is then passed in over the top round of the bottom length and out under the bottom round with plenty of slack. This bight is brought up and a short bight taken out through it from the standing part and made fast to its own part with the first part of a sheepshank. The parts are then hauled taut and a turn taken under the third or fourth round of the bottom length with two half hitches round all parts. The ladders are then turned so that the line is on the under side.


26. Q.—How are the ladders marked? A.—The number of the station is marked in black letters on the inside of the strings.
Chapter VII.—HOSE.

1. Q.—What size hose is used in the Brigade? A.—3¼ in. lined and unlined, 2½ in. lined and unlined, and ¾ in. rubber lined.

Note.—No more unlined hose is being purchased for use in the Brigade.

2. Q.—Of what is hose made? A.—It is woven from the best flax, and, when manufactured, termed "canvas hose."

3. Q.—What couplings are used in the Brigade and where are they fitted? A.—Hudson's Surelock couplings are fitted to 3¼ in. hose, L.F.B. round thread to 2½ in. hose and V-shaped thread to ¾ in. hose and rubber tubing. Couplings are supplied separately and fitted to the hose in the hose room at headquarters.

4. Q.—How are hose couplings secured to hose? A.—The shank of the coupling is inserted in the end of the hose, the end of the hose is then bound with leather and finished off with three copper wire setings.

5. Q.—How is hose marked on issue from Headquarters? A.—The record number and letter is marked in black paint at either end, a few feet from the couplings; three letters "B" one at either end 6 ft. from the coupling and one in the centre; also the maker's stamp. The number of the station in brass figures on the strap and a copper burr on the same showing the maker also the month and year of issue.

Note.—The letter "B" shows the position for the shifting becketes.

6. Q.—What pressure is lined hose subjected to before being accepted by the Brigade? A.—300 lbs. to the square inch.

7. Q.—How much is hose allowed to stretch during the above test? A.—5 per cent. of its length.

8. Q.—What percentage of hose is selected for the above test? A.—One length in ten.

9. Q.—What is the length of 2½ in. hose? A.—100 feet, lined and unlined.

10. Q.—What is the length of ¾ in. hose? A.—100 feet, unlined; 50 feet, lined.
11. Q.—What is the length of ¾ in. hose and what is it used for? A.—10 feet lengths, used with the hand pumps.

12. Q.—What rubber tubing is used in the brigade? A.—¾ in. rubber tubing.

13. Q.—What length is rubber tubing supplied in? A.—60 feet lengths for the first aid and 20 feet lengths for washing-down purposes.

14. Q.—How often is rubber-lined hose tested at a station and to what pressure? A.—Rubber-lined hose is tested every six months to a pressure of 150 lbs., the station officer or sub-officer being present.

15. Q.—How often is unlined hose tested at a station, and to what pressure? A.—Every twelve months to 120 lbs. pressure, the station officer or sub-officer being present.

16. Q.—What other test is hose subjected to, apart from the periodic test? A.—After being in use at a fire all hose is tested to 100 lbs. pressure on a pump. If a motor pump is not available it is tested to full hydrant pressure. The station officer or sub-officer is to be present at the test.

17. Q.—What is done with hose after being in use at a fire? A.—It is tested, cleaned, and hung up to dry.

18. Q.—If a length of hose should burst when in use at a fire what procedure is adopted? A.—After the length is changed, if time does not permit of it being made up, an overhand knot is put in each end and the length is laid aside.

19. Q.—What is done with a damaged length when making up? A.—It is made up on the female coupling and an overhand knot is put in the strap.

20. Q.—What is done with damaged hose at the station? A.—After being cleaned and dried it is made up in a figure of eight ready to be sent to the hose room for repairs, the damaged part being marked.

21. Q.—What is a “Butt Joint”? A.—A method of repairing hose lately in use in the Brigade whereby the damaged portion being cut out, the two ends were sewn together and then covered with a canvas patch on which was spread an adhesive mixture.

22. Q.—If a burst occurs near a coupling, how is it repaired? A.—The coupling is cut out and tied in again.

23. Q.—If a burst occurs in any other part of the hose, what means are employed to repair it? A.—The hose is cut in
two where the burst occurred and rejoined by means of lugless couplings.

24. Q.—How many becets are there on a length of hose? A.—Three, with the exception of the first length out of the appliance, which also has a snottor becket near the branch.

25. Q.—Where are the shifting becets placed? A.—One in the centre of a length of hose and one about 6 ft. from either coupling.

26. Q.—How are the becets secured? A.—By a round turn taken round the hose with the strap and then buckled.

27. Q.—After being in use at a fire what are the most important points to be observed before hose is stowed in an appliance? A.—That the hose is thoroughly dry, becets in place and couplings clean.

28. Q.—If a small leak or pinhole occurs when hose is in use at a fire, what should be done with it? A.—A lapping leather and line should be procured from the nearest appliance and fastened over the leak or hole.

29. Q.—What are hose whips? A.—Lines used for hoisting up hose to dry in the hose hoist.

30. Q.—How are hose whips fitted? A.—The standing part is spliced round a wooden toggle about 9 in. long; a short leg fitted with a running eye is spliced in about 2 or 3 feet above, the running eye fitting over the opposite end of the toggle. The end is then rove through a block at the top of the hose hoist and secured with a clove hitch above the splice.

31. Q.—How is hose which is not required to be stowed in an appliance made up? A.—It is made up on hose bollards in figures of eight.

32. Q.—What are the number of turns top and bottom for a length of 2½ in. hose, made up as above? A.—Seven turns form the bottom flake, the remainder on top.

33. Q.—What is done with the couplings when the strap is passed? A.—For neatness, the turns are regulated so that the outside flake is clear and the couplings are then joined, the male being brought through the lower hights to meet the female.

34. Q.—How is 3½ in. hose made up? A.—On the bight, the female coupling underneath, the male coupling drawn back about 18 in. When rolled up, the male coupling should just clear the female when the strap is passed.
35. Q.—What is the hose hung on in the appliance room? A.—It is hung on iron saddles bolted to the wall.

36. Q.—How often are washers on hose couplings examined? A.—Every three months and when testing the hose.


38. Q.—What is used for cleaning and lubricating the couplings of hose? A.—Graphite applied over a thin coat of terbine and then polished with a black lead brush.

39. Q.—A line of hose 1,500 feet in length has been laid out in a straight line and a motor pump is got to work at 150 lbs. pressure; a branch and a 1 1/2 in. nozzle is being used 80 feet above the ground level. Why does the hose become curved along the road and why does the water continue to issue from the nozzle for a few moments after the pump is knocked off? A.—The expansion of the hose accounts for the curving; the subsequent contraction of the hose accounts for the continued issue of the water.

40. Q.—Why should a length of rubber-lined hose on receipt from the makers be allowed to remain in some cool well-ventilated place before test or issue? A.—This is done to enable the canvas to regain the moisture which it lost during the process of fitting the rubber. Experience has shown that hose tested immediately after the rubber has been fitted to it will give an undue percentage of bursts.

41. Q.—Where are hose ramps carried and for what purpose are they supplied? A.—Hose ramps are carried on turntable ladders and lorries. Their use is to allow vehicles to pass over hose. Hose ramps are also used as scotch blocks for turntable ladders.

42. Q.—When running out a line of hose, which coupling is nearest the fire? A.—With 2 1/2 in. hose, the male coupling; with 1 1/2 in. hose, the female coupling.

43. Q.—What is the makers' test for 2 1/2 in. unlined hose? A.—The same as for lined hose; but it is never tested in full lengths—a short length being cut off and expended for testing purposes.

44. Q.—Where is 2 1/2 in. unlined hose carried? A.—In all motor escapes the two lengths farthest from the branch should be unlined. Floats are supplied with 20 lengths of 2 1/2 in. unlined.

45. Q.—Is 2 1/2 in. unlined hose ever carried on a motor pump?
A.—Yes, in some outlying stations where there are considerable areas of undergrowth or furze which might become ignited, a few lengths are carried rolled up on the box; also at stations in the vicinity of docks and wharves, where oil or tar, or any substance detrimental to the rubber of lined hose may be encountered, a similar routine is carried out.

46. Q.—What are the great disadvantages of using unlined hose as compared with rubber-lined hose? A.—Loss of pressure at the nozzle due to friction and water damage to interiors of buildings.

47. Q.—What are the main points to be observed when getting hose to work? A.—The hose should be laid out in as straight a line as possible, avoiding interruption of traffic as far as practicable. All joints should be properly hardened up, and the couplings not dragged over, or dropped on the ground. When leading hose over walls or fences, care should be taken to avoid glass or spikes, with which these are often topped.

48. Q.—With motor appliances, what are the chief factors that contribute towards damage to hose? A.—Contact with oil, grease, or petrol, and in the case of electric appliances, acid.

Chapter VIII.
BRANCH HOLDERS, BREECHINGS AND VARIOUS GEAR USED IN CONNECTION WITH FIRE APPLIANCES.

1. Q.—What branch holders are in use in the Brigade? A.—Three, viz.: large, small and float’s branch holder.
Note.—The large branch holder is often referred to as the radial branch.

2. Q.—What is the object of a branch holder? A.—To render more easy the work of holding and controlling the branch. It is used when working outside a building.

3. Q.—Where are large branch holders carried? A.—On turntable ladders.

4. Q.—What are they used for? A.—They are used if
getting to work with 3½ in. hose, using a special two-way breeching fed by two lines of 2½ in. hose.

Note.—This would seldom be done now, and the large branch holder will be obsolete when the present supply of 2½ in. lined hose is exhausted.

5. Q.—Are special nozzles carried for a large branch holder? A.—Yes, three in number—sizes, 1½ in., 1¾ in., 1¾ in.

6. Q.—What is the name of the small branch holder? A.—The Ajax.

7. Q.—Where are they carried? A.—On motor pumps.

8. Q.—What is a two-way breeching? A.—A breeching fitted with three female couplings, two round thread 2½ in. and one Surelock 3½ in., with two non-return valves. The two 2½ in. couplings are fitted with non-return valves so that water cannot flow back along the 2½ in. hose in the event of a burst or stoppage of the pump.

9. Q.—Where is a two-way breeching carried? A.—On all turntable ladders.

10. Q.—What is its use? A.—It is used to enable two lines of 2½ in. hose to be connected to 3½ in. lined hose. It will be obsolete when the present supply of 2½ in. lined hose is exhausted.

11. Q.—What is a one-into-two delivery breeching? A.—A breeching fitted with two male and one female couplings.

12. Q.—On what appliances are they carried? A.—All appliances.

13. Q.—When is a one-into-two delivery breeching used? A.—It is used for dividing one stream of water into two when cooling down at fires.

14. Q.—Describe a one-into-two dividing breeching. A.—A breeching fitted with two male and one female couplings, also two shut-off valves and a control key.

15. Q.—What is its use? A.—Principally for cooling down ruins, the control valves enable one line to be shut off without interfering with the other.

16. Q.—On what appliances are they carried? A.—On some motor pumps and on all superintendent’s cars.

17. Q.—Describe an elbow for nozzle. A.—An elbow for nozzle is a metal attachment which can be fitted between the branch and the nozzle so as to enable the jet of water to be delivered at right angles to the branch.
18. Q.—Where is an elbow for nozzle carried, and when is it used? A.—It is used to get at a fire in the basement of a house or ship's hold, when, owing to the density of the smoke or other cause, it is not possible to get down to it.

19. Q.—Describe a float's breeching. A.—A float's breeching is fitted with three male couplings, one 8 1/2 in. Surelock and two 2 1/2 in. round thread.

20. Q.—What is a float's breeching used for and where is it carried? A.—A float's breeching is used for connecting 8 1/2 in. hose from the floats to 2 1/2 in. hose on shore. Only carried aboard floats.

21. Q.—What is a float's adaptor and where is it carried? A.—A float's adaptor consists of two male or two female couplings, each having one Surelock and one round thread connection. Only carried aboard floats.

22. Q.—What is the use of float's adaptors? A.—For connecting 2 1/2 in. hose to 8 1/2 in. hose.

23. Q.—What is always attached to a float's branch? A.—A wooden tally showing the name of the float and number of delivery.

24. Q.—Give a description of a pair or set of connecting screws. A.—Two gummetal connections, each fitted with a V-shaped and round thread.

25. Q.—What are they used for and where are they carried? A.—They are used for connecting L.F.H. round thread to a V-shaped thread, sometimes found on couplings of hose and hydrants belonging to business premises. They are carried on all appliances.

26. Q.—What other connecting screws are used in the Brigade? A.—Those used in connection with the hand pump when filling the first-aid cylinder.

27. Q.—Where are they carried? A.—On appliances fitted with first-aid cylinders.


29. Q.—Why have short metal branches been introduced? What is their object? A.—Leather branches were formerly used for inside work. These branches being done away with, it was found awkward to work inside a building with the long metal branch, consequently the short branch has been introduced.
30. Q.—Which branch should be used when getting to work either from a pump or a hydrant? A.—If working inside a building the hand-controlled branch should be used in order to minimise water damage and so that the branch can be shifted from floor to floor without sending back to "knock off" the pump. Where an efficient jet is of first importance the Ajax or metal branch must be used.

31. Q.—State any order in connection with hand-controlled branches, the neglect of which might cause a burst hose. A.—Always shut down very gently, or the sudden rise of pressure resulting from shutting down quickly will burst the hose.

32. Q.—What branch would be used for a second delivery from a motor pump? A.—A metal branch with 1 in. nozzle.

33. Q.—What is a preventer? A.—A pole about 8 ft. in length having at the top a steel point and a spur at right angles to it, each being about 4 in. in length.

34. Q.—What is the use of a preventer? A.—For pricking ceiling to release water, pulling down a drooping ceiling, laths and plaster, etc.

35. Q.—What is a basement nozzle? A.—A gunmetal casing fitted with a 3/4 in. female coupling at one end, the other end forming a T which terminates in two 1 in. nozzles in line, and opposite to each other, and at right angles to the line of hose, the nozzle being fitted with a screw cap.

36. Q.—What is a basement sprayer? A.—A gunmetal fitting, threaded to screw on to a branch. On the lower end it has a fork to which is bolted a plate of such form as to throw a spray of water in all directions like a sprinkler.

Chapter IX.—LINES.

1. Q.—What is a lowering line used for? A.—Its principal use is for rescue purposes in connection with hook ladders.

2. Q.—How is a lowering line fitted? A.—One end is pointed, the other is fitted with two short legs, one slightly longer than the other, each having a running eye in the end. A small stop is also fitted above the splice to bend on a guy line.

3. Q.—What is the difference between the short and long
legs, and how is a short leg denoted? A.—The short leg is the standing part of rope, and is denoted by a Turk's head worked in it.

4. Q.—What is the size of the lowering line? A.—3 in. in circumference.

5. Q.—What is the length of a lowering line? A.—Not less than 100 feet.


8. Q.—Where is a lowering line on a motor pump likely to be found? A.—The lowering line is usually carried strapped to the hook ladders.

9. Q.—A stretcher is being lowered to the ground using a line and an escape, how would the line be rove? A.—The line would be led down the escape, under one of the drums of the carriage gear, and a round turn taken round the handrail of the escape.

10. Q.—Which leg of a lowering line is used for securing the head and which the feet, using a scaling ladder as a stretcher? A.—The short leg goes round the body under the arms and a small lanyard is secured to the round of the ladder, the long leg passes between the legs through the two top rounds of the ladder and the eye is passed over the feet.

11. Q.—What is the length of a long line? A.—80 feet.


13. Q.—What is the size of a long line? A.—2½ in. in circumference.

14. Q.—What is the test for all lines? A.—A fair turn taken and the steady strain of six men applied on any part of the line.

15. Q.—What is the principal use of a long line? A.—For hauling up and securing lines of hose when working at any height above the ground.

16. Q.—Is it permissible to use a long line for life-saving purposes? A.—They are quite strong enough and should be used when it is not convenient to use the lowering line.

17. Q.—What appliances carry long lines? A.—They are carried on all appliances.
18. Q.—What is the length of a short line? A.—40 feet.
19. Q.—How is a long or short line marked? A.—By a copper rivet at either end having the number of the station stamped on the burl.
20. Q.—What is the size of a short line? A.—2½ in. in circumference.
22. Q.—How often are lines tested in the Brigade? A.—Once a month.
23. Q.—What is a short line principally used for? A.—For miscellaneous purposes, such as lashing scaling ladders, securing suction, etc.
24. Q.—What is the object of a life line at the head of an escape? A.—It has several uses: (1) as a guide for a man to return by, after entering a very smoky room; (2) for securing a line of hose which has been led over the escape; (3) for securing the first floor ladder if using it as an extra extension.
25. Q.—What is the length of the life line? A.—From 15 to 20 feet.
26. Q.—How is the life line fitted? A.—One end is whipped and the other has a running eye spliced into it. It is secured to the head iron of the escape.
27. Q.—What is it made of? A.—It is made of tinned manila as in the case of long and short lines.
28. Q.—What is the length of a bobbin line? A.—Bobbin lines are supplied not less than 50 feet in length and are lengthened according to the height of buildings in the locality.
29. Q.—Where is the bobbin line carried? A.—Hung on a small “D” eye attached to the hook belt.
31. Q.—How is it fitted? A.—One end is whipped or backspliced, the other is spliced into a small spring hook, the whole being wound on a leather bobbin reel.
32. Q.—What is the use of the bobbin line? A.—It is used principally for hauling up a line when working with hook ladders.
33. Q.—At a fire, after using the bobbin line and still at work aloft, what would you do with the line? A.—Make one end fast in case it is required again.
34. Q.—What is a pocket line? A.—A small line forming part of a fireman’s equipment, usually carried in the tank pocket.
35. Q.—What is the length of the pocket line? A.—12 feet.
36. Q.—How is it fitted? A.—One end is whipped or backspliced, the other is fitted with a long eye.
37. Q.—How is the pocket line made up? A.—In the form of a blood knot.
38. Q.—What is the length of a lapping line, and what is it made of? A.—9 feet. It is made of hemp, laid up very loose.
39. Q.—What appliances carry these lines and how many are carried? A.—All appliances carry six lines and six lapping sheathers.

Chapter X.—FIRST-AID MACHINES.

1. Q.—How many types of first-aid machines are there in the Brigade? A.—Two.
3. Q.—What is the difference between an old type of first-aid and one of the latest pattern? A.—The old type of first-aid has a cylinder which is charged with water under pressure, the pressure being maintained while at work by means of a bottle of compressed air. The new pattern first-aid is fitted with a tank from which the water is discharged by means of a small pump run off the engine.
4. Q.—What is the capacity of the first-aid cylinder or tank? A.—25 gallons.
5. Q.—What is a first-aid tank or cylinder made of? A.—Both tank and water cylinder are made of copper.
6. Q.—What appliances are fitted with the old pattern first-aid? A.—Electric escape vans and some older types of motor escape vans.
7. Q.—What pressure is the old pattern first-aid kept charged up to? A.—120 lbs. to the square inch.
8. Q.—What are the relative parts of air and water in the cylinder when charged? A.—Seven parts water, one air.
9. Q.—When should the air bottle be used while at work? A.—When the pressure drops below 60 lbs.

10. Q.—Up to what pressure is the air bottle charged? A.—1,800 lbs. to the square inch.

11. Q.—How is air introduced into the first-aid cylinder? A.—The air inlet to the first-aid cylinder is first opened, then the cock on the union, and lastly the air outlet valve on the air bottle itself.

12. Q.—How often are the valves of the first-aid machine tested and what is done in connection with the test? A.—They are tested every twenty-four hours and an entry is made in the station occurrence book showing the name of the man who tested them.

13. Q.—How are the valves tested? A.—By sharply opening and closing each valve in succession to see that they act freely.

14. Q.—What pressure will the safety valve blow off at? A.—150 lbs.

15. Q.—How is the first-aid charged after use? A.—It is first charged up from the hydrant, then completed to the required pressure by means of a hand pump.

16. Q.—What apparatus is required when charging the first-aid? A.—A pair of ½ in. connecting screws to connect the hand pump hose to the inlet to cylinder.

17. Q.—What is required to manipulate the air bottle? A.—A metal spanner cut to fit the spindle of the valve and the union nuts.

18. Q.—Where are the spanner and connecting screws usually carried? A.—They are either kept in a pocket of the escape coat, or for convenience are secured to the fittings of the first-aid.

19. Q.—How should a new pattern first-aid tank be filled? A.—The filling cap on the top of the tank should be removed and the tank filled up by means of hydrant or buckets.

20. Q.—Can a hydrant be used with first-aid tubing in order to keep the first-aid at work after the tank supply of water is exhausted? A.—Yes. In the new pattern first-aid tank, a male and female connection are provided on the tank for this purpose. In an old pattern first-aid machine a first-aid adaptor is required; one end of the adaptor takes the 2½ in. hose, the other end takes the first-aid tubing which has been disconnected from the cylinder.
21. Q.—How many air bottles are allowed to each first-aid appliance? A.—Three.
22. Q.—What size nozzle is used with the first-aid? A.—3/16th in.
23. Q.—What is the size of the first-aid tubing? A.—1/4 in.
24. Q.—How many lengths of first-aid tubing are carried on a motor escape? A.—Three 60 ft. lengths.
25. Q.—How often is the first-aid tubing tested, and to what pressure? A.—All tests for first-aid tubing, including the maker's test, are to the same pressure as for rubber lined hose, and are carried out on similar occasions and intervals.
26. Q.—How is the first-aid tubing carried on an escape van? A.—On a reel fitted with a swivel joint, which enables the water to be passed through the tubing without disconnecting.
27. Q.—How many times would an air bottle empty the first-aid? A.—There should be sufficient air to enable the first-aid cylinder to be emptied three times.
28. Q.—How long does it take approximately to empty the first-aid cylinder without using the air bottle? A.—From three to four minutes.
29. Q.—How far will the first-aid throw a jet? A.—From 35 to 40 feet.
30. Q.—How often are air bottles tested? A.—They are sent in for testing once every twelve months.
31. Q.—What precautions are necessary in connection with first-aid tanks in winter? A.—6 lbs. of common salt should be introduced when charging. In severe weather the first-aid tubing should be drained and the valves covered.
Chapter XI.—HAND PUMPS.

1. Q.—What is a hand pump? A.—A hand pump is a small single-acting force pump.

2. Q.—How many lengths of hose are required to make up a hand pump complete? A.—Two 10 ft. lengths of $\frac{3}{4}$ in. rubber lined hose.

3. Q.—What washers are required for the hand pump? Mention where they are fitted. A.—Four washers are required in all; two cup washers for the piston, one washer for the valve-box, and one for the piston head, inside the stuffing-box.

4. Q.—What valves are there in the hand pump? A.—Two; one inlet and one delivery valve.

5. Q.—How can the suction inlet valve be removed? A.—By unscrewing the valve box.

6. Q.—How can the water in the hand pump be released in order to drain the cylinder? A.—By removing the suction valve box and pressing up on the spindle of the delivery valve.

7. Q.—What size nozzle is used with the hand pump? A.—$\frac{3}{16}$ths of an inch.


9. Q.—How is a hand pump carried on an appliance? A.—In a canvas bag painted black with the number of the station in white letters.

10. Q.—How can the piston be removed? A.—By unscrewing the stuffing-box and withdrawing the piston from the cylinder, after which the cups may be removed from the piston rod.

11. Q.—How are the cup washers secured on the piston rod? A.—By two nuts, one above and one below; the underneath one being slightly burred to prevent unscrewing.

12. Q.—What distance will the jet carry? A.—To a height of about 30 ft.

13. Q.—Where are hand pumps principally used? A.—At mall and chimney fires, and for obtaining the required pressure when charging the old pattern first-aid appliances (air-bottle type).
Chapter XII.—CHEMICAL EXTINCTEURS.

1. Q.—What type of chemical extincteur is in use in the Brigade? A.—One of the scaled bottle type, with a capacity of 2 gallons.

2. Q.—Describe the charge for it, giving weights of ingredients? A.—12 ozs. of bi-carbonate of soda, 5 ozs. of sulphuric acid, in addition to the 2 gallons of water.

3. Q.—How is the extincteur got to work? A.—The command cock is first opened, the nozzle unhooked from the screw cap, and the safety pin removed. The canister should then be struck on the side with a knob fitted for the purpose.

4. Q.—How is the knob fitted, and retained in place when not in use? A.—It is hinged to a bracket on the outside of the canister sufficiently high to bring the knob in line with the bracket on the inside, which holds the cage for the acid bottle in position. It is secured when not in use by a split pin passing through two small brackets.

5. Q.—How is the acid portion of the charge inserted? A.—The bottle containing the acid is placed, with the sealed end uppermost, in the cage. Both bottle and cage are tapered to fit fairly tight, thus ensuring that the bottle is broken on impact.

6. Q.—What is the length of the tubing? A.—2 ft.

7. Q.—What is the size of the nozzle? A.—3-16ths of an inch.

8. Q.—How is the jet controlled? A.—By a small command cock fitted on the top of the canister.

9. Q.—How far will the jet carry? A.—From 25 ft. to 40 ft.

10. Q.—By what means is the liquid forced out of the tubing, seeing that the outlet is at the top? A.—On the bottle of acid being broken by the impact of the knob striking the canister, the acid is liberated into the solution of water and bicarbonate of soda. Gas is generated, and the pressure from this acts in the dome on the surface of the water. The only way for the water to escape is by means of a metal tube (fitted with a strainer), extending from near the bottom of the canister up to the bulb in connection with the tubing.
11. Q.—How is the chemical extincteur charged? A.—If
the extincteur has been in use, it is washed out thoroughly to
remove all traces of previous charge, then one gallon of water
is put in, and 12 ozs. of bi-carbonate of soda added. It is then
well shaken to ensure soda being dissolved, then filled to the
water-line. The bottle containing the acid should be placed
carefully in the cage, the cap screwed on, the knob and tubing
secured, then wiped thoroughly dry. If this last item is not
done, the acid from the previous charge might corrode the paint.

12. Q.—What prevents the inside from becoming rusty?
A.—The inside being tinned.

13. Q.—What is the charge for the chemical extincteur con-
tained in? A.—In small tin cylinders with directions for use
printed on the outside.

14. Q.—How often and how are chemical extincteurs tested?
A.—Every two months, by discharging them.

15. Q.—Is there any other test carried out? A.—Yes.
After repair by workshops, the extincteurs are subjected to a
hydraulic pressure test of 600 lbs. per square inch.

16. Q.—How often is the control cock examined? A.—At
least once every 24 hours.

17. Q.—What is the principal use of chemical extincteurs,
and where are they carried? A.—For attacking small and
chimney fires with the least possible delay. They are carried on
all appliances.

18. Q.—What other types of chemical extincteur may be met
with in London and elsewhere? A.—The open bottle or turn-
over type.

19. Q.—How is this type actuated? A.—All that has to be
done is to invert the extincteur. The acid then flows into the
solution and gas is generated with the same effect as in the sealed
bottle type of extincteur.

Note.—In some designs the inverting of the extincteur causes
a lead weight to slide down a tube and break the acid bottle.
Chapter XIII.—BELLOWS SMOKE HELMETS

1. Q.—Of what material is the Bellows Pattern Smoke Helmet made? A.—The helmet is made of hardened leather with a soft leather curtain, fitted with a strap to tighten it round the neck of the wearer.

2. Q.—How is the air supplied to the man wearing the helmet? A.—The air is forced through the tubing by means of bellows.

3. Q.—What is the length of the tubing? A.—120 ft. in three 40 ft. or two 60 ft. lengths.

4. Q.—How are the lengths connected? A.—By screw couplings.

5. Q.—What is the object of the metal junction piece? A.—To form a junction for a speaking tube which enables verbal communication to be maintained between the man working the bellows and the man wearing the helmet.

6. Q.—What should be done by a man wearing the helmet, and receiving too great a supply of air? A.—He should open the shutter.

7. Q.—What line is used in connection with the bellows smoke helmet and what is its use? A.—A long line is used to convey signals and to assist in hauling a man out of a job if in difficulties.

8. Q.—What are the signals when using the bellows smoke helmet? A.—One pull on the line indicates “Man all right,” and is to be repeated at frequent intervals. Two pulls on the line indicates “Turn on the hydrant.” Three pulls on the line indicates “Lighten in more hose.” Four pulls on the line indicates “Knock off.” One pull on the air tubing “Man wants more air.” A succession of pulls on the air tubing “The man is in difficulties and must be got out.” All signals are repeated by the attendant.

9. Q.—What are the most essential points to look out for when getting a bellows smoke helmet to work? A.—To place the man working the bellows in a position where the pyret can be obtained, and to see all joints and connections properly made.

10. Q.—What are the duties of the attendant? A.—He
should attend the line and pipe so that an accumulation of slack is avoided; he should be careful, however, not to hamper the smoke helmet man's movements by keeping line and piping too taut. He must answer all signals.

11. Q.—How is the line secured to the man wearing the helmet? A.—With a round turn and two half hitches round the belt and tubing.

12. Q.—What precaution should the man using the helmet take when going down stairs? A.—He should take his line and tubing under one arm and proceed down backwards.

13. Q.—What steps should be taken by the attendant on receiving the signal "Man in difficulties"? A.—He should answer the signal, and with what assistance is available endeavour to get the man out. At the same time, a message should be sent to the officer in charge of the fire.

14. Q.—What should be done before the helmet is put on, all gear being connected up? A.—All foul air should be blown out of the tubing by means of the bellows.

15. Q.—Where are smoke helmets carried? A.—On certain motor pumps distributed round the Brigade.

Chapter XIV.—SMOKE HELMETS
(Self-Contained Type).

1. Q.—What special apparatus is in use in the Brigade for dealing with fires at chemical works, etc.? A.—"Proto" self-contained breathing apparatus.

2. Q.—To what stations are these attached and what appliances carry them? A.—Headquarters and No. 66 Station, Clerkenwell, and carried by the emergency tenders at those stations.

3. Q.—What is the difference between this type of apparatus and the ordinary smoke helmet? A.—With the "Proto" apparatus the wearer is independent of all external air supply and carries a supply of oxygen in a cylinder attached to the apparatus. With the old pattern, i.e., the "Koenig" type of bellows smoke helmet, the wearer has to depend for his air supply on air being pumped to him through a pipe.
4. Q.—How long can a man remain in poisonous fumes, gas, or smoke with the "Proto" apparatus? A.—One hour at a time, after which he must change his oxygen cylinder.

5. Q.—How do the men work? A.—In pairs, the relief men standing by.

6. Q.—Give a short description of the apparatus. A.—Vulcanised rubber breathing bag, canvas bag containing same, breathing tubes fitted with mica inhaling and exhauling valves, rubber mouthpiece, nose clip, goggles, and oxygen cylinder with pressure gauge attached, also reducing valves.

7. Q.—What amount of oxygen is contained in the cylinder? A.—6 cubic ft. compressed to approximately 1,800 lb. on the square inch.

8. Q.—Is it permissible for any man to wear this apparatus? A.—No; men are specially trained for this apparatus at a mine rescue station.

9. Q.—Where is it essential that self-contained apparatus should be used? A.—Fires in chemical works, leakages of acids, ammonia, etc., rescue work in sewers where a leakage of coal gas has penetrated, very smoky and difficult jobs in basements, etc.

10. Q.—What special gear is carried on the emergency tenders for dealing with leakages of corrosive acids, ammonia, etc.? A.—Special face masks which are connected to the bag, and cover the face completely.

11. Q.—The bag when charged contains about 3 lbs. of caustic soda or alkali. What is this for? A.—The exhaled breath passes through the caustic soda and is filtered or cleared of all impurities which it has gathered during the passage through the lungs. It is afterwards mixed with the pure oxygen flowing in from the cylinder.

12. Q.—Should the bag become overcharged and breathing consequently restricted, how can the wearer remedy this? A.—By means of a relief valve fitted on the bag and kept closed by a spring, which, when depressed, allows a certain amount of the contents of the bag to escape.

13. Q.—It is necessary to keep the caustic soda constantly shaken up. Why is this? A.—Unless this is carried out the sticks cake together and consequently offer a smaller surface to attract the impurities (viz., carbonic acid gas) from the exhaled air.
Chapter XV.—JUMPING SHEET.

2. Q.—When would a jumping sheet be used? A.—For rescue purposes where time or circumstances do not permit of any other method of rescue being employed.
3. Q.—How is a jumping sheet strengthened? A.—By two cloths sewn diagonally to the seams, a centre patch, roping and lining.
4. Q.—What is the shape and size of a jumping sheet? A.—Circular, with an area of about 70 square feet.
5. Q.—How many becketts are there on a jumping sheet? A.—Twenty-four.
6. Q.—How are the becketts fitted? A.—Fitted as cringles worked through eyelets in the sheet and finished on the crown.
7. Q.—How should a jumping sheet be got to work, time and circumstances permitting? A.—Obtain as much assistance as possible to hold the sheet, keep close in to the building where the rescue is to be carried out, and place a bed, mattress, or some soft substance underneath to assist in breaking the fall.

Chapter XVI.—LARGE DAM.

1. Q.—What is the size of a large dam? A.—*8 ft. by 6 ft. by 3 ft. 6 in.
3. Q.—What is the capacity of a large dam? A.—*900 gallons; approximately four tons.
4. Q.—What is the dam sack made of? A.—Best No. 1 canvas.
5. Q.—What is the length of the trunk? A.—*5 ft., and has a waterway 6 in. in diameter.

*Not to be committed to memory.
6. Q.—What is the use of the trunk? A.—To drain the dam sack and to use as a levelling pipe when two large dams are rigged end on to one another.

7. Q.—What is done with the trunk when the dam is full? A.—It is secured to the top part of the frame.

8. Q.—When putting the dam sack into position, on which side should the roping be? A.—On the side nearest the dam frame.

9. Q.—Which parts of the dam sack are secured first when rigging the dam? A.—The four corners.

10. Q.—To which part of the frame should the pins which keep the stays in position be secured? A.—On the underside, and the chain brought round the outside when putting the pins on to keep them clear of the dam sack.

11. Q.—How is the lacing secured to the dam sack? A.—After being cut to length and both ends whipped, the lacing is middled through the centre eyelet hole and one part tucked under a strand of the other.

12. Q.—How is the lacing secured when rigging the dam? A.—Over, and through each successive eyelet hole, taken under the ends of the top part of the frame, brought over the top and reef knotted to the opposite lacing.

13. Q.—Under what circumstances would a dam be brought into use at a fire? A.—Under the following combination of circumstances: (a) If the hydrant water supply was insufficient. (b) If a float could be got to work within a reasonable distance of the fire. (c) If the float was so far away that the fire could not be efficiently attacked using the float's delivers direct, or if the fire was of so great an area that sufficient deliveries drawing water direct from the float could not be obtained.

14. Q.—For what purpose is a dam used other than at a fire? A.—Dams are used at wet drill in order to economise in water, the same water being pumped over and over again.

15. Q.—How many dams are there in the Brigade, and where are they kept? A.—There are ten kept at various stations in the Brigade where they are likely to be required.
Chapter XVII.—LIGHTS.

1. Q.—How many different lights are there in the Brigade, exclusive of hand lamps and the search lights and clusters carried on the emergency tenders? A.—Five, namely: large and small imperial, ideal, contractor's, and water light.

2. Q.—What is the charge for the large and small imperial lights? A.—25 lbs. and 6 lbs. of carbide of calcium respectively.

3. Q.—What is the most essential point to be observed when charging imperial lights? A.—To see that they are clean and thoroughly dry.

4. Q.—What is the candle power of the large and small imperial lights? A.—2,500 c.p. and 850 c.p. respectively.

5. Q.—How long should an imperial light burn continuously? A.—Large—10 hours. Small—8 hours.

6. Q.—How much water should be put in the imperial lights? A.—The water chamber should be kept as nearly full as possible, and never below 3 ins. from the top.

7. Q.—Describe the burner of an imperial light. A.—A metal attachment made in the form of a nut recessed and threaded on the inside to screw on to the uptake. It also has a small hole passing through from the recess which forms the outlet for the gas; it is threaded on the outside to receive the reflector. The burner terminates in a sleeve about three-quarters of an inch in diameter, and about the same in length, which has twelve small holes near the inner end to enable air to get to the jet.

8. Q.—If at a fire the burner of the imperial light would not act, to what might the cause be attributed? A.—This might be the result of the air holes becoming choked by a chemical substance, which is formed while the light is burning.

9. Q.—What is the remedy in the above circumstances? A.—Shut off the gas to extinguish the light and open again when the burner is removed; clean off any substance which is adhering to the burner, prick the holes clear, screw on the burner and re-light.

10. Q.—Describe the gas bell or chamber of the imperial light? A.—A cylinder to which the uptake for the gas is secured, and which covers the carbide chamber, being kept in place by a clip at the bottom.

* Not to be committed to memory.
11. Q.—How many grids or separators are there in the carbide chamber of the imperial light? A.—Two.

12. Q.—What is the object of the grids? A.—To separate out the carbide, thus allowing the water to circulate freely amongst it; a larger surface of the carbide is thus exposed to the action of the water and a correspondingly greater amount of gas is generated.

13. Q.—Where is the control valve situated? A.—It is situated just before the cross bar, and a key is attached by a short length of chain.

14. Q.—What is the difference in the construction of the imperial lights and that of the ideal or contractor’s lamp? A.—The principle of all these lights is the same, but they vary slightly in construction, mainly in the carbide chambers and gas controls.

15. Q.—How is the gas obtained in all water lights? A.—The gas is generated by water coming into contact with the carbide.

16. Q.—What is the charge for the ideal light? A.—4 lbs. of carbide of calcium.


18. Q.—How long should the ideal light burn when fully charged? A.—Six hours.

19. Q.—What is the charge for the contractor’s lamp? A.—2 lbs. of carbide of calcium.

20. Q.—What is the candle power of the contractor’s lamp? A.—*300 c.p.

21. Q.—How long should the contractor’s lamp burn with both pairs of nipples or burners open? A.—Five hours.

22. Q.—How is the charge for the contractor’s lamp carried on a motor pump? A.—It is usually issued in the sealed tin and stowed in the carbide chamber of the lamp until required for use.

23. Q.—How many of the following lights are there in the Brigade and where are they kept? (a) Imperial large. (b) Imperial small. (c) Ideal. (d) Contractor’s? A.—*(a) 4. (b) 2. (c) 11. (d) 33. They are distributed round the Brigade, and ordered on to fires as required.

* Not to be committed to memory.
24. Q.—If at a fire a man were sent for a water light, where would he find one? A.—On the nearest appliance.

25. Q.—How could the top be distinguished from the bottom, in the dark? A.—By feeling the two strips on the top, and only one at the bottom.

26. Q.—How is a water light got to work? A.—Obtain a bucket, iron if possible, tear off the two top and one bottom strips, shake the cylinder to level the carbide, place the light in the water, wait a few seconds for the gas to generate, and apply a light.

27. Q.—How is the light enabled to retain its upright position when in the water? A.—By the iron weight which is fitted in the bottom of the light.

28. Q.—How is the water admitted to the carbide? A.—*When the bottom strips are removed, a small circular recess is uncovered; this recess is fitted with two small holes, which lead into a perforated tube passing about two-thirds the length of the cylinder. This perforated tube, which is charged with wool or cotton waste, enables the carbide to present a larger generating surface.

29. Q.—How long will the water light burn, one and two strips being removed? A.—With one strip only removed, the light should burn for three hours and give a 200 c.p. light; with both strips removed, it should burn for one and a-half hours and give a 400 c.p. light.

30. Q.—If when the three strips were removed and the light was placed in water, it would not act, what is the most likely defect? A.—The small holes which act as burners would probably be blocked or imperfectly made, thus allowing no outlet for the gas.

31. Q.—What should be done in the above circumstances? A.—The light should not be interfered with, but placed in a safe position, and another obtained.

32. Q.—What is done with burnt-out water lights? A.—Placed in a tank of water for at least ten hours.

33. Q.—What defects are likely to occur in water lights? A.—Small pinholes may show up, due to rust caused by dampness, faulty soldering, etc., or the light may be damaged by bad stowage. They should be examined periodically in order to detect these defects.

* Not to be committed to memory.
Chapter XVIII.—HYDRANTS AND WATER SUPPLY.

1. Q.—What is a fire hydrant? A.—An apparatus connected to a water-main for controlling and delivering water to hose or engines.

2. Q.—What types of hydrants are there? A.—The sluice valve and screw down patterns for fixing below ground level; firecooks and post hydrants used for above ground and for buildings.

3. Q.—What pattern hydrants are provided in the London County area for London Fire Brigade purposes? A.—Sluice valve hydrants of single and double pattern.

4. Q.—What pattern hydrant is in use in the City of London area? A.—Double outlet sluice valve hydrants.

5. Q.—Give a short description of L.C.C. single hydrants. A.—A single hydrant consists of (a) cast-iron socket flanged piece for connecting to the water-main; (b) sluice valve; (c) delivery bend with gun-metal screw outlet for hose connection; (d) an automatic frost valve for draining the elbow after use. The hydrant is fixed in a brick pit with a stone base, or in a cast-iron watertight chamber, and has an iron surface cover.

6. Q.—Give a short description of a L.C.C. double hydrant. A.—A double hydrant comprises two single hydrants joined together with an iron breeching or Y-piece arranged in a pit similarly to a single hydrant.

7. Q.—Give a short description of City Corporation hydrants. A.—City hydrants consist of (a) cast-iron socket flanged piece for connecting to water main; (b) sluice valve; (c) a delivery bend with two outlets having screwed caps; (d) a non-automatic frost valve is fitted for draining the elbow after use. The hydrant is arranged in a brick pit with a hinged surface cover.

8. Q.—What is the difference between a L.C.C. double hydrant and a City Corporation double hydrant? A.—The Brigade pattern has a separate sluice valve for each outlet. A City hydrant has one sluice valve to control both outlets.

9. Q.—What is the difference between getting a second delivery to work from a Brigade double hydrant and from a City hydrant?
A.—With the Brigade pattern it is only necessary to attach hose to second outlet and open the sluice valve, but with the City hydrant before the second delivery can be connected the hydrant must be shut down, screwed cap removed, hose attached and hydrant re-opened.

10. Q.—Who are the authorities concerned with installing and maintaining the system of hydrants in the County area and in the City of London? A.—The hydrants are obtained to the Council’s specifications and designs and are installed and maintained by the Metropolitan Water Board to the Council’s direction and at their expense. City hydrants are installed and maintained by the City Corporation.

11. Q.—Is there anything else in connection with a hydrant that is maintained by the Metropolitan Water Board at the expense of the London County Council? A.—Yes; command cock and branch pipe, leading from the main to the hydrant.

12. Q.—What is the approximate number of the L.F.B. hydrants? A.—About 30,000.

13. Q.—What is the approximate number of City hydrants? A.—About 830.

14. Q.—What distance apart are hydrants usually fixed in the London streets? A.—From about 50 to 450 ft., depending on the fire risks in the vicinity.

15. Q.—How often are hydrants tested? A.—Every two months.

16. Q.—Is each test during the year carried out in the same manner? If not, what is the difference? A.—On the first annual inspection the hydrant head and shaft are used and the sluice valve of the hydrant fully opened, on the other inspections the reduction cap and short length of tubing or metal branch with elbow is used.

17. Q.—In which direction is the spindle turned to open a standard pattern L.F.B. hydrant? A.—To the right, i.e., clockwise.

18. Q.—Are there any hydrants whose spindles turn in the opposite direction to open? A.—Yes, there are a limited number which open to the left, i.e., anti-clockwise, but these are being replaced.

19. Q.—By what means is a hydrant with a left-hand spindle

* Not to be committed to memory.