

London Midland and Scottish
Railway Company

THE PRIMARY OBJECT OF THIS BOOK-
LET IS TO INSTRUCT MEMBERS OF THE
COMPANY'S FIRE BRIGADES. IT WILL,
HOWEVER, GIVE SERVICE TO THE
STAFF GENERALLY, AND THOSE TO
WHOM IT IS ISSUED ARE EXPECTED
TO MAKE THEMSELVES CONVERSANT
WITH THE INSTRUCTIONS CONTAINED
————— HEREIN. —————

Each Member of a Fire Brigade must sign
for this booklet, and produce it for inspection
when called upon.

When a member retires from a brigade
the booklet must be given up immediately.

CHIEF MECHANICAL ENGINEER'S
OFFICE, EUSTON,
JULY, 1935.

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London Midland and Scottish Railway Company

FIRE PREVENTION AND FIRE EXTINGUISHING ARRANGEMENTS.

(1) The Fire Department is under the control of the Chief Mechanical Engineer, who is responsible for all arrangements (except only in regard to vessels afloat) for fire protection or prevention, fire extinguishing and investigating the causes of fire to Company's property or on Company's premises.

The Headquarters of the Fire Department are at Euston, with Divisional Headquarters at Crewe, Derby, Horwich and St. Rollox. A Fire Superintendent is stationed at each of these four centres.

(2) Communications on matters of policy or general procedure affecting more than one area should be addressed to the Chief Mechanical Engineer, Euston. Correspondence of a routine character, however, should be addressed to the Divisional Headquarters as indicated in paragraph (6).

(3) Payment of accounts for fire hydrant rentals, services at fires, &c., must not be made until the amounts have been certified by the C.M.E. Department. (Attention is called to Circular No. 47 dated 1st October, 1924, respecting the payment of staff fire brigades—see Appendix "B".)

(4) When schemes for new buildings or for structural alterations to existing buildings are in hand,

the Fire Department in every case should be given an opportunity of considering them from a fire protection point of view.

(5) The four Divisional Headquarters and their respective fire areas, including any joint lines where the maintenance is the responsibility of this Company, are as follows :—

Address of Divisional Headquarters.	Area.
MECHANICAL ENGINEER, St. Rollox, Glasgow.	All stations north of Gretna.
MECHANICAL ENGINEER, Horwich.	All stations Gretna and south thereof to a line including Liverpool Dock Stations, Allerton, Appleton, Moore, Styall, Handforth, Poynton, Disley, Barnsley, Cudworth, Grimethorpe (D.V.R.), Askern Inc., Goole, Hull; the Axholme Joint Railway is also included in this Division, also premises at Donegal Quay, Belfast, are included in this Division.
WORKS SUPERINTENDENT, C.M.E. Department, Crewe.	All stations south of the Central Division, Liverpool-Disley line, including Garston Dock, and west of a line including Alton, Uttoxeter, Lichfield, Tamworth, Market Bosworth, Croft, Broughton Astley, Lubenham, Clipston, Northampton, Roade, Ridgmont, Dunstable and Boxmoor; the Dundalk, Newry and Greenore Railway, also premises at Dublin and Kingstown, are included in this Division.
WORKS SUPERINTENDENT, C.M.E. Department, Derby.	All stations south of the Central Division, Liverpool-Hull line and east and south of the Western Division, Disley-Boxmoor line.

Action to be taken in case of Fire.

In case of fire on or threatening the Railway Company's property give alarm at once by fire bell, whistle or other means to :—

The Company's Staff Fire Brigade.

When a fire is of such proportion that it cannot readily be extinguished by the Company's Fire Brigade, or means are not available for successfully dealing with the outbreak, **the Local Authority's Brigade must immediately be called out.**

If necessary give alarm also to the Company's Fire Trains in accordance with the instructions in the Chief Operating Manager's Circular dated December, 1934.

Brief details as to the nature of the fire and lines and property involved with particular reference to any petrol, oil or any highly inflammable material must be given at the time the Local Authority's Brigade and/or the Company's Fire Train are ordered.

Diagram Indicating Position of Fire Appliances, &c. A diagram prepared by the station master, goods agent, or other officer in charge, indicating the position of all hydrants, stop valves, drain cocks, hose boxes, fire buckets and fire extinguishers, must be exhibited in a prominent place at each station, depot, &c.

The telephone number of the Local Authority's Fire brigade must also be plainly shewn on this diagram.

At stations, depots, &c., where there is no Post Office telephone, the position of the nearest accessible telephone or fire alarm must be clearly indicated on the diagram.

Reporting of Fires.

All fires on or threatening the Company's property to be immediately reported direct to the Fire Department of the area concerned and in accordance with Departmental instructions. A written report on Form E.R.O.14335 giving full details to follow as soon as practicable.

L.M.S. Fire Brigades.

The number of men forming a Brigade depends upon the risk at each Station or Depot. The selection of members of Brigades is made from the staff on different turns of duty with a view to the whole of the 24 hours being covered as far as practicable by some portion of the Brigade. *Watchmen must, where practicable, be members of the Fire Brigade.* With this exception preference is given to suitable members of the staff who reside nearest the place to which they are attached, so that they can readily be called upon in case of fire.

At each Station and Depot where there is a Fire Brigade a list which must be kept up to date, must be posted in a prominent position showing the full name and address of each member of the Brigade, with information as to how the men are to be called in case of fire at night.

At intervals the Fire Superintendent of the Area, or his assistant, will pay surprise visits to Stations and Depots to test the general efficiency of the Fire Brigade.

The Captain of each Fire Brigade (and in his absence the Sub-Captain or Senior Fireman) is responsible for

seeing that the stop valves, hydrants, &c., fire appliances and equipment are in proper order and available for instant use. He is responsible for the general discipline of the Brigade and for the performance of the regular drills, which must be executed in his presence and in a proper manner. He must keep a fire occurrence book up to date recording there-in all changes of staff, dates of drills and individual performances thereat, dates and particulars of fires, appliances received or sent away for repairs, &c., and all other matters pertaining to the working of an efficient Fire Brigade.

Every member of a Fire Brigade should drill at least once every calendar month. Any member not able to drill on the appointed day must take his drill on the first next convenient day in that month. Records of each one-man drill, combined drill and any surprise drills that take place are to be entered with the correct times inserted on the monthly "Drill and Appliances Return" (E.R.O. 14330) which is to be forwarded to the Fire Department of the area at the end of each month. In the event of any member not attending a drill during the month, the reason for such non-attendance is to be given on the return. Payment of annual allowance and his membership of the Brigade are dependent upon the number of attendances per annum.

As far as possible all drills must be carried out during ordinary working hours. Where this is found impracticable, the authority of the Fire Department of the area should be obtained before other arrangements are made.

Without special permission from the Fire Department, not more than two wet drills per annum must

take place, and these should be held in the summer months when it is possible to dry the hose thoroughly before it is made up again.

All wet drills should be entered on the monthly return. When a sealed hydrant or sealed valve is opened for the purpose it should be specially mentioned. Sealed hydrants and valves should be opened, at an average, once in twelve months.

Before opening any sealed hydrants or valve for the purpose of holding a wet drill, or for inspection, adequate notice must be sent to the Local Water Authority; the Fire Department of the area must be notified at the same time.

Where separate Fire Brigades are maintained by the Passenger, Goods or other Departments, members of each Brigade must answer fire alarms in any department and assist in the work of extinguishing fires, the Captain of the Brigade in whose area the fire is will take charge. If assistance arrives from one of the Company's Fire Trains the Officer in charge will take full control of the extinguishing arrangements, unless the Local Authority's Brigade is in attendance in which case the Chief Officer of that Brigade will take charge.

Firemen are required to carry out readily and smartly all orders given by their Officers. (A senior fireman, acting as deputy, is an "Officer" for the time being.)

They are to attend the periodical drills at the stipulated times, and endeavour by attention and practice to make themselves efficient members of the Brigade.

When members of the Fire Brigade are likely to be away from home they must inform their Superior Officer.

All ranks are to take their fair share in maintaining the appliances and equipment in good and clean condition and in preventing misuse; and are expected to assist in seeing that the Regulations for **Fire Prevention** are rigidly observed, reporting to the Captain any circumstances requiring attention.

They are to answer fire alarms promptly, whether the alarm is given for an actual fire or for drill.

Each member should recollect that he is a unit of a Brigade, and in Brigade work should be able to take his proper place. At the same time he should fit himself to act on his own initiative in the absence of his Captain or other Officer. To enable him to do this efficiently and without excitement, it is essential that he be competent to handle each appliance and be thoroughly acquainted with the use and position of all stop valves, hydrants, and landing valves (generally fixed on walls or the upper storeys of warehouses) which may be required for use in case of fire.

It should never be necessary for a fireman to wait the arrival of a comrade before starting to get the appliances into use to deal with a fire.

All orders are to be given by the Officer in charge, and whether at drill or at a fire, work is to be done silently, quickly and intelligently, and discipline must be maintained. Indiscriminate shouting or blowing of whistles is not permitted. On no account must conversation be held with, or instructions taken from, outsiders; they are to be referred to the Officer in charge.

In case of a fire off the Company's property, and Company's property is not likely to be endangered, if the Company's Brigade is called out to render

assistance, it is desirable that the Captain or other person responsible obtain an order from the owner or his representative before getting the appliance into use, making it clear that any expense incurred by the Company will be reimbursed, unless standing arrangements for Fire Brigade services are in force. It is, however, inadvisable to interfere with the routine of the Company's staff if it can be reasonably avoided.

In towns where there are public fire alarms the members of the Brigade must make themselves acquainted with the positions of those nearest the Company's property and the method of working them. The necessary information will be freely given at the Fire Station.

Firemen should be conversant with the method of operating any special stop valves which have to be opened or closed in order to increase the pressure of water for fire fighting purposes.

Also firemen should be acquainted with the position and method of operating the gas main cocks, and electrical main switches at their Station or Depot.

Care and Maintenance of Fire Appliances.

The Captain of each Fire Brigade is responsible for seeing that :—

Fire buckets, extinguishers and other appliances are in good order and ready for immediate use.

Hydrant boxes are kept clean inside.

In frosty weather the hydrants are packed with straw or otherwise suitably protected, and hydrant covers kept well salted.

Fire buckets are emptied when frost sets in and refilled with fresh water as soon as the frost breaks.

During frosty weather exposed vertical fire mains are kept empty, the stop valve closed and drain tap left open. **Some discretion should be exercised in turning the water on and off so that the mains will be available for instant use as much as possible.**

At stations and depots where there is no fire brigade the Station Master, Goods Agent or other Officer in charge will be responsible for seeing that the fire buckets, extinguishers and other appliances are kept in good order and ready for immediate use.

On no account are fire appliances (including fire buckets) to be used for other purposes than that for which they are provided.

The brass and copper portions of fire appliances can be kept clean satisfactorily by the frequent use of an oily cloth.

Canvas fire hose having *instantaneous* (snap) couplings should be rolled up as a single coil starting with the female coupling. This does not apply to the Northern Division where all hose is made up in a similar manner to hose having *screw* or *bayonet* couplings, i.e., from the centre with the male coupling uppermost.

Fire buckets, battens, hose boxes, hydrant and stop valve indication plates, etc., are painted by the Engineering Department when stations are being painted. Chemical fire extinguishers, however, must not be painted at the station but sent to the Fire Department of the area when in need of painting.

Unless specially arranged otherwise by the Fire Department, all equipment in need of repainting between the periodical paintings of the station, and all equipment requiring repairs, must be dealt with as follows :—

Battens	}	Notify requirements to Fire Department by letter, giving details.
Hose Boxes		
Indication Plates		
Sand Boxes and other fixtures.		

Buckets	}	Send to Fire Department of the area. In the case of buckets not more than three should be sent at one time and care should be taken to see that they are securely fastened together.
Extinguishers, Hose, and other Loose Appliances.		

All appliances, &c., sent in for repairs or repainting must have a label attached showing Station and Department forwarding, and at the same time a repair note should be forwarded stating requirements.

All requisitions for fire appliances must be forwarded to the Fire Department of the area.

It is absolutely essential that all fire appliances should be kept in good working order, and available for instant use when required.

Defects must be immediately reported and dealt with.

Hydrants, landing valves and other fire appliances must not at any time be covered or obstructed by merchandise.

Every care must be exercised in using appliances whether at drill or fire. They are not to be thrown or dropped on the ground but when necessary should be laid down, thus avoiding damage.

Fire alarm bells should be kept in full working order and oiled weekly, and where electric alarms are installed these should be tested frequently at stated times and the tests recorded. Any defect in the working of alarms should be immediately reported.

At some stations where hydrants are supplied with water without passing through a meter, either the main stop-valve or the fire hydrants are sealed by the Water Authorities, and this seal has to be broken to bring them into use. The stop valve key and bar, or the key which in some cases is in one piece, must always be kept in the hose cupboard, or hung up close by so that there will be no delay in obtaining water.

Hydrants—
Stop Valves
and Bye-pass
Valves.

At other stations a sealed bye-pass valve is fitted with a fixed hand-wheel for turning on the water and obtaining a better supply of water in case of fire.

When it has been necessary to break any of these seals for dealing with fire, notice must be sent to the local Water Office and to the Fire Department of the area as soon as possible.

Hydrants must be opened and closed gradually ; if they are opened suddenly the hose or water main is liable to sustain serious damage.

In all cases of failure of water supply to fire hydrants the district representative of the Chief Mechanical Engineer's Outdoor Machinery Section must be informed by telephone or telegram.

Where these are installed it is most important that the positions of the stop valves and drain cocks be

Automatic
Sprinklers.

well known; *they are set with the stop valve open.* If the sprinklers are accidentally actuated, the stop valve must at once be closed and the drain cock opened in order that water damage may be prevented. The defect remedied the stop valve must be opened again. In case of fire great care should be taken to see that the stop valve is not closed before the fire is properly extinguished.

Bucket Hand
Pumps and
Corridor
Pumps.

For extinguishing small fires these appliances are most useful, water being distributed by their use with better effect and to higher points than when delivered direct from a bucket.

The buckets or cisterns must be kept clean in order to prevent the choking of pump valves, the leathers on plungers frequently lubricated to keep them soft, and the suction valve chamber occasionally removed and replaced to avoid getting set. Castor Oil or some animal fat only to be used on the leather washers on both pump and hose; on no account must mineral oils, lamp oils, &c., be used.

The small brass jet or nozzle must always be kept on the length of hose, and the hose must be kept dry when not actually in use.

To test these pumps, the delivery outlet should be covered by the thumb. The piston should then be worked for a few strokes and released when at the bottom of the down stroke. If a proper fit the piston will rise by reason of the compression in the delivery chamber. If this does not happen a report should be sent to the Fire Department.

Hose
Cupboards.

The hose cupboards must be kept clean and in good repair, with the glass and key (where provided) in position. The hinges and lock should be oiled regularly.

Every care must be taken of the canvas hose.

Hose.

After a fire or a wet drill it must be washed, carefully drained, and thoroughly dried before being put away. In many instances hose put away apparently dry has been found mildewed and unfit for use owing to the want of proper drying.

When salt water has been used, the hose should as soon as possible afterwards be connected to a fresh water main and flushed out.

If the hose is dusty after a dry drill, remove the dust with a brush before making up.

Damage to hose is often caused by dragging over the ground, and Captains are specially cautioned not to allow this.

After a dry drill hose should be made up neatly and tightly so that it may be readily run out without kinks being formed.

For drills each length of hose should be used in rotation to prevent undue wear of any one length.

To obtain best results good washers must be maintained. The rubber ones (instantaneous couplings) should be kept free from oil or grease. Leather washers should be kept soft with castor oil or some suitable animal fat.

Washers.

Do not screw up the nuts on the flanged joint too tightly or the swivel head of the standpipe will not turn in the direction required when wanted.

Standpipes.

These must not be handled roughly or they will be bent or dented, resulting in a bad jet of water.

Branchpipes.

These must always be kept in the hose cupboard so that there will be no delay in removing hydrant lids.

Hydrant Lid
Keys.

These are supplied to stations where the valve type of hydrant is fixed. The key and bar must be kept

Valve Keys
and bars.

together in the hose cupboard or hung up close by as one without the other is useless.

Fire Stations
and Hose
Carts.

These must be kept scrupulously clean. The wheels, springs, axles, axleboxes, shackles, nuts and bolts of hose carts must be cleaned and oiled at least once in every six months, and after a run out should be examined to see that all are in order.

Stationary
Pumps.

These pumps are to be thoroughly examined at least once every twelve months, valves and leathers renewed if necessary, and any necessary repairs promptly carried out.

In no case is a power-driven firepump to be disabled for repairs without first acquainting the Fire Department by wire or letter.

Sand-boxes.

Sand-boxes on electrified lines must be kept supplied with dry sand, and with a scoop in each. Supplies of sand to be requisitioned from the Permanent Way Department.

CHEMICAL FIRE EXTINGUISHERS.

General
Instructions.

The chemical fire extinguishers at the various Stations, Depots, Hotels, &c., also on passenger trains and road motor vehicles, are of different types and supplied by different makers, but each extinguisher has instructions printed upon it stating how to bring it into use, and all concerned should make themselves familiar with the method of operating each type they come into contact with during the course of their duties.

After use, an extinguisher should never be allowed to stand empty (unless it is being sent in for repairs, &c.), but should be immediately recharged.

Note.—Soda-Acid and Foam type of extinguishers should receive a thorough wash out previous to being re-charged.

Charges for extinguishers are supplied from Crewe, Derby, Horwich and St. Rollox, in tins or packages containing the exact ingredients, and requisitions for them must be made on the Fire Department at these places.

When ordering spare charges, state type and maker of extinguisher, also capacity.

Sufficient spare charges should always be kept on hand. The containers holding these spare charges generally have printed on them instructions for re-charging and care must be taken to see that these instructions are strictly observed. General instructions for charging soda-acid type extinguishers, however, are given below:—

1. Carefully remove all broken glass and accumulation of bi-carbonate of soda. (It is essential that any deposit of soda be carefully removed each time

To Charge
Soda Acid
Type Fire
Extinguishers

the extinguisher is charged otherwise the deposit will block up the small holes at the bottom of the discharge pipe, rendering the appliance useless.)

2. **Wash out with clean water.**
3. Put the White Powder (bi-carbonate of soda) into a clean bucket containing a few inches of water (warm water is best as the bi-carbonate of soda dissolves more readily therein) then stir by hand until the powder is dissolved. Empty the mixture into the extinguisher and fill up with clean water, leaving a clear space of four inches for the carbonic acid gas to accumulate. *Great care to be taken that the powder is properly dissolved in the bucket before decanting into the extinguisher.*
4. Draw the plunger out to its fullest extent; then place the bottle containing the sulphuric acid in position in the cage or cradle and screw down the cover firmly. The extinguisher remains in this state until required for use.

Extinguishers
on Passenger
Stock.

Guards on taking charge of a van or brake carriage must see whether the seals on the tool cupboard are intact, and that fire extinguishers, buckets and ladder are in their places. If they are not, the guards must advise the Station Master or Carriage and Wagon Department staff who must arrange to do what is necessary either before the train leaves or wire the nearest depot. A special remark must also be made by the guard on his journal.

Extinguishers
on Road
Motor
Vehicles.

The driver of each vehicle should be conversant with the method of operating the fire extinguisher and be responsible for seeing that it is in position and *in good order*. If the extinguisher is found to be out of order it must be immediately exchanged.

At Road Motor Department Depots the Leading Fitter is responsible for seeing that each vehicle is fitted with the recognised fire extinguisher and that it is charged and in good order each time the vehicle is in for repairs or periodical inspection. At stations where there is no Road Motor Department staff the Carriage Foreman or person in charge is responsible for seeing that each vehicle is fitted with the recognised fire extinguisher, and he should satisfy himself at least once each month that each extinguisher is in good order.

The Captain of the Fire Brigade to be responsible for seeing that all extinguishers in the area protected by his brigade are kept in good order, and ready for immediate use in case of emergency. Where there is no fire brigade the Station Master, Goods Agent, or other responsible officer to undertake the duty.

Extinguishers
at Stations,
Depots,
Hotels, &c.

Extinguishers should be examined frequently and if any defects are noticed the charge should be removed through the filling cap and the extinguisher sent to the Fire Department of the area, with a report, for examination and testing.

Examination
and Testing.

Soda-Acid and *Foam* types of extinguishers are tested by hydraulic pressure when new and should be again hydraulically tested every six years. Those on Passenger Trains will be dealt with when the vehicles are in the shops for overhaul whilst those at Stations, Depots, &c., will require sending to the Fire Department for testing. The date of the last test will be marked on the extinguisher. Extinguishers, however, should not be sent in for periodical testing until arrangements have previously been made with the Fire Department.

In addition, the contents of the extinguishers should be examined every 12 months, and in the case of "Foam" extinguishers, the charges should be renewed every two years.

To examine the charge of a "Foam" extinguisher, the two liquids should be emptied into separate clean buckets, and if in order, carefully replaced in the extinguishers.

To examine the charge of a Soda-Acid extinguisher, the acid bottle should be carefully lifted out of the cage, and the soda charge emptied into a clean bucket. If in order, they should be carefully replaced in the extinguisher.

In the case of both types, whilst the charges are removed, the inside of the extinguishers should be examined, and if any sediment is noticed, it should be thoroughly washed out, and a fresh charge used.

In all cases when charging extinguishers, care must be taken to see that the inside is clean, the powder thoroughly dissolved, and the extinguishers filled up to the correct level.

Before an extinguisher is sent in for testing, painting, &c., it should be emptied and thoroughly washed out. On such occasions, in order to familiarize the staff in the use of these appliances, opportunity should be taken to discharge the extinguisher on to an imaginary fire, as many of the staff as convenient being allowed to witness or take part in the demonstration.

In frosty weather extinguishers in exposed places should be taken indoors and placed in accessible positions; otherwise they will be liable to damage by frost and consequently when wanted may be found to be useless.

C.T.C. (Carbon Tetrachloride) type extinguishers which are usually in the form of a small pump, should be frequently shaken in order to ascertain whether they are fully charged.

FIRES AND FIRE EXTINCTION.

To be successful in fire fighting it must be distinctly General Fires. understood that it is no use to try to work at a distance. Fire is extinguished either by exclusion of air or by lowering the temperature below that of ignition. In the former case the object is attained by smothering the burning substance and in the latter by the application of water. In some case, however, beating is resorted to. Where water is used it must actually hit the burning material to obtain useful result, therefore, the object must be to work as closely as possible to the fire. Working at a distance should only be done when the heat or danger of falling walls, roofs or floors prevents the firemen getting closer.

If discovered in time, most fires can be subdued or kept in check by buckets of water, hand pumps, or extinguishers. Fires often look much worse than they are, and no one should flinch from attacking a fire at close quarters, especially when it is in its earliest stages.

Promptitude is the essence of fire fighting. Next to prevention, quick extinction is more efficacious in saving life and property than any other possible means. If a small outbreak can be dealt with by buckets, hand pumps, or extinguishers, it will save heavy water damage. The best fireman is he who extinguishes a fire with the least water damage.

It must be remembered that much good can be done in the early stages by isolating the substance which is on fire. It may be possible, while means of extinction are being procured to separate the burning mass from material likely to fire. Where water or other means of extinction is not available, or where the burning building or other substance on fire cannot be knocked down and

trampled on, separation is the only way to reduce fire loss.

Many large fires have occurred which could have been confined to small limits had a van or a few packing cases been removed and so broken the course of the fire. Similarly the prompt action of tearing down curtains or other inflammable material will go far towards saving a building.

When there is the slightest doubt as to the ability to extinguish a fire single handed, assistance must be summoned early.

When called to a fire in a building the first action should be to ascertain the extent of the outbreak, if possible by entering the building by ordinary means, by ladder, or by ordinary fire escape. Having learned the extent of the fire (by observation or information given on the spot), appliances should be got into use to deal with the outbreak.

Persons in danger must always receive first consideration. It may be possible for one section of men to attend to this while the other is getting fire appliances to work.

Where a person's clothing is on fire, wrap a blanket, coat, rug or similar article round the body in order to smother the fire, or if this cannot be done, the person should be made to roll over and over on the floor.

Until the fire fighting appliances are ready to be brought into use, all doors and windows should be kept closed. It is of the utmost importance to locate the exact position of a fire at the earliest possible moment, so that it may be properly dealt with and so that steps may be taken to prevent adjacent property taking fire.

It is not always easy to locate and define the extent of a fire owing to smoke filling the compartment, room or building. If there is much smoke, it will be found that the air is clearer nearer the ground; therefore a wet cloth should be tied over the nose and mouth, and a stooping or even crawling attitude should be adopted. If working with a jet, keep near the stream of water. To enable some advance to be made, some judicious opening of doors or windows will have to be done to help clear the smoke and a jet brought forward ready for use. Often fires difficult to locate, owing to large quantities of smoke, have been found to be of comparatively insignificant size, the burning material having been of a class that gives off large volumes of smoke. It is therefore important that attention be given to the heat of the smoke. If there is a great heat in the smoke the fire is extensive and there is great risk of a larger fire, because access of air is liable to convert a volume of highly heated smoke into a sheet of flame. Care and judgment are therefore called for.

A fireman should be careful when entering a burning building alone. If there is dense smoke, a life-line should, where possible, be used, one end being fastened outside and the other to the fireman; by this means the way back can be more readily traced.

Where the building on fire communicates with another by means of doors, shoots, shafting boxes, &c., it is of the utmost importance that all such doors be at once shut tight and the other openings closed, with the exception of those openings through which it is found convenient for the firemen to work their jets on to the fire. As far as possible no goods must be left in the immediate vicinity of such doors, &c. Men must also be told off to watch the doors or shutters protecting

the openings, so that if they fail to confine the fire to the first building affected, special steps may be taken to check its advance.

Any building in close proximity to a large fire needs protection by detailing men to close all windows and doors, and at any risky points firemen should be posted with appliances ready for immediate use should the threatened building take fire.

It is also necessary to set men on to look out for burning wood, papers, sparks, &c., falling upon goods either in wagons or upon dunnage, so as to extinguish any fire in its early stages.

In working at a fire in a building, should the firemen working the jets be driven back, they must make every effort to close or make up the doors through which they have been working. Also, if they are working with a hose attached to a hydrant or landing valve in the vacated room, the valve should be shut off before leaving, otherwise it will spend its water uselessly and deprive the jets at other points of vitally necessary pressure. This is of very great importance. Discretion is necessary in deciding upon the best number of jets to use at a large fire. Two good jets of water are more effective than four indifferent ones. Each Brigade must therefore find out how many hydrants can be used effectively by day and by night at their respective stations; if for instance, two fair jets of water are available by day, it may be found that three can be obtained at night owing to less call upon the water mains. In some cases the quantity and pressure of water are only sufficient to supply one good jet, and in others not even one can be obtained without the aid of a fire engine.

Where gas is installed in a building which is on fire the main cocks must be turned off at the earliest possible moment.

Burning gas from an iron pipe, if it cannot be turned off, should be stifled with a cloth or rug and the hole immediately plugged. In the case of lead or composition pipes the end should be turned back and flattened. If gas is burning with other substances, every effort should be made to cut off the supply before the fire is extinguished in order to avoid risk of explosion.

When small leadpipes (either gas or water) are melted or broken, they should be knocked up to prevent further loss when the gas or water is afterwards turned on.

During the time a fire is burning—if it is in the upper floors of a warehouse or other similar buildings—all available tar sheets should be brought into use to cover the merchandise stored on the floors under the fire: men should be started to sweep the water out of the delivery doors or down the staircase: and when the fire is out, and water cleared off, the floors should be well covered with sawdust to soak up the moisture, and all doors and windows opened for a while to help to dry the buildings and clear off smoke fumes. If this is done promptly and effectively, the company will be saved heavy losses.

Care must be taken to avoid needless damage; but when necessary impeding obstacles may be broken down, or removed, doors broken open, windows cut away, or partitions pierced or moved to get at a fire; also holes cut through floors to allow water to drain away.

Whenever a fire has occurred and presumably extinguished the debris and surroundings must be carefully examined to make certain that the fire is actually out before being left.

Where it is likely that electric light or power conductors or fittings have been damaged by fire or

Electrical
Fires.

it is probable that water will come in contact with them the current should be cut off at the main switch.

In power houses, or where electrical plant is extensive, water should not be used without the approval of the electrician.

In many instances a slight outbreak on an installation can be dealt with by switching off the current on the section affected, any small fire remaining can then be effectively dealt with.

For small electric fires, dry sand is generally used as a means of extinction but sand in the mechanism of a switch-board or motor would do much damage.

There is a class of chemical extinguisher in the form of a small pump, using carbon tetrachloride, recommended for dealing with electrical fires, and where these are installed they should be used in preference to sand where mechanism is involved; always bearing in mind that when practicable the current should first be cut off.

Exclude all draught by closing dampers, &c. An effective means of dulling a chimney fire, if not altogether extinguishing it, is to sprinkle water on the fire in the grate.

Where cotton or similar material has been on fire, directly the outbreak is checked the work of removing the bales from the building must be commenced, and the fire then completely extinguished. This is best accomplished by treating each bale separately, picking out the fire, and putting the smouldering matter into buckets of water and then thoroughly damping the surrounding portion of the bale with water from fire buckets.

Fire damaged cotton at all times needs careful watching, the bales should not be broken open (see also "Fires in Wagons").

Chimney
Fires.

Cotton, etc.

For internal fires in stacks a passage should, where practicable, be cut through the stack to separate the cool from the heated portion, and a trench, say two feet broad, cut round the burning portion, and water delivered into the trench. If the stack is ablaze, extinguish it in the ordinary way with water, working all round from edge to centre, and remove surrounding objects of a combustible nature.

The increased danger of burning liquids, compared with solids, is that if they are not kept below ground level or in sufficiently strong containers, they may in their flow carry fire to other substances. Also in certain circumstances, there is a danger of explosion.

Sand and earth should be used to extinguish oil or spirit fires, and, if necessary, to form a bank to prevent flow. If chemical extinguishers of the Foam type are available, they should be brought into action as soon as possible. A rug or cloth is also useful in stifling small fires.

In the case of large tanks, where it is found that the fire cannot be subdued, all combustible material, should, as far as possible, be moved to a safe distance from the fire. Where this cannot be done, water may be used to keep the surroundings and the lower parts of the tanks cool by spraying, but care must be taken that such volume of water capable of bearing burning oil is not accumulated either in the pits or on the ground.

Where a vehicle takes fire, whether running or stationary, and being in the vicinity of other vehicles, bridges, buildings, &c., likely to become involved, it should be moved clear, if practicable, then brought to a stand, the petrol shut off and the chemical extinguisher used quickly.

If the efforts to put out the fire are not quickly successful, send for the local Fire Brigade, and if the

Coal and
Coke.

Inflammable
Liquids.

Fire on
petrol-driven
vehicles.

fire is off the Company's premises give them the name of the street and location.

In the case of a fire occurring in a building and a C.T.C. type fire extinguisher has been used, immediately the fire is put out, open windows and allow as much air to get into the place as possible.

Fires in
Wagons
(General).

When accidents or fires occur involving or threatening explosives or other dangerous goods in the possession of the Railway Company, the first aim must be to prevent injury to life, and the next to prevent the damage extending to merchandise or to other property.

The steps to be taken depend upon the nature of the goods involved, and this should be, if possible, ascertained at the outset. Trucks containing Explosives, Inflammable Liquids or other Dangerous Goods have distinctive labels, as per specimens shewn below.

The labels are printed in black and red inks.

LONDON MIDLAND AND SCOTTISH RAILWAY COMPANY. L.M.S. BOARD
1917

EXPLOSIVES 3

DATE _____ 19 ____ TRAIN _____

FROM _____

TO _____

VIA _____ C.T.C. _____

SIDING _____

Owner and No. of Wagon _____

Consignee _____

PLACE AS FAR AS PRACTICABLE FROM ENGINE, BRAKE-VAN and VEHICLES LABELLED "INFLAMMABLE"

SHUNT WITH GREAT CARE.

LOAD and UNLOAD OUTSIDE GOODS SHEDS.

This label to be used for GUNPOWDER and all other EXPLOSIVES.

LONDON MIDLAND AND SCOTTISH RAILWAY COMPANY. L.M.S. BOARD
1917

HIGHLY INFLAMMABLE 3

DATE _____ 19 ____ TRAIN _____

FROM _____ TO _____

Via _____

SHEETS IN or ON Wagon, Total No. _____

Owner and No. of Wagon _____

Consignee _____

PLACE AS NEAR MIDDLE OF TRAIN AS POSSIBLE AND AWAY FROM VEHICLES LABELLED "EXPLOSIVES" AND TANK WAGONS CONTAINING COMPRESSED GASES

KEEP LIGHTS AWAY

SHUNT WITH CARE

LOAD and UNLOAD OUTSIDE GOODS SHEDS

LABEL FOR CLASS "A" INFLAMMABLE LIQUIDS

LONDON MIDLAND AND SCOTTISH RAILWAY COMPANY. L.M.S. BOARD
1917

INFLAMMABLE 3

DATE _____ 19 ____ TRAIN _____

FROM _____

TO _____

Via _____

SHEETS IN or ON Wagon, Total No. _____

Owner & No. of Wagon _____

Consignee _____

PLACE AS FAR AS PRACTICABLE FROM ENGINE, BRAKE-VAN AND VEHICLES LABELLED "EXPLOSIVES."

KEEP LIGHTS AWAY FROM THIS TRUCK.

LOAD and UNLOAD OUTSIDE GOODS SHEDS.

This Label to be used for INFLAMMABLE LIQUIDS.

LONDON MIDLAND & SCOTTISH RAILWAY COMPANY. S.A.S. 2001 191

DANGEROUS

DATE _____ 19 ____ TRAIN _____

FROM _____

TO _____

Via _____

SHEETS IN or ON Wagon. Total No. _____

Owner & No. of Wagon _____

Consignee _____

A

2

SHUNT WITH CARE

FOR SPENT OXIDE ONLY.

LONDON MIDLAND AND SCOTTISH RAILWAY COMPANY. S.A.S. 2001 191

DANGEROUS

DATE _____ 19 ____ TRAIN _____

FROM _____

TO _____

Via _____

SHEETS IN or ON Wagon. Total No. _____

Owner & No. of Wagon _____

Consignee _____

3

SHUNT WITH CARE

THIS LABEL TO BE USED FOR ACIDS AND ALL OTHER DANGEROUS GOODS EXCEPT INFLAMMABLE LIQUIDS AND EXPLOSIVES.

LONDON MIDLAND AND SCOTTISH RAILWAY COMPANY. S.A.S. 2002 192

PLACE AS FAR AS PRACTICABLE FROM ENGINE, BRAKE-VAN AND VEHICLES LABELLED "EXPLOSIVES"

DATE _____ 19 ____

TRAIN _____

FROM _____

TO _____

Via _____

DANGEROUS

Owner and No. of Wagon _____

Consignee _____

3

KEEP NAKED LIGHTS AWAY

NOT TO BE SHEETED

SHUNT WITH GREAT CARE

ESCAPE OF GAS FROM VALVES IS NORMAL AND NECESSARY

FOR LIQUID OXYGEN ONLY

Where a fire occurs in a wagon forming part of a train, unless it is clear that it can be dealt with by water from the locomotive tender, or by smothering with earth, sand or ballast, the wagons in the rear of the one on fire should be detached and, where practicable, the front part of the train with the burning wagon run to the nearest water column or to the next station where fire appliances can be brought into use.

If the fire is serious and other wagons are likely to be involved before the wagon can be got to a water column or station, the burning vehicle should be dealt with in accordance with General Rule 188 in the Book of Rules and Regulations.

After a fire the wagon must be detained under observation at the nearest station until it is certain that no further outbreak of fire will occur, and should not be sent forward until a representative of the Carriage and Wagon Department has given permission.

Where any smouldering goods are left at the side of the line the Station Master at the nearest station must be notified. The Station Master must then take steps to have the goods, after extinction of any remaining fire, removed to his station without delay.

Where possible, packages on fire should be removed from the wagons before extinguishing, so as to avoid damaging more goods than necessary with water.

Explosives. Explosives are conveyed in :—

- (a) Metallic Gunpowder Vans which are practically fireproof, or
- (b) Metallic packages in ordinary trucks.

If a fire occurs on a train conveying Explosives, the first effort should be to remove the vehicles containing the Explosives to a safe distance. If, however, the fire involves the vehicle actually carrying the Explosive, efforts should be confined to getting every person to a safe distance.

Cotton,
Wool, etc.

If practicable try to separate the bales or bags which are burning before attempting to extinguish the fire under a water column or by buckets, as wetting the unburnt cotton increases the loss. Do not remove the bands, as loose cotton on fire is difficult to deal with and the fire loss is greater.

It is better, after the blaze has been checked, to pluck out such of the material as is still smouldering.

The hose must be kept attached to the standpipe ready to check the fire should it show signs of breaking out again.

The following points are to be borne in mind when dealing with cotton fires :—

It must never be assumed that the fire is out and left too soon.

Water damage to sound bales and bags is to be averted as far as it is possible with safety, and the burnt cotton should not be placed where it is liable to be damaged with mud and dirt.

The bands must not be taken off.

The same directions apply to wagons of esparto, jute, hay, straw and other fibres.

In dealing with wagons of yarn, the burning skips should be drenched with water, as in the case of burning cotton bales; but the cops of yarn should afterwards be picked out and placed in a clean skip. Failure to attend to the latter point will result in still heavier loss by dirt on the cops.

After the fire has been extinguished, the remainder of the load must be carefully examined and the wagon or wagons affected isolated and kept under observation as such fires tend to break out again. After detention for several hours and there being no smoke or signs of fire, the wagon or wagons may be sent forward to destination. The bales which have been on fire must, however, not be replaced in the wagon with sound bales, but if only slightly damaged, the burnt cotton, blackened portions, &c., should be picked off and the bales sent on to destination in a spare wagon, or one in which there are no other inflammable materials.

Great care must be exercised in dealing with wagons Acids containing drums, carboys, or bottles of acids.

Fires are in some cases caused by a spark igniting the straw packing around the glass carboys or bottles. The bottles then crack with the heat and allow the contents to escape into the wagons.

In other cases bottles are broken by rough shunting, and by the acid coming in contact with the straw packing, wood-work, and ironwork of the wagon, decomposition is set up and flames break out.

The best method of dealing with such cases is to remove any cracked or broken bottles with care, and if any of the liquid has been spilled in the wagon, place it under a water column, or use the fire hose without branch pipe attached, drop one of the side doors, preferably the one on the side which is lowest, and swill the wagon bottom well out **using plenty of water**. A small quantity of water is dangerous. Whilst doing this, keep on the weather side of the wagon, so that any fumes given off will be blown away from the person. Ashes, lime or ballast may be used to check a fire caused by acid.

In cases where Oleum (Fuming Sulphuric Acid) is leaking from a glass vessel and the containing vessel is not broken, the package should either be carefully lifted out of the wagon and deposited on the ground in a safe place until it can be attended to by some authorised person, or, if the leak can be temporarily closed with a wooden plug and the vessel securely scotched in the wagon, it should be surrounded with ashes or lime and sent forward to destination, the special attention of the guard being called to the matter. (Care should be taken not to inhale the fumes given off by nitric and sulphuric acids. If, however, fumes have been inhaled medical advice should be sought. Also corrosive liquids in contact with the hands or body may cause burning. Wash the hands or parts of the body affected well with water.)

Cylinders of Compressed Gases are liable to explode if near a fire, and there are dangers both from the

Compressed
Gases.

cylinders themselves, and from the escaping gases. If the fire is very near such cylinders, keep everyone far away.

These fires rapidly become fierce and the fumes are dangerous. Water is the best extinguisher but only useful if applied in large quantities. It is generally better to concentrate on the protection of the surroundings, leaving the celluloid to burn out. Celluloid.

Note.—On passenger trains celluloid films should be carried in the rear van, and kept away from heaters or heating pipes. Also whilst in Parcels Offices, &c., awaiting despatch they should be kept separate from other traffic and away from sources of heat.

Some kinds of charcoal are liable to ignite spontaneously, damp charcoal being specially liable to this. It is better to unload the portion which is alight before attempting to put out the fire with water. If this is not practicable, water may be used sparingly to extinguish the visible fire; then, after removal of all the charcoal from the wagon, the wet should be separated from the dry. The portion remaining dry and undamaged should be forwarded with all speed to destination, and the wet portion should be stored in the open and held pending instructions. The special attention of the guard should be called to the load. Charcoal.

These should be removed from the vicinity of a fire to a cool place. If this cannot be done at once, the vessels must be kept cool by the application of water. Gas
Cylinders,
Gas, Oil and
Spirit Tank
Wagons &c.

The lime near the burning part should be thrown out and fire extinguished, if possible, by smothering. If water has to be used on the burning woodwork, care must be taken not to wet the lime remaining in the truck. Lime.

Matches.

If packed in a well made case although a few matches may ignite, they are generally smothered by their own smoke which clears away without any flame appearing. In such cases, do not apply water. If, however, flame appears, the case should be removed from the wagon or warehouse, or, if this is not practicable, other combustible goods in the vicinity should be moved to a safe distance, and water used.

Do not open the case unless the contents continue to burn.

Saltpetre and other Nitrates.

Saltpetre, Nitrate of Soda, and other Nitrates do not burn, but if they come into contact with a fire the latter becomes very fierce. Special efforts should be made to remove such materials from the zone of fire.

Spent Oxide (Sulphur).

Extinguish with water. The fire is generally localised in the wagon. If it is discovered in time, the burning portion may be removed, but a load after once being on fire is liable to kindle again, so should be kept under special observation.

The fumes of burning sulphur should be avoided.

Don't use water to extinguish fires involving :—

- Calcium Carbide
- Metallic Sodium
- Metallic Potassium
- Metallic Calcium

CAUSES OF FIRE.

The following are some causes of fires breaking out :—

<i>Cause.</i>	<i>Example.</i>
Direct ignition with flaming or glowing material.	Spark alighting on inflammable material.
Prolonged heat, even though faint.	Stove pipe near to or resting upon unprotected wood-work.
Spontaneous combustion.	Damp hay, straw, manure, &c., also cleaning cloths and waste left for comparatively long periods.
Explosion.	Ignited petrol vapour, gas and air, &c., in confined places.
Electrical causes.	Short circuits, flashes of lightning, &c.
Chemical reaction.	Lime and water, acids in contact with other material through leaking vessels, &c.
Focussed rays of the sun.	Sun's rays pouring through unprotected roof lights, &c., or reflected from bottles, pieces of glass, &c.
Friction.	Shafting allowed to run hot.

FIRE PREVENTION.

Rules and Regulations under which Privately-Owned Mechanically Propelled Vehicles may enter the Premises of The London Midland and Scottish Railway Company.

Steam
Vehicles.

1. Must be fitted with ash pans which will not allow ashes to fall or be blown out. Efficient spark arresters must be provided for the funnels.
2. No clinking, cleaning or dropping of fires may be done on the Company's premises.

Petrol-driven
vehicles.

1. No petrol-driven vehicle with leaky petrol tank, pipe or carburetter may enter the Company's premises.
2. The petrol tank must not be filled, nor is petrol in any way to be exposed to the atmosphere on the Company's premises, and if the vehicle is left for any length of time the petrol must be turned off at the supply pipe from the tank.
3. The end of the exhaust pipe must be approximately horizontal; no vehicle from which the exhaust beats downwards on to the ground will be permitted to enter the Company's premises.
4. No petrol-driven vehicle may be left unattended on the Company's premises, except with the written permission of the Goods Agent.
5. So long as the engine of a petrol-driven vehicle is running the driver must be in attendance.

6. Every petrol-driven vehicle must carry a fire extinguisher capable of extinguishing burning petrol.

Note.—All concerned must see that the above rules and regulations are strictly observed, any irregularity being reported immediately to the Officer in charge of the Depot.

Garages.

Constructional woodwork to be eliminated as much as possible.

Cupboards, shelves, benches and floors to be kept as clear as possible of spirit, oil, or other inflammable material.

Smoking to be strictly prohibited.

Petrol other than that in the tanks of the vehicles not to be stored unless in accordance with the Home Secretary's Regulations and the L.M. & S.R. Company's conditions.

Ventilators, which should be provided at the highest and lowest points, not to have articles placed in front of them, or be allowed to become choked.

Great care to be taken with regard to lights; naked ones not to be used.

Petrol not to be exposed to the atmosphere more than is absolutely necessary, and then to be as far as possible from lights or heated surfaces. The practice of replenishing tanks by daylight to be adhered to as strictly as circumstances will permit.

When spirit is poured from one vessel to another, it is to be done in a gentle manner to avoid splashing.

Petrol tanks not to be replenished while engines are running.

The petrol supply from tank to be shut off, and the car inspected before the person in charge leaves it.

Vehicles are, if practicable, to be placed so that in case of emergency they can be easily moved.

Waste material to be deposited in a receptacle of fire-resisting construction, and removed from the garage daily. A careful inspection to be made before the garage is closed.

Sand and suitable fire appliances to be placed ready for use, at least one chemical extinguisher of the "Foam" type to be provided, and instructions posted to call the local Fire Brigade immediately in case of fire.

In case of fire in the building, advantage should be taken to use any chemical fire extinguishers available on motor vehicles.

General—Carbide &c.

Store rooms must be kept locked, and legible notices posted prohibiting the entry of unauthorised persons. Smoking and the introduction of open lights or fires to be strictly prohibited. The ventilation arrangements must be such as to permit the escape of acetylene in all directions. Droppings of spent carbide invariably contain some undecomposed carbide and must therefore be handled with care, not thrown into fire-places, on compost heaps, down lavatory pans, or into ash-pits, &c.

In dealing with wagons in which drums of calcium carbide, calcium phosphide (marine light signals), metallic potassium, metallic sodium or metallic calcium have been broken, water should not be allowed to come into contact with the materials in question as, if so,

inflammable gases will be generated. If such an event occurs, smoking, lighted matches, hand lamps or engines in steam must not be allowed in the vicinity.

Carriage Sheds and Carriage Sidings.

Arrangements should be made at all carriage sheds and carriage sidings for the immediate attendance of a locomotive or locomotives in the event of a fire occurring in order that the carriage stock may be rapidly removed to safety. Persons in charge should review the arrangements from time to time and make sure that all concerned are fully aware of the steps to be taken in an emergency.

Clothing, Papers, &c.

Clothing, sacking, paper, waste paper baskets or other inflammable articles are not to be left too near fires, stoves or stove pipes.

Wire waste paper baskets must not be attached to woodwork unless the latter is protected by a sheet of metal.

Coaches and Vans.

If, when passenger coaches and guards' vans are being put away at the end of a journey, a smell of burning or other sign of fire, or, in the case of gas-lighted stock, any sign of escaping gas is noticed, the matter should be investigated immediately and the necessary steps taken to protect the stock.

Tail lamps must not be left alight on brake van floors as they are likely to be upset and cause fire.

Cotton, &c.

Wagons of cotton, textile and other goods liable to fire to be thoroughly sheeted.

No loose cotton to be allowed to accumulate on floors; it must be placed in skips, &c.

Gas and Electric Fittings.

All fittings to be maintained in good order.

Gas brackets to be of the rigid type and the lights provided with globes or wire guards and placed clear of all inflammable material. Where gas lights are within two feet of ceilings or near wooden walls, partitions, &c., protection shields with an intervening air space to be fixed.

On no account are rubber connections for gas to be used.

Approved lamp sticks only to be used for lighting gas lamps in Goods Yards, Warehouses, Sheds and on Passenger Platforms.

In banana-ripening rooms, all new gas piping to be of iron. Gas jets for lighting purposes to have suitable globes or wire guards, and gas burners used for heating purposes to be fixed in wire cages, the mesh to be not larger than $\frac{1}{4}$ inch.

Inflammable Materials Stored in the Open.

Materials of an inflammable nature, such as rags, hay, straw, &c., when stored in the open to be completely covered by sheets.

Matches.

The use of matches for the lighting of lamps, &c., should be strongly discouraged; where, however,

their use is unavoidable, great care must be taken by each person using them to see that they are properly extinguished before being dispensed with.

Oil Lamps and Lamp Rooms.

Oil lamps to be kept in thorough repair and not placed on any merchandise or left on the floor of any warehouse or shed. The chains of suspended oil lamps to be examined frequently and renewed as necessary.

Lamps should be cleaned, trimmed and filled in a proper lamp room, or, where such room is not provided, in the place approved for this purpose.

Where lighted signal lamps are left unattended in a lamp room every care must be taken to see that they are in a safe position. Lamp rooms to be kept clean and no oil allowed to accumulate on the trimming bench, table, shelves, or floor. Windows are to be kept closed and door closed and locked when not in use.

Paraffin and Petroleum Oil barrels if left on the line side are liable to be set on fire by grass or oil saturated ground in the vicinity being fired. They should not, therefore, be left, whether full or empty, in a position where they would endanger other property. The cocks or taps of oil tanks to be kept in good repair and not allowed to drip; where practicable, they should be kept locked to prevent unauthorised persons from turning on the cocks or taps and allowing the oil to escape. (*Note.*—Sand should be used for absorbing leakage, not sawdust.)

At least one bucket filled with dry sand must be kept at all lamp rooms or places where any considerable quantity of inflammable oil or spirit is stored.

Petrol, &c.

Special regulations are in force where petrol or other highly inflammable liquids are authorised to be stored or handled and these must be closely observed by all concerned.

Rail tanks of petrol, benzole, turpentine, &c., also wagons containing drums of such liquids, must be very carefully dealt with. Where vessels are found to be leaking no lights or means of ignition must be allowed within 60 feet of the tanks or drums concerned.

These inflammable liquids vapourise very rapidly when exposed to the air but if there is any doubt as to the inflammable nature of any liquid a piece of paper or rag should be saturated with the substance, placed on the ground at a safe distance (at least 60 feet) from the tanks or drums and a live match thrown thereon, when if highly inflammable it will readily burst into flames.

Roofs.

Station Masters and Agents should arrange for birds' nests to be removed from under the roofs of signal cabins, station buildings, goods warehouses and sheds, both inside and out, as many fires are caused through sparks falling in such nests.

Slates on all roofs should be kept in proper repair so as to avoid the lodgment of sparks.

Roof windows of warehouses and sheds containing cotton and other fibres should be whitewashed early in the Spring to prevent the sun's rays penetrating through the glass.

Smoking.

Any infringement of the regulations in regard to smoking to be at once reported.

Storage Spaces.

A gangway at least 3 feet wide to be kept clear through each room in warehouses, and all staircases, communication doors and fire escape doors to be kept clear from all storage.

Stoves and Fires in Buildings.

Stoves to be placed on iron or stone slabs.

Stoves and stove pipes not to be placed near or resting upon woodwork unless the latter is adequately protected. When wood is used as fuel extra care is needed, fires and stoves must be kept under constant observation as wood is liable to throw out sparks and cause overheating of stove pipes.

All open fires should be provided with adequate fenders and fireguards.

Fires are not to be made up too large and should be allowed to burn low some time before closing. On no account are ashes to be raked out on to hearthstones when closing the premises.

Chimneys to be swept periodically as necessary and not intentionally fired.

Wood, &c., for Fire Lighting.

Wood and other material used for kindling fires must not be placed in ovens attached to stoves, nor left close to fires, stoves or stove pipes.

Waste, Sweepings, &c.

Waste, sweepings, oily rags or other inflammable litter to be removed from buildings and not allowed to accumulate.

Inflammable litter or material not to be left lying about the precincts of any shed or yard where motor vehicles are authorised to pass or stop.

Windows.

Broken windows in all buildings to be repaired without delay.

On Closing Premises.

Before premises are closed they should be inspected to see that everything is left safe.

Provision should be made for gaining access to buildings in case of emergency.

All concerned must, as far as practicable, see that such of the above instructions as are applicable are also observed by tenants and others using the Company's premises.

**DRILLS AND OPERATIONS
WITH APPLIANCES.**

Suitable drills may be selected from the Company's standard drills (see Appendix "A"), but the Captain or Officer in charge at the periodical drill **must personally see each member present perform the one-man drill** and afterwards a suitable combined drill must be gone through.

All drills are to be commenced with the appliances in the hose cupboard and with the cupboard door closed.

When this operation has to be performed, the stoppage must be limited to the shortest possible time. The best place to add a length of hose is between the last length and the branch-pipe, and the addition should always be made at that place unless ordered otherwise.

Adding a length of hose when branch is at work.

Upon the order being given, "Add a length of hose," another length must be obtained, and leaving one end with the branchman run the hose out in a circle returning to the same place with the other coupling. Give the order "Turn off the water," disconnect the branch-pipe, and attach to the hose just run out, couple the hose together, and give the order "Turn on." If ordered to be placed between any other particular lengths, the hose is run out in a similar manner and connected up. The man with the branch-pipe can then approach nearer the fire.

Run out another length of hose alongside the one to be replaced. Give the order "Turn off the water," break the joints of defective length, connect the sound length, and give the order "Turn on the water."

Replacing a badly leaking or burst length of hose.

If a man cannot be spared to roll up the damaged length, make an overhand knot near the end. When the hose is made up this must be done the wrong way about; this will denote that the length is defective and not to be used.

Taking off
last length of
hose.

Upon the order being given, "Take off the last length of hose," have the water shut off, branch disconnected and placed on next length, and water turned on again.

Have the length of hose taken off made up immediately a man can be spared, so as to prevent its being damaged and persons tripping over it. It may also be required elsewhere and can be readily taken if made up.

Taking hose
up ladders.

When hose has to be taken up ladders or escapes, run the hose out in the ordinary way to the bottom of the ladder or escape, then sling the branch-pipe over the shoulder and mount.

Great care must be taken not to turn the water on until the branchman is in a safe position and gives the order "Turn on."

Great care must also be taken when working on ladders, escapes, escape landings, and roofs, not to drop the branch-pipe or hose or any other article that will injure anyone below.

Fire Calls.

Assemble	...	...	...	Two long blasts
Turn on water	...	...	...	One short blast.
Turn off water	...	...	...	Two short blasts.
Make up and replace gear	...	...	...	Three short blasts.

All men not engaged to report themselves to Officer in Charge Four short blasts.

In case of fire the brigade should be called by the recognised fire alarm provided, or by two long blasts on a whistle.

[APPENDIX "A."]

LONDON MIDLAND AND SCOTTISH RAILWAY COMPANY'S STANDARD DRILLS.

As far as possible and unless specified otherwise by the Fire Superintendent, a fine day should be chosen for a practice, so that the hose will not be unnecessarily wet.

The Officer in charge should cause his men to fall in, five yards from and facing the hose cupboard. The men should then be called to attention and numbered off from their left, 1, 2, 3 and 4 according to the number present and the drill about to be performed. The men should be distinctly told whether it is to be a dry or wet drill, and the place to which the branch-pipe is to be taken.

ONE-MAN DRILL (DRY).

Man to stand at attention, and at the order "Get to work," open door with cupboard or carriage door key, take hydrant lid key or bar and key as the case may be, standpipe, one length of hose and branch-pipe to hydrant, fix standpipe, run out hose, and attach branch-pipe. (If it is a wet drill or at a fire, the man will run back to the hydrant, turn on the water, then run to and pick up the branch-pipe.)

TWO-MEN DRILL (DRY).

Men to stand at attention, and at the order "Get to work," No. 1 opens doors, takes hydrant tools and standpipe to hydrant and fixes standpipe; whilst he is doing this he must be on the lookout for No. 2 and must be ready to grasp the male end of No. 2's hose, which he places on the ground under his foot and connects to standpipe when it has been firmly fixed. No. 2 takes branch-pipe, places it under his left arm well up under the armpit and with large end forward,

unstraps a length of hose, holding it by the lugs on his right side and passing to the left of No. 1. The male end of the hose should hang down about a foot so that No. 1 can easily grasp it. In this drill it does not matter which man finishes first, the time being taken when both men are standing at attention again.

THREE-MEN DRILL (DRY).

Men to stand at attention, and at the order "Get to work," Nos. 1 and 2 act as in the two-men drill, except that No. 2 does not take the branch-pipe. No. 3 places branch-pipe under left arm, unstraps a length of hose and follows the man with the first length of hose, allowing the male end of hose to hang down a foot so that it can be easily grasped by No. 2 when he has run out his own length. The drill will be considered complete when the branch-pipe is laid down and all men concerned are standing at attention again.

FOUR-MEN DRILL (DRY).

Men to stand at attention, and at the order "Get to work," Nos. 1, 2 and 3 act as in the three-men drill, excepting that No. 3 does not take the branch-pipe. No. 4 places branch-pipe under left arm, unstraps a length of hose and follows No. 3 allowing the male end of hose to hang down about a foot, so that it can easily be grasped by No. 3 when he has run out his own length. The drill will be considered complete when the branch-pipe is laid down and all concerned are standing at attention again.

At those stations which have more than three lengths of hose, and it is desired to have a five or six-men drill, it is only necessary to add additional men numbering 5, 6 and so on, the last man in all cases taking the branch-pipe.

In arranging drills, Officers in charge should remember that it is not advisable to have all the hose uncoiled at one time, as in the event of a fire breaking out some distance away from a hydrant the uncoiled hose would be very difficult to carry about.

There is no objection to a left-handed man running out hose on his left side, or carrying branch-pipe under right arm. Where hose carts are kept the Brigade should, for a change, drill from the hose cart instead of the hose cupboard.

The following penalties are usually imposed in Competitions:—

Omitting to take lid key to hydrant ...	1 second.
Standpipe not screwed home—each half turn	1 second.
Dragging loose male coupling over ground when running out—each length	1 second.
Hose not drawn out to full extent—each length	1 second.
Kinks in hose—each kink	1 second.
Accepting comrade's coupling or running out with one hand before at least three-fourths of hose is run out. ...	5 seconds.
Throwing down or dropping branch-pipe when completing drill	5 seconds.
Couplings loose after branch-pipe is down	disqualified.
Touching work after completing drill ...	disqualified.

Firemen who have not taken a course of ambulance training, should at least make themselves acquainted

with the method of rescuing injured persons from a burning building :—

Firemen's Lift.

- (1) Roll the person to be rescued over on the face, the arms to the side.
- (2) Stand at his head, place your hands beneath his shoulders, and raise him to a kneeling position.
- (3) Place your hands under his arm-pits, raise him up, stoop, place your head beneath his body, bring his right arm around your neck, put your right hand around his right thigh, bring his weight well on to the centre of your back, grasp his right wrist with your right hand, and rise to the erect position.

[APPENDIX "B."]

(Extract from Circular No. 47.)

FIRE BRIGADE ALLOWANCES.

Rank in Brigade.	Annual Allowance Paid to Members of the Company's Fire Brigade.	Rates Paid for Fire Brigade Work Performed in Men's Own Time.		
		Drills and Other Fire Brigade Duties, excluding Services at Fires.	For Services rendered at Fires on the Company's Premises.	
			First hr. or part thereof.	Per hr. after.
	£ s. d.	s. d.	s. d.	s. d.
Captain ...	2 0 0	2 0 per hr.	5 0	3 6
Sub-Captain	1 10 0	1 10 per hr.	5 0	3 0
Engineer or Fireman	1 0 0	1 8 per hr.	5 0	2 6

1. These rates will only apply to properly appointed members of fire brigades as shown in the posted certified list and the full annual allowance for the rank, which must not be exceeded, will only be paid where the drills are performed in regular monthly periods and numbering not less than 12 drills per annum. Except where there are extenuating circumstances the annual allowance will be reduced in proportion to the non-attendance of the member at the monthly drills. All drills are to be recorded upon the monthly Drill and Appliance Return submitted to the Fire Department of the area.

2. As far as possible all drills are to be carried out during ordinary hours of duty. Where this is impracticable the authority of the Fire Department is to be obtained before other arrangements are made.

3. The annual allowance will cover all ordinary fire brigade duties performed during ordinary working hours. The hourly rates are for duties performed out of ordinary working hours only and take the place of the ordinary or overtime rates for railway grades which will not be paid for fire brigade duties performed out of working hours. Extra drills may be undertaken for the purpose of enabling members to enter competitions and displays ; they must, however, be performed only in the men's own time and are not to be paid for. Facilities will be afforded as far as possible to members desiring to compete in fire brigade competitions.

4. In those cases where one Captain is in charge of two small brigades, for the purpose of the annual allowance they are to be considered as one brigade.

5. In future the designation of members as Captain, Sub-Captain and Fireman only, will be used for all fire brigades except in the case of brigades in charge of a fire engine when the additional rank of " Engineer " is authorised. There will be only one Captain and not more than three Sub-Captains for each brigade.

6. No alteration in the personnel or equipment of any fire brigade to be made without authority from the Fire Department of the area concerned.

7. The annual allowances and the amounts to be paid for drills and fire services out of ordinary working hours are to be entered on expenses forms (form E.R.O.14331) and after certification by the Fire Department of the area concerned the amounts are to be included in the current pay lists.