

Publications of the

BRITISH FIRE PREVENTION COMMITTEE—No. 65

Edited by Edwin O. Sachs

THE
TESTING ARRANGEMENTS
OF THE
BRITISH FIRE PREVENTION
COMMITTEE

SOME DESCRIPTIVE NOTES WITH ILLUSTRATIONS

BY

ELLIS MARSLAND

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HON. SECRETARY OF THE BRITISH FIRE PREVENTION COMMITTEE;
CHAIRMAN OF THE TESTING STATION SUB-COMMITTEE

LONDON, 1902

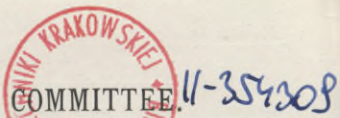
PUBLISHED AT THE OFFICES OF
THE BRITISH FIRE PREVENTION COMMITTEE

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1 WATERLOO PLACE, PALL MALL

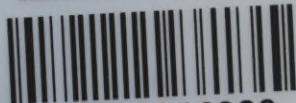
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14. FIRE TESTS WITH FLOORS. A Floor by the Expanded Metal Co.
15. CONFLAGRATIONS DURING THE LAST TEN YEARS. A Paper, with Twenty-three Maps. By CHARLES E. GOAD, M.Am.Soc.C.E.
16. FIRE TESTS WITH FLOORS. A Floor of Wood Joists filled in with Concrete.
17. THE TALL BUILDING UNDER TEST OF FIRE. A Paper, with Illustrations. By H. de B. PARSONS.
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41. THE SAFETY OF THEATRE AUDIENCES AND THE STAGE PERSONNEL AGAINST DANGER FROM FIRE AND PANIC. A Paper. By WM. PAUL GERHARD.
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43. FIRE TESTS WITH PROTECTIVE COVERINGS. Gilder Coverings by the "Gypsin" Brick Company, Ltd., London and Paris.
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45. FIRE TESTS WITH FLOORS. A Floor and Ceiling by the Mural and Decorations Syndicate, Ltd., London.
46. FIRE TESTS WITH FIRE-RESISTING CURTAINS. Two "Screen-Sail" Curtains by Mr. Rasmus Bugge.
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OBJECTS OF THE COMMITTEE:

The main objects of the Committee are :—

To direct attention to the urgent need for increased protection of life and property from fire by the adoption of preventive measures.

To use its influence in every direction towards minimising the possibilities and dangers of fire.

To bring together those scientifically interested in the subject of Fire Prevention.

To arrange periodical meetings for the discussion of practical questions bearing on the same.

To establish a reading-room, library and collections for purposes of research, and for supplying recent and authentic information on the subject of Fire Prevention.

To publish from time to time papers specially prepared for the Committee, together with records, extracts and translations.

To undertake such independent investigations and tests of materials, methods and appliances as may be considered advisable.

The Committee's Reports on Tests with Materials, Methods of Construction, or Appliances, are intended solely to state bare facts and occurrences, with tables, diagrams, or illustrations, and they are on no account to be read as expressions of opinion, criticisms, or comparisons.

NOTE.

FREQUENT inquiries having reached the Offices of the Committee as to the character of its Testing Station, the following particulars and illustrations are published with the hope that the information afforded may be useful to the Members and those interested in the work of the Committee.

In presenting Mr. Marsland's notes, I should like to refer to those sentences which explain that the Committee are quite as anxious to undertake investigations with materials and systems that are *not* patented, or in any way subject to special makers' interests, as they are to try the so-called "fire-proof" specialities; but such tests with the *ordinary* materials and methods of construction can only be arranged as the funds of the Committee permit. Several tests of this character have already been undertaken, as may be seen by the published reports. Others will follow, from time to time, as funds permit.

Such general investigations being of the very highest importance to the community at large as well as the professions primarily interested, it is to be hoped that public authorities and allied technical societies will see their way to assist in this matter by subscribing to the Committee's funds. A series of systematic tests is the only way of obtaining the exact and reliable information so urgently required.

EDWIN O. SACHS.

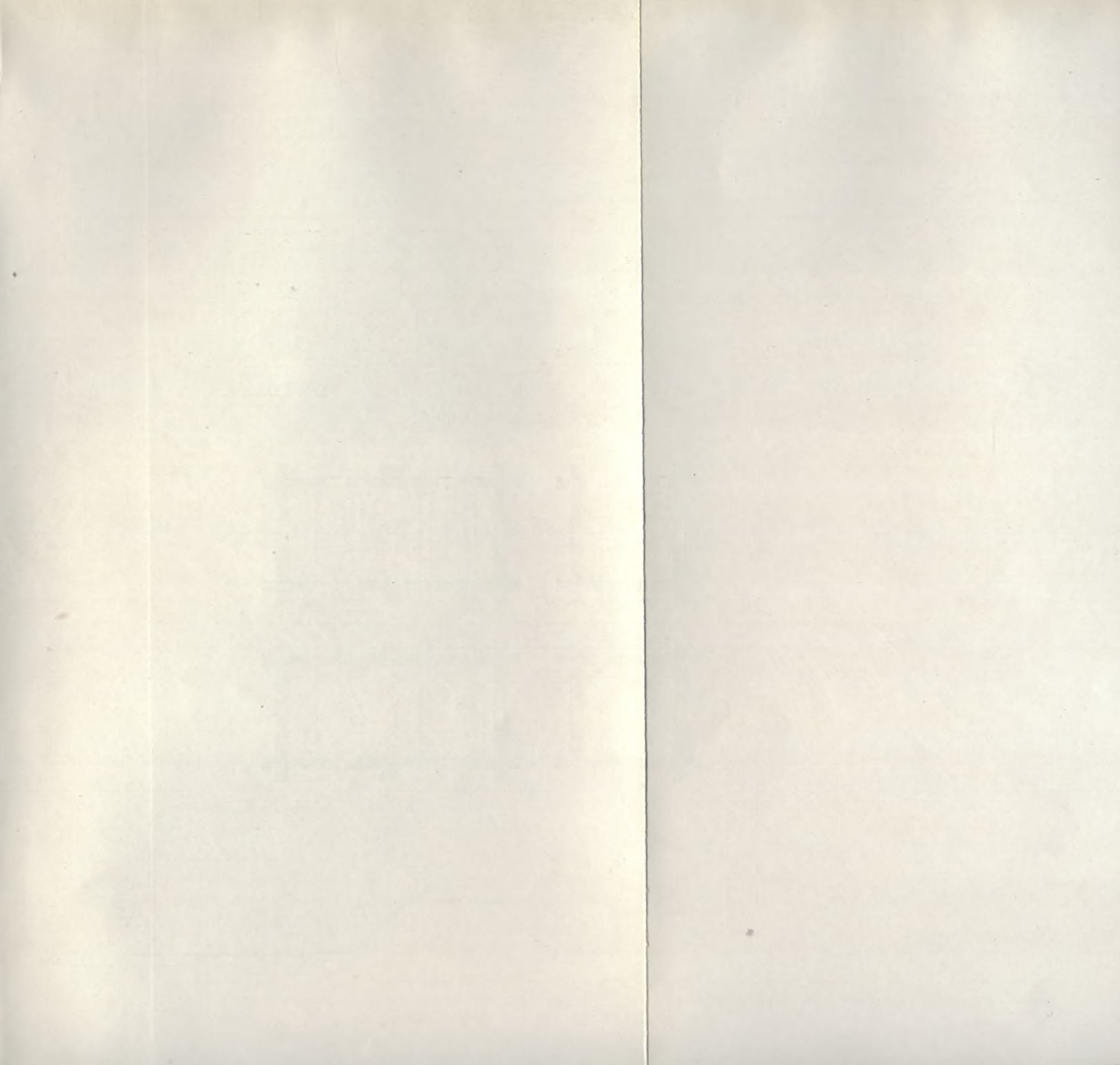
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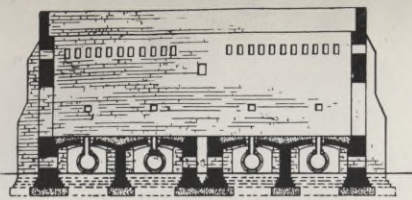
15th April, 1902.

PUBLICATIONS of the BRITISH FIRE PREVENTION COMMITTEE

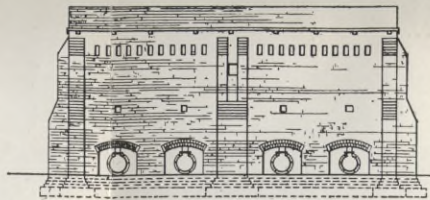
(Continued from Second Page of this Publication).

49. FIRE TESTS WITH DOORS. A 2½-inch Door of Archangel Deal constructed in Three Thicknesses; a 2½-inch Door of Quebec Pine constructed in Three Thicknesses. Particulars of Experimental Fire Tests.
50. FIRE TESTS WITH DOORS. A 2½-inch Door of Archangel Deal constructed in Three Thicknesses; a 1½-inch Door of Teak, Flush Panelling on each side, the Panels being in Two Thicknesses. Particulars of Experimental Fire Tests.
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53. FIRE TESTS WITH PARTITIONS. A Partition known as the "Cunnah-Wright" Partition, by the Fireproof Partition Syndicate, Ltd., London. The Committee's Report.
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65. The Testing Arrangements of the British Fire Prevention Committee. Some Notes with Illustrations. By ELLIS MARSLAND.

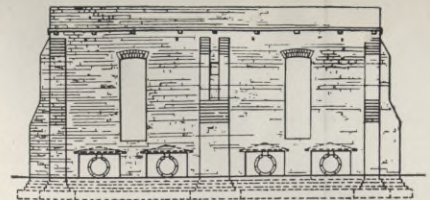




SECTION LOOKING EAST.



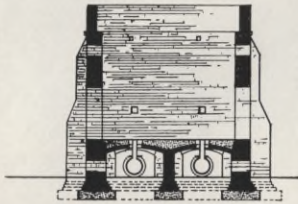
EAST ELEVATION



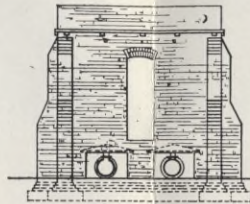
WEST ELEVATION.

SECTION AND ELEVATION OF DOUBLE MUTOS

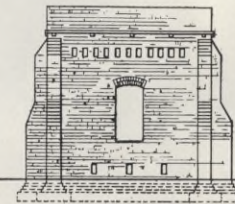
NOTE. THE NORTH & SOUTH ELEVATIONS ARE THE SAME AS THE SINGLE MUTOS



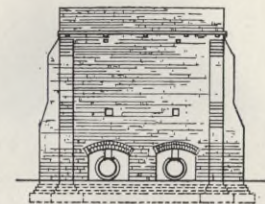
SECTION LOOKING EAST



WEST ELEVATION

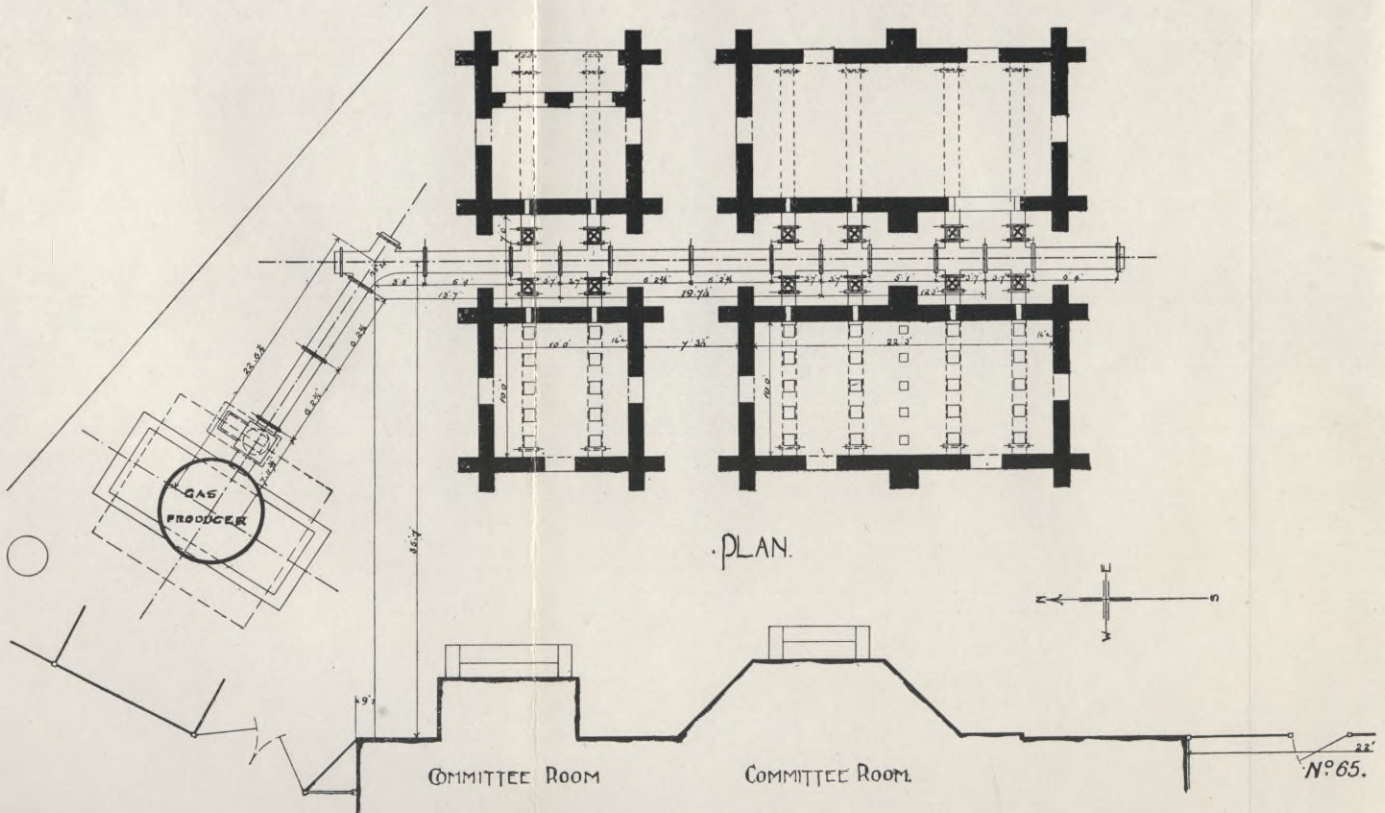


NORTH & SOUTH ELEVATION



EAST ELEVATION.

SECTION AND ELEVATIONS OF SINGLE MUTOS





VIEW OF ENTRANCE TO NEW TESTING STATION.

THE TESTING STATION.

INTRODUCTION.

THE object of the tests undertaken by the British Fire Prevention Committee is to obtain reliable data as to the exact fire resistance of the various materials, systems of construction, or appliances used in building practice. Such data have not as yet been available, owing to the fact that nearly all investigations in this direction have been carried out by individual makers or inventors with specific commercial objects in view. The few official tests hitherto made in the United States and on the Continent have, unfortunately, been only of minor importance, inasmuch as they were mostly organised to meet some special circumstance, such as the specification of work in a particular building or the framing of building regulations.

The series now undertaken by the Committee not only fulfils a want long felt by the professional man, but gives

“fire-proofing” trades, too, an opportunity to obtain authenticated records as to the reliability of their work.

The tests are of an entirely independent character, arranged on scientific lines, but with full consideration for the practical purpose in view. Absolute impartiality is assured, records being mostly taken automatically, and by photography, while the temperatures are carefully regulated and maintained, as the means for applying heat is by the combustion of gas.

All reports on tests state solely the bare facts and occurrences, with tables, diagrams and illustrations, and on no account include expressions of opinion, nor should any phrase be read as a comparison or criticism.

The general arrangement and direction of the tests is in the hands of the Executive, and in accordance with certain principles laid down after careful study and experiment.

The actual tests are attended by the members of the Council and the members of the Committee in rotation, care being taken that the attendance is always thoroughly representative of the technical professions primarily interested in the specific object under investigation.

The late Testing Station comprised two houses, standing in their own grounds, near Regent's Park, and backing on the Regent's Canal, but, owing to the land being required for railway extension, the Committee was obliged to vacate these premises.

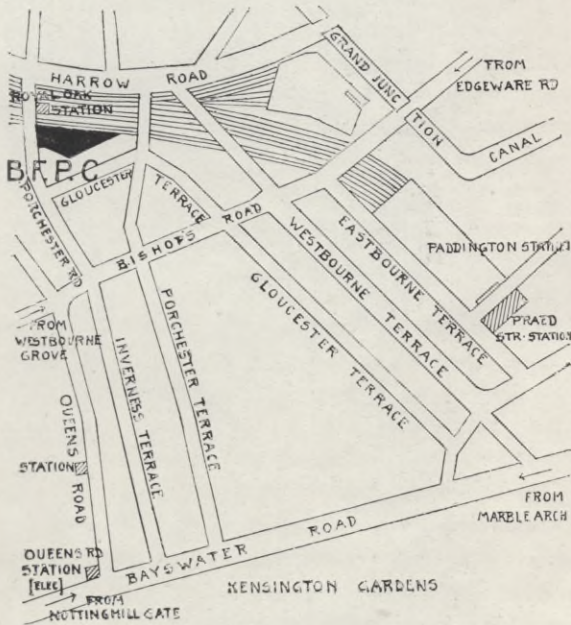
The present Testing Station is at Westbourne Lodge, 66 Porchester Road, Westbourne Park, W., and adjoins the Royal Oak Station of the Great Western Railway.

The premises comprise an old and commodious residence and garden. The principal rooms are used for Committee and Reception Rooms, a Museum, Laboratory and Photographic Dark Room, and also a residence for the Resident Engineer.

A portion of the garden is occupied by the huts in which tests are conducted.

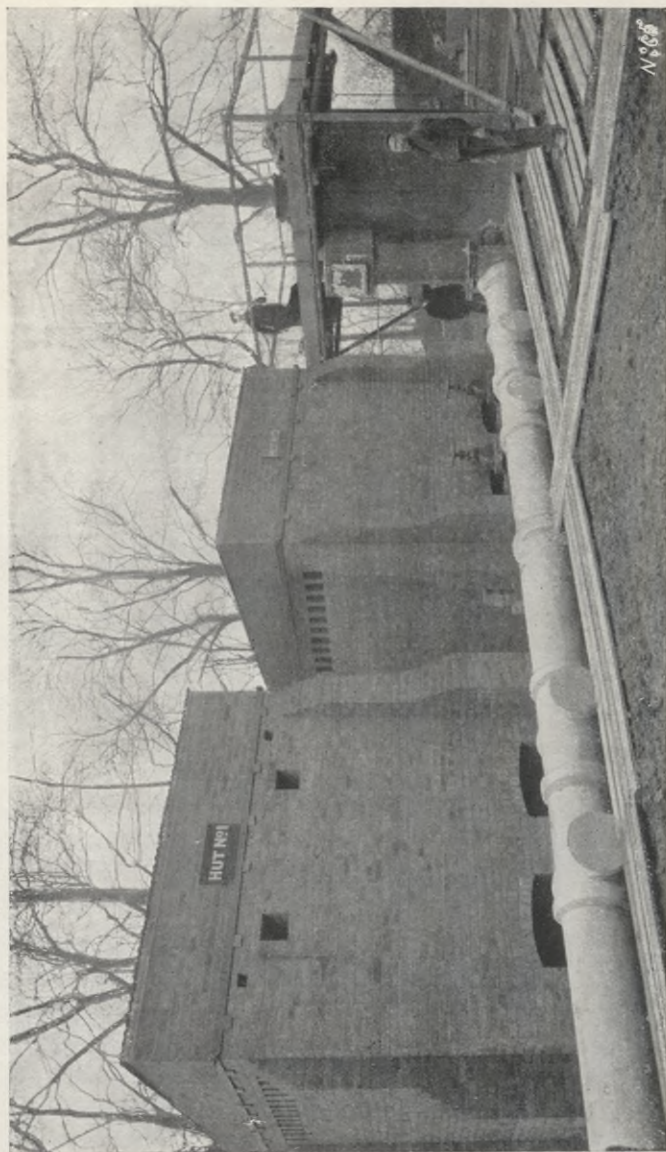
The premises are accessible by rail or omnibus from any part of London, and are in telephonic communication (No. 1555, Paddington) with the offices of the Committee at No 1 Waterloo Place.

With regard to the financial aspect of the Station, the establishment expenses are met by a special subscription and, as far as the funds of the Committee permit, investigations with ordinary (i.e. not patented) forms of construc-



SITUATION OF NEW TESTING STATION.

tion are undertaken from time to time, and duly reported on. Official tests with patented materials, makers' systems, etc., etc., are subjected to a scale of charges so regulated as to only just cover the actual cost. The Testing Station is also open to Members for such private research work or tests as they may desire to undertake, at nominal charges for loan of plant and instruments.



VIEW OF GAS GENERATOR AND PLANT AT THE OLD TESTING STATION.

N^o 688

The services of the Members participating in the management of the Station, conducting or attending tests, are given entirely gratuitously.

PLANT.

The plant actually completed comprises a set of testing huts, in which floors, partitions, doors or ceilings can be tested. The huts are laid down in two rows, their construction being explained on the plans and sections illustrated in this publication, as well as by the photographs showing some general views of the plant. The materials used in their construction are stock bricks with lime mortar.

The fuel used is gas, produced on the spot by a generator supplied by Messrs. Mason, of Longsight, Manchester, and a boiler by Messrs. Shand, Mason & Co., of Blackfriars Road.

The gas is conveyed from the generator by pipes to the several huts, and the supply is regulated by valves and dampers, and as the gas enters the huts from the branch pipes it is diffused by means of mixing chambers of fire-brick, as shown.

Each hut has door-openings, ventilation and observation holes, the doors being closed by brickwork during a test, and the ventilation holes blocked, according to requirements, by fire-brick or fire-clay.

Each chamber for a floor test allows for the floor under investigation to be placed at least 7 ft. 6 in. above the floor of the hut, and the chambers are roofed in with galvanised iron, or taupaulin, when necessary.

Bricks or pig-iron are used for any loads that may be applied to floors under investigation, and water is applied from an ordinary manual pump equipped with pressure gauge.

RECORDS.

Records of temperatures are taken, as far as possible, automatically, by electrical pyrometers designed by Professor Roberts-Austen, of the Royal Mint, and are able to record temperatures up to 2400° F.



A TEST IN OPERATION.

Visual observations as to work under investigation are also recorded, as far as possible, by photography.

Deflections are measured by level and staff, or by weights and pulleys.

ATTENDANCE AT TESTS.

The general arrangement and direction of the tests, as already explained, are in the hands of the Executive, the

work being done according to certain principles laid down by them after careful study and experiment.

The actual tests are attended by the members of the Council and the members of the Committee in rotation. Attendances at tests have to be strictly limited in accordance with the regulations of the Testing Station, for quite irrespective of the fact that any crowding disturbs those directing the operations, and that the actual attendance is by no means free from danger, there is the question of vibration—for instance, the movements of people in the house are distinctly felt on such delicate instruments as pyrometers.

For the regulation of the attendance at tests, with due consideration for the representation of the Committee—and also of the exhibitor, should it be the case of a patented piece of construction, system or appliance—the following arrangements are in force, and call for attention.

REGULATIONS FOR THE TESTING GROUND.

1. The official attendance at Tests with materials, systems or appliances of Members of the Commercial Section is limited to:—

The Council and Executive.

Ten Members of the Committee.

The Chairman of the Commercial Section.

Six Representatives of the Exhibitor.

Two Visitors nominated by the Exhibitor.

Such special Visitors as the Executive may invite.

2. Members and Visitors attending will be admitted by a card setting forth the conditions under which they attend, and they must sign an attendance book similarly setting forth these conditions, which are as follows:—

(i.) Members or Visitors attending a Test expressly undertake to in no way, directly or indirectly, publish or allow to be published, any description, account or criticism of the Test. Exhibitors, or their representatives, expressly undertake to in no way, directly or indirectly, publish or allow to

be published, any description, report, account or criticism of the Test, other than the duly authenticated official report of the Committee without abbreviation.

(ii.) Members, Exhibitors or Visitors shall in no way hold the Committee, its Council, Executive or Officers responsible for any personal or other injury, loss or damage sustained at a Test, or while visiting the Testing Station, whether through accident, negligence or otherwise.

(iii.) Members, Exhibitors and Visitors undertake to implicitly conform with the rules in force at the Testing Station, and to comply with all instructions given by the Executive or its representatives.

3. Every Test is in charge of a special Sub-Committee of the Executive, of whom one shall be the Directing Member. The complete technical direction is in their hands, and each Member of the Sub-Committee will wear a distinguishing badge.

4. A Member of the Executive will be delegated at each Test for the reception of Members and Visitors.

5. Members and Visitors will have at their disposal the two rooms known as the "Large and Small Committee Rooms." The room known as the "Lounge" will be reserved solely for the Executive, but all inquiries should be made at the Resident Engineer's Office at the Entrance Hall. All rooms marked "Private" are *strictly private*.

6. (a) The Members of the Sub-Committee in charge of any one Test, and the Officers and Employees of the Committee, must not be interfered with during the Test by Visitors and others wishing for explanations or information. (b) All inquiries should be put to the Members of the Executive specially delegated to receive Members and Visitors. (c) The Executive have powers to determine the distance within which Members and Visitors may not approach the testing huts, instruments or appliances during the progress of any Test. Nor shall any hut be entered or examined without special permission of the Directing Member of the Sub-Committee in charge of the Test, and any such permission shall involve no responsibility on the part of the "Directing Member," or that of the Executive, Council, Committee or its Officers.

7. For the execution of any one Test the Officers and Employees of the Committee will take their instructions only from the Directing Member of the Sub-Committee in charge of that Test, and will be responsible to him for their due execution.

BY ORDER OF THE EXECUTIVE.

THE COMMITTEE'S INVESTIGATIONS.

In respect to the ordinary building materials or forms of construction which are not subject to any patent or the interest of any special maker, investigations as to their fire-resistance are undertaken from time to time, according to means at the disposal of the Executive for such purposes. It rests with the Executive, either on their own initiative or at the instigation of others, to arrange for tests of this description, and it is hoped that the various public authorities interested in the subject will, in due course, contribute financially towards the cost of such experiments as they may consider of general public utility.

Up to the present the Executive have tested several floors of various constructions, as well as wood and iron doors.

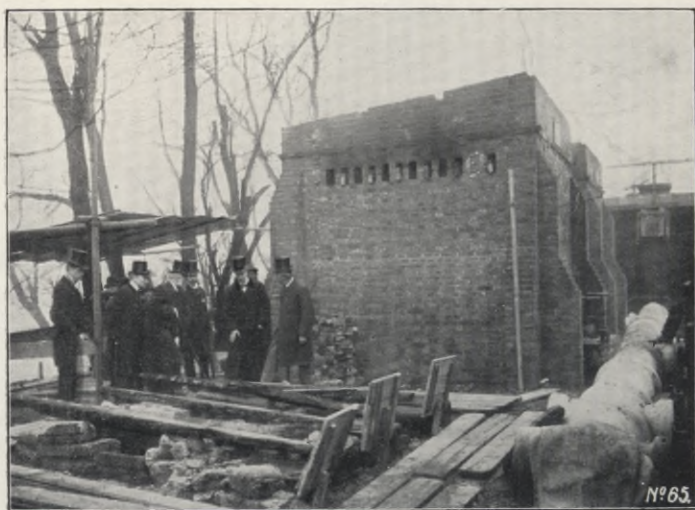
It is needless to say that there are endless questions relating to the fire resistance of ordinary forms of construction that have yet to be solved, and it is hoped that further research will be made in this direction, as means permit.

The Executive hope, in due course, to be able to record the exact resistance of all the more common methods of construction used in the British Isles.

MAKERS' OFFICIAL TESTS.

As already indicated, quite irrespective of the tests undertaken by the Committee with work that is not subject to patents, or not the speciality of individual makers,

the fireproofing trade also have every opportunity for obtaining official and independent reports on their systems or appliances at a fixed tariff, the charges being based on the actual cost of such tests. Should the Executive find that these testing charges leave any material surplus, such surplus will, after due consideration of wear and tear of plant, instruments, etc., be utilised for improvements in the Committee's plant ; but as a matter of fact experience has



WRECKAGE LAID OUT FOR INSPECTION.

shown that the charges only cover the expenses of the testing station when numerous tests are being carried out at short and regular intervals, whilst a loss is made on tests requiring special preparations.

The tariff reads as follows :—

For purposes of finance, the cost of the tests is divided into:—
I. Preliminary expenses ; II. Establishment capital ; III. Testing charges.

All firms or individuals, not members of a firm desiring tests,

shall contribute a donation of £5 5s. to the preliminary expenses incurred by the British Fire Prevention Committee in forming the station.

All firms or individuals desiring tests shall contribute to the establishment capital of the station from £10 to £50, according to the nature of the test and the group to which it belongs, as defined below.

All firms desiring tests shall pay in form of testing charges



VIEW TAKEN DURING TESTING OPERATIONS.

from £50 to £125, according to the nature of the test and the group to which it belongs, as defined below.

These contributions and charges will cover all expenses for ground, carcass, walls, ovens or heating apparatus, instruments, firing, loading, water, attendance and supervision, and on no account shall any other expense be incurred; gratuities to the servants of the Committee, for instance, being strictly prohibited. No responsibility for breakage of instruments, etc., is incurred.

The firm or individual having work tested shall supply and fix

his materials, systems, or appliances at his own cost, everything pertaining to the actual test being covered by his contributions as per scale.

The following classification of tests has been decided on with the view of fixing the contributions :—

- Group A. Tests with built-up walls, floors, partitions, etc., safes, etc., intended to endure severe tests.
- Group B. Tests with built-up walls, floors, partitions, etc., with plaster, special lathing, etc., and intended to stand medium tests.
- Group C. Tests with individual pieces of material, with sprinklers, individual fittings, such as doors, glass panels, skylights, etc.
- Group D. Tests with automatic appliances, such as fire-alarms, etc.

When second tests are desired by the same firm or individual the testing charge—no matter in what group—will be according to scale, but there will be no further contribution to the establishment capital or preliminary expenses. Where three or more tests are undertaken for the same firm or individual a discount of 10 per cent. off the scale charges will further be allowed. All contributions are payable in advance at such times as the Executive shall determine.

Before any test with any materials, system or appliance is started, or the arrangements for such a test are commenced, all contributions shall have been paid in advance, and the ordinary application for a test shall have been supplemented by an undertaking on the part of the firm or individual desiring the test, to accept all or any reports of the Committee, framed on the lines indicated above, and further to permit the Executive to issue such reports. The undertaking shall be on a form obtainable at the offices of the Committee. Any firm or individual, however, desiring to see the report on a test with his work prior to issue will always have an opportunity given him for this purpose.

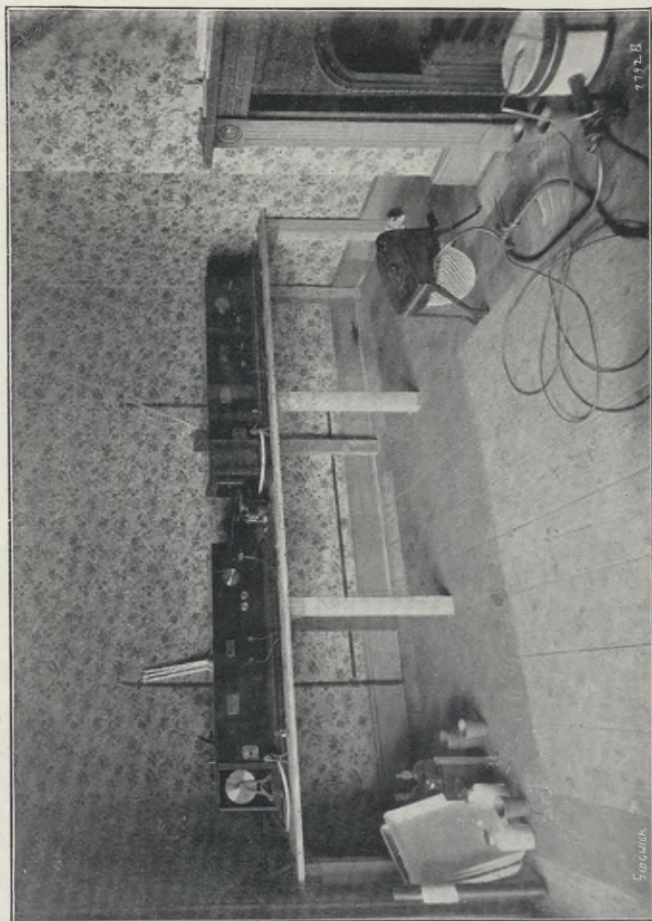
Under exceptional circumstances, at the discretion of the Executive and under special conditions to be determined on, tests may be undertaken elsewhere than on the Committee's grounds.

The sum total of the contributions of an individual or firm undertaking a test in a single chamber will be as follows for any one of the four groups:—

	GROUP A. Tests with built-up walls, floors, partitions, etc., safes, etc., intended to endure severe tests.	GROUP B. Tests with built-up walls, floors, partitions, etc., with plaster, lathing, etc., intended to stand medium tests.	GROUP C. Tests with individual pieces of material, with sprinklers, individual fittings, such as doors, glass panels, skylights, etc.	GROUP D. Tests with automatic appliances, such as fire-alarms, etc.
Contributions for:				
I. To preliminary expenses	£ 5 5 0 s. 5 0 d. 0	£ 5 5 0 s. 5 0 d. 0	£ 5 5 0 s. 5 0 d. 0	£ 5 5 0 s. 5 0 d. 0
II. To establishment capital	50 0 0	50 0 0	25 0 0	10 0 0
III. To testing charges	125 0 0	100 0 0	75 0 0	50 0 0
Total . . .	185 5 0	155 5 0	105 5 0	65 5 0

MAKERS' PRIVATE EXPERIMENTAL TESTS.

Quite irrespective of the independent tests, the testing grounds are, under special conditions, available to members



THE INSTRUMENT ROOM.

of the Section for private experiments, private investigations, etc., and research work of a private character.

As regards the loan of ground or space at the testing station for private full-size or laboratory tests of an experimental nature, a scale of charges will in due course be arranged, according to which the members of the Section will be able to avail themselves of the accommodation, instruments, etc., at moderate rates. Every encouragement and facility will be afforded to members undertaking research or experimental work.

Such tests have, however, to be conducted purely as private tests, and no report on investigations of this description may be issued by the maker, as it is of the utmost importance that the only reports issued in respect to work carried on at the Testing Station should relate to the official tests conducted under the auspices of the Committee.

REPORTS.

In respect to the Reports issued by the Committee, the only reference as to their framing that need be made is again to emphasise the fact that every possible precaution is taken in wording them to avoid any semblance of opinion or comparison. They are drafted solely as a record of facts, and are intended to be read as such.

In the case of makers' tests, the exhibitor has an opportunity given him to put any grievance before the Executive prior to the issuing of the report dealing with his individual test, and any observations on his part receive the full consideration of the Executive.

The Reports are published at the discretion of the Executive, and they are not only distributed among the members of the Committee, but among such non-members as is thought advisable, including the officials of the leading public offices.

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