SHAND, MASON & (13 STEAM FIRE ENGINES

Paur I.



ESTABLISHED A.D.1774.

75, UPPER GROUNDST S BLACKFRIARS R: LONDON

BEAMISH Recoveriseventy medals, awards etc. FOR THE EXCELLENCE OF THEIR SHAND, MASON 36. FIRE APPLIANCES

INCLUDING

THE FOLLOWING:

FIRST PRIZE MEDAL, Great Exhibition, London, 1851
FIRST PRIZE MEDAL, International Exhibition, 1862
FIRST PRIZE of £250, Crystal Palace, London, 1863
SECOND PRIZE of £100, Crystal Palace, London, 1863
ONLY GOLD MEDAL, Middleburg, Holland, 1864
FIRST AND SPECIAL MONEY PRIZES,
Middleburg, Holland, 1864

GREAT GOLD MEDAL, Cologne, 1865

FIRST PRIZE MEDAL, Dublin Exhibition, 1865

PRIZE MEDAL, Paris Exhibition, 1867

FIRST AWARD, Bradford Competition, 1867

ONLY GOLD MEDAL, Akola Exhibition, India, 1868 SILVER MEDAL and Special Money Prize, Akola

Exhibition, India, 1868
ONLY GOLD MEDAL, Altona, Germany, 1869

FIRST PRIZE MEDAL, Edinburgh, 1869

FIRST AWARD, Glasgow Competitive Trials, 1870

FIRST AWARD, Preston Competitive Trials, 1871

GOLD MEDAL, Moscow Exhibition, 1872

GRAND MEDAL, Vienna Exhibition, 1873

GRAND MEDAL, London International Exhibition, 1874

ONLY GOLD MEDAL, Norrköping Exhibition, Sweden, 1876

FIRST AWARD, GOLD MEDAL, South African Exhibition, 1877

FIRST AWARD, Orebro Competition, Sweden, 1877

FIRST AWARD, Silver Medal, Christiania, Norway, 1877

GRAND MEDAL, Paris Exhibition, 1878

FIRST PRIZE MEDAL AND AWARD, Sydney Exhibition, 1879

GOLD MEDAL AND DIPLOMA, Melbourne Exhibition, 1880

FIRST AWARD, Karlskrona Competition (Sweden) 1881

SPECIAL DIPLOMA OF HONOUR, International Fisheries Exhibition, London, 1883

SPECIAL DIPLOMA OF HONOUR, International Health Exhibition, London, 1884

HIGHEST AWARD, GOLD MEDAL, International Inventions Exhibition, London, 1885

SPECIAL DIPLOMA OF THANKS (no medals awarded) Indian and Colonial Exhibition, London, 1886 TWO GOLD MEDALS (Highest Award), Edinburgh International Exhibition, 1886

FIRST AWARD, United Fire Brigades Jubilee Tournament, Melbourne, 1887

THE MEDAL and THREE AWARDS of the First Order of Merit, Adelaide International Exbibition, 1887

GOLD MEDAL (Highest Award), Royal Yorkshire Exhibition, Saltaire, 1887

INTERNATIONAL COMPETITION, TURIN,
Best results in every respect and Sale of Steamers to
Milan and Florence, 1887

GOLD MEDAL (First order of Merit), and

SPECIAL MENTION for General Excellence, Melbourne International Exhibition, 1888

GOLD MEDAL (Highest Award), Edinburgh International Exhibition, 1890

FIRST ORDER OF MERIT (Highest Award), Gothenburg International Exhibition, 1891

GOLD MEDAL (Highest Award), International Horticultural Exhibition, London, 1892

GOLD MEDAL (Highest Award), Kimberley International Exhibition, 1892

GOLD MEDAL for General Excellence of Exhibits, also

SILVER MEDAL, for Services Rendered, International Fire Tournament, London, 1893

FIRST AWARD, Competitive Steam Fire Engine Trials, Lyons, 1893

FIRST AWARD, Punjab Sanitary Exhibition, Lahore, India, 1894

SPECIAL DIPLOMA OF HONOUR (Highest Award), International Fire Tournament, London, 1896

FIRST AWARD, Competitive Steam Fire Engine Trials, Sunderland, 1898

GOLD MEDAL (Highest Award), for General Excellence and Utility of Exhibits, also

SPECIAL GOLD and SILVER MEDALS, International Fire Exhibition, Earl's Court, London, 1903

GRAND PRIX (Highest Award), International Exhibition, Milan, 1906

SPECIAL DIPLOMA OF HONOUR, Japan-British Exhibition, London, 1910

DIPLOMA OF HONOUR, Coronation Exhibition, London, 1911

GRAND PRIX (Highest Award), Latin-British Exhibition,

TELEGRAPHIC CODE.

Code words for the use of correspondents abroad are given with the prices of engines, brake, special fittings, hose, and suction-pipe on pages 40, 41 and 42 of this catalogue.

The following sentences will in addition be found of service : Supply and ship as quickly as practicable the goods specified hereafter, paying freight and insurance Braviabais. Credit opened in your favour at the London Agency of the add name after code word or use A B C Code word for name | Bank on presentation of Braznabais. *** Put order in hand in accordance with your estimate: letter follows Bregaglia. ... Prepare the following for shipment; written order, with forwarding instructions and remittance, follows by this mail ... Brevetames. ... *** *** *** Supply with all possible despatch duplicate of our last order, payment as before

SHAND, MASON & CO.'S REGISTERED TELEGRAPHIC ADDRESS is "Shand, London."

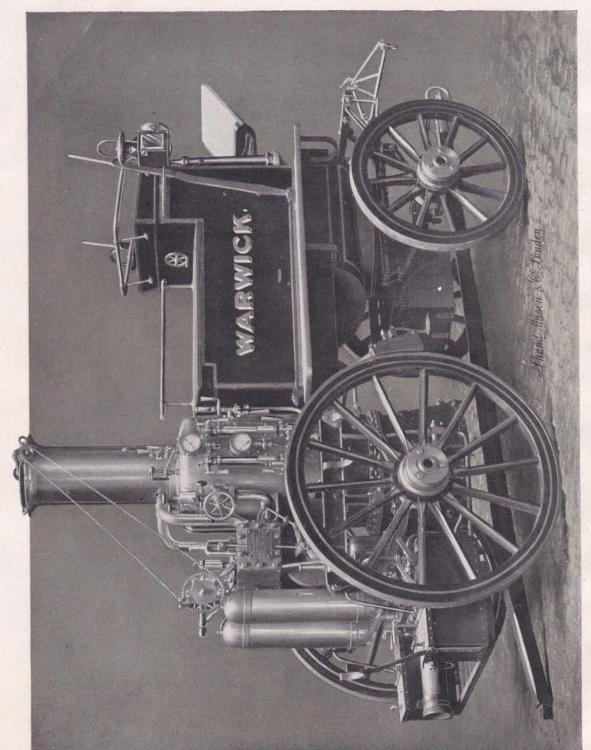
N.B. – Where more than one machine or length of hose or suction-pipe are required the number should always be placed *before* the code word as in example below.

EXAMPLE OF ORDER BY TELEGRAPH.

MESSAGE IN FULL: To Shand, Mason & Co., London.—Supply and ship as quickly as practicable the goods specified hereafter, paying freight and insurance: One Patent "Double Vertical" Variable Expansion Steam Fire Engine, No. 1 size (350/400 gals. per minute), with brake, four lengths of suction-pipe, and thirty 100-ft. lengths of "Bear" hand-woven canvas hose, complete with "Sure-Lock" Instantaneous couplings (with lugs), etc. Credit opened in your favour at the London Agency of the Bank of Australasia on the presentation of documents.—Thompson, Mayor, Princeton.

MESSAGE IN CODE: Shand, London. Braviabais Cabaletta Cansaronos Calcetilla four Calderico thirty Caliendrum Caninotum Braznabais Australasia—Thompson Mayor Princeton.

Any message may be sent using the words of the A B C Code (5th edition), in conjunction with the foregoing special code.



400-GALLON SIZE VARIABLE EXPANSION "DOUBLE VERTICAL" STEAM FIRE ENGINE.

SHAND, MASON & CO.'S

ILLUSTRATED CATALOGUE OF

STEAM FIRE ENGINES.

PART I:

PATENT "DOUBLE VERTICAL" STEAM FIRE ENGINES;

Application of Variable Steam Expansion to fire engines;

IMPROVED PETROLEUM OIL FUEL FURNACE;

MOTOR TRACTOR ARRANGEMENTS, Etc., Etc.

ESTABLISHED A.D. 1774.

SHAND, MASON & CO.,

75 UPPER GROUND STREET, BLACKFRIARS ROAD,
LONDON.

THE SUCCESS OF SHAND, MASON & CO.'S "DOUBLE VERTICAL" STEAM FIRE ENGINE has led to the production by other makers of Engines of apparently similar design, but which in construction and working are not to be compared with the original, this result being due in part to the fact that some of the most important features of the Shand-Mason "Double Vertical" are constructed under the firm's patents, and also to the fact that in the case of Shand, Mason and Co., the adoption of this type of Engine is a direct and progressive outcome of the firm's own experience in Steam Fire Engine construction.

In view of these attempts at imitation, it is necessary for foreign clients or others ordering indirectly to INDENT SPECIALLY AND IN FULL FOR SHAND, MASON AND CO.'S "DOUBLE VERTICAL" Steam Fire Engine.

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PREFATORY HISTORICAL NOTES

Descriptive of the

Introduction and Development of the Shand-Mason Steam Fire Engine.

1829.—The First Steam Fire Engine Constructed.

THE history of the Steam Fire Engine dates back to the year 1829, when the first fire engine worked by steam was designed and built by John Braithwaite and John Ericsson, in London, but it, apparently, did not meet the requirements of the day, and very little further was heard of the Steam Fire Engine as a Fire Brigade appliance until more than twenty years later, when, as described below, it was permanently introduced by Shand, Mason & Co.

1855.—First Complete Floating Steam Fire Engine.

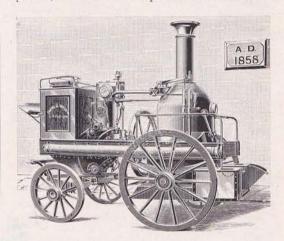
In 1852, Shand, Mason & Co. were employed by the London Fire Engine Establishment (the Fire Brigade of that period) to apply steam power to one of the existing floating hand-worked fire engines on the Thames. The result proved to be so satisfactory that it was decided to obtain a complete self-propelling Steam Fire Engine, which Shand, Mason and Co., after submitting designs in competition with others, were commissioned to build. This Engine, the first complete Floating Steam Fire Engine built, went into service in 1855, and until 1890 was in constant and successful use at riverside fires.

1858. Shand, Mason & Co.'s First Land Steam Fire Engine.

THREE years later, the construction of Land Steam Fire Engines in this country was commenced by Shand, Mason & Co., who completed their first Engine of this description towards the latter end of 1858. This Engine was sold by the makers to the St. Petersburg authorities. It had a capacity of from 200 to 250 gallons per minute, and was tested with very good results before leaving London. Respecting this trial the Times of November 25th, 1858, reported as follows: - "On Friday morning, at seven o'clock, this new machine was worked at the Grand Surrey Canal, Camberwell. . . . In ten minutes from the time of lighting the fire sufficient steam was obtained to throw a §-in. jet to a considerable elevation. This was changed for larger ones up to one inch in diameter, the height of the latter being equal to that from a Brigade [Manual] Engine when worked at its greatest speed. Two jets, one 7-in. and the other a sixteenth smaller, were used at one time, and the water was projected to the same height."

1860.—First Land Steamer used by London Fire Brigade.

IN 1860, the London Fire Engine Establishment hired from Shand, Mason & Co. the first Steam Fire Engine on wheels used by the Brigade, and a year afterwards (1861), purchased from them a larger Engine. This second Engine was of a horizontal pattern, and received a first prize medal at the London



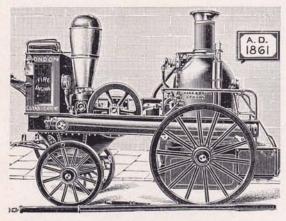
No. 1. FIRST SHAND-MASON LAND STEAMER.

Smoke Tube Boiler: Vertical Engine in front of Boiler Crank and Connecting Rod; stoking behind,

International Exhibition in 1862. Two similar Engines were constructed for the London & North-Western Railway, and arranged in carriages to run on the rails. Both Engines, it may be noted, although upwards of fifty years old, are still in service at Crewe and Wolverton.

1863.—Shand Mason Steamers at the Crystal Palace Trials.

By this time interest in Steam Fire Engines had been fairly aroused, and the way was prepared for the now famous competitive trials at the Crystal Palace in July, 1863, when a committee of scientific and practical men, headed by the late Duke of Sutherland, and with the late Captain (afterwards Sir) E. M. Shaw, as secretary, raised £700 to be offered as prizes for the best Steam Fire Engine. The result of this competition was that one half the £700 offered was awarded to Shand, Mason & Co., the remainder in sums of £250 and £100 going to two competitors. In No. 3 picture is shown Shand, Mason & Co.'s smaller Engine, the winner of the first grand prize of £250 for light Steam Fire Engines. This Engine was the first one of the "London Brigade Vertical" type. No. 4 illustration on page 7 represents the larger steamer, a double cylinder horizontal engine tested at the Crystal Palace in conjunction with the foregoing. Both Engines were purchased for St. Petersburg.



No. 2. FIRST LAND STEAMER PURCHASED BY THE LONDON FIRE BRIGADE. CONSTRUCTED BY SHAND, MASON & CO.

Smoke Tube Boiler; Horizontal Engine; Crank and Crosshead; Double Acting Pump; India-rubber Disc Valves; stoking behind.

1864-7. — Some other International Contests.

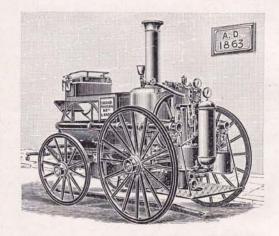
THE next international competitive trial took place at Middelburg (Holland) in July, 1864, and at this Shand, Mason & Co. obtained the only gold medal with first and special money prizes. The Engines of this firm were also successfully worked at the Cologne, Paris and Altona International Exhibitions, held in 1865, 1867 and 1869. At the Dublin International Exhibition in 1865, also at the Bradford competition in 1866, the Engines of Shand, Mason and Co.'s construction won high honours. As a result of the latter trial the authorities of Bradford purchased the winning Engine for the town. This Engine, which in 1870 was worked continuously night and day for three months filling the town

reservoir, has since done much excellent service in Bradford, and was in regular use up to 1907. At each of these trials the Engines submitted by Shand, Mason & Co. were of the Single Vertical type.

1869. — Introduction of the Shand-Mason "Equilibrium" Steamer.

The year 1869 saw the introduction of an entirely new class of Steam Fire Engine. This was Shand, Mason & Co.'s patent "Equilibrium" pattern—an Engine with three steam cylinders and three double-acting pumps arranged vertically. A prominent feature of the "Equilibrium" Engine was the equal balancing of the parts, by which perfect steadiness in working was ensured.

Contemporaneous with the invention of this powerful type of Engine was the introduction by Shand, Mason and Co. of an improvement as important in comparison as was the three-cylinder Engine—the patent inclined water—tube boiler now so well and favourably known, and by which the steaming time has been so much reduced.



No. 3. SHAND, MASON & CO.'S SMALL STEAMER AT CRYSTAL PALACE TRIALS.

Improved Smoke Tube Boiler, with top and bottom joints for taking apart to inspect interior; Vertical Engine at back of Boiler; Crank and Connecting Rad; Double-acting Bucket and Plunger Pump; India-subber Dise Valves; lighting door at rear of Boiler; stoking at side.

The new type of Engine played a prominent part in the competition at Glasgow in March, 1870. This was carried out in the presence of three gentlemen selected as judges by the Corporation. When put to the test the "Equilibrium," though weighing nearly 6 cwt. less than its rival, soon showed

its superiority, raising steam more quickly, and projecting the water 37 ft. further at the maximum and 47 ft. further at average distance, whilst consuming 1 cwt. less coal during the trial. The decision of the judges was therefore entirely in Shand, Mason & Co.'s favour, and the "Equilibrium" was accordingly purchased by the Glasgow authorities.



No. 4. SHAND, MASON & CO.'S LARGE STEAMER AT CRYSTAL PALACE TRIALS.

Improved Smoke Tube Boiler as No.3; Double Cylinder Horizontal Engine; Crank and Crossheads; Double acting Pumps; Indiarubber Valves; stoking behind.

The "Equilibrium" Engine was also subjected to severe tests at Preston in the early part of 1871, and a full report of the trials was given in the Engineer of May 12th. As at Glasgow, the "Equilibrium" weighed less by three hundredweight than its opponent, yet the jets were thrown to a considerably greater distance, the capacity was larger, and during the hour's continuous working it was conclusively proved that the three-cylinder Engine required less attention than its opponent.

The result of the trial was the adoption of the "Equilibrium" Engine by the Preston Corporation.

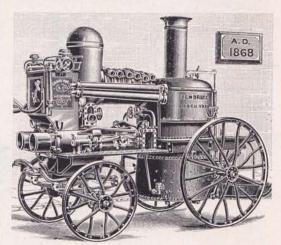
1877.—A Shand-Mason Motor Steam Fire Engine.

In 1877, Shand, Mason & Co. constructed a novelty in the shape of a motor steam fire engine—the first designed in this country on modern lines. In this machine the fire pump was a three-cylinder or "Equilibrium" engine of 600 gallons per minute capacity, mounted on a four-wheel carriage, and the propelling arrangement was by means of a sprocket wheel on the crankshaft of the fire pump, the fire

pump being fitted with link-motion reversing gear. The sprocket wheel drove by chain on to a sprocket wheel on hind axle, the two hind wheels being driven by compensating gear. When the propelling gear was not in use, the sprocket wheel on the crankshaft was thrown out of gear by a friction clutch. This early motor steam fire engine was eventually reconstructed by the firm for horse draught, it being considered that the greater cost and weight of the motor did not show to advantage against the horse-drawn engine, with the speed limit and other regulations then in vogue.

1877.—Shand - Mason "Volunteer" Single-Cylinder Steamer.

IN 1877, Shand, Mason & Co. introduced their "Volunteer" Steam Fire Engine, a specially light, single-cylinder engine, for small capacities, designed to meet the requirements of Volunteer Fire Brigades. This Engine is now constructed by the firm in an improved form, known as the "New Volunteer." Engraving No. 7 (p. 8) exhibits the "Volunteer" Engine as built in 1879.



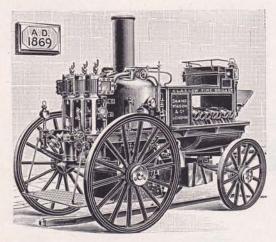
No. 5. SHAND, MASON & CO.'S "DOUBLE HORIZONTAL"
STEAMER FOR ADMIRALTY USE.

Improved Smoke Tube Boiler; Double Cylinder Horizontal Engine; Crank and Connecting Rods; Double-acting Pumps; stoking at rear.

1879.—The Shand-Mason Improved "Equilibrium" Steam Fire Engine.

In the early part of 1879, Shand, Mason & Co. introduced the improved "Equilibrium" Steam Fire Engine, of which the picture No. 8 (p. 9) is an illustration. In this there was a considerable improvement made in the design throughout, giving

an increase of 50 per cent. in power, the time taken in raising steam in the improved boiler being also reduced. The first competition in which the Improved "Equilibrium" was engaged was that at the Melbourne Exhibition in 1880, where it was awarded the gold medal and diploma.



No. 6. SHAND-MASON PATENT "EQUILIBRIUM" STEAM FIRE ENGINE.

New Patent Inclined Water-tube Boiler, with top and bottom joints for taking apart to inspect interior; Three-Cylinder Engine with Crank and Connecting Rods; Double-acting Bucket and Plunger Pumps; Engine at back of Boiler; stoking at side.

1881.—Karlskrona International Competition.

A STEAM Fire Engine Competition of great importance took place at Karlskrona (Sweden) in the following year (1881). For this trial three makers sent Steam Fire Engines, Shand, Mason & Co. presenting a 450-gallon Improved "Equilibrium" and a 350-gallon "London Brigade Vertical."

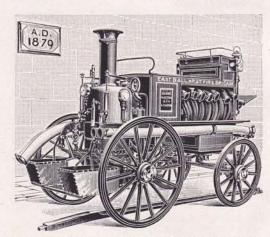
In the course of their report describing the trials the judges remarked: "The construction of the boiler is undeniably a very important point in the choice of a Steam Fire Engine, and after mature consideration we must confess that both the boilers of Shand, Mason & Co. offer the greatest advantages." As the result of the tests, and considering themselves bound to put the greatest importance on the future durability and service-ableness of the Steam Fire Engine, the judges made the following award: 1st, Shand, Mason & Co.'s "Equilibrium"; 2nd, Shand, Mason & Co.'s "Vertical"; 3rd, Single Cylinder Engine by another English maker; 4th, Swedish maker's engine. The "Equilibrium" was purchased for Karlskrona.

1881-7.—Fixed and Floating Steam Fire Engines.

In the following years complete self-propelling Floating Fire Engines, fitted with Shand-Mason "Equilibrium" Engines were constructed for Bristol and Rio Janeiro, and in 1883 the same type was supplied to the Metropolitan (London) Fire Brigade for use at riverside fires. In 1884 also the Shand-Mason "Equilibrium" was adopted as a Fixed Steam Fire Engine in conjunction with fire mains and hydrants for the protection of Osborne House, Isle of Wight, the marine residence of Her late Majesty Queen Victoria.

1887.—International Competition at Turin.

For this Exhibition Steam Fire Engines were sent from England, Belgium, and Sweden, the first-named country being represented by Shand, Mason & Co.'s 350-gallon "London Brigade Vertical," and their 600-gallon "Equilibrium." Exhaustive tests were



No. 7. SHAND, MASON & CO.'S "YOLUNTEER" STEAM FIRE ENGINE.

Improved Inclined Water-tube Boiler; Single-Cylinder Engine with Double-acting Pump arranged vertically in front of Boiler; stoking behind,

made extending over several days, and the results obtained from Shand, Mason & Co.'s Engines were far superior to those of all competitors, as shown by the official report of the jury. The trials resulted in the disposal of both engines submitted by Shand, Mason & Co. to Milan and Florence authorities respectively.

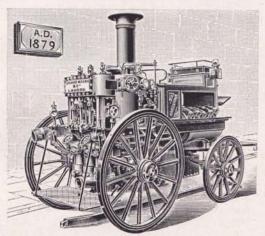
1889. — Introduction of the Shand-Mason "Double Vertical."

THE year 1889 saw the introduction of what has proved to be the most popular and successful of steam fire engines—the now well-known and widely used Shand-Mason "Double Vertical."

The first engine of this pattern was supplied to the Hamburg Fire Brigade in September, 1889, and gave such excellent results at the trials that an order was subsequently given for five more engines.

1893.—The "Double Vertical" wins the Paris and Lyons Contests.

This competition was initiated by the authorities of Lyons. Paris was the scene of the first trials, where the engines of three makers were put to exhaustive tests, at the conclusion of which the Commissioner appointed with the Commandant



No. 8, SHAND, MASON & CO.'S IMPROVED PATENT EQUILIBRIUM" STEAM FIRE ENGINE.

Improved Inclined Water-tube Boiler with Increased Heating surface; Increased area of Steam Cylinders and Pump Valves; new Lever arrangement for working Stide Valves; Double-acting Bucket and Plunger Pumps; Engine at back of Boiler; stoking at side; shortened steaming time; increased power of Engine, 50 persecent.

and Chief Engineer of the Brigade to witness the experiments reported as follows:—

"Notwithstanding my great desire to favour the French makers, to my great regret I am compelled to conclude that the No. I engine (Shand-Mason 350-gallon 'Double Vertical' Steam Fire Engine) is the one that has given the best results. The construction is careful, the material employed is of the best quality, and the arrangement of the parts is such as to facilitate the working and inspection of the

engine. The boiler raises steam rapidly, and is sufficient to supply the engine without being forced. Without having the wheels scotched the engine worked silently at 240 revolutions per minute without producing any vibration upon the carriage. Two men worked the engine easily where three were necessary for the competing engines. This engine is lighter and stronger than the others."

The second trial of Engines took place at Lyons between Shand, Mason & Co.'s "Double Vertical" Engine and the engine of a fourth maker. In this case the judges were chiefly prominent engineers and constructors of steam engines. The Lyons daily paper, Le Progrès, of August 24th, reporting the trial, stated that the Shand-Mason Engine raised steam to 100 lb. pressure in 7 minutes whilst the competing engine occupied 14 minutes. During the whole of the ten hours the Shand-Mason Engine maintained a steam pressure of 100 lb., never falling below that, and its working was always regular. The other engine commenced working at 100 lb. steam pressure, but this varied from 60 lb. to 25 lb., and after three hours a twenty minutes' stop occurred. The Shand-Mason Engine did not stop a second.

The superiority of Shand, Mason & Co.'s Engine having been conclusively proved, the same was forthwith purchased by the Lyons Town Council.

1898.—The Sunderland Contest between three English Steam Fire Engine Makers.

The historical conflagration at Sunderland in July, 1898, was indirectly responsible for one of the most important competitive steam fire engine trials held in this country. The Sunderland Watch Committee, as a consequence of the conflagration, invited three English fire-engine makers to submit engines of 35c gallons capacity for competitive tests at Sunderland.

On the date fixed for the trials, Shand, Mason and Co. were alone represented.

To exhibit the capabilities of the Engine (No. 1 size "Double Vertical") some very exhaustive tests were made (on Sept. 22nd), which were witnessed by Alderman Fairless (Chairman of the Watch Committee) and the majority of the Town Councillors and officials.

Steam was first raised, the time occupied in obtaining from cold water a pressure of 100 lb. to the square inch being 7 minutes 28 seconds. Then starting at the Town Hall and taking the supply of water from the mains, jets of water of sizes varying

from $\frac{7}{8}$ in. to $1\frac{1}{4}$ in. in diameter were thrown to a height of 180 ft. The spire of the Town Hall is 140 ft. in height, and this was covered by fully 40 ft.

A test then followed of a very severe character. The conditions were that the Engines standing on the Quay Wall had to raise water from a depth of 14 ft., and then deliver the water up the cliff to the bridge level, a rise of 90 ft., then a further rise of 10 ft. to Havelock House, making 114 ft. vertical lift in all, while the distance from the Engine to the jet-pipe was 900 ft. From this position, jets of I in. and Is in. diameter were thrown to a vertical height of 100 ft. and a horizontal distance of 180 ft.

The Engine was then taken to the Electric Light Works, and under the supervision of Mr. Snell, the Chief Engineer, the quantity of water delivered through a 1\frac{1}{4}-in. jet was taken and found to be 390 gallons per minute.

On September 27th an Engine constructed by another London firm was offered for testing, being one recently supplied to a local shipyard.

The Engine was worked by the makers' own engineers, and in order to obtain a direct comparison, Shand, Mason & Co. also worked their Steamer alongside. The results of the tests were as follows:—Raising steam to 100 lb. pressure from cold water—Shand, Mason & Co., 9 minutes 17. seconds; competing engine, 9 minutes 38 seconds. Working from Quay to Havelock House with 1-in and 1½-in. diameter jets, the results showed that Shand, Mason and Co.'s Engine threw to a greater vertical height by 20 ft. and to a greater horizontal distance by 30 ft. than the competing engine.

In the test for quantity, Shand, Mason & Co.'s Engine delivered 390 gallons per minute, and the other Engine 380 gallons, through the same size jet.

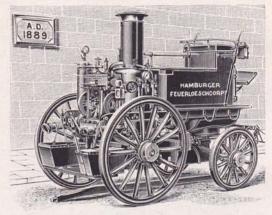
The weights of the Engines were: Shand, Mason and Co.'s 35 cwt., the competing Engine 383 cwt.

On October 5th a Manchester firm submitted their Engine for testing, and Shand, Mason & Co. again elected to work their Engine in competition. The tests were briefly as follows: Raising steam to 100 lb.—Shand, Mason & Co., 7 minutes, 17 seconds; competing Engine 8 min. 47½ secs. Jets were then delivered from the Quay Wall to Havelock House, starting with 1-in diameter jet, and the horizontal distance thrown and the vertical height reached by Shand, Mason & Co.'s Engine were considerably in excess of those attained by the jets from the competing Engine, the difference being estimated at 50 ft. to 60 ft. in the horizontal distance and 30 ft. to 40 ft. in the vertical height.

After about ten minutes working a mishap occurred to the competing engine which prevented it taking further part in this test. Shand, Mason & Co.'s Engine worked on, and, during the three-quarters of an hour run threw jets of 1 in. and 1 in. diameter with excellent results.

In the quantity test Shand, Mason & Co.'s Engine pumped 354 gallons per minute for about ten minutes' run, while the competing Engine had a more serious mishap, which prevented it completing the test.

Mr. Snell, the engineer officially appointed by the Watch Committee to judge the contests, gave as his decision "that Messrs. Shand, Mason & Co.'s Engine was undoubtedly the best from all points," and the Committee, accepting the report, unanimously decided to purchase two Shand-Mason "Double Vertical" Engines.



No. 9. SHAND, MASON & CO.'S "DOUBLE VERTICAL" STEAM FIRE ENGINE.

Improved Inclined Water-tube Boiler; Double Cylinder Engine arranged vertically at back of boiler; Double-acting Pump; shortened steaming time; stoking at side.

1899. Application of Variable Expansion to the "Double Vertical,"

An important improvement in fire engine construction was made in the early part (May) of 1899, when Shand, Mason & Co. introduced their patent "Double Vertical" Steam Fire Engine fitted with Variable Steam Expansion gear. The first of the type was a 450-gallon engine specially designed by the firm for the London Fire Brigade.

1902. — Success in competition with American and Continental Engines.

In 1902, important orders for the equipment of Cuban Brigades with "Double Vertical" Engines were awarded to Shand, Mason & Co. upon the representation of Brigade authorities in the Island that Shand, Mason & Co.'s steam fire engines, in use for many years in Cuba, were more durable and more suitable for general use than the American engines; while on the Continent the choice of the Shand-Mason "Double Vertical" in preference to machines of local manufacture by the authorities of such centres as Amsterdam, Douai, Milan and Lubeck, amongst a number of others, showed the high reputation of the "Double Vertical" in Europe.

1903.—The Earl's Court International Fire Exhibition.—Oil Fuel.

In connection with the unique exhibition of fire apparatus at Earl's Court, London, during the summer of 1903, when, as is known, steam fire engines by all the leading European makers were shown, the whole of the exhibitors were invited by the Exhibition authorities to submit their respective engines for trial before the official jury at the lake in the Exhibition grounds on July 11th. The result of the severe series of tests was to demonstrate clearly the superiority of Shand, Mason & Co.'s Engines at all points.

The machines by which Shand, Mason & Co. were represented at the trials—selected from the firm's exhibit in the Imperial Court—were two of their 450/500-gallon patent "Double Vertical" Engines with Variable Steam Expansion Arrangement, the following being the results obtained from one of these machines:—

Time occupied in raising steam from cold water to 7 atmospheres (105 lb. to the square inch)................................. 8 min.

Time during which Engine worked without any addition to fuel and without stoking, the Engine throwing two good jets (time taken from start with 105 lb. steam pressure until same had been reduced to 45 lb.) ... 33 min. 40 sec.

Shand, Mason & Co. were the only British firm taking part, the competing engines being by German, Austrian, and Swedish makers. As already indicated, the results (shown above) obtained from Shand, Mason & Co.'s Engine were not only well in advance in every test, but in the majority of the tests, including those of the greatest importance, very far in advance of those given by any competing engine.

As a sequel to the trials—the latest International competitive tests—Shand, Mason & Co. were rewarded

by the only Special Award given in respect of engines taking part in this International Contest.

Another feature of the year's record was the adoption for regular Brigade use of a new and improved apparatus for burning oil-fuel in lieu of coal in steam fire engine furnaces, introduced by Shand, Mason & Co. several years previously. As in the case of the variable steam expansion, the new oil-fuel burner was first applied to engines constructed for the London Fire Brigade.

* * The limitations of space prevent the extension of these Historical Notes to include more than a reference to the re-introduction and development of Motor Propelled Steam Fire Engines. Particulars of these appliances are given separately, and it will be sufficient to observe here that the high qualities of the up-to-date Shand-Mason " Double Vertical" have led to its incorporation by the firm in a special type of Motor Fire Engine, in which the fire-pump and quicksteaming boiler are fitted at rear of a high-class petrol or electric chassis, thus effecting the combination of the most efficient and most highly-developed form of fire engine with the swiftest and most convenient road machine. Yet another successful type of Motor Steam Fire Engine-having independent propelling and pumping engines, both worked by steam from the one boiler-is also constructed by the firm. Small illustrations of these Motor Engines appear on page 53.

SUMMARY OF DATES

Of the Introduction by Shand, Mason & Co. of Various Features and Improvements in Steam Fire Engine Construction.

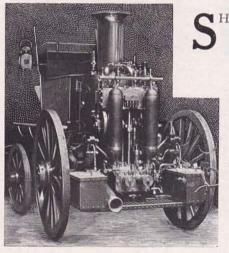
Feature or Improvement in Engine.		When Introduced.		
Crank to determine Stroke			1858	
Disc Valve to Pumps	***		1861	
Engine at back of Boiler	222		1863	
Boiler jointed for removal of Interio	or		1863	
Treble Cylinder Engine			1869	
Inclined Water Tubes to Boiler			1869	
High Speed Engine and Pumps			1877	
Self-propelling Steam Fire Engine		(4.00)	1877	
Self-acting Lubricating Apparatus			1882	
Special Feeding Arrangements of F	Boiler		1888	
Double Cylinder Vertical Construc	tion		1889	
Oil-Fuel Furnace			1893	
Variable Steam Expansion	***		1898	
Quick-Steam-Raising Apparatus			1905	
Motor Steamer with Independent	Prope	elling		
		***	1909	
Steam Fire Engine on Motor Chass	sis	100	1909	

GENERAL DESCRIPTION

OF SHAND, MASON & CO.'S PATENT "DOUBLE VERTICAL" STEAM FIRE ENGINE.

(For Prices and Particulars of Sizes, etc., see pages 40 and 41).

An Outline of the Working Parts.



The Shand-Mason "Double Vertical" Variable Expansion Steamer.

Rear View, exhibiting the position of Engine, Air Vessels, Suction Inlet, Delivery Outlets and Feed-water Tank,

HAND, MASON & CO.'S Patent "Double Vertical" Steam Fire Engine, which forms the subject of this Catalogue, has for its principal features two double-acting steam cylinders working directly on to two doubleacting pumps placed vertically, the steam cylinders and pumps being rigidly connected either by a strong gunmetal frame cast whole with the pump cylinders, valve chambers and passages, or by stout standards of polished forged steel. Two piston-rods convey the movement of each piston to the corresponding pumprod, and the movement is communicated to the doublethrow crank-shaft by steel connecting-rods of special form running from a joint in the head-piece of each pump-rod. This improved arrangement, which replaces the less effective cross-head, while facilitating the smooth working of the machinery, minimizes friction, thereby considerably lessening wear and tear. It is also capable of easier adjustment. At each end of the crank-shaft are eccentrics for working the slidevalves of the steam cylinders.

The cranks of the Engine being set at right angles permit of it starting in any position immediately steam is turned on. A light wheel, weighted to balance the moving parts of the Engine, is fitted at each extremity of the crank-shaft, and by the aid of a small bar inserted in holes in the rims of these wheels the moving parts may be turned in the fire station to prevent setting and assist in cleaning. Other points of the Shand-Mason "Double Vertical" are the simplicity of design, the rapidity and ease with which the various parts, including pump valves, can be got at for cleaning or examination, or renewal of valves when necessary, and the lightness of the whole machine in comparison with its power and capacity.

Steam Construction and Simple Design.

The piston-rods, slide-valve rods, and pump-rods with special head-Cylinders and pieces forged in one piece, are of bronze (which while having a tensile Pumps: their strength equal to mild steel, is not liable to get set through corrosion, an important feature where the Engine may remain a considerable time without being used), the pump is of gunmetal, and all surfaces with which the water comes into contact are of this metal, bronze or copper.

Capacious suction and delivery air-vessels are fitted, and the waterways and valve area of the pumps are also of large capacity to allow of the Engine being worked at high speed; the pump valves can be examined and renewed upon the removal of one cover. The oil-feeding arrangements are as complete as possible, comprising improved self-acting arrangements for lubricating the working parts and special apparatus for supplying lubricating oil to the steam pistons, including sight-feed lubricator.

An improved by-pass cock is fitted to assist the Engine when working with a small jet owing to a short water supply, or when working through a long line of hose.

In the A, B, and No. 1 size Engines two delivery outlets for $2\frac{3}{4}$ -in. hose are provided; while to the larger sizes four are fitted, the No. $4\frac{1}{2}$ size Engine having in addition an outlet for $3\frac{3}{4}$ -in. hose. All the outlets are provided with stop-valves.

The Patent Quick-Steaming Boiler. The boiler is of Shand, Mason & Co.'s patent inclined water-tube type as described and illustrated on pages 20 and 21. The design, which has been in practical use a number of years, has been improved where experience has shown it possible, and in its present perfected form steam can be raised from cold water to 100 lb. pressure in the A, B, Nos. 1 and 2 size

Engines in from 6 to $7\frac{1}{2}$ minutes while stationary, and in some few minutes longer while travelling, while for the larger sizes $7\frac{1}{2}$ to about 10 minutes should be reckoned, with corresponding addition when steam is raised whilst travelling. The pressure can be continuously maintained without the slightest difficulty. Polished brass dome, funnel, etc., are fitted to boiler.

[A considerable reduction in the steaming times, with other advantages, may be obtained by the use of the firm's new and successful Patent QUICK-STEAM-RAISING APPARATUS, described separately on page 24.]

Improved
Boiler-Feeding
Arrangements
and other
Fittings.

The boiler-feeding arrangements have been remodelled and bear several important improvements, including a safety sight-feed, which has been found of great advantage in simplifying the engineer's work. The apparatus for maintaining the water supply to the boiler consists of a feed-pump worked direct from one of the piston-rods, and in addition a simple form of injector is fitted to the boiler.

With this system the boiler may be fed by the injector drawing its supply from the water tank on rear footboard (the tank being kept full automatically from pump-head), or when foul or sea water is passing through the pumps, the injector takes its supply through flexible suction hose from a canvas dam, a stream, or other fresh-water supply.

The feed-pump, in addition to these sources, may also be supplied direct from the pumphead except when foul or sea water is being used. Suitable cocks with index plates are provided for confining the supply to any one of the sources and regulating the quantity pumped. These various means cover every requirement, and ensure a certainty of supply.

Improved duplicate lock-up safety-valves are supplied, either of which will at once relieve the boiler of all excess of steam above the blowing-off pressure, even should the Engine be suddenly stopped when running at full speed with a heavy fire in the furnace.

The intensity of the fire can be increased or diminished by a blast regulator, which lessens or adds to the force of the main exhaust.

Double glass gauges in duplicate are fitted to show the water level, test cocks being thus dispensed with. The steam and water pressure gauges, whistle, blow-off cocks, mud plugs, etc., are all of the highest quality, and all the principal cocks on boiler are asbestos packed.

For use in cold climates, all pipes and fittings are made so that no water remains in them when out of use, and the connections between feed-pump and boiler are kept thawed by an improved frost-proof arrangement. In special cases a steam pipe is laid alongside any pipe liable to freeze.

Smoothness and Steadiness in Working: Ease of Handling. In Shand, Mason & Co.'s "Double Vertical" Engine the design and even balancing of the moving parts ensure a uniform delivery of water under even pressure with remarkable steadiness of the carriage even when the Engine is working at highest speed, while its simplicity of construction enables the Engine to be easily handled and worked by one man.

Handling. The importance of the Engine's smooth, regular working and freedom from oscillation cannot be over-estimated, as the vibration and movement present in the working of faultily-designed Engines wear out both hose and suction-pipe at a rapid rate, increasing the labour of the firemen, and adding greatly to the cost of maintenance.

Stoking Arrangements of the "Double Vertical" Steamer. In Shand, Mason & Co.'s "Double Vertical" Steam Fire Engine the furnace door is placed at the side in preference to rear of boiler, because of the advantages this arrangement possesses in actual service over the alternative of placing fire door, working parts and suction and delivery connections all at the rear of the boiler. These advantages are of such special importance that they are set out more fully on page 23 of this catalogue. The correctness of this Shand-Mason principle of side-stoking is endorsed by

the leading Public Fire Brigades of the country, including the London Fire Brigade, who specified that new horse-drawn Steam Fire Engines built for the Brigade should be so arranged.

No Stoking en Route is needed with Shand-Mason Steamers.—The fire can be lighted in the ordinary way when leaving the station, or at any point on the journey without stopping, by means of the simple yet effective apparatus for the purpose fitted at front of boiler. The rapid steaming capacity of the boiler permits steam of 100 lb. pressure to be raised from cold water while travelling to a fire in so short a time that no stoking en route is needed, and when a small pressure is kept up in the fire-engine house by means of a gas burner, the full head of steam can be obtained, while travelling, still more quickly. [A notable NEW QUICK-STEAM-RAISING IMPROVEMENT by the use of which several minutes can be saved in raising steam to 100 lb. pressure is described on page 24.]

Construction of Carriage— Portability and Lightness of Running on all roads—

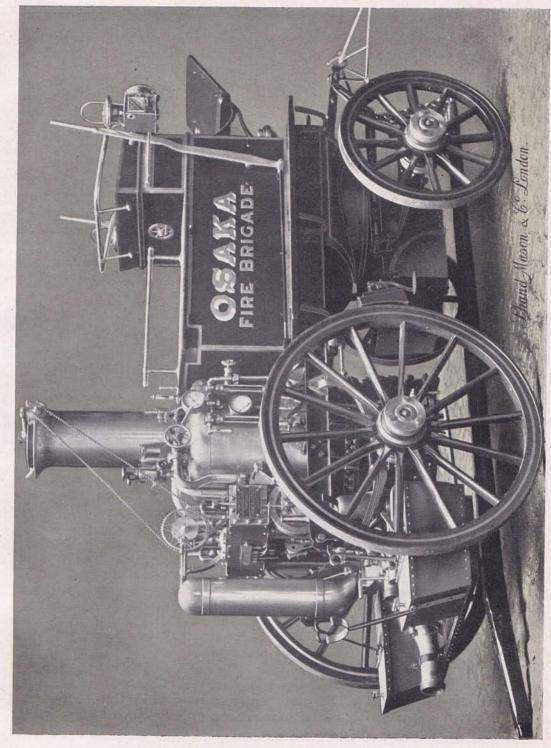
Largeness of carrying Capacity, The "Double Vertical" Engine is light and portable, but care is also taken to ensure strength in all parts, thus making the Engine suitable for country districts as well as for manufacturing and other large towns, and the machine travels readily over rough and hilly roads.

An improved form of forelocking carriage of wrought steel construction with polished splinter-bar is provided, and made to lock completely round, with fittings for pole and sway-bars for horses.

The axles fore and hind are straight, and axles, framework, springs, and sway-bars are of best solid forged steel.

Above the fore-carriage, and fitted to the framing in front of boiler, is a capacious box, constructed of well-seasoned mahogany, for hose and riving seat and footboard for coachman, while the record footboard for coachman while the record for the record for

implements, with driving seat and footboard for coachman, while the rear footplate on which the engineer travels is of wrought iron. Wooden blocks with gunmetal spring clips are fitted to the front of the box under driver's seat for carrying branch-pipes.



SIZE VARIABLE EXPANSION STEAMER—SPECIALLY LIGHT ENGINE, WEIGHT 27 CWT. One of Seven "Double Vertical" Steam Fire Engines recently constructed for Osaka, Japan. 250-GALLON SIZE VARIABLE EXPANSION

The lid of the hose box, which is fitted with a brass rail down the centre, forms seats for the firemen when proceeding to a fire; suction-pipes are carried on each side of the Engine with hinged footboard covering the same, while improved bunkers are provided for fuel, so that all requisites for working the Engine are carried upon it.

The bright metal parts are highly burnished, and the whole of the woodwork is painted and picked out in the very best style.

For ordinary purposes strong high wood-spoke wheels with gunmetal hoops and polished steel plates are used, but for specially heavy strain extra strong hind wheels with metal hubs may be supplied, and for hot climates wrought-iron or steel wheels of special design are generally substituted. The additional cost of these wheels is shown on page 41.

A number of special fittings designed for use with Shand, Mason & Co.'s "Double Vertical" Steamers are described on pages 40 and 41, following the List of Prices of these Engines.

[For Patent Variable Steam Expansion arrangement, see below, Oil-Fuel Furnace, page 18, and Quick-Steam-Raising arrangement, page 24 of this catalogue.]

SHAND, MASON & CO.'S

PATENT VARIABLE STEAM EXPANSION

ARRANGEMENT FOR STEAM FIRE ENGINES.

. Shand, Mason & Co. were awarded a SPECIAL GOLD MEDAL at the Earl's Court International Fire Exhibition (London), 1903, for the application of Variable Expansion to Steam Fire Engines.

THIS most successful addition to steam fire engine construction has already been adopted by the London Fire Brigade and over one hundred Provincial, Foreign and Colonial Fire Brigades. By its means the steam in the cylinders can be used more or less expansively as desired, enabling Considerable economy to be made in Steam Consumption and a greater amount of work to be obtained with a given quantity of fuel. As a result the work of the Engineer is reduced, less stoking being necessary, and far fewer sparks are emitted from the funnel on account of the softness of the exhaust, while a greater power is developed in proportion to the weight of the engine and boiler.

The new variable expansion arrangement, while increasing so greatly the efficiency of the Engine, is of very simple action. In working, all that is necessary to bring the expansion gear into use is a slight movement of the hand lever placed close to the steam valve of the Engine. The cut-off can be varied from three-fourths to one-half the stroke at will, according to the distance the lever is drawn forward, an index plate at back of lever indicating the extent of the cut-off. The Engine can be started in any position.

As evidence of the popularity of the Improved "Double Vertical" Engine with variable expansion gear, attention is invited to the numerous and influential purchasers included in the list on pages 44 to 52, while the highly complimentary expressions of opinion from Officers of Brigades here quoted further indicate the complete success of the engine in actual running.

17.—**I.**

"The Variable Expansion gear . . . is undoubtedly a very valuable steam economiser, and adds greatly to the smooth running of the engine."—CHIEF OFFICER R. WILDS. Walton-on-Thames.

"The Expansion gear enables the steam man to economise with both steam and fuel, and the longer the steamer is at work the greater is the advantage shown."—SUPT. F. G. CROASDELL, Edmonton.

"The Variable Expansion arrangement is **a great boon**, especially at out-of-the-way fires where coal is often short."—CAPT. A. HEWETT, Sutton-at-Hone.

"Your Variable Expansion gear is a veritable godsend to Volunteer Brigades." CHIEF OFFICER R. G. GRAHAM, Hampton.

"The Variable Expansion gear is of great assistance in long steaming and working. It economises fuel, and relieves the cylinders of a great amount of back pressure which is generally experienced in other patterns of engines."—SUPT. S. SIMPSON, Blackburn.

"Your Variable Expansion gear is a great acquisition, and is much appreciated where the engine has to be driven for a long period, and where there is difficulty in getting coal and clean water."—MR. W. LAURENCE BRADLEY, Engineer and Surveyor, Tonbridge.



Copyright Photo]

Cassell & Co., London.

STEAMER INSTRUCTION CLASS AT LONDON FIRE BRIGADE HEADQUARTERS.

The Steam Fire Engine is Shand, Mason & Co.'s Patent Variable Expansion "Double Vertical," 200 gailon size.

SHAND, MASON & CO.'S PATENT

APPARATUS FOR THE USE OF OIL-FUEL

(IN PLACE OF COAL)

FOR STEAM FIRE ENGINES,

As in use by the LONDON FIRE BRIGADE, also SYDNEY, MELBOURNE, Perth (W.A.), Alexandria, Milan, Bristol, Rosario, Birmingham, Cambridge, Hove, Ealing, Southampton, Edmonton, Wem, and other Fire Brigades, Messrs. Kynoch, Ltd., Witton, The Earl of Macclesfield, Shirburn Castle, etc., etc.

Advantage of the Shand-Mason Oil-Fuel Apparatus.

Y the use of Shand, Mason & Co.'s Perfected Oil-Fuel Apparatus in connection with Steam Fire Engines the time occupied in raising steam is appreciably shortened—in fact, where 20 lb. to 30 lb. of steam is maintained, as at the London Fire Stations, it becomes almost a negligible quantity, 1 to 12 minutes sufficing to bring the pressure to 100 lb. after the burner has been lighted. STEAM PRESSURE IS MAIN-

TAINED WITH GREATER EASE AND STEADINESS than with coal fuel; there is also, of course, an entire absence of sparks and flying cinders when the engine is working; no stoking is required, and last, but not least, NO PREPARATION OF FURNACE, ETC., IS NECESSARY WHEN THE STEAMER RETURNS TO THE STATION.

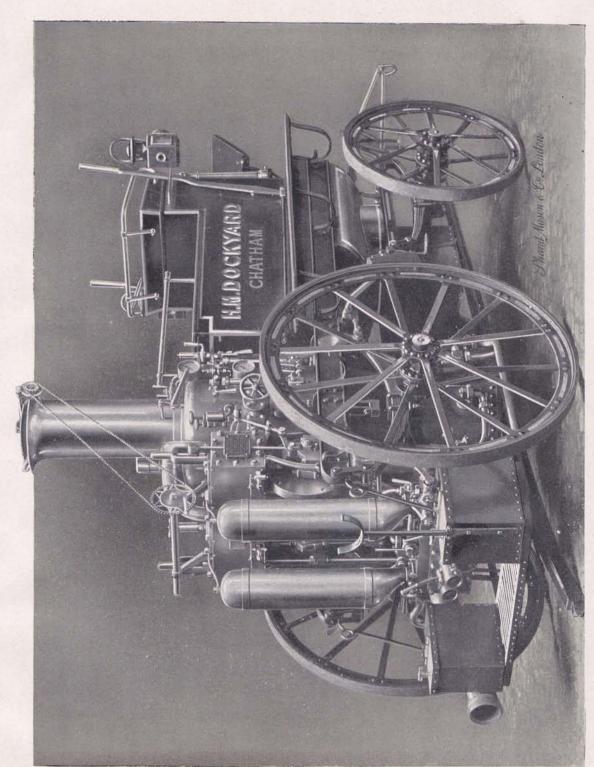
Description of Oil-Fuel Burner.

In the Shand-Mason Patent Oil-Fuel Burner a striking advance Shand-Mason has been made in the direction of simplifying and perfecting the apparatus. The oil is stored in a copper tank holding several hours' supply, placed in the fore part of the hose-box under the coachman's seat, whence it is fed by gravity to the burner. In working, the oil is sprayed into the

furnace by means of a jet of highly superheated steam, which disperses it into fine molecules and forces it against a baffle-plate in the furnace, ensuring thorough combustion. When starting with the furnace cold, air forced into the boiler takes the place of the steam jet for temporarily spraying the oil until a pressure of 10 lb. has been obtained. The supply of fuel to the furnace can be regulated as desired. Thus, when the Engine is standing for any length of time the supply can be limited to a small jet or turned off completely, the re-lighting occasioning no loss of time.

Shand, Mason & Co.'s Oil-Fuel Apparatus has been adopted after exhaustive and very successful tests by the London Fire Brigade, not only for new engines constructed by the firm, but also for a number of other steamers already in use. It has further been specified for engines for Home, Colonial and South American Brigades.

The engraving upon page 34 illustrates the method by which oil-fuel apparatus can be fitted to existing engines designed for burning coal in the furnace.



500-GALLON SIZE VARIABLE EXPANSION "DOUBLE VERTICAL" STEAMER FOR H.M. ADMIRALTY.

DESCRIPTION OF SHAND, MASON & CO.'S IMPROVED

PATENT QUICK-STEAMING BOILER,

As Fitted to their "Double Vertical" Steam Fire Engines.

SHAND, MASON & CO.'S Patent Inclined Water-Tube Boiler, which has successfully stood the test of over a quarter of a century's practical working, has been the subject of a number of important improvements, and it is now, as when introduced,

UNEQUALLED AS A MEANS OF RAISING STEAM RAPIDLY AND OF MAINTAINING A STEADY WORKING PRESSURE.

Numerous testimonies with regard to these important and distinctive qualities of the Shand-Mason Steam Fire Engine Boiler have been received from Brigade Chief Officers and others.

The boiler is applied to all Steam Fire Engines of Shand, Mason & Co.'s construction, and, in addition, has been adopted for yacht engines and in other cases where it is desirable to obtain a maximum of power in a minimum of space without sacrificing efficiency or durability.

Every boiler, before leaving the works of Shand, Mason & Co., is thoroughly tested, and some particulars of the steaming times which may be obtained are given on pages 13 and 24. On the first-mentioned page the boiler fittings are also described.

Design and Construction of Boiler. The boiler is constructed in two pieces, bolted together by an angleiron faced joint which affords direct access to the whole of the interior.

Best quality selected Yorkshire iron only is used, with the longitudinal seams welded, and all holes, whether for rivets or bolts, are drilled. The

tubes are of solid hard-drawn brass, and as the ends are removed from the hottest part of the fire no leakage whatever takes place, while the clear passage through the tubes, combined with their inclined position, prevents the accumulation of deposit, which in practice invariably takes place in tubes where one of the ends is closed.

The whole of the tubes are straight, and therefore have the advantage of being easily cleaned, inspected, or renewed.

A sight-hole with screwed plug is provided on the side of the boiler, enabling a partial inspection of the crown plate, uptake, etc., to be made from the exterior.

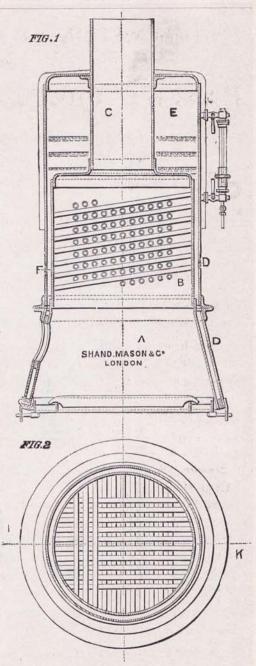
The shape of boiler shell while giving great strength also gives perfect freedom for expansion when steam is being rapidly raised.

Working The working steam presSteam sure of Shand, Mason & Co.'s
Pressure of Engines is 125 lb. on the square
Boiler. inch, and the safety valves are
constructed so that the engineer cannot exceed
this; but the boilers are proved to 250 lb., and
the Engines could be worked with safety at a
pressure of 150 lb. on the square inch.

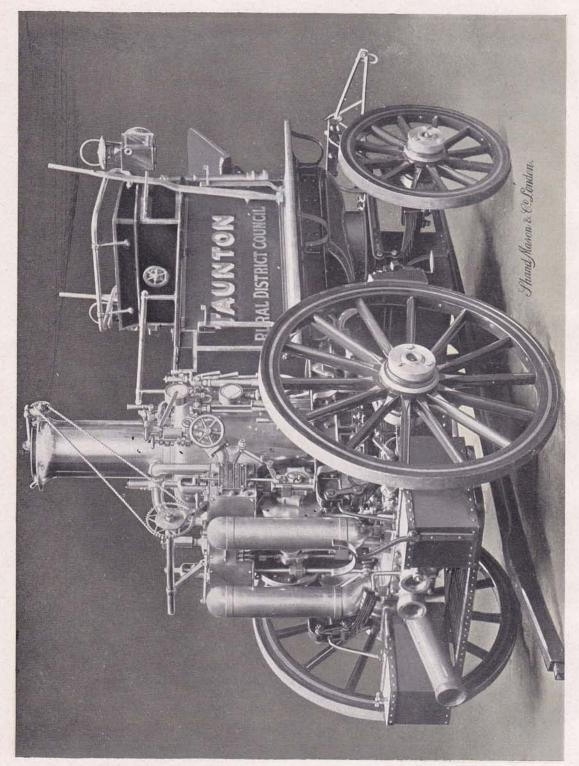
Explanation of Sectional Diagram.

In the diagram at side Fig. 1 is a sectional elevation of the boiler and Fig. 2 a plan of the absorption chamber.

A indicates the position of the furnace; B, the absorption chamber sectioned on the line I, K (Fig. 2); C, the chimney, or funnel; D, the outer shell; E, the steam chest; and between B and D is the water space by which the tubes are supplied with water at their lower ends, and through which the upper ends deliver the steam produced from the heat absorbed by the tubes, and transmitted to the water during its passage through them. By the arrangement of tubes and water spaces a general circulation of water is obtained in the boiler, and especially through the tubes, while the water space allows of an easy separation of steam from the accompanying water, and of its rising into the steam chest. Priming is in this manner prevented and water allowed to return to the lower ends of the tubes, thereby maintaining a constant circulation through them and by crossing the tubes in alternate layers a constant flow towards and into the lower ends is induced, and a constant discharge from the upper ends, thus causing general and uninterrupted currents of water and steam.



For the instruction of the members of the Fire Brigade precise directions for working Shand, Mason & Co.'s Patent "Double Vertical" Steam Fire Engines are furnished with every Engine, explaining fully and clearly all that is necessary to enable the Engineer or Firemen to efficiently work the machine.



300-GALLON SIZE VARIABLE EXPANSION "DOUBLE VERTICAL" STEAM FIRE ENGINE.

SOME OF THE

ADVANTAGES OF SIDE-STOKING

ADOPTED IN THE SHAND-MASON "DOUBLE VERTICAL."

THE principal advantages of the Shand-Mason side-stoking arrangements which have influenced the leading Fire Brigades in the adoption of the principle in preference to the old style of fire door at rear are as follows:—

- 1. More Convenient for the Engineer.—With the furnace door at side instead of beneath the machinery at rear, the engineer has perfect freedom of movement. He has all the gauges and other boiler fittings within view and easy reach from his position at the side, and is not interfered with by the firemen in connecting or laying the suction-pipe and delivery hose, nor hampered by the presence of these latter when at work. At the same time the lever of delivery outlets is easily reached by the engineer, when standing at the side of the Engine.
- 2. More Convenient for the Firemen.—With the stoking door at side the firemen can proceed with the coupling up of hose and the arrangement of suction-pipe immediately on arrival at a fire, without in any way incommoding the engineer, and any liability to damage to hose and suction-pipe during the process of stoking is also avoided.
- 3. More Convenient for Cleaning.—The arrangement of the machinery being so much less cramped and of readier access, the cleaning, oiling and inspection, also any adjustment that may be necessary, can be more easily and quickly performed.
- 4. Greater Safety of Engine when Travelling.— By removing the fire door from the rear to the side, it has been made practicable to lower the machinery considerably, with the result that the centre of gravity is as low as possible, and greater safety, as well as steadiness, when travelling is secured.
- 5. Better Design of Engine Obtained.—Similarly the adoption of side-stoking has permitted of the introduction of a much more satisfactory design. The entire back of boiler being free, the working parts are not confined or crowded as in the case of Engines having machinery and fire door both at rear.

THE OLD AND THE PRESENT DAY STOKING ARRANGEMENTS OF SHAND-MASON STEAMERS.



1875.—Machinery, Suction and Delivery Connections and Fire Door all at rear. (Engine constructed by S. M. & Co. for Brussels).



Present Day.—Machinery, Suction & Delivery Connections at rear, Fire Door at side. (Modern Shand-Mason Engine in position for working).

6. Position of Suction Inlet Lower.—The lower position of the suction chamber, which side-stoking allows, gives a very decided advantage when working from a depth, when even a few inches more or less may make all the difference between prompt, successful working and failure or an ignominious wait for the turn of the tide.

7. No Sacrifice of Strength.—To make the arrangement of machinery and fire door both at rear workable, it is often necessary to adopt curved axles and other expedients. In the Shand-Mason "Double Vertical" Steamer the axles are straight and in no respect is there any sacrifice of strength or durability.

SHAND, MASON & CO.'S PATENT OUICK - STEAM - RAISING APPARATUS.

(Shown fitted to Engines illustrated at pages 2, 19, 22 and 51).

A SIMPLE but effective means of accelerating the raising of steam, by which several minutes can be saved in obtaining working pressure, has been recently introduced by Shand, Mason & Co. for use with their Steam Fire Engines. This is a portable attachment consisting of a light revolving exhauster fan with vertical and horizontal shaft and bevel gear shafting run in ball bearings, and the whole is contained in a casing fitting into the top of the Steamer funnel. The fan is actuated by a driving wheel and chain, the driving wheel being placed in a convenient position for use by the Engineer whether the Engine is standing or travelling. The rapidity with which the fire is drawn up by the action of the new quick-steam-raising apparatus allows of the furnace being much more closely packed with fuel, so that while the raising of steam to full working pressure is materially quickened, at the same time a strong fire is built up in the furnace. Thus the engine can be started at full speed without fear of the temporary loss of steam pressure which sometimes occurs under ordinary conditions.

Steam is raised so rapidly and surely with the new apparatus that even when the boiler is kept cold the full pressure can under most circumstances be readily obtained before the firemen have completed the making-ready of hose, stand-pipes and other apparatus at a fire, and in cases where it is thought desirable to maintain a heater in use, the Quick-Steam-Raising Apparatus allows of a considerable reduction in the quantity of gas or oil used, with other obvious advantages, since the boiler need only be kept warm, ensuring the fuel being kept dry and in proper condition.

The following are examples of steam-raising (from cold water to 100 lb. per square inch in each case) at recent official trials of Shand-Mason "Double Vertical" Steamers fitted with the new apparatus:—

At Ambleside (200/250 gal. Engine), 4 min. 30 sec.; at Torquay (300/320 gal. Engine), 4 min. 55 sec.; at Silsden (350/400 gal.), 5 min. 37 sec.; at Byfleet (300 gal.), 5 min.; at Taunton (300/320 gal.), 5 min. 22 sec.; at Hall Barn (260/300 gal. Engine for Lord Burnham), 5 min. 20 sec.; at Cowbridge (300 gal.), less than 5 min.; at Canford Manor (300 gal. Engine for Lord Wimborne), 5 min. 45 sec.; at Stevenage (250 gal.), less than 5 min.; at Herne Bay (250 gal.), 4 min. 50 sec.; at Huntingdon (260/300 gal.), 4 min. 14 sec.; at Lowestoft (260/300 gal.), 5 min.; at Marsden (500 gal.), 5 min. 20 sec.; at Slaithwaite (500 gal.), 6 min.

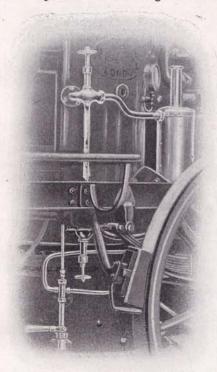
STEAM FIRE ENGINE BOILER HEATERS

For Maintaining Steam while Engine is in Station.

I. Improved Gas-Burning Boiler Heater for Portable Steam Fire Engines.

HIS successful apparatus, of which numbers have been supplied for Fire Brigade service, comprises an improved atmospheric gas burner of Shand, Mason & Co.'s special design for placing inside the fire box of Steamer, complete with movable sleeve for adjusting flame, shield and bracket for fire-door opening, gas nozzle and cock for regulating supply, constructed throughout of copper and gunmetal; also improved governor and weighted shut-off cock for stopping gas supply when heater is withdrawn from fire-box. By using a small flame the water can be kept at a temperature of, say, 150 deg. Fahr., or by a larger flame 15 to 20 lb. or higher steam pressures can be maintained. For price see page 40.

II. Special Circulating Boiler Heater with Gas Burner for Large Size Engines.



SHAND, MASON & CO.'S SPECIAL CIRCULATING BOILER HEATER IN POSITION ON STEAMER.

IN this simple and economical form of Boiler Heater, designed by Shand, Mason & Co., for large size engines, the heater itself is made of copper, and is provided with inclined crossing tubes. Check valves closed by springs govern the circulating pipes between the heater and the main boiler. These are connected by lever and link motion, and are held open by a loose spindle, the withdrawal of which, effected by means of a cord attached to it, causes the valves on the circulating pipes to close automatically, thus shutting off instantly the connection between heater and fire engine boiler, the same movement shutting off the connection between gas-pipe and burner. The moving forward of the engine when turning out releases the slip joint of the gas-pipe below the heater, and at the same time pulls over the ball lever on the gas supply, so shutting off the gas at the main. A screw spindle is fitted to each check valve on the circulating pipes, by means of which the check valves can be set down firmly when the engine is to be worked. A gas regulator attached enables a constant pressure of gas to be maintained at the burner, allowing for varying pressure from the mains. The burner is large enough to maintain from 20 lb. to 30 lb. steam pressure, but it can be regulated to keep the water in the boiler simply at boiling point or lower. Independent cross-tube boiler heaters are also constructed by Shand, Mason & Co.

III. Oil-Burning Boiler Warmer.

THIS apparatus is designed to keep the boiler of a Steamer warm and dry and is particularly suited for small engine houses, where no stove is used, in which case it will not only serve to warm the boiler, keeping the

temperature of the water at about 120 deg. Fahr. (50 deg. Cent.), and greatly facilitating the raising of steam, but also to keep the Engine house dry. It consists of a powerful oil-burner with double wick, copper reservoir, and extended curved chimney with shield to cover fire door opening. Price complete for Steamers up to 400-gallon size £5 (code word CAPESSITUS).

COST OF MAINTAINING AND WORKING

SHAND-MASON STEAM FIRE ENGINES.

LOCAL AUTHORITIES who have not had practical experience with Steam Fire Engines often have the impression that the cost of maintaining and working these Engines must involve a heavy outlay. This, however, is entirely at variance with the experience of those who have Steamers in use.

It is found in practice that the Steam Fire Engine itself costs very little more to keep in good working order than does a manual engine, while the cost of actual working is, of course, much less, due to the fact that there are no pumpers required. A dry, well-ventilated building and occasional cleaning and moving the working parts are practically all that is required when the engine is not working. Any fireman of intelligence can, with ordinary instruction, run a Shand-Mason Steam Fire Engine. There is no necessity for the engagement of a special engineer.

The following extracts from letters written by Chief Officers of Fire Brigades experienced in the matter of steam fire engine maintenance and working will confirm these facts:—

ROSS, HEREFORD.

"I AM agreeably surprised to find that the upkeep is practically no more than that of a manual engine, the little extra metal polishing being done cheerfully by the men. Our Steamer has not cost the Council anything for repairs during the four years, and works as well now as the day of her first public trial."—Captain BLAKE.

PERSHORE.

"In our selection of a Steamer we had the following points in view: -(1) To do away with the inconvenience, trouble and expense of finding pumpers and keeping them at work during the long and tedious farm fires with which our Brigade have to deal; (2) to find an Engine both light in weight and easily drawn (as our distances to be traversed are often great) yet possessing great strength and durability in all working parts in conjunction with effective and pleasing design in construction. After three years of practical work we can truthfully say your Engine has fulfilled all our requirements, and has even exceeded our desires. It has convinced even the most determined opponents to its purchase that its advantages as a time and money saver over the manual engine are enormous. The Steamer is universally admitted to be a most useful and economical machine." -Captain A. W. SMITH.

SANDOWN, I.W.

"The cost of upkeep of the Brigade Steamer is very small."—Captain J. DORE.

DARTMOUTH.

"We have been in possession of the Steamer (260-300 gall." Double Vertical") about five years, and she has cost us practically nothing up to now for repair, minor matters, which we attend to ourselves, being, of course, excepted."—Captain WALLIS.

PETERSFIELD.

"WITH regard to cost of upkeep I cannot give you any figures, as we have had steam coal, wood and oil given to us since having the steamer, but the cost of maintenance is very small, the Engine being very economical in the use of coal and oil."—Mr. W. A. GAMMON, Hon. Sec.

WELLINGBOROUGH.

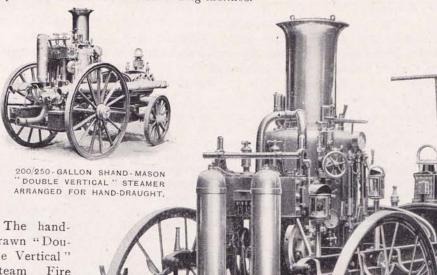
"Our repair bill for the last five years would be many times covered by a £5 note."—Captain E. W. JACKSON, B.A., LL.B.

DATCHET.

"The new (200/250-gall.) Steam Fire Engine has now been in the village for over a year, and I am able to report as to the result of the working for the year 1905. At fires and drills the Engine has pumped 236,400 gallons of water, equal to more than 1,000 tons of water. Total cost of coal, wood, oil and repairs for the year, £5 10s. 6d.; in stock—coal, wood, oil to value of £1 18s. 6d.; net expense, £3 12s. The officers and men have taken a keen pride in voluntarily performing the extra work involved in cleaning."—Captain F. P. Ward.

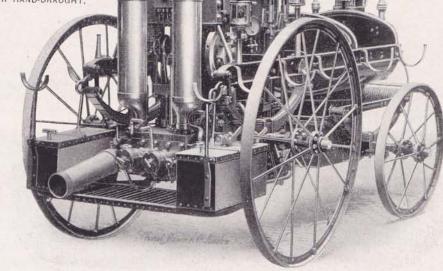
THE SHAND-MASON "DOUBLE VERTICAL" ARRANGED AS A HAND-DRAWN STEAM FIRE ENGINE.

POR various Colonial and foreign districts and private property owners, and, in a few cases, for home purposes, Steamers arranged to be drawn by hand instead of by horses are preferred, and to meet this demand, Shand, Mason & Co. have constructed the type of machine here illustrated. In this the hose-box and coachman's seat are replaced by a neat "boat" for hose above the fore-carriage, and in place of the splinter-bar is an improved arrangement of drag-ropes and a steering handle. The drag-ropes are wound upon two small reels with pawls and ratchets, allowing the ropes to be drawn out wholly or partially as required. Eyes for steadying ropes are fitted at rear of frame enabling the Engine to be kept under control when descending inclines.



The handdrawn "Double Vertical" Steam Fire Engine is constructed in the various standard sizes

When this design is required add Catusca to code word for the Engine as given on page 40.



J. 350/400-GALLON? VARIABLE EXPANSION "DOUBLE VERTICAL" STEAMER ARRANGED FOR HAND-DRAUGHT.

Engine illustrated, constructed for Madras Harbour Board, was fitted with wrought-iron wheels.

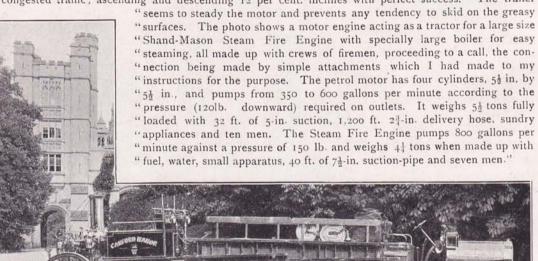
MOTOR TRACTION ARRANGEMENTS

FOR STEAM FIRE ENGINES.

Shand, Mason & Co. supply specially-designed fittings to enable Steam Fire Engines to be drawn by motors, whereby any difficulty with regard to horsing may often be overcome. Suitable motors for the purpose are available in most towns, and in cases where Brigades already possess motor apparatus which can be attached to the Steamer there should be, as a rule, considerable economy in traction.

R. T. P. PURCELL, CHIEF OF THE DUBLIN FIRE BRIGADE, writing with reference to the general introduction of motor traction, reminds Fire Brigade Officers that they should not overlook "the services rendered by such reliable apparatus as "the modern Steam Fire Engine, the most powerful and compact portable pumping "unit for a given weight ever put at the service of Fire Brigades," and describes how a steam fire engine can be hitched on to a motor and brought to the scene of the fire much more quickly than is at present possible with horses. He goes on to give his experience:

"I have fully tested the plan in my own department," he says, "under the most difficult condition "of street surface and traffic which I could find, including turning into narrow passages; moving through "congested traffic; ascending and descending 12 per cent. inclines with perfect success. The trailer



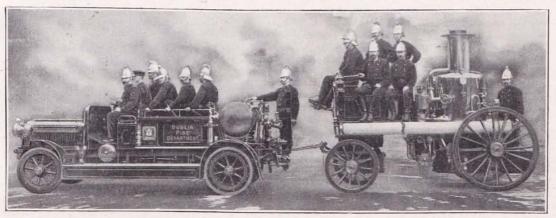
CANFORD MANOR STEAM FIRE ENGINE WITH ESTATE MOTOR LORRY AS TRACTOR. (See page 29).

"No alteration to motor or Steamer is required. The Steamer or trailer must, of course, be "provided with an effective brake and can be connected or detached in a few seconds. It steers in good "style. See the possibilities!"

* +

THE SHAND-MASON "DOUBLE VERTICAL" STEAMER FOR THE PROTECTION OF CANFORD MANOR, the Dorset seat of Lord Wimborne, has been the subject of an interesting note from Mr. B. Trevett, the Canford Manor Estate engineer. Primarily, the Steamer is intended to protect the main mansion buildings, but the Brigade have to attend fires at some considerable distance away with the Engine. How this is rapidly effected is described by Mr. Trevett in the note referred to.

"The need for rapid transit in the event of a Brigade call has," he says, "been overcome by "coupling the engine to the estate lorry by means of a detachable drawbar. The lorry is used on the "estate for conveying workmen and materials, as apart from fires. In dealing with a fire at a distance "from Canford Manor the value of the lorry at once becomes apparent. . . . Pickaxes and shovels "buckets, hose, spare gear, rush hurdles (for damming streams), and sufficient coal for 24 hours' continuous "steaming, together with 18 men, are conveyed by the lorry, with Steamer attached at rear at a speed of 12 to to 15 miles per hour.



DUBLIN'S SHAND-MASON 750/800 GALLON STEAM FIRE ENGINE WITH MOTOR TRACTOR. (See page 28.)

"The working cost with above load, including tyres, petrol, repairs, driver, etc., is eightpence per "mile. I can confidently recommend this arrangement to all estate engineers, as during three years "practical experience it has never failed."

* * *

IN THE UNITED STATES OF AMERICA, according to "Insurance Engineering," the well-known New York technical paper, "It is noticeable that the large City Fire Departments are still placing "their dependence upon steam-driven pumps, and the popular belief among fire chiefs seems to be that if "the Steam Fire Engine can be brought to the fire by an automobile the result will be the most satisfactory "that can be secured at the present time."

THE LATEST ORDER GIVEN BY THE NEW YORK FIRE DEPARTMENT includes no fewer than 28 Steam Fire Pumps, each combined with petrol motor engine as tractor, this combination having proved the most satisfactory during practical trials extending over several months.

The Utility of Shand-Mason Steam Fire Engines for General Pumping Purposes.

NSTANCES are constantly being reported of valuable work done with Shand-Mason Steamers both by public and private Fire Brigades in preserving life and property from injury by water, or from loss that would follow a temporary shortage of water. Examples of this are given below.

PROVIDING OR SUPPLEMENTING WATER SUPPLY TEMPORARILY.—At Dublin, in September, 1893, the Brigade's 750/800-gallon Shand-Mason Steamer was worked continuously for several weeks maintaining supply of water in reservoir when severe drought occasioned shortage. At Wimbledon, in February, 1881, shortage of supply due to the freezing of a section of the street mains was overcome by the use of three Shand-Mason Steamers, which pumped from one main to another beyond the obstruction, to supply the dwelling houses on the Common. At Dartmouth, recently, the Shand-Mason 260/300 gallon "Double Vertical," supplied in 1906, provided a temporary water supply for the town for two days, pumping through 3,500 feet of wrought iron pipe into a reservoir 300 feet O.D.

PUMPING OUT RAILWAY CUTTINGS.—On the Metropolitan District Railway in February, 1885 (37 hours' continuous working), and in June, 1903 (3 days); on the Metropolitan Railway in June, 1901 (several days), and on the London, Tilbury and Southend Railway in August, 1888 (a week or more), Shand-Mason Steamers were used successfully to remove storm water and prevent dislocation of the service.

PUMPING OUT FLOODED HOLD OF VESSEL.—At Dundee, in September, 1901, the foundering of the SS. Ardolinis, through the sea cocks accidentally being blown out, was prevented by the timely assistance of the Harbour Steamer, which for two hours pumped out the water at the rate of 600 gallons per minute.

FLUSHING SEWERS AND DRAINS.—At Selby, in August, 1884, the town Steamer worked 10 hours daily for three months flushing the sewers. Similar work was done at Lincoln during an epidemic in February, 1905, also in various Indian municipalities during the bubonic plague.

DIVERTING STREAM DURING EXCAVATIONS.—At Rawtenstall, in July, 1908, for several days, during the laying of a main sewer through a stream, the town Brigade's two Steamers were used to pump water from the stream into a well beyond the excavations, thus maintaining the supply for two mills and a water wheel, and averting compensation payments of £100 per day demanded in the event of stoppage.

PUMPING OUT FLOODED BASEMENTS.—Good service has been rendered by Shand-Mason Steamers on innumerable occasions of floods. Noteworthy cases are those of the Newspaper Offices in Whitefriars and Bouverie Streets, London, in July, 1903, and in Carmelite and Tudor Streets in June, 1906, when serious floods prevented printing of newspapers until the water had been removed. After the collapse of a canal wall in Birmingham in 1901, during the extensive floods at Kingston in 1894, the great Sheffield inundation, and the heavy flood at Maidstone in November, 1909, valuable work was done by the Steamers of the local brigades.

REMOVING SILT AND MUD FROM RIVER BANKS.—On the Trentham Hall Estate, before its disposal by the Duke of Sutherland, the Hall Steamer was utilised to remove the thick deposits of black mud which frequently accumulated; on one ocasion 700 cubic yards was cleared by the Steamer in 12 hours. At Wisbech, in May, 1903, the town Steamer effected in a short time what had in previous years taken weeks to accomplish—the removal of the mud and silt blocking the swinging berth. At Adelaide, in 1893, a Shand-Mason Steamer was used with conspicuous success to remove the extensive deposits of silt from the shores of the Torrens.

FILLING OR EMPTYING GASOMETERS.—At Haslemere, recently, the Brigade Steamer worked for 31 hours filling a large gasometer, and at Kenilworth, in September, 1910, the Brigade Steamer was utilised for filling a new gas holder tank and worked for several hours, pumping in all 320,000 gallons of water. At Sutton, Surrey, in July, 1884, a Shand-Mason Steamer worked for some days emptying a gasometer pit containing 412,200 gallons of water.

PREVENTING FLOODING OF COAL MINE.—At West Bromwich, in November, 1890, the two Brigade Steamers were run for 24 hours and 120 hours respectively to keep down the water which had broken in, in order to save the ponies and prevent the stoppage of work.

CLEARING EXCAVATIONS.—At Warwick, during the construction of an open-air swimming bath near the Avon, the inflow of water from the river was so great that to allow the work to proceed, it was necessary to work the town Steamer 15 hours a day for eight weeks pumping out. At Govan, in August, 1910, when, during the laying of a new sewer the old one immediately above it burst, flooding the excavation, the prompt use of a Steamer was the means of saving the lives of several men working in a compressed air chamber in the cutting. Shand, Mason & Co.'s Steamers have also been frequently used by Contractors for similar purposes. In addition they have been utilised for:—

Watering race courses and cricket grounds—Irrigating sugar and coffee plantations, market gardens, parks, growing crops, etc.,—Emptying docks, river locks, ponds, etc.,—Filling swimming baths, ornamental lakes, elevated tanks, etc.,—Washing down public and other buildings in towns,—Pumping from waterlogged vessels,—Pumping water supply for vessels,—and for many other purposes.

SOME EXTRACTS FROM TESTIMONIALS

Received since the issue of the last Catalogue respecting

SHAND, MASON & CO.'S "DOUBLE VERTICAL" STEAMERS.

SWANSEA.

"AT a fire in 1909 the Engine worked $8\frac{1}{2}$ hours continuously at 110 lb. steam and 120 lb. water pressure with a double line of hose 125 yards long, with a perpendicular lift of 20 ft. After being in use for over 6 years all parts of the Steamer are in first-class condition."—Captain J. COLQUHOUN, Chief Constable.

BELIZE, British Honduras.

"THE two Steam Fire Engines which you supplied to this Government last year have given entire satisfaction. Although powerful they are light and easily handled, and are able to get over raised bridges and down narrow lanes. . . . These Engines have come fully up to the specification; have proved that they can do all that is claimed for or required of them, and are certainly a most valuable addition to the fire-fighting appliances of the town of Belize."—The COLONIAL SECRETARY on behalf of Sir E. J. E. SWAYNE, K. C.M.G., Governor.

DARTMOUTH.

"At the official trial the Engine was placed at the edge of the Harbour Embankment, necessitating 20 ft. of suction-pipe to reach the tide. Two lines of hose, each 1,000 ft. in length, were carried up a hill to a point 90 ft. ordnance datum and there connected to a single line terminating with a $\frac{7}{8}$ -in. jet, which threw a powerful stream of water well over the ridge of a four-storey building without any difficulty, thus giving a vertical lift of approximately 140 feet from the Engine. I may add that since the above test I have, unknown to the makers, put her

to a more severe trial, by delivering a temporary supply of water to the town for two days, through a line of $2\frac{1}{2}$ in. wrought-iron pipe 3,500 (three thousand five hundred) feet into a reservoir 300 feet O.D. giving a back pressure on the delivery valves of 175 lb. per square inch with two backpressure valves in the line of pipe. This of course is an exceptional lift, but I have given it to you to show that this type of Steam Fire Engine is capable of doing more than the makers claim for it, and in my opinion surpasses all other makes."—Captain J. H. Wallis.

CANFORD MANOR, Dorset.

"THE new Fire Engine recently delivered by you for Lord Wimborne was put under test yesterday, and was in every way satisfactory. Steam of 100 lb. pressure was raised in 5 min. 45 sec. from a perfectly cold boiler, which had not been previously heated since its arrival here on the 20th of last month. This is especially commendable. The Engine was quite free from the vibration so often seen in pumps of this class. I consider your Engine a thoroughly efficient machine."—MR. B. TREVETT, Estate Engineer.

WALTON-ON-THAMES.

"The construction and workmanship of the Engine leave nothing to be desired, and the fact that it has been in considerable use for over five years, both for fires and other purposes, without once giving any trouble or needing a single renewal, speaks for itself."—Captain R. WILDS.

HASLEMERE.

"ON one occasion we pumped for seven hours, without stopping, very dirty water from a muddy pond with a rise of over 100 ft. and a quarter of a mile of hose. On other occasions we pumped for 9½ hrs., 9¾ hrs., and 12 hrs. on three consecutive days filling a gasometer. On each day, the engine having been started was not stopped until the time stated; rise about 80 ft., all bearings quite cool. . Such records show that there are no weak parts about it. The Engine has never failed us."—Rt. Hon. The EARL OF ALTAMONT, Chief Officer.

ECCLES.

"OUR Engine has been called upon to do some heavy work at fires with excellent results, and on two occasions pumped water from a sewer continuously for 171 hours and 29 hours respectively without a hitch."—Chief Officer G. A. BAINBRIDGE.

HERNE BAY.

"WE find the Engine an ideal fire-fighting machine—a quick steam raiser—smooth running—high power developed—no vibration—practically a one-man Engine, all parts of control being within easy reach and in sight, which is a very great point. She is absolutely reliable and we are very proud of her. We never use more than two light horses to take our Steamer, fully equipped."—Captain F. W. WACHER.

WIMBLEDON.

"I HAVE had one of your Engines at work for 63 hours at one time. I consider them most suitable for suburban and country towns, and for our own Engine I have nothing but the highest praise. The expansion gear is of great assistance for long working. The Engine is specially light and powerful."—Chief Officer Butler.

BIRMINGHAM—Kynoch Works.

"AT the recent unfortunate fire at our candle works, you will be interested to learn, the Engine worked for 32 hours without a stop, with the exception of a period of three minutes, when it was found necessary to remove it further from the fire."—Messrs. Kynoch, Ltd., Birmingham.

TAUNTON.

"WE gave our Steamer a harder test at a fire to-day than we did at the official trial last year. We had the whole half mile of hose run out and all up-hill. The Steamer worked splendidly."—Captain PALMER.

CROYDON.

"THE arrangement of fire-box door and all working valves on one side of the Engine, clear of suction and hose connections, frees the engineer from obstruction and allows him to do his work in comfort and without getting wet. It is of no advantage to have rear-stoking, as in all my experience I have never had to stoke en route to a fire."—Chief Officer J. W. DANE.

HOVE.

"THE Engine was working continuously [at a country fire] for $4\frac{1}{2}$ hours, drawing water through 21 ft. of suction and pumping through one line of $2\frac{3}{4}$ -in. hose 1,500 ft. Then I placed a breeching piece and two branches with two $\frac{3}{4}$ -in. jet-pipes, and did good service. I cannot speak too highly of the oil-fuel apparatus, as our Engine returned after eight hours almost as clean as when we left the station."—Captain O. DUMBRELL.

SUTTON-AT-HONE.

"I CONSIDER it the ideal Engine for a country district. Although we have worked the Engine a great deal it has never wanted repairing in any way, and although we had not an engineer in our Brigade we had no trouble in driving it."—Captain A. HEWETT.

BROKEN HILL.

"THE machine has given entire satisfaction, and we are pleased with her performances at various tests made. For her capacity she is light and strong, and a pair of horses can take the machine along with all the speed compatible with safety."-Mr. J. M. LAMBORNE, District Officer, N.S.W. Fire Brigades.

ALEXANDRIA, Egypt.

"Two new Steam Fire Engines were purchased from Messrs. Shand, Mason & Co. of 250-gallons per minute capacity, one being fitted with coal furnace and the other for petroleum in conjunction with the Shand-Mason Patent Oil Burner. They have both proved entirely satisfactory, and are just the right type for this town." Chief-Officer H. HOPKINSON, Lewa.

"AT one fire she had to send the water a distance of over half a mile, and eighty feet above the place where she was working. She did her work well."-Captain T. CHANDLER.

WARE.

"AT one fire the Engine was running the greater part of 24 hours at a stretch; at another, 9 hours; and at another, 12 hours. Everyone is more than satisfied with her."-Captain J. PAGE.

SHIRBURN CASTLE, Oxon.

"On Friday night and Saturday the Engine was working at a fire for four hours, pumping through two lines of hose each 1,150 ft. long, and gave every satisfaction."-RT. HON. THE EARL OF MACCLESFIELD.

EDMONTON.

"THE oil-fuel 'Double Vertical' Variable Expansion Steamer has proved a most excellent and useful appliance, working smoothly and easily maintaining a good head of steam with low fuel consumption."-Supt. CROASDELL, Edmonton.

STOKE EDITH PARK, Hereford.

" My Stoke Edith Brigade was again called out on Thursday to a fire in a small building. They had to use 21 lengths of hose, or 700 yards, to reach the fire, yet the Engine ran splendidly."-P. Foley, Esq., D.L., J.P.

RHYL.

"Your Engine was used in all for thirty hours at a town fire with the greatest satisfaction, and I am pleased to say was found in first-class condition when finished with."-Captain T. PARRY.

AMBLESIDE.

"ALTHOUGH it was a sheer drop of 26 ft. to the water below, she worked splendidly. and in ten minutes from the time of getting to work all danger of the fire spreading was at an end."-Mr. J. T. BATTERSBY, Gas and Water Engineer.

WELLINGBOROUGH.

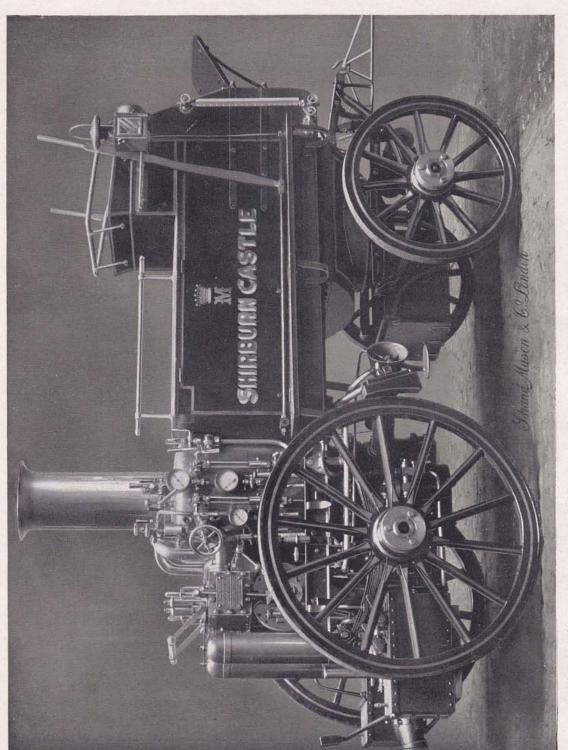
"THE Engine has been put to very severe tests and has always worked well, in spite of the fact that she has always been driven by men who had no previous practical engineering training. She is a very handy size and weight for a Brigade liable to calls in a hilly country district."-Captain E. W. JACKSON, B.A., LL.B.

SANDOWN, I.W.

"Everything worked admirably, and steam was raised to blowing off in a few minutes. There was no exaggeration on your part as to the Engine's capabilities and simplicity of working, and the cost of upkeep is very small."-Captain J. DORE.

WADEBRIDGE.

"We have absolute confidence in her ability to face any task that may come along. She is light and easy running; steam is rapidly raised and easily maintained."-Captain J. H. GRANT, Wadebridge.



300-GALLON SIZE VARIABLE EXPANSION "DOUBLE VERTICAL" STEAMER WITH OIL-FUEL FURNACE,

REPORTS OF OFFICIAL TRIALS

OF SHAND, MASON & CO.'S "DOUBLE VERTICAL"
STEAM FIRE ENGINES.

Some Extracts from Newspaper Descriptions of Public Trials at Various Dates (See also Historical Section.)

ESHER and the DITTONS-225/250-gallon Variable Expansion Engine.

STEAM of 100 lb. pressure was obtained in 7 min. 1 sec, and a 40 minutes' pumping test was entered upon. The water was taken from one of the precipitation tanks, and throughout the forty minutes 240 gallons per minute was pumped, the volume of water being carried a distance of 180 ft. A test in pumping to a height showed that with a 1-in. nozzle the water was thrown to 140 ft. with the greatest ease.—Surrey Comet.

FOWEY—260/300-gallon Variable Expansion Engine.

PLACED ready, close to the enclosed reservoir by Fowey Hall entrance gate, "The Fove" was worked with two lines of hose, consisting of twenty-six 50-ft. lengths-conveyed right up across the field to the higher reservoir. Here the hoses were coupled to a single branch-pipe. . . . The fire was set going in the engine, steam pressure of 100 lb, being obtained in less than eight minutes. . . . The demonstration proved beyond dispute the power of the little Engine to deliver water under pressure to a considerable height. From the ordnance survey map we see that the actual difference in the levels between the tank and the branch main was 108 ft., the jet of water being then thrown to a further height of well over 100 ft.-Western Weekly Budget.

COWBRIDGE—300-gallon Variable Expansion Engine.

In less than 5 min. 100 lb. steam pressure was obtained and a strong stream of water was thrown to a great height. Two, then four, jets were tried with excellent results, and ultimately **2,100 ft. of hose** was unrolled from the Engine to the Market Square, and despite the **estimated rise of 60 ft.**, two strong jets were thrown over the buildings.— Glamorgan Gazette.

CAMBRIDGE—400-gallon Variable Expansion Engine; oil-fuel furnace.

Within 6 min, 22 sec. of lighting the oilfuel 100 lb. of steam pressure had been obtained. Various tests were applied and the water was pumped in dense volumes to a great height, and with enormous power behind it. One test was exceedingly interesting. It is 138 ft. to the top of the flagstaff on Great St. Mary's Church, and with a 1-in. jet the water was thrown fully 20 ft. above the top of the staff.—Cambridge Express.

WIMBLEDON—250-gallon Variable Expansion Engine.

The steaming test was first made, time taken from smoke issuing from chimney to 5 lb. steam pressure being 1 min. 50 sec.; 10 lb., 2 min. 35 sec.; 20 lb., 4 min. 20 sec.; 30 lb., 5 min. 3 sec.; 60 lb., 5 min. 40 sec.; 100 lb., 6 min. 4 sec. The factory chimney is 120 ft. high, and the following jets were measured against it, the extra height being approximate: 1-in. jet, 135 ft. high; 1½-in., 125 ft. The pumping power of the Engine was measured through a line of hose and 1½-in. jet into a measuring tank. In a run of two minutes, 533 gallons were put into the tank at the rate of $266\frac{1}{2}$ gallons per minute.

On the afternoon of the 31st ult, the Engine was tested on Wimbledon Common. The steam raising time to 100 lb. pressure was 6 min. 5 sec., or practically the same as at the test on the 27th. A single line with 1-in. jet, and a single line with 1-in. jet, were then thrown from side to side of the pond, which measures 200 ft. Then the Engine was moved to the front of the residence of Col. Mitchell, and from a hydrant there the Engine took its supply and pumped back to the pond, a distance of 650 ft. The jets were successively \(^3_4\text{-in.}, \cdot_5\text{-in.}, \cdot_1\text{-in.} and \(^1_5\text{-in.}, \text{and were thrown to heights of 90 ft. to 100 ft.—Wimbledon Herald.}\)

RUTHIN-200/250-gallon Engine.

A SHRILL whistle in about 8 min. time from the lighting of the fire announced that there was 100 lb. pressure of steam, and two 100-ft. lengths of hose were then attached to the Engine. With this length of hose water was forced through it to a height of about 150 ft. . . The Engine was stationed at the river and the hose run from Prior Street to St. Peter's Square. Through this water was forced to a good height. Considering the lengths of hose [two lines each 600 ft., breeching, then 700 ft.] used, and the fact that there was a 50 ft. or so rise from the river to St. Peter's Square, the test was indeed a severe one, and the success which accompanied it speaks well for the makers of the Engine.

—Denbighshire Free Press.

CHURCH—350/400-gallon Variable Expansion Engine.

THE Engine was dragged to the Canal bank, where it was thoroughly tested with highly satisfactory results. As the torch was applied to the fire a loud cheer rang out, repeated as the whistle blew to signal the starting of the Engine. Following are details of the steam raising: -51b. steam pressure, 2 min, 10 sec.; 10lb, in 2 min. 35 sec.; 20lb. in 3 min, 6 sec.; 30lb. in 3 min, 50 sec.; 60lb. in 4 min. 30 sec.; 100lb. in 5 min. 5 sec. With a 11-in. jet, water was thrown 160 ft. high. Other jets were attached at intervals, and the combined jets threw water to a height of about 100 feet. At the conclusion of the tests a couple of horses were attached to the Engine, which was dragged to the canal bridge, and tested with a deep lift. This test was also satisfactory, there being a 24-ft. lift with empty suction. - Accrington Gazette.

FLEETWOOD, L. & Y. Ry.—600/700-gallon Engine.

The Lancashire and Yorkshire Railway Co. have purchased a new fire engine to be stationed at Wyre Dock. The trial of the Engine took place on Tuesday afternoon. Supt. Conroy and his men got the Engine into position opposite the elevator, and when steam was up they played on this huge building. The force of water from the 1½-in. jet was tremendous, the water passing right over the high towers, a height of 190 ft. Four ¾-in. jets were afterwards connected to the vertical mains of the elevator and water poured all over the building.—Fleetwood Chronicle.

STEVENAGE — 250 - gallon Variable Expansion Engine.

SMOKE issued from the chimney almost immediately, and a steam pressure of 100 lb. was obtained in well under five minutes. With a $\frac{7}{8}$ -inch jet water was thrown to a height of about 140 ft. This was followed by the use of two jets simultaneously, water being thrown to the height of a hundred feet. The exhibition was very satisfactory. A move was then made to the lake. Here again a $\frac{7}{8}$ -inch jet was first brought into play, followed by a 1-inch jet. This was succeeded by $\frac{9}{8}$ -inch and $\frac{3}{4}$ -inch jets used together. Eventually four $\frac{1}{2}$ -inch jets were thrown simultaneously with very great effect.—

Herts Express.

HORSHAM — 260/300-gallon Variable Expansion Engine.

In 5 min. 43 sec. steam was raised to 100 lb. pressure. The first test consisted of two lengths of hose from the Engine into a large breeching using a 3-inch jet. The water reached to a height of about 140 feet vertically, and was carried 150 ft. horizontally. Two jets were then used, one from each delivery of the Engine, and each 3-inch in diameter. Both reached to a height of about 100 ft. Four 12-inch jets were next coupled to two breechings and these each reached to the height of about 80 ft. vertically, and were carried 100 ft. horizontally. The last test was similar to the first one, except that a 11-inch jet was used. In this case the water reached to a height of 145 ft. vertically, and was driven 150 ft. horizontally.-Sussex Daily News.

BURNLEY—350-gallon Variable Expansion Engine.

FROM the time of lighting the fire 100 lb. pressure of steam was registered in 7 min. 40 sec.

Water at once began to flow through two lines of hose, about 250 yards in all, so as to get a jet along-side the destructor chimney, various **jets being** thrown up from 160 ft. to 180 ft. The jets were 1 in., $1\frac{1}{8}$ in. and $1\frac{1}{4}$ in. The latter jet was considered by experts present the best, and some comments were made on the fine solid jets thrown up in face of the strong wind prevailing at the time.

The Engine was next tested with the object of taking its capabilities of maintaining steam, and it started with 100 lb. pressure, and with $1^{\rm t}_{\rm s}$ in. jet it was driven at 260 to 270 revolutions, the water

pressure registered from 140 lb. to 160 lb. and the steam pressure maintained from 110 lb. to 120 lb.

After the severe tests the Engine was removed to Tate's Terrace and a lifting test there tried, this point being one having the deepest lift in the town, about 23 ft., the suction attached being 25 ft. 6 in. long. Two 3-in. jets were fixed and the Engine pumped two powerful streams of water.—Burnley Advertiser.

ELY-350/400-gallon Variable Expansion Engine; oil-fuel furnace.

THE Engine, followed by a huge crowd, made its

way to the cathedral, and was drawn up to the west front where a water tank had been sunk and filled from the ordinary town main supply. Two lines of hose were connected with the outlets at rear of Engine which was not long in getting up full steam [official time recorded, 100lb. in 61 min. and the men played on the cathedral at three different points on the north side in turn. Jets were thrown to an enormous height and we believe we are right in saying that practically the highest point of the ancient and historic building was reached. Cambridgeshire

Times.

[The tests for the height of jets were made against the tower of the cathedral, officially stated to be about 215 ft. high.]



TESTING THE ELY STEAMER Against the Cathedral West Tower. [Photo, Bolton, Ely.

TONBRIDGE-300-gallon Variable Expansion Engine.

On one side of the stream rose the tall shaft of the Electric Power Station. From the water level to the coping round the summit measured a good 126 ft., but to the top of the flagstaff over 140 ft.

The first jet was a 15-in. jet. Two lengths of hose were coupled to the Engine, and at the other end into a large breeching and one large length of hose. From this a jet was thrown to a height of 150 ft.

Next four 50-ft. lengths of hose were coupled, two from each delivery, with two 3-in. jets, and the water was thrown to a height of 120 feet.

For the third test four lengths of hose were coupled with two breechings to the two from the Engine, and four 1-in. jets were brought into play, each jet throwing a spray of water to a distance of 100 ft.

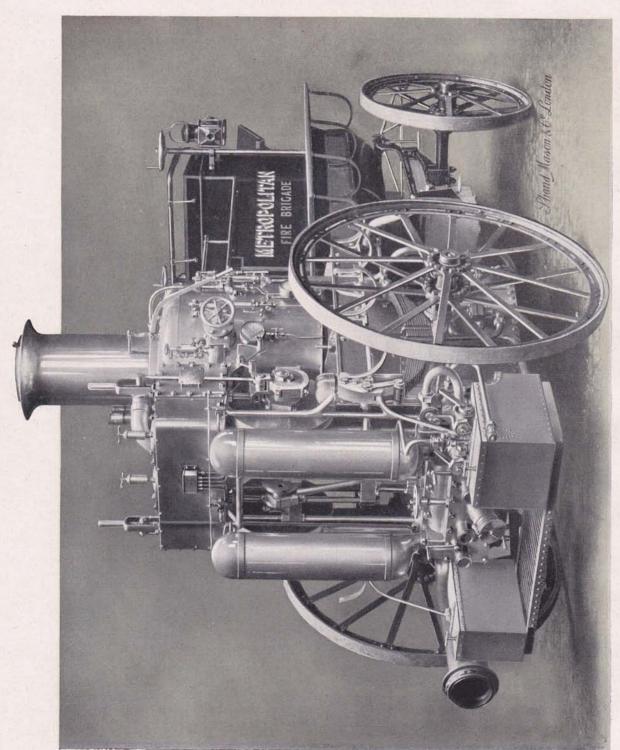
In the last test a 1-in, nozzle was used, working from a breeching attached to the two outlets of the Engine; and a solid stream of water was thrown over the shaft to a height of at least 160 feet.—Tonbridge Free Press.

ASHTON-UNDER-LYNE-450 - gallon Variable Expansion Engine.

THE Brigade proceeded to the market ground, where steam of 100 lb. was obtained and the Engine started. Four hoses were run out into one breeching with a 11-in. jet and then a 11-in. jet, followed by one of 1½ in., which threw the water to a considerable height. Four jets of 3 in. were then got to work, throwing streams as high as the top of the flagstaff on the top of the Town Hall. The Engine and appliances were then packed up and driven to the Waterside Mill yard, the water supply being taken from a jack-well connected with the river supply. Various jets from 11 to 11 in. were used. The chimney stack was 195 ft., and the water went considerably higher when the jet-pipe was held vertical. - Ashton-under-Lyne Herald.

SMETHWICK-350/400-gallon Variable Expansion Engine.

In 6 min, 30 sec. there was 100 lb, of steam generated. Two lines of hose (400 ft.) were taken towards the chimney stack, and jets of water were sent over the top, 160 ft. high.-Oldbury Weekly News.



1000-GALLON SIZE VARIABLE EXPANSION "DOUBLE VERTICAL" STEAM FIRE ENGINE. An exceptionally powerful Engine for Cape Town Metropolitan Fire Brigade.

GRIMSBY-750-gallon Engine.

The water in the boiler was perfectly cold, and the time from the moment the smoke issued from the chimney to the raising of 100 lb. of steam was 7 min. 40 sec. . . . Steam was raised to 120 lb. and the water pressure was from 170 lb. to 180 lb. The branch-pipe was placed in a vertical position, and a kite which had been flown in the Park at a height of 200 ft. was reached with water from the jet.—Grimsby News.

BURY, Lancs.-600 gallon Engine.

The new large Fire Engine purchased by the Bury Corporation from Messrs. Shand, Mason & Co. was tested on Wednesday afternoon. Water was obtained from Messrs. Walker & Lomax's lodge, and for the purpose of the testing it was supposed that Barnbrook Mill was on fire. With a jet of 1\frac{1}{4} in. the water was sent nearly to the top of the chimney, which has an altitude of 200 ft. The Engine was then subjected to tests with jets varying from 1\frac{1}{8} in. up to 1\frac{1}{8} in. in diameter, and in number from one to four jets, the result in every case being considered satisfactory.—Bury Times.

KIDDERMINSTER-260-gallon Engine.

IN 6 min. 32 sec. steam pressure of 100 lb. was indicated. A double line of hose, converging into a pipe of larger capacity near the nozzle, which had been fixed to the base of the chimney stack at the landward shed, was attached to the outlets, and within 10 min. from the lighting of the fire the Engine was throwing a splendid volume of water over the chimney, a total of 147 ft. from the ground. . . . The Engine lastly pumped 4,508 gallons up an inclined plane into the tank in 17 min. 9% sec.—Kidderminster Times.

ARBROATH-450-gallon Engine.

THE Engine was first wheeled to the side of the Brothock. . . . As a fine gauge of the height to which the water was to be thrown, a perpendicular stand, with hose and nozzle attached, was fixed at the base of Messrs. Gordon's chimney, which is 180 ft. high. . With a 1\(\frac{3}{2}\)—in, nozzle on the upright pipe, and a pressure on the water gauge of 120 lb., a jet was thrown clean up to the top of Messrs. Gordon's chimney in an unbroken stream. The Engine behaved splendidly under all the tests.—Arbroath Herald.

MELBOURNE-1,000-gallon Engine.

The test yesterday proved that at its maximum power the Engine can throw a jet of water to the top of the dome of the Exhibition building, 220 ft. in height. In this respect, therefore, it was if anything superior to its specified capacity. The specification also provided that it must be equal to pumping 1,000 gallons a minute from the River Yarra to a point in the central blocks in the city. This quantity would suffice to keep three of the smallest Engines fully at work, throwing some six or eight jets, and so render the Fire Brigade independent of the water system of the city. The tests showed that the new Engine was fully up to the requirements in this respect also.—

Melbourne Age.

SYDNEY-750-gallon Engine.

THE display was entirely satisfactory. First four lines of hose, with 15-in. deliveries, were attached to the big Steamer [supplied by Shand, Mason & Co. some few years previously] and two 14-in. deliveries to the new Engine. The pumps were started and immediately six streams of water rose to a height of 147 feet. The streams were maintained at this height for some time, and directed over a considerable area. Then a single delivery, 13-in. in diameter, was attached to the big Steamer, and a delivery of 18-in. to the new Steamer, and again the pumps were started. This time two great jets of water rose into the air to a height of over 200 ft. The top of the Town Hall tower, which is 198 ft. from the ground, was well cleared. - Sydney Daily Telegraph.

THE Sydney Engine also underwent a public test at Grimsby prior to being despatched to its Colonial home. The trial was officially attended and reported upon by Mr. M. Petree, then Borough Surveyor and Chief Officer of the Grimsby Fire Brigade. The object of the test was mainly to show the height to which a strong jet could be thrown. The following is an extract from the report referred to:—

"The Engine was placed on the east side of the entrance to the Royal Dock, and put to work. Steam was raised to 120 lb., and the water pressure from 160 lb. to 170 lb. The branch-pipe was placed in a vertical position on the north side of the tower [300 ft. in height], and although a rather strong wind was blowing a splendid jet of water was driven through a 1½-in. nozzle to a height of 230 ft. above the level of the dock wall. The vertical lift for the suction was 13ft."

PRICES AND PARTICULARS of Shand, Mason & Co.'s Fire Engine. Patent DOUBLE "VERTICAL" Steam

Size, Horse Power,	A 19	B 24	No. 1 30	No. 2 40	No. 3 55	No. 3½ 67	No. 4½ 95
ated Diameter rse of Jet.	9 15 in. (24 m/m.)	4 1.1 in. (27 m/m.)) 118 in. (30 m/m.)) 1,5 in. (33 m/m.)	5 1½ in. (38 m/m.)	7 1 ³ in. (44 m/m.)	2 in. (51 m/m.)
r Height of Jet.	140 ft.	. 150 ft. .) (46 mètres)	.) (49 mètres)	.) (52 mètres)	190 ft. (58 mètres)	195 ft. (60 mètres)	205 ft. (62 mètres)
Pumping Capacity per Minute.	200—250 galls, (900—1,100 litres)	260—300 galls. (1,200—1,350 litres)	350—400 galls. (1,600—1,803 litres)	450—500 galls. (2,050—2,270 litres)	600—650 galls. (2,730—2,950 litres)	750—800 galls. (3,400—3,630 litres)	1,000 galls. (4.500 litres)
PRICE OF ENGINE; also Code Word.	£400 (Calomabais)	£450 (Cabaleront)	£ 500 (Cabaletta)	£ 600 (Cabaleur)	£ 700 (Cambeteado)	£800 (Cammeilius)	£1,100 (Cantopean)
Extra for Double Lever Brake.	.si	£9 Calcetil	£10 pr Brake,	512 a word fo	£12 Coqq	£13/10	£35 Screw Brake.
Packing and Delivery at Docks, London	710	1113	£12	£14	£14	£14/10	£16/10
Approximate Dimensions of Engine in case for shipment.	10 ft. × 5 ft. 3 in. × 6 ft. 6 in. (3 05×1'60×1'98 mètres)	11 ft. 6 in. × 5 ft. 4 in. × 6 ft. 9 in. (3:50×1'63×2'06 metres)	11.ft. 6 in. × 5 ft. 5in. × 7 ft. (3.50 × 1.65 × 2 13 mètres)	11 ft. 6 in. × 5 ft. 6 in. × 7 ft. 3 in (3.50 × 1.68 × 2.21 mètres)	12 ft. 6 in. × 6 ft. × 8 ft. (3.81×1'83×2*44 mètres)	13 ft. × 6 ft. 3 in. × 8 ft. 3 in. (3.95×1.90×2.51 mètres)	14 ft, 6 in, × 6 ft, 6 in, × 8 ft, 6 in (4.42×1.98×2.59 mètres)
Suction-Pipe* per length with Couplings.	£5 5s. 8 feet, (Calcoletto)	£6 6s. 8 feet. (Caldamente)	£7 18s. 10 feet. (Calderico)	£8 18s. 10 feet. (Calderuela)	£9 18s. 10 feet. (Calebitur)	£11 18s. 10 feet. (Calefactum)	£14 185. 10 feet. (Calentaba)

Shand. Mason & Co.'s "Double Vertical" Engine fitted with Patent Variable Steam Expansion Arrangement page 16), £30 to £80 extra, according to size of Engine; add Cansaronos to code word for Engine.

Shand, Mason & Co.'s Patent Quick-Steam-Raising Apparatus (see page 24), worked by hand-wheel, reducing the time taken in raising steam and enabling engine to start working with a stronger body of fire in furnace. Prices from £7 10s, extra. Code word Caricarum. Shand, Mason & Co.'s New Patent Oil-Fuel Arrangement (see page 18), complete with improved air-pump, tubing, etc., copper oil-tank, gauges, controlling valves, etc., and patent burner having steam jet with control valve and oil jet or jets with N.B.—The ordinary coal-burning grate is also included, and as the oil-burner can be quickly removed from the fire-box, either system can be separate pipes, valves, etc. Prices £40 to £70 extra, according to size of engine. Code word, Cantavisse. used at will

Shand, Mason & Co.'s Gas-Burning Boiler Heater, as described on page 25, complete with shield and bracket for * SUCTION-PIPE.—This is of improved internal construction, reducing friction, very flexible and made with very high fire-door opening, improved governor and control cock. Prices from £5 15s. Code word, Catunga. For other heaters see page 25.

quality vulcanised india-rubber, copper-wire bound, each length fitted with strong gunmetal couplings.

DOUBLE LEVER BRAKE.—The prices given above for this necessary fitting are for a powerful brake of improved construction to act on both hind wheels, with levers brought up on each side of the driver's seat, the gunmetal brackets also forming racks for Steps to assist in mounting engine are fitted to brake arms. The SCREW BRAKE recommended for very large size engines is an extra powerful arrangement with polished spindle and wheel handle coming up on each side of driver's seat.

OTHER FITTINGS FOR "DOUBLE VERTICAL" STEAM FIRE ENGINES.

STRONG WOODEN HIND WHEELS WITH METAL HUBS, designed for use in tramway and other districts in which to heavy strain. Prices £12 to £25 additional. Code word, Cantinella. wheels are liable

WROUGHT IRON WHEELS, A, B, and Nos. 1 and 2 sizes, £20 additional; Nos. 3 and 3½, £25; and No. 4½, £30 (code word,

as follows:-WOOD-BURNING FURNACE, for use where coal is not obtainable, if required, is charged extra as follows: -A size, £7 SPECIAL STEEL WHEELS, with gunmetal naves, steel axle boxes, etc., for rapid travelling, charged extra A and B, £25; No. 1, £30; No. 2, £35; No. 3, £45; No. 3\frac{3}{2}, £50; No. 4\frac{3}{2}, £60 (code word, Calcidico)

B, £8 10s.; No. 1, £10; No. 2, £11; No. 3, £12; No. 3½, £13 10s.; No. 4½, £15 (code word, Calcifraga).

IMPROVED LOUD-SOUNDING POLISHED METAL GONG fixed to front of hose box under driver's seat and worked by means "LONDON BRIGADE" PATTERN BELL. gear and small hand-wheel at rear, £7 10s. extra. Code word, Bomicavano. Code word, Manecit. with wrought iron standard, etc., complete, £4. Jo

£2 10s. (code IMPROVED GUNMETAL BREECHING PIECE to work two jets from one line of hose, £2 5s. code word Biscornear); ditto to connect two lines of hose into one jet, Bispalia).

IMPROVED PORTABLE CANVAS CISTERN OR DAM, folding into very small space for age on engine, size for A, B, and No. 1 engines, provided with two valved inlets, £7 10s. code word, Bambacion); size for No. 2 to No. 4½ engines, with four valved inlets, £8 10s. stowage on engine, size for (code word, Bambagello).

£4 10s.; Breeching Piece (two 21-in. into one 31-in.), £3 10s.; Extra Strong Rubber-lined Hose 34-in. diameter with gunmetal couplings complete, 10-ft. length, £3 15..; 15ft. length, £4 15s.; 20-ft. length, £5 15s.; Long "Float" Branch-pipe for 34-in hose, £3 10s.; Jetwith large Steam Fire Engines:-Gunmetal Three-way Piece (three 21-in. into one 31-in.), FLOAT" BRANCH AND JET PIPES, HOSE, ETC., i.e. fittings for 33-inch hose for



Improved Canvas Dam extended for use.

LIST OF ACCESSORIES INCLUDED WITH ENGINES.—Copper suction strainer, basket strainer; set of nut wrenches; copper branch pipes with A, B, Nos. 1 and 2 sizes, four with Nos. 3, 3½ and 4½ engines; four gunmetal jet-pipes with A and B sizes, five with Nos. 1, 2 and 3, eight with Nos. 3½ and 4½; two branch-pipe staves with A, B, Nos. 1, 2, and 3 sizes, funnel, damper, telescopic funnel; pair of copper carriage lamps, copper engine lamp, tube brush, oil and tallow cans, two Three and four with Nos. 3½ and 4½ engines; set of spare valves, spare valve guards, spare pump leathers, two spare fire-bars, spare coupling washers, spare water-gauge glasses, and rings; deep-lift suction cock with rubber pipe, valve, etc., boiler-filling also supplied with A, B, and No. 1 sizes. The above include everything necessary for the working of the Engine, except hose hose, suction, branch and jet-pipe wrenches, two gland wrenches, screw wrench, wheel-cap spanner, stoking irons. suction-pipe. INSTANTANEOUS COUPLINGS are fitted in lieu of screw couplings if desired, without extra charge. canvas water-bags to protect wheels; pole with patent quick-release head, and bright steel sway-bars.

PRICES OF DELIVERY HOSE

For the SHAND-MASON "DOUBLE VERTICAL" STEAM FIRE ENGINES.

NOTE.—Hose and Suction Pipe ordered at same time as Engine can generally be packed and shipped without addition to freight charges

wishout dudition to freight charges.			
Shand, Mason & Go.'s "SOUTHWARK" (18-strand) Hand-Woven Canvas Hose (see page 43), treated to resist rot (with oak bark or cutch tan if desired) and fitted with strong well-finished gunmetal screw couplings, bound in with copper wire, with leather guards and straps, etc., complete, per 100-ft. (30'5 metres) length (code word for 100-ft. length, Calfeutrer)	£8	0	0
Shand, Mason & Go.'s "BEAR" (24-strand) Hand-Woven Canvas Hose (see page 43), treated to resist rot (with tan if desired), and with couplings, etc.,			
complete, per 100-ft. length (code word, Caliendrum)	8	10	0
Shand, Mason & Co.'s BEST COPPER-RIVETED LEATHER HOSE, made from the best parts of the hide, without neck or belly, and free from flaws, complete with hand-loops, and fitted with gunmetal couplings, etc., per 40-ft. (12'2 metres) length (code word			
for 40-ft. length, Callandriz)	8	10	0
Same Quality Leather Hose with a double row of copper rivets, 40-ft, length complete			
(code word, Calliditas)	9	10	0
Shand, Mason & Co.'s BEST QUALITY WOVEN CANVAS HOSE, LINED WITH VULCANISED INDIA-RUBBER, with guinnell couplings, leather guard, strap, etc., complete, per			
100-ft. length (code word, Calinerai)	10	15	0
Do. Do. per 50-ft. length (code word for 50-ft. length, Caliturus)	5	17	6
Shand, Mason & Co.'s BEST QUALITY MACHINE-WOVEN CANVAS HOSE, treated with rot- resisting preparation, and fitted with gunmetal couplings, etc., complete per 100-ft.			
length (code word Caligabat)	6	16	0
Shand, Mason & Co.'s SECOND QUALITY do., do., with couplings, etc., per 100-ft. length (code word, Caligarium)			
	6	0	0

SPECIMEN ESTIMATE for "Double Vertical" Steam Fire Engine with Hose and Suction-Pipe.

SHAND, MASON & Co.'s IMPROVED "DOUBLE VERTICAL" STEAM FIRE ENGINE, B size, to deliver 260-300 gallons per minute, complete with the following accessories: Suction strainer, basket strainer, set of nut wrenches; hose, suction, branch-pipe and jet-pipe wrenches; two gland wrenches, screw wrench, wheel-cap spanner, stoking irons; three copper branch pipes; four gunmetal jet-pipes; two branch-pipe staves; set of spare valves, spare valve guards, spare pump leathers, two spare fire bars, spare coupling washers, spare water gauge glasses and rings; deep-lift suction cock with india-rubber pipe, valve, etc.; boiler-filling funnel, damper, telescopic funnel, pair of carriage lamps, engine lamp, tube brush, oil and tallow cans, two canvas water-bags to protect wheels, pole with quick release head and bright steel sway				
Dars, also drag nandle	£450	0	0	,
Improved Double Lever Brake	9	0	0	
Four 8-ft. lengths best India-rubber Suction-pipe, with gunmetal screw couplings complete Ten 100-ft. lengths "Southwark" brand Hand-woven Canvas Hose, treated with oak-bark tan,	25	4	0	
with gunmetal couplings, etc., complete	80	0	0	
	£564	4	0	

If Engine fitted with Shand, Mason & Co.'s Quick-Steam-Raising Arrangement, add £7 10 0 Packing and delivery of Engine at Docks or Railway Station in London (if for export) £11 0 0

SHAND, MASON & CO.'S Improved Patent INSTANTANEOUS AND SECURE FIRE HOSE COUPLING, THE "SURE-LOCK."

As Supplied to the LONDON COUNTY COUNCIL for FIRE FLOATS, and in use by numerous Fire Brigades.

The patent "Sure-Lock" Coupling possesses important advantages over other patterns of instantaneous couplings.

While INSTANTANEOUS in action it is also SECURE WHEN CONNECTED.

The strain of the coupling is taken by the three projections on the spigot and the corresponding flanged portion of the socket, instead of by the spring bolt.



Shand, Mason & Co 's Latest Patent Instantaneous and Secure Hose Coupling, the "Sure-Lock." (Made also with Swivel Lugs.)

It is therefore NOT LIABLE TO GIVE WAY UNDER PRESSURE, a fault so often present in quick couplings in which the spring catch is used to hold the two ends of the coupling together.

To couple, the spigot end is thrust into the socket, and a sixth of a turn secures the connection. A spring stop prevents the accidental turning of the spigot. To uncouple, the spring stop is pressed down, the spigot moved a sixth round in either direction, and then withdrawn. The "Sure-Lock" Coupling is supplied with or without lugs.

SHAND, MASON & CO.'S

"BEAR" & "SOUTHWARK" CANVAS HOSE

For Use with Brigade Steam Fire Engines.

HAND-WOVEN FROM FINE QUALITY LONG FLAX.
CAPABLE OF WITHSTANDING VERY HIGH PRESSURES.

The "SOUTHWARK," which is an 18-strand hose, has an established reputation both at home and abroad for its reliability as a steam fire engine hose. The "BEAR" is a 24-strand hose of extra thick substance for exceptionally hard wear, and very suitable for the larger class of steam fire engines. Both are well shrunk before leaving the manufactory.

Trade Marks.—Purchasers of "Bear" and "Southwark" Hose—particularly when the Hose is bought indirectly—are urged to see that each length is stamped with the official trade

mark according to the brand ordered. Hose which does not bear such trade mark is not the genuine "Bear" or "Southwark," and should not be accepted by the indentor.

Sample Lengths.—Orders are solicited for sample lengths of "Southwark" and "Bear" Hose that intending buyers may satisfy themselves as to the superiority of the hose before ordering larger quantities. Small Samples of either hose sent free on application.

SOME USERS of

Shand, Mason & Co.'s Brigade Steam Fire Engines.

- *.* Although the superior working powers of Shand-Mason Steam Fire Engines have been fully established at competitive trials at home and abroad, the DIRECT TESTIMONY of those who have had years of experience with engines of this construction, will to many be the best evidence of their superiority, and carry more weight with intending purchasers. Reference is accordingly invited to the following, not only in confirmation of the working capabilities of the Engines, but in respect of their durability and freedom from repairs. So far as can be ascertained the whole of the engines included in this list are still in active service, although some date back to the sixties, and a considerable number more have been in service between thirty and forty years.
- *** Engines with capacity figures in Roman type, thus, "300-gal.," are of the Shand-Mason "Double Vertical" type, an asterisk (*) indicating that that Engine is fitted with Variable Steam Expansion Gear, and a dagger (†) that the furnace is adapted for burning oil fuel. Where the capacity figures are in italics, thus, "300-gal.," the Engines are of the firm's earlier types—"London Brigade Vertical," "Yolunteer" and "Equilibrium." Purchasers of Light Two-Wheel Steamers, Engines with Motive Power Attachment, and Fixed and Floating Steam Fire Engines are NOT INCLUDED in the list.

THE BRITISH GOVERNMENT.

			GO V EIGHTEITT.		
Where Stationed.	Ca	pacity of Engine.	Where Stationed.	Capacit	y of Engine.
ALDERSHOT CAMP .		*260/300-gal.	Hong Kong Government	F. B (Three Engi	350-gal.
		260 ,,	Indian State Railways	(Seven Engi	300 ,,
ASCENSION ISLAND .		300 ,,	JAMAICA Dockyard		350 ,,
BENARES, Public work	s	600 ,,	MADRAS		350 ,,
BERMUDA Dockyard .	 (Tw	300 ,, o Engines).	" Grand Arsenal		350 ,,
,, ,, ,,		350	" P. W. Department	t	450 ,,
		o Engines).	" P. W. Department	t, Chepauk	450 ,,
BOMBAY Marine Dept.		*400 ,,	MALTA Dockyard		450 ,,
., ,, ,, ,,		350 ,,	,, ,,		260 ,,
" Government D	ockyard F	actory 350 "	PEMBROKE Dockyard		*350 ,,
BROADMOOR Criminal I	unatic Asy	dum 350 "	, , , , , , , , , , , , , , , , , , , ,		900 ,,
CAPE OF GOOD HOPE	Dockyard	350 ,,	,, ,, ,,,		- ,,
CHATHAM Dockyard .		*450/500 ,,	PORTLAND Prison		300 ,,
CURRAGH Camp, Irelan	nd	*350/400 ,,	PORT SAID Naval Depot		350
DARTMOOR Prison .		200/250 ,,	PORTSMOUTH Dockyard		350 ,,
		260 ,,	RAWAL PINDI Ordnance I	Department	260 ,,
GHAZIPUR, Behar Govt,	Opium Fa		ROORKEE Government Wo		450 ,,
GIBRALTAR Dockyard .		*260/300 ,,	SHEERNESS Dockyard		- "
		350/400 ,,	SYDNEY, Spectacle Island		350 ,,
Hong Kong Dockyard		350/400 ,,	" Naval Depot'		300 ,,
Donata setting to the Set		600 ,.	TRINCOMALEE		260
		450 ,,	VANCOUVER, Esquimalt Do		200
		300			200
		200	YARMOUTH Royal Naval F	,,	200 ,,
39 39 39		300 ,,	TARMOUTH ROJAI NAVAI P	Hospital	200 ,,

LONDON COUNTY COUNCIL (London Fire Brigade).

Land Steam Fire Engines - 41 | Floating Steam Fire Pumps - 9
Including 18 Double Vertical Variable Expansion Engines (Three 200-gal., One 260-gal. Six 300-gal., One 350-gal., and Seven 450-gal. size); 1 Self-Propelled Double Vertical Expansion Engine, 6 Double Vertical Engines (350-gal. size); and 16 Single Vertical Engines (Eight 350-gal. and Eight 260-gal. size); also Four Double Vertical Variable Expansion Steam Pumps (each 1,000-gal. size) for Fire Float "Beta"; One Double Vertical Floating Steam Pump (450-gal. capacity); and Four Equilibrium Floating Steam Pumps (Three 1,000-gal. size and One 1,350-gal. size).

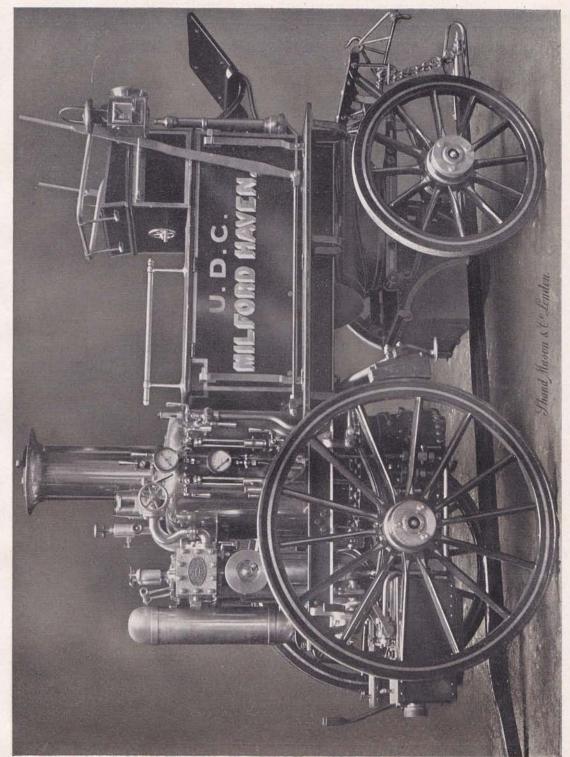
The first Steam Fire Engine acquired by the London Fire Brigade was supplied by Shand, Mason & Co. in 1855, and the majority of the Steam Fire Engines purchased for the Brigade since then have been constructed by this firm. At the present time (1913) the Brigade has 78 Steam Fire Engines and Pumps, of which, as will be seen, 50 are of Shand, Mason & Co.'s construction. It should be noted that included in this total are nine of the eleven Floating Steam Fire Pumps of the London Fire Brigade. The total pumping capacity of the Shand-Mason Engines in the London Brigade is 22,090 gallons per minute.

OTHER MUNICIPAL AND PUBLIC FIRE BRIGADES

		(Great Britain	and Ireland).		
Town.	Size of Engine.	Town.	Size of Engine.	Town. S	ize of Engine.
ABERDEEN	350-gal.	BIRMINGHAM	350-gal.	BURNLEY	900-gal.
,,	600 ,,	**	360 ,,	BURTON-ON-TRENT	350 ,,
ABINGDON	*260/300 ,,	,,	750 ,,	BURY	450 ,,
ACTON	350 ,,	BP. AUCKLAND	*350/400 ,,	BURY ST. EDMUNI	os 260 "
ACCRINGTON	600 ,,	BPS. STORTFORD	*300 ,,	BUXTON	350 ,,
Alloa	*350/400 ,,	BLACKBURN	*350 ,,	BYFLEET	300 ,,
,,	260 ,,	,,	600 ,,	CAMBERLEY .	200 ,,
AMBLESIDE	200/250 ,,	.,	670 ,,	CAMBORNE	300 ,,
ARBROATH	450/500 ,,	Bognor	*260/300 ,,	CAMBRIDGE *+	350/400 ,,
ASHTON-U-LYNE	*450/500 ,,	ROLTON	350 ,,	CARMARTHEN .	260 ,,
.,	600 ,,	,,	900 ,,	CASTLEFORD .	350 ,,
AYLESBURY	*260/300 ,,	Boston	300 ,,	CHELMSFORD *	260/300 ,,
BARKING	300 ,,	BOURNEMOUTH	*350/400 ,,	,,	260 ,,
AYR	450/500 ,,	"	350 ,,	CHEPSTOW .	200 ,,
Bakewell	250 ,,	BRACKLEY	200 ,,	CHERTSEY .	260 ,,
BATLEY ,	350/400 ,,	BRADFORD (Two) 450 ,,	CHESHAM	350 ,,
BECCLES	200/250 ,,		670 ,,	CHESTERFIELD .	350 ,,
BECKENHAM	*260/300 ,,	BRENTFORD	350 ,,	CHIPPING NORTON .	200 ,,
BEDFORD (Two) *260/300 ,,	BRIERFIELD	*350/400 .,	CHURCH *	350/400 ,,
BERWICK-ON-TW	EED 350 ,,	BRIGHTON	200 ,,	CLAYTON-LE-MOORS	450 ,,
BINGLEY	670 ,,	BRISTOL (Self-prop	elled) *+500 ,,	COLCHESTER .	350 ,,
BIRMINGHAM(Two	o)*350/400 "	BROMLEY	260 ,,	COLESHILL	200 ,,
(1),	*450/500 ,,	BURGESS HILL	350 ,,	COLNE, LANCS	400 ,,
,, (Two	o) 450 "	BURNLEY	*350 ,,	, ,	350 ,,

OTHER MUNICIPAL AND PUBLIC FIRE BRIGADES—(Cont.).

OTTER MONIC		CONTROL NO. CONTRO
Town. Size of Engine.		Town. Size of Engine.
CONGLETON *300/320-gal.		HERTFORD 260-gal.
COWBRIDGE *260/300 ,,	FALKIRK 350 ,,	HESTON & ISLEWORTH 350 ,,
COWDENBEATH *450/500 ,,	FAREHAM 200 ,,	HEYWOOD 350 ,,
COWPEN & BLYTH 200 ,,	FELIXSTOWE *260/300 ,,	,, 900 ,,
CRIEFF 350 ,,	FESTINIOG 200/250 "	HIGH WYCOMBE 350 ,,
CROYDON *350/400 ,,	FLINT 250 ,,	HINCKLEY 260 ,,
DALTON-IN-FURNESS 450 ,,	FOLKESTONE 350 ,,	HITCHIN 260 ,,
DARLINGTON 350 ,,	FOWEY *260/300 ,,	HORNSEY *260/300 ,,
450 ,,	FROME 350 ,,	,, 260 ,,
DARTFORD 350 ,,	FULWOOD *350/400 ,,	HORSHAM *260/300 ,,
DARTMOUTH 260/300 .,	GALASHIELS *450/500 ,,	HOVE *†260/300 ,,
DATCHET 200/250 ,,	GATESHEAD 350 ,,	HUDDERSFIELD 350 ,,
DAWLISH 300 ,,	GILLINGHAM, Drst. 200/250 .,	,, 670 .,
DENTON *350/400 ,,	GLASGOW *350 ,,	HUNTINGDON *260/300 ,,
DERBY *350 ,,	,, 350 ,,	HYDE *450/500 ,,
,, 600 ,,	,, 450 ,,	Нутне 300 "
DESBOROUGH 200 "	,, (Three) 600 ,,	ILFORD 260 ,,
DEWSBURY 450 "	GODALMING *260/300 ,,	ILKESTON 450/500 "
DUBLIN 300 ,,	GOOLE 350 ,,	ILKLEY 450 ,,
,, 750 ,,	,, 350 ,	IPSWICH 260 ,,
DUDLEY 350 "	GOSFORTH 260/300 ,,	KEIGHLEY 900 ,,
DUNDEE (Two) 350 ,,	Goudhurst, Weald	KENILWORTH 260 ,,
,, 600 ,,	of Kent 300 ,, GRANGEMOUTH 350/400	KETTERING *450/500 ,,
EALING *350/400 ,,	analara	,, 260 ,, KIDDERMINSTER 260
,, 350 ,,	970	370
EARBY 350 ,,	350	470
EAST BARNET *260/300 ,,	** "	- 200/200
EAST GRINSTEAD *200/250 "	***	
EAST STONEHOUSE 260 "	***	LEAMINGTON SPA 350 ,, LEEDS 670
Eccles *400 ,,	TI 200	" 900 "
EDINBURGH *450 "		,, 350 ,,
,, 350 ,,	***	LEEK 350
,, (Two) 450 ,,	was a second sec	LEICESTER 600 ,,
" 350 "	***	,, 350 ,,
EDMONTON*+300 "	HASLINGDEN 450 ,,	LEIGH-ON-SEA 200/250 "
ELLAND 600 ,,	CONTRACTOR IN THE INTEREST IN	LEITH 350/400 ,,
ELY *+400 ,,	HAY 200/250 ,,	,, 600 ,,
ENFIELD (Ponders End) 300 "	HEANOR 350 ,, HEMEL HEMPSTEAD	LICHFIELD 350 ,,
ESHER & DITTONS *200/250 ,,	*200/250 *,,	LINCOLN *260/300 ,,
ETON *260/300 ,,	HENDON *260/300 ,,	LITTLEBOROUGH 450 ,,
EVESHAM 300 ,,	HERNE BAY 200 ,,	LLANDRINDOD WELLS 300 "



200/250-GALLON SIZE "DOUBLE VERTICAL" STEAM FIRE ENGINE,

OTHER MUNICIPAL AND PUBLIC FIRE BRIGADES—(Cont.).

Town.	Size of Engine.	Town.	Size of En		Town.		of En	
	200/250-gal.	NEWBURY		-gal.	RUTHERGLEN		260	-gal.
LONDON FIRE BRI County Council)		NEWCASTLE, Staf			RUTHIN		0/250	33
see page		NEWTOWN	350		SAFFRON WALDE			25
LONDON SUBUR		NORTH BERWICK			ST. HELEN'S		450	33
(see separate hea		Northwood	*200/250	11		A.	450	11
Barking, Beckenha		Norwich	*260/300	,,	ST. HELIER		*260	12
Bromley, Cherts Ealing, East Ba		,	450	31	ST. NEOT'S	200	1/250	117
Esher and Ditto		NOTTINGHAM	450/500	,,	SALE & ASHTON	. 194	200	99
Hanwell, Horns	sey, Heston,	,,	600	330	SANDBACH		250	1,5
Ilford, Maldens, M	olesey, Pinner,	,,	600	**	Sandown, I.W.	*260	/300	13
Southall, Southga Sutton, Teddingto	on. Waltham-	22	350	**	SANDY	1111	300	22
stow, West Ham, e		OLDBURY	350	991	Scarborough		*350	17
LONG EATON	450-gal.	Oldham	*600/700		Selby	***	350	.,,
Loughborough	*300 ,,	Ormesby	*†350	,,	SELKIRK		600	31
LOWESTOFT	*260/300 ,,	OTLEY	260	**	SHEFFIELD	***	350	.,,
Lydd	250 ,,	PAIGNTON	250	,,	,,		600	11
MACCLESFIELD	450 .,	Paisley	450		SHREWSBURY		260	***
MAIDSTONE	350 ,,	PANGBOURNE	200	,,	Alliance Insu			
MALDENS AND		PEEBLES	260	,,	SHREWSBURY Royal Insura		350	199
Соомве	*260/300	Pershore	300	77	SIDCUP	*200	/250	,,
MANCHESTER	350/400 .,	PERTH	260	,,	SILSDEN	*350	/400	99
,,	350 ,,	PERTH COUNTY		.,	SITTINGBOURNE		260	**
MANSFIELD	350 ,,	Peterboro' Vol.	200/250	,,	SKELMERSDALE	+	300	3.9
MARCH	450 ,,	Petersfield	*260/300	.,	SLOUGH		260	32
MARKET		PINNER	*260/300		SMETHWICK	*350	400	2937
HARBOROUGH	*260/300 ,,	PONTYPOOL	350		SOUTHALL-NORWO	OOD	350	22
Marsden	*500 ,,	POOLE	350	,,	SOUTHAMPTON	*450	500	**
Masham	*450/500 ,,	POTTON	260	-11	SOUTHBANK, York	s. *	350	35
Mere	260/300 ,,	PRESTON	*450/500	**	SOUTHEND		260	,,
MEXBOROUGH	200/250 ,,	,,	670	.,		350/	400	,,
MIDDLESBROUGH	450 ,,	PUDSEY	300	,,	SOUTHGATE		350	3.9
MIDDLETON	350 ,,	RAWTENSTALL	350	,,	**		350	,,
	600 ,,	REDDITCH	300	11:	STAFFORD		350	,,
MILFORD HAVEN	200/250 ,,	RETFORD, EAST	260	,,	STAMFORD	*200	250	,,
MOLD	200/250 ,,	Rнуг	*300	,,	,,		350	**
MOLESEY	*300 ,,	RICHMOND, Yorks.	260	,,	STEVENAGE	*200/	250	**
MORECAMBE	350 ,,	RICKMANSWORTH	260	11	STIRLING	350/	400	**
NEEDHAM MARKE	т 200 ,,	ROCHDALE	450	,.	STOCKPORT	*350/	400	**
NELSON	*350 ,,	Ross	200	,,	,, .,,		600	,,
,,	600 ,,	ROTHERHAM	450	,,			450	**
NEWARK	450 ,,	RUSHDEN	*300	11	STROUD VOL.		260	,,
-			La second					

Town.	Size of Engine.	Town. Siz	e of Engine.	Town,	Size of Engine
SUNDERLAND	350-gal.	TUNBRIDGE WELLS	260-gal.	WELLINGBOROUG	
"	450 ,,		200 ,,	Wem	*+200/250 ,,
SURBITON	260 ,,	UTTOXETER	350 .,	WEST BROMWIC	н 600 ,,
"	200 ,,	WADEBRIDGE *20	0/250 ,,	WEST HAM	*350/400
SUTTON	260 ,,	WALSALL	350	11 11 11	350 ,,
SUTTON-AT-HONE	*200/250 .,		450 ,,	,, ,, (T	wo) 300 .,
SWANSEA	*350/400 .,	Walthamstow	260	WILLENHALL	*350 ,,
SWINDON	300/320 ,,	WALTON-LE-DALE *35	0/400	WISBECH	260 ,.
TAUNTON	*300/320 ,,	WALTON-ON-THAMES	*300		450
TEDDINGTON	*350/400 ,,	WARBLINGTON	300 .,	WITHAM	200/250 ,,
,,	200 ,,	Ware	*300 .,	WOLSTANTON	300 ,,
TENBURY	200/250 ,,	WARWICK *35	0/400 .,	WOLVERTON	*300 ,,
TENTERDEN	200 ,,		350	WORKSOP	450 ,,
TODMORDEN	450 ,,		0/250	WREXHAM	*350 ,,
Tonbridge	*300	,, .,, .,,	350	YARMOUTH	450
TORQUAY	*300/320 ,,	Wednesbury		YORK	450 ,,

ROYALTY, NOBILITY AND LANDED PROPRIETORS.

(Great Britain and Ireland.)

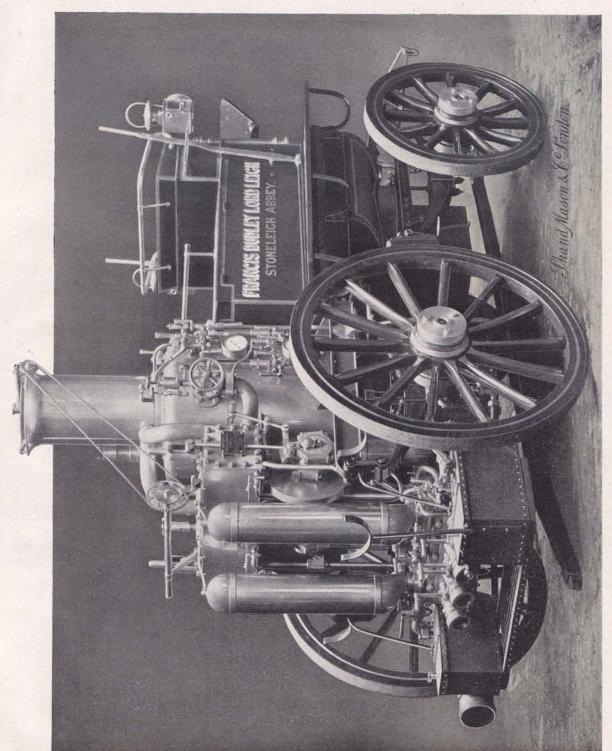
Owner of Mansion. Size of Engine.	Own
H.M. THE KING, Sandringham *260/300-gal.	LORD WI
Duke of Norfolk, Arundel Castle 350	SIR G. M.
DUKE OF PORTLAND, Welbeck 450 Abbey 450	SIR J. MA Ballin
Duke of Sutherland, Dunrobin Castle 350 ,,	SIR W. Wyni
DUKE OF WESTMINSTER, Eaton Hall 350 ,,	LADY WI
Duke of Beaufort, Badminton *200/250 "	W. W. A
MARQUIS OF BATH, Longleat 260 ,,	W. ASTO
Marquis of Northampton, Castle Ashby 350 ,,	R. BENYO
EARL EGERTON OF TATTON, 1*300 Tatton Hall 1*200	W. D. Ci Castle
EARL OF MACCLESFIELD, Shirburn	P. FOLEY
Castle*†300 ,,	C. J. LUCA
EARL STANHOPE, Chevening 200 ,,	G. H.
EARL OF SHAFTESBURY, St. Giles' House *260/300 ,,	Horto
Long Lucas Ct. 1:1 Att. Acodesa	H. PEEL,
	C. F. K. M
LORD RUNNING Hall 350 "	Otele
LORD BURNHAM, Hall Barn 260/300 "	W. A. S
LORD ROTHSCHILD, Ashton Wold 200 "	Birkw

Owner of Mansion.	Size	of Eng	ine.
LORD WIMBORNE, Canford Manor	*300	/320-	gal.
SIR G. MEYRICK, BT., Hinton Adm	iral	200	,,
SIR J. Macpherson Grant, Bart., Ballindalloch Castle			,,
SIR W. WILLIAMS-WYNN, Bart., Wynnstay		260	
			.11
LADY WERNHER, Luton Hoo		260	35
G. W. E. Loder, Esq., D.L., Wakel			**
W. W. ASTOR, Esq., Hever Castle	200	/250	**
W. Astor, Esq., M.P., Cliveden		350	22
R. Benyon, Esq., Englefield		350	99
W. D. CRUDDAS, Esq., Haughton			
Castle		/300	,,
P. Foley, Esq., Stoke Edith	260	300	,,
C. J. Lucas, Esq., Warnham Court		150	110
G. H. WINTERBOTTOM, Esq.,			
Horton House	200	/250	,,
H. PEEL, Esq., Overton, Ellesmere		120	**
C. F. K. MAINWARING, Esq., D.L.,			
Oteley	200	250	21
W. A. SCOTT-MACKIRDY, Esq.,			
Birkwood Castle, Lanark	***	200	**

MILLS, FACTORIES, INSTITUTIONS, RAILWAYS, Etc.

(Great Britain and Ireland.)

Tewn and Purchaser,	Size of Engine.	Town and Purchaser. Size of Engine.
ACCRINGTON, Steiner & Co., Ltd.,	Size of Engine.	
Bleachers and Dyers	670-gal.	HAWORTH, Merrall & Sons, Stuff Manufacturers 450-gal.
Bolton, Ainsworth, Sons & Co.,	070-gan	Manufacturers 450-gal. IPSWICH, E. Packard & Co., Ltd.,
Bleachers	450 ,,	Chemical Works 260 "
BIRMINGHAM, Kynoch Ltd., Ammu-	,,	KIVETON PARK, Sheffield, Kiveton
	*200/250 ,,	Park Colliery Co 450 "
BIRMINGHAM, Austin Motor Co.	450 ,,	LANCASTER, County Asylum 350 ,
Bradford, Foster & Son, Ltd.,	,,,,,	LOCHEE, N.B., Cox Bros., Ltd.,
Worsted Spinners	670	Jute Spinners 750 "
BRADFORD, Garnett & Co., Worsted	and the far	LONDON, Gas Light & Coke Co.,
Spinners	670	Beckton 600 ,,
BRADFORD, W. & J. Whitehead,		LONDON, Metropolitan Water Board 1500 "
Worsted Spinners	450 ,,	The state of the s
BRAINTREE, Courtauld & Co., Ltd.,		
Crape Manufacturers	300 ,,	" " " 320/350 " " 320/350 " " " " " 200 " " " " " " " " " " " "
Bridge of Weir, N.B., Orphan		MIDDLETON, O. Ashworth & Co.,
Homes of Scotland	450/500 ,,	Bleachers and Dyers 350 ,,
BURNTWOOD, Staffordshire County		
Asylum	350 ,,	MUSSELBURGH, Inveresk Paper Co 450 "
BUTTERLEY, Butterley Co., Ltd.,	SECONDARY.	Neilston, N.B., English Sewing Cotton Co., Ltd *500 ,,
Ironmasters, etc	200/250 ,,	
BURTON-ON-TRENT, Allsopp & Sons,		NEWTON ABBOT, Candy & Co., Ltd., Brick & Tile Works 350
Ltd., Brewers	670 ,,	NEWTON - LE - WILLOWS, Vulcan
CHIRNSIDE, N.B., Y. Trotter & Son,		Foundry, Ltd 450 "
Ltd., Paper Mill	350 ,,	NORTHAMPTON, County Asylum,
CHURCH, F. Steiner & Co., Bleachers	1=0/=00	Berrywood 450 ,,
and Dyers	450/500 ,,	Norwich, J. & J. Colman, Mustard (*500
CLYDEBANK, W. Beardmore & Co.,	* I = 0 / = 00	Manufacturers 600 ,,
	*450/500 ,,	OAKHILL, near Bath, Oakhill
CLYDEBANK, Singer Mfg. Co., Sewing Machine Mfrs., Kilbowie	600 ,,	Brewery Co 260 ,,
COVENTRY, Dunlop Pneumatic Tyre	000 ,,	OLDBURY, Showell's Brewery Co., Ltd. 450 ,,
Company, Ltd	350 ,,	
DENNY, N.B., Vale Paper Co	150	Paisley, Clark & Co., Ltd , Thread Manufacturers 450
DERBY, Bemrose & Sons, Ltd.,	450 ,,	PAISLEY, J. & P. Coats, Ltd., Thread
Printers	*350	Manufacturers 450 ,
	300 ,,	PENICUIK, Cowan & Sons, Ltd.,
FORFAR, W. & J. Don & Co., Linen		Paper Manufacturers 450 ,,
Manufacturers	350	PERTH, Pullar & Sons, Dyers 450 ,,
GLASGOW, London and Glasgow		PORTSLADE, Brighton and Hove
Shipbuilding Co., Ltd	350	Gas Co 350
GLASGOW, A. Stephens & Sons, Ltd.	1300	Prescot, Union Workhouse 350 ,,
	450 ,,	PRESTON, Horrockses, Crewdson
Grantham, Hornsby & Son, Engrs.		and Co., Ltd., Cotton Spinners 450 ,,
GUARDBRIDGE, N.B., Guardbridge		RATHDOWNEY, Ireland, R. Perry
Paper Co., Ltd *		and Sons, Ltd., Brewers 350 "
HALIFAX, Crossley & Sons, Ltd.,		RENFREW, Lobnitz & Co., Ltd.,
Carpet Manufacturers	(600 ,,	Shipbuilders 600 "



600/650 GALLON SIZE VARIABLE EXPANSION "DOUBLE VERTICAL" STEAMER,

MILLS, FACTORIES, INSTITUTIONS, RAILWAYS, Etc.—(Cont.).

Town and Purchaser.	Size of Engine.	Town and Purchaser. Si	ze of Eng	gine.
ROMFORD, Ind, Coope & Co., Ltd., Brewers		WEST HARTLEPOOL, W. Gray and Co., Ltd., Shipbuilders	350-	gal.
Rugby, British Thomson-Houston Co., Ltd., Engineers	*350/400 .,	WICKWAR, Glos., Arnold, Perrett and Co., Ltd., Brewers	350	.,
Rugby, Willans & Robinson, Ltd., Engineers		GREAT NORTHERN Ry., Boston GREAT NORTH OF SCOTLAND Ry.,	. 260	,,
St. Helens, Pilkington Bros, Glass Manufacturers	300		. *300	.,
SHEPTON MALLET, Anglo-Bavarian Brewery, Ltd		Co., Dublin	. 350 . 450	"
SLAITHWAITE, Slaithwaite Spinning Company		LANCS. & YORKS Ry., Fleetwood 6	00/700	**
SMETHWICK, Mitchells & Butlers, Ltd., Brewers		" " Newton Heath " Horwich	. 350	"
STEVENSTON, N.B., Nobels Explosives Co., Ltd		LONDON & N. WESTERN Ry., Crewe ,, , , , Wolverton	. 350	**
SUNDERLAND, Sir J. Laing & Sons	450 ,,	London, Brighton & South		
Warrington, Crosfield & Sons. Ltd., Soap Manufacturers		COAST RY., Brighton LONDON, TILBURY & SOUTHEND	. 670	**
WARWICK County Asylum, Hatton		Ry., Plaistow MIDLAND RAILWAY, St. Pancras	. 450 . 450	,,
Watford, M. A. Sedgwick & Co., Brewers		" " Derby		,,
WEST HARTLEPOOL, The Central		LEITH, Dock & Harbour Commrs		**
Marine Engine Works	350 ,,	London, East & West India Dock Co. (Two Eng		**

COLONIAL AND FOREIGN PURCHASERS.

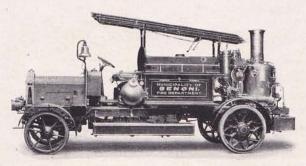
SHAND, MASON & Co.'s Brigade Steam Fire Engines have also been widely adopted by Colonial and Foreign Government Departments, Municipalities, Harbour and Dock Boards, Railway Authorities, and private property owners, the list of purchasers under these headings being almost as lengthy as that of Home authorities, etc. The following are a few of the most important Foreign and Colonial towns to which Shand-Mason Steam Fire Engines have been supplied:—

ST. PETERSBURG, MOSCOW, WARSAW, REVAL, SARAPUL, RYBINSK, AMSTERDAM, THE HAGUE, COPENHAGEN, UTRECHT, CHRISTIANIA, KARLSKRONA, GRIMSTAD, HAMBURG, ALTONA, ROSTOCK, BREMEN, LUBECK, LYONS, DOUAI, BRUSSELS, LOUVAIN, ÖSTEND, LUCERNE, MADRID, SANTANDER, LISBON, OPORTO, PRAGUE, PIRÆUS, ROME, MILAN, FLORENCE, NAPLES, GENOA, SMYRNA, ETC.

SYDNEY, MELBOURNE, ADELAIDE, BRISBANE, PERTH, WELLINGTON, AUCKLAND, CHRISTCHURCH, CAPETOWN, JOHANNESBURG, PORT ELIZABETH, ALEXANDRIA, CAIRO, PORT SAID, WOODSTOCK (S. Af.), BOMBAY, MADRAS, BENARES, AHMEDABAD, HYDERABAD, LAHORE, BARODA, MANDALAY, SAIGON, COLOMBO, HONGKONG, OSAKA, SHANGHAI, HANKOW, TOKIO, YOKOHAMA, KOBE, VLADIVOSTOCK,

HALIFAX (Nova Scotia), HAVANA, SANTIAGO DE CUBA, BATAVIA, MANILA, PORT OF SPAIN, LAGOS, BELIZE, RIO DE JANEIRO, BUENOS AYRES, ROSARIO, ETC.

SOME OTHER TYPES & ADAPTATIONS of the SHAND-MASON "DOUBLE VERTICAL" Steamer.



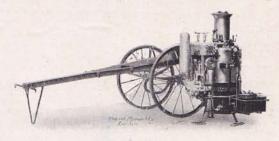
VARIABLE EXPANSION STEAMER, WITH OIL-FUEL FURNACE, FITTED AT REAR OF MOTOR CHASSIS, CARRYING ALSO FIRST-AID CHEMICAL CYLINDER AND TELESCOPIC LADDER, FORMING COMPLETE MOTOR FIRE EQUIPMENT.



ENGINE FITTED WITH EXTRA SWAY-BAR AND POLE FOR DRAUGHT BY THREE HORSES ABREAST—ADAPTED FOR USE WHERE HORSES ARE SMALL, ALSO FOR LARGE SIZE ENGINES IN HILLY DISTRICTS.



ARRANGEMENT OF ENGINE AT FRONT OF BOILER TO MEET SPECIAL REQUIREMENTS.



ENGINE ARRANGED FOR CONVEYANCE SUSPENDED ON TRUNNIONS ON TWO-WHEEL CARRIAGE FROM WHICH IT IS LOWERED TO THE GROUND FOR WORKING. CARRIAGE IS DESIGNED FOR IRAND-DRAIGHT, BUT CAN BE FITTED WITH SHAFTS FOR HORSE.



CARRIAGE FITTED WITH DOUBLE SIDE-SPRINGS TO REAR AXLE AND SIDE AND TRANSVERSE SPRINGS TO PRONT; ALSO EXTRA STRONG HIND WHEELS WITH METAL HUSS; FOR DISTRICTS (MAINLY ABROAD) WHERE ROADS ARE VERY DEFECTIVE.



ARRANGED AS MOTOR STEAM FIRE ENGINE WITH INDEPENDENT PUMPING AND PROPELLING, ENGINES, OIL-FUEL FURNACE, ETC.

FURTHER PARTICULARS FORWARDED UPON APPLICATION TO

SHAND, MASON & CO., 75 Upper Ground Street, Blackfriars Road, LONDON.

SHAND, MASON & (C) STEAM FIRE ENGINES

Pant I.

OTHER SECTIONS of

SHAND, MASON & CO.'S

HLUSTRATED CATALOGUE

of A

Steam Fire Engines

. are

Part II.—Single-Cylinder Steam Fire Engines on two and four wheels, Portable Pumping Engines, etc.

Part III.—Fixed Steam Fire Engines for manufacturing and other premises.

Part IV.—Floating Steam Fire Engines for Protection of waterside property and shipping, Salvage Pumping, etc.