

THE BRITISH COMMISSION IS INDEBTED TO THE FOLLOWING FIRMS FOR THE EXHIBITS SPECIFIED BELOW, WHICH HAVE BEEN LENT FOR USE IN THE EXHIBITION.

- ADAMSON, D., & COMPANY, *Newton Moor Iron Works, Hyde, near Manchester.***—Two Steam Boilers of 40 horse-power each, one with steel shell plates, solid welded flue-rings and circulating pipes.
- APPLEBY, BROTHERS, *Emerson Street, Southwark, London.***—Portable Steam Crane for lifting 3 tons, one for lifting 5 tons, and one for lifting 7 tons. Each of these Cranes can perform the following operations by steam:—1, Lifting loads at different speeds, in proportion to weight; 2, Turning completely round in either direction without stopping or reversing the engines, so that the load may be lifted or lowered at the same time as it is being turned—the larger Cranes have two speeds of turning; 3, Raising and lowering the jib head, thus altering the radius of the crane; 4, Travelling by steam along a line of railway of any gauge.
- AVELING & PORTER, *Rochester, and 72, Cannon Street, London.***—Three-ton Steam Crane for roads; one Steam Traction Engine and three Waggons; one Steam Road Roller of 7½ tons.
- BARNARD, BISHOP & BARNARDS, *Norfolk Iron Works, Norwich.***—Two bays of Wrought Iron Palisade, designed by Alfred Barnard; Wash-stand of Wrought Iron, in the style of the Fourteenth Century; Candle Holder; Flower Stand of Wrought Iron; Wrought Iron Dressing Table, with Looking-Glass (the Ornamental parts of this are of Iron bent cold); Studies from Nature in Wrought Iron, a Bracket of Wrought Iron, all designed by T. Jeckyll, Esq., F.R.I.B.A.; Reading Stand of Wrought Iron, designed by Alfred Barnard; 22-inch Improved Geared Lawn Mower, fitted for a Donkey; and 30-inch Improved Geared Lawn Mower, fitted for a Pony.
- BLACKWOOD & SONS, *Edinburgh.***—Educational and other Books. (*See also page 138.*)
- BRADFORD, T., & COMPANY, 63, *Fleet Street, London.***—Model of Laundry House, such as would be suitable for a Family Mansion, and fitted up with Bradford's Patent Apparatus for Washing, Boiling, Rinsing, Blueing, Wringing and Drying the clothes, the system adopted in conjunction with these appliances ensuring the absolute cleanliness and good colour of the fabric, with great economy of labour and materials employed in the washing process; and as proved by the reports of several large Public Establishments in London, effecting a saving of 50 per cent. in the wear and tear of the fabric. As will be seen upon inspection, one small fire supplies all the Hot Water, Dries the Clothes, and also heats the Smoothing and Polishing Irons for finishing the Linen. Many other similar Laundries have been built upon the same model in various parts of England, including one upon a large scale adjoining the Crystal Palace, London, which employs some 70 women and girls.
- BROTHERHOOD & HARDINGHAM, 53 and 56, *Compton Street, Goswell Road, London.***—Patent Paragon Steam Pump, erected for supplying Messrs. Cater & Walker's Steam Boiler of 50 horse-power. This Pump, capable of delivering 1200 gallons per hour, consists of a steam cylinder 5½ inches diameter, placed on the top of a hollow column which contains the pump. The chief peculiarity of the Steam Engine is, that the working parts are enclosed and protected from injury, the crank working in a bonnet on the upper cover of the cylinder, and the connecting rod being coupled direct to the piston. The pressure keeping the crank disc against the inner face of the bearing prevents the escape of steam, thus dispensing with the use of stuffing boxes and reducing friction. The Pump is of the Bucket and Plunger Class, with all the working parts of best gun-metal, the plunger being worked by a steel rod attached to the piston and passing through the lower cylinder cover. On the up stroke of the plunger the full contents of the pump barrel is drawn in and half of it delivered, the remaining half being delivered on the down stroke of the ram, the pump is thus double acting and produces a constant stream. Paragon 3-Cylinder Engine (Brotherhood's Patent), of 35 Horse-power, supplied for driving a section of shafting; the special advantages of this Engine are, that it will start in any position, there being no "dead centre," and that a perfectly uniform motion of the crank shaft is obtained, without the use of a fly-wheel; no wire-drawing of steam takes place before acting on the pistons, and the connecting rods being always in tension there is no blow or back-lash on the crank pin at either end of the stroke, no matter how loose the fit may be, or at what speed the engine may be running; perfect self-adjustment for wear is maintained in the crank shaft and rotary slide valve, the pressure always insuring a steam-tight joint. All stuffing boxes are dispensed with, the working parts are entirely enclosed and protected from injury, and the lubrication is carried by the steam to every part; very high speeds may be attained and great power thereby developed in proportion to the small size of the Engine; that exhibited, has three cylinders, 9 inches diameter and 8 inches stroke, and running at 225 revolutions per minute with a mean steam pressure of 40 lbs. per square inch, develops a power of 35 horse-power.

- BROWN BROTHERS & COMPANY, *Rosebank Iron Works, Edinburgh*.—Patent Steam Pump for feeding boilers and raising water for other purposes.
- BURNEY & COMPANY, *Tank Factory, Millwall Docks, London*.—Wrought Iron Tank, for Water, as used in the British Navy; Galvanized Iron Tank, mostly used for holding spirit; Painted Wrought Iron Cistern, for factory, house, or farm purposes; Galvanized Iron Cistern; Cattle Drinking Trough, with Burney's safety edge.
- CATER & WALKER, *Grove Steam Boiler Works, Southwark, London*.—Steam Boiler of 50 horse-power.
- CLARK & COMPANY, *Rathbone Place, Oxford Street, London, & 8, Kärnthnerstrasse, Vienna*.—Patent Self-coiling Shutters in one Sheet of Steel; Self-coiling Wood Shutters, lined with Steel Bands; Louvre Venetian Shutters.
- COALBROOKDALE COMPANY, *Coalbrookdale, Shropshire*.—Grand Entrance in Mediæval style, consisting of a pair of Wrought Iron Gates, 2 Hand Gates, 4 Pillars, and short lengths of Railing to match, executed from designs by B. J. Talbert, Esq., with enrichments of cast iron, applied, and twisted bars produced by Tuddenham's patent process; and the two lengths of Wrought and Cast Railing on either side. (The above enclose the space between the two North entrances to the British section.) The Gates, Railings, Gas Pillars, &c., enclosing the house of the Royal British Commission, viz.:—The principal entrance of cast sheet fence and gates, terminated by 2 gas pillars; the 2 lengths improved cast palisade fence on either side; a length of cast sheet balcony railing on east side; the west entrance to the building, of patent twisted angle bar fence and gates; a length of the same fence of various designs, on west and north sides; a length of bracket railing, on east side within the grounds. Various coats of arms and trophies in and about the house of Royal British Commission. Garden Chairs in grounds and park:—Osmunda Regalis, Water Plant, Mediæval, Midsummer Night's Dream, Nasturtium, Horse Chestnut, and Medallion. Vases in grounds and park:—Milton, Night and Morning, Classic, and Jardinière. Flower Stands in grounds and park.
- COLLINGS & WALLIS, *King Edward's Road, Birmingham*.—Portable Smith's Forge for use in erecting Iron Work, &c.
- COOKE, SONS, & LAW, 12, *Friday Street, London*.—Mats in British Section of Industrial Palace, Agricultural Hall and Machinery Hall, and Matting for the Office of the Royal Commission and Fine Art Galleries.
- COOKE, T., & SONS, *Buckingham Works, York*.—Clocks for Machinery Hall, and Workmen's Houses.
- COOPER & HOLT, 48, 49, 50, *Bunhill Row, London*.—Two Mahogany Dwarf Bookcases, the mouldings and inlays of Ebony, the centre doors decorated with hand-painted Medallions; A 12-feet by 4 feet 6 inches Mahogany Telescope Dining Table, with Patent Screw; Five 4 feet 6 inches Mahogany Writing Tables, the top covered with Green Morocco and Gilt Edgings; Mahogany Settee, stuffed with best Horse Hair and Springs, and covered with hard-grain Green Morocco; Easy Chairs; Chairs; Patent Reversible Billiard Table, of polished Walnut with black Mouldings, and Adjusting Feet, with Slate Bed and India Rubber Cushions, covered with best Cloth, and Brass, Cues, Rest, Ivory Balls, Tips, Cue Stand, Brush Marking Board, Green Holland Cover, and a Book on Billiards; Polished Walnut Settee, stuffed with Horse Hair and Springs, and covered in Green Persian Cretonne; Two Polished Walnut Couches and Easy Chairs; Twelve Stuffed-back Chairs; Two Amboyne Occasional Tables; and Two Chess Top Tables; Polished Oak and Black Registered Writing Table and Desk Chair; Stuffed-back Chair, in Brown Leather; Inlaid Embossed Dwarf Bookcase, with Ormolu Mouldings; Polished Mahogany Pedestal Writing Table, with Leather Top; Bookcase, with Glass Doors; Polished Mahogany Cylinder Writing Table; and Stuffed-back Chairs, in Maroon Worsted Rep.
- COPESTAKE, MOORE, CRAMPTON & COMPANY, *Nottingham and Bow Churchyard, London*.—Thirty-six Pairs of Nottingham Lace Curtains, in the Prince's Room, Public Room, Ante Room, and Secretary's Room.
- DENNIS, W., & COMPANY, 19, *Holborn, London*.—Patent Pneumatic Fire Extinguishers, and Garden Irrigators.
- DERHAM, JOHN J., *Blackburn*.—Horizontal non-condensing Expansion Steam Engine of 20 nominal Horse Power, for driving Printing Machinery, Cylinder 16 inches in diameter, and 3 feet stroke, Steam Jacketed Cylinder, Adjustable Expansion Valves, &c. Horizontal non-condensing Expansion Steam Engine of 25 nominal Horse Power, for driving wood-working machinery, Cylinder 18 inches diameter, and 3 feet stroke; Steam Jacketed Cylinder, fitted with Patent Expansion "Cut-off Valves," and motion for maintaining a uniform speed of Engine under the extreme variations of load, dispensing with Throttle Valve, and ensuring the full boiler pressure of steam on piston at the beginning of stroke, thus working with the greatest economy of fuel. The Engines have balanced Cranks, large wearing surfaces, all parts easily accessible and adjustable, improved Metallic Piston, Steel Piston Rods, Crank Pins, &c., and are mounted upon strong Cast-iron Foundation Frames, planed for receiving the usual parts.

- EDGINGTON, JOHN, & COMPANY, 48, *Long Lane, Smithfield, London*.—Improved Marquee Hospital, 40 feet by 20, of Double White Canvas; Improved Campaigning Tents, 10 feet by 7, of White Canvas; Patent Lawn Tent, of Striped Material, requiring no Lines, Ropes, or Separate Poles.
- ELKINGTON & COMPANY, *Newhall Street, Birmingham*.—A Kettle Drum Silver Gilt Tea Service, consisting of Coffee and Tea Pot, Sugar Basin, Cream Ewer, Silver Waiters, Tea Spoons, Sugar Tongs, Tea Cups and Saucers. A Luncheon Tray with Decanters, Biscuit Box and Wine Glasses, Soda Water Stand, Decanter and Glasses. A Bronze Statuette of Her Majesty the Queen; Bronze Statuettes of Their Royal Highnesses the Prince and Princess of Wales. Four 7-light Candelabra; two 2-light branches; twelve gilt candlesticks.
- FEETHAM, M., & COMPANY, 9, *Clifford Street, Bond Street, London, W.*—Bright Ventilating Warm-air Grate for Fire-place in H.R.H. the Prince of Wales' Room; Bright Ventilating Warm-air Grate, combined with a Mantel-piece, for Fire-place in the Exhibitors' Club Room; two Feetham's Circular Camp Cooking Stoves for Kitchens in Workmen's Dwellings; Grill Stove for Cooking Chops and Steaks.
- FIELD, J. C. & J., *Upper Marsh, Lambeth, London*.—Candles and Soap.
- FOX, J. CAYEN, *Royal Horticultural Gardens, South Kensington, London*.—Rustic Summer House.
- GALLOWAY, W. & J., & SONS, *Knott Mill Iron Works, Manchester*.—Pair of Compound High and Low Pressure Engines to indicate 100 horse-power, designed specially to secure economy in fuel and simplicity of construction. The whole of the Engines self-contained, and the Governor, by being placed in direct communication with the Slide Valve for the admission of steam into the high-pressure Cylinder, does away with the necessity of a Throttle Valve, and thus gets the full pressure of steam effectually upon the Piston. The Exhaust Valves for both high and low-pressure Cylinders are worked off separate eccentrics, and the Air Pump is placed horizontally in rear of the Engine, and is of simple construction, so as to enable the Engine to be run at very high rates of speed if required. Two Patent Galloway Boilers, each of 50 horse-power, and each capable of giving off sufficient steam to drive about 200 indicated horse-power, suitable for an ordinary working pressure of 5 atmospheres. The especial feature of these Boilers consists of the "Galloway" Tubes, which are largely introduced into the flues, the Boiler being formed in the front similar to a plain two-flued Boiler, but immediately in rear of the fire-bars, these two furnaces uniting into an oval back flue, in which are placed 24 "Galloway" Tubes and 4 Side Pockets. These Tubes cause a rapid circulation of water, and prevent, in a great measure, the wear and tear which always takes place in a two-flued Boiler where there is so great a difference in temperature in the water above and below the flues. This form of Boiler is being rapidly introduced into England, about 4000 of them being now working. The "Galloway" Tubes are also largely applied to the ordinary Cornish and two-flued Boilers, as they have the advantage of strengthening the flues, improving the circulation, and increasing the power of the Boiler. These Boilers have been found, from careful experiment, to evaporate upwards of 10 lbs. of water per lb. of coal, the water having been let in at 60 degrees temperature.
- HEMBRY, B., & COMPANY, 91, *Newgate Street, London*.—Linoleum Floor Cloth and Cement.
- HEMMING, S. C., & COMPANY, 25, *Moorgate Street, London*.—Iron Buildings, namely, two Workmen's Houses; Royal Commission Pavilion, and Offices of British Commission; and a Club Room.
- HILL & SMITH, *Brierley Hill Iron Works, Brierley Hill, Staffordshire*.—Ornamental Iron Railings and Gates for one of the Open Courts, and Wire Fencing for Workmen's Houses.
- HOBBS, HART & COMPANY, 76, *Cheapside, London*.—Fire-proof Safes.
- HOWARD, J. & F., *Britannia Works, Bedford*.—Safety Steam Boiler of 30 horse-power.
- HUDSPITH, WILLIAM, *South Tyne Works, Haltwhistle, Northumberland*.—Tazzi, for Arboretums; Fern and Floral Arboretums; and Garden Border Tiles.
- JACKSON & GRAHAM, 29, 33, 34, 35, 37, and 38, *Oxford Street, London, W.*—Furniture in the Royal Commissioners' Pavilion.—Three Pile Carpets and Borders, designed by Mr. Owen Jones, architect. Three Pile Carpets and Borders, designed by Mr. C. Berger. Three fine Patent Axminster Carpets, designed by Mr. Owen Jones. Three fine Patent Axminster Carpets, designed by Mr. Owen Jones. Ebony Cabinet, inlaid with box, purple, orange wood, &c.; Wardrobe of Tuya Wood, inlaid with lemon, purple, and black; 5 feet 6 inches Brass Bedstead, designed by Mr. Owen Jones. Ebony Cabinet, inlaid with ivory, and engraved; Cabinet of Tuya Wood, inlaid with ivory, box and other woods, and engraved; Vitrine of Figured Ebony, inlaid; Oval Amboyana Table, inlaid and engraved; Figured Ebony Writing Table, inlaid; Amboyana Cabinet, inlaid and mounted with marble; Amboyana Cabinet, inlaid and engraved; Sideboard of Olive, walnut, and black, inlaid with red wood, designed by Mr. A. Losmier. Ebony and Ivory Secretaire; Cabinet, with plaques of porcelain; Olive Wood Cabinet, inlaid; Olive Wood Table, inlaid, designed by Mr. E. Prignot. Hall Chairs of Walnut, inlaid with ebony; Satin Wood Table, inlaid; Octagon Table of Figured Ebony, inlaid; Table Cabinet of Figured Ebony, inlaid; Oblong Amboyana Table, inlaid; Octagon Amboyana Table, inlaid; Small Brass Bedstead; Suite of Bedroom Furniture, oak inlaid, designed by Mr. C. Berger.

- JACOBY, MORITZ, & COMPANY, *Stoney Street, Nottingham*.—Muslin Curtains for Decoration of British Section.
- JENNINGS, G., & COMPANY, *Lambeth, London*.—Sanitary Arrangements, Lavatories, &c., for Offices and Workmen's Houses.
- KENT, G., 199, 200, 201, *High Holborn, London*.—Rotary Knife Cleaners, Ventilated Refrigerators, Bread Slicing Machines, Egg Beaters, Cinder Sifting Machines, and various other domestic labour-saving appliances for the Workmen's Houses.
- KENT, G. B., & COMPANY, 11, *Great Marlborough Street, London*.—Brushes and Combs.
- LAWRENCE, W., & COMPANY, 14, *St. Mary Axe, London*.—Refrigerators, Water Purifiers, &c.
- LEWIS, JOHN, *India Buildings, Halifax*.—Paintings in H.R.H. the Prince of Wales' Room. Royal Wilton Carpet of special design, in the same room and offices adjoining; Brussels Carpet of Oriental design, in the Exhibitors' room and adjoining offices; Royal Wilton Carpet, conventional flowers, in Rotunda.
- LLOYD, EDWIN, *Horticultural Works, Grantham*.—Conservatory of a new mode of construction recently patented by the Exhibitor. A wood sill forms the base of the building, and may be either secured by bolts and nuts to wood sleepers, or on a concrete bed in which the bolts are imbedded. The rafters are about six feet apart, and are constructed of two fitches of wrought iron, with a fitch of wood between, well bolted together, the iron on each side being slightly raised above the wood to form a channel for the water, there being no coping used to cover the meeting styles of the sashes. The rafters and mullions are formed in one piece, the ends of the mullions being flanged at the ends, and bolted to the sills, and the ends of the rafters secured in a similar manner, with this difference, that both ends of the rafters meet together at the apex of the roof, and are bolted together through the ridge. The ends are constructed of extra strength, so as to require no framework, and the whole of the building is strongly braced together by light round wrought-iron rods passed through the rafters and end framing, and through lengths of wrought-iron tubing fitted between the rafters; the rods have threads at one end, with washers and nuts, by which the whole building is strained tightly together, and rendered rigid by the iron tubing. The sashes are all grooved, and the glass fixed without putty in a manner recently patented by the manufacturer. A moveable wood slip is fixed on the bottom rail of each sash, by which the lower end of each square of glass is secured from slipping, and protected from breakage. The gutters are of cast iron, and secured by bolts and nuts to the gutter plate and upright mullions, the down pipes from the gutter forming a column at each corner of the building; the ridge has ornamental cresting in cast-iron, and at each end is fixed an ornamental wrought-iron finial. The ends have a moulded coping and fascia, and a projecting corbel at the eaves, concealing the end of the gutters. The building is so portable and simple in construction, that two men of ordinary capacity can fix and glaze it ready for use in a week.
- MERRYWEATHER & SONS, 63, *Long Acre, London*.—Steam and Manual Fire Engines, including such as are used by the London Fire-brigade, &c.
- MILNER, T., & SON, *Phoenix Works, Liverpool*.—First Class Extra Strong Holdfast and Fire-resisting Safe, "Milner's Patent," with Drawers. Door $1\frac{1}{4}$ inches thick, formed of $2\frac{1}{2}$ inch wrought iron plates with $\frac{1}{4}$ inch hardened steel between them. Body of Safe constructed throughout of $\frac{1}{2}$ inch and $\frac{1}{4}$ inch wrought iron, with $\frac{1}{4}$ inch of hardened steel between them, making 1 inch in thickness, bolted together with hardened steel bolts, and lined throughout with double, treble, or quadruple chambers, 3, $4\frac{1}{2}$, or 6 inches in thickness.
- MINTON, HOLLINS & COMPANY, *Stoke-upon-Trent*.—Encaustic Paving Tiles for Verandah of Royal Commissioners' House.
- MINTONS, *Stoke-upon-Trent*.—Jardinières, Garden Seats, &c.
- PATENT IMPROVED FIRE EXTINGUISHER COMPANY, 19, *Holtorn, London*.—Smith and Langley's Patent Steam Sentinel.
- PATENT GAS COMPANY (LIMITED), 25, *Fenchurch Street, London*.—Complete Apparatus for Manufacturing Gas by Dr. Eveleigh's Patent Process, which consists in distilling coal at a comparatively low temperature, by which a considerable quantity of gas of a superior quality is produced, and also a certain proportion of rich oily matter. This oily matter is then distilled by a secondary process, and a further quantity of gas produced, which is afterwards mixed with that resulting from the first distillation. The practical advantages that are claimed for this over the ordinary process are the following:—1st. A larger quantity of gas is obtained per ton of coal; 2nd. A much higher illuminating power is obtained without the use of Cannel; 3rd. Greater purity of gas; 4th. An increased quantity of coke of better quality; 5th. No tar is left as a residue, but instead a proportionate quantity of pitch.

- PAVY'S PATENT FELTED FABRIC COMPANY (LIMITED), 14, *Hansell Street, Falcon Square London*.—Wall Decorations and Window Draperies in Exhibitors' Room, Corridor, and Jury Room, (large corner Pavilion).
- PERKINS, B., & SONS, 141, *Cannon Street, London*.—Self-heating Gas Bath and Fittings, japanned and marbled, sienna and rouge royal.
- PILLISCHER, M., 88, *New Bond Street, London*.—Two 4-light Silver-plated Table Lamps, two 2-light Silver-plated Table Lamps, two 1-light Silver-plated Reading and Microscope Lamps, and one Bronzed; Barometograph and several Thermometers.
- POWIS, CHARLES, & COMPANY, *Cyclops Works, Millwall Pier, and 60, Gracechurch Street, London*.—3-ton Locomotive Steam Crane; and 20 horse-power Steam Engine.
- PRICE'S PATENT CANDLE COMPANY (LIMITED), *Belmont Works, Battersea, London*.—Palmitine and Paraffine Candles, Toilet Soaps, and Glycerine.
- READING IRON WORKS COMPANY (LIMITED), *Reading, Berkshire*.—Twenty-five Horse-Power Class A. High Pressure Condensing Steam Engine. The bed is in the form of a massive moulded girder rounded at one end and square at the other. The crank shaft is of forged scrap iron, with the fly wheel keyed to same, and turned on the face so as to act as a driving wheel if required. The bearings throughout are of gun metal, and adjustable, to compensate for wear. The feed pump is worked by an eccentric on the crank shaft, having double valves, trial and suction taps. The governors are connected with a throttle valve which effectually controls the admission and regularity of the steam supply. The cylinder is 17 inches in diameter, and is steam jacketed so as to keep the working steam in the cylinder quite dry, and consequently free from condensation. The piston is metallic, and the rod of steel, the stroke 30 inches. The Engine is also furnished with an extra expansion valve, which can be set and altered whilst the engine is running, so as to cut off the steam at any point varying from 1-10th to one-half of the volume necessary to fill the cylinder. The condenser forms an important element in the economical working of this Engine, as by its use the back pressure on the piston is relieved, and an increase of power is gained or a saving of fuel effected equal to 20 per cent.
- SHAND, MASON & COMPANY, 75, *Upper Ground Street, Blackfriars-road, London*.—Patent Equilibrium Steam Fire Engine, capable of delivering 1,000 gallons per minute, throwing to a height of 200 feet through a jet of 1½ inch diameter, fitted with Patent inclined Water Tube Boiler, by which Steam is raised to a pressure of 100lb. to the square inch, in 6½ to 7 minutes from the time of lighting the fire, the Boiler being supplied with cold water, fitted with Giffard Injector, Feed Pump, Suction Pipe and Hose complete, and constructed to be drawn by horses at great speed. Steam Fire Engine of the same description, capable of delivering 670 gallons per minute, and of throwing to a height of 185 feet through a jet 1½ inch diameter. These Engines are fitted with a set of Treble Pumps worked direct by a corresponding set of Treble Steam Cylinders, by use of which, perfect uniformity is obtained in the flow of water through Hose and Suction Pipes. The use of three Steam Cylinders, besides securing the above advantages, enables the fly wheel to be dispensed with. Great economy of steam, and consequently of boiler space and fuel, is thus obtained, and the weight of the whole machine is greatly reduced. A Patent Vertical London Brigade Steam Fire Engine, constructed on the same principle as the above, but fitted with one steam and one water cylinder only, will deliver 350 gallons per minute, and throw to a height of 160 feet, through a jet 1½ inch diameter. Patent Horizontal Steam Fire Engine, consisting of a Strong Gun Metal Pump placed horizontally, and worked direct by a Steam Cylinder fitted with patent maintaining motion, so that the fly wheel is not required; it has large waterways, and the valves are removed and replaced with the utmost facility, which renders it also well adapted for irrigation purposes. It is fitted with the same description of boilers as the other engine, and is carried on a strong wrought iron frame, and adapted for rapid travelling, and is drawn by a pair of horses. It will deliver 300 gallons per minute, and throw to a height of 150 feet, through a jet 1 inch diameter. Manual Fire Engine of the same construction as those in use by the London Metropolitan Fire Brigade, and also by Municipal and Volunteer Fire Brigades in Great Britain, and all parts of the world.
- SHARP, STEWART & COMPANY, *Atlas Works, Manchester*.—Improved Giffard Injector, 12 inch, or brass throughout, adapted for feeding a range of boilers and for working with any steam pressure; the Injector is capable of drawing the feed-water from a depth of six feet, with steam pressure under 50 lbs.; it will work with feed-water heated to 130° Fahrenheit.
- SILICATED CARBON FILTER COMPANY, *Church Row, Battersea, London*.—Two Silicated Carbon Main Service Filters; Two Silicated Carbon Dining-room Filters; Two Large Silicated Carbon Dining-room Filters; Two Large Domestic Filters.

- SIMON, MAY & COMPANY, *Nottingham*.—Lace Curtains, in a variety of widths, styles, and designs.
- SIMPSON, W. B., & SONS, 456, *West Strand, London*.—Art Tile Chimney Piece for Her Majesty's Commissioners' Office; the Chimney Piece is of American walnut wood and marble, with upper and lower shelves and clock bracket, projecting side shelves, supported by turned columns, a bevelled mirror above the lower shelf; the panels filled with art tiles, fable subjects, painted in deep blue relieved with yellow, the chimney linings of art tiles; Encaustic Tile Hearth, arranged for open grate and marble fender. Designed and executed by W. B. Simpson & Sons.
- SPICE, R. P., C.E., 21, *Parliament Street, Westminster, London*.—Gas making Apparatus and Fittings.
- SUTTON & SONS, *Reading, Berkshire (Queen's Seedsmen)*.—Grass Seeds, for sowing the lawns and the greater part of the Prater. Flower Seeds and Gladioli—A choice assortment, specially prepared by Messrs. Sutton for planting round the Prince of Wales's Pavilion. Vegetable Seeds—A large assortment, especially prepared for sowing in the gardens adjoining the Workmen's Houses, belonging to the Royal British Commission.
- TALL & COMPANY (LIMITED), 8, *Lawson Street, Great Dover Street, London*.—Labourers' Cottage in concrete.
- TANGYE, BROTHERS, & HOLMAN, 10, *Laurence Pountney Lane, London*.—Hydraulic Lifting Jacks, Pulley Blocks, &c.
- TEMPLETON, JAS., & COMPANY, *Glasgow and London*.—Curtains for Decorations of Industrial Buildings.
- TYLER, HAYWARD, & COMPANY, *Upper Whitecross Street, London*.—Independent Steam Pumping Engine, consisting of a steam engine 5 inches in diameter, and double acting pump, the plunger of which is 3 inches in diameter. The motion is communicated from one to the other by a piston-rod, to one end of which is attached the steam piston, and to the other the pump plunger. It works independently of all other machinery, only requiring to be connected with the steam pipe to set it in motion. The Steam Engine is remarkable for its simplicity. The piston is long and hollow, containing a cylindrical slide valve, by which the distribution of the steam to the two ends of the cylinder is effected. The piston and slide valve are the only moving parts of the Engine. The piston passes at each end of its stroke over steam and exhaust ports in the sides of the cylinder by which the steam enters, and causes the slide valve to move into the position in which the steam supply and the exhaust of the piston are reversed. Both the main piston and the slide valve are thoroughly cushioned with steam at the end of their travel, so that the machine works without the concussion of any parts, and the positions of the valve faces are so arranged that the longer the Engine works the more perfectly do they fit. The Engine has no dead points, for in whatever direction the piston may be moving, it is evident that it will continue to move until it has passed over the ports which reverse the slide valve. As soon as this is the case the motion of the piston is absolutely reversed, by which we mean that the slide valve cannot alter its position until the piston reaches the other end of the stroke. The pump is double-acting. The valves are so arranged that by undoing four bolts, and removing the air vessel, they are all exposed to view without interfering with any of the pipes. In the middle of the barrel of the pump is a gland entirely separating the two ends of the barrel, and provided with arrangements for being easily tightened up when the end cover of the pump is removed. Through this gland works the plunger of the pump, each end of the plunger working in its own half of the barrel as a single acting plunger; thus the pump consists of two single acting plunger pumps. The object of this arrangement in preference to the ordinary piston working in a bored barrel, is that the plunger is much less liable to be worn, through the presence of impurity in the water than the piston, and in case of its requiring to be tightened, the gland can be readily tightened up by only removing the end cover of the pump. No parts are liable to wear but the plunger and gland, which can be removed without interfering with the body of the pump. These pumps are applied to many purposes, but for boiler feeding they possess important advantages. The motion being dependent solely on the action of the steam on the piston, they have no dead point, so that the Engine runs very slowly. The speed regulates itself according to the work it has to do. The Engine if stopped either by want of steam, or by the exit of water being closed, starts of itself as soon as the obstacle is removed. The pump may therefore be made self-acting, dependent on a float arrangement, and will keep the water to a uniform height in the boilers.
- UNITE, JOHN, 291, *Edgware Road, London, W.*—Two best White Duck Marquees, 30 feet by 15 feet, waterproof, one used by Her Majesty's British Commissioners as a Workmen's Refreshment Tent; Square Garden Tent, 8 feet by 8 feet, no centre-pole, and easily erected, thoroughly waterproof; Alpine Tent, 6 feet square, weight 20lb., very portable and waterproof; Emigrant's Tent, 6 feet square, waterproof; Military Camp Tent, 36 feet circumference, waterproof and durable.

WARNER, JOHN, & SONS, 8, *Crescent, Cripplegate, London.*—Three Garden Engines, with Lawn Spreaders; Three Water Barrows, with Lawn Spreaders.

WINFIELD, R. W., & COMPANY, *Cambridge Street Works and Rolling Mills, Birmingham.*—A Handsome Massive Egyptian Sphinx Chandelier, with Five Lights and Four Brackets to match, with richly Ornamented Glasses complete, for the apartments specially prepared for His Royal Highness the Prince of Wales, K.G., President; Large Mediaeval Chandelier, with Nine Lights and Trefoil Burners projecting from each arm, for the Exhibitors' Meeting Room; Chandelier, with Five Lights, and Table Stand, for the Secretary's Office; Two massive Billiard Pendants, with Six Lights each, for the Smoking Room; Three Light Chandelier, for the Ante-Room; Two large Two Light Pendants, for the Clerks' Offices; Hexagon Lamp, with Swing Bottom, for convenience of lighting, for the Entrance Hall; Lamp for the Vestibule, and Brackets for the Passages, &c., and sundry other Chandeliers and Brackets for the Artizans' Dwelling Houses; Fourteen large Chandeliers in the Nave and Rotunda, consisting of five, six, seven, and eight Lights.

WOODBURY PERMANENT PRINTING PROCESS COMPANY, 9A, *Hereford Square, Brompton.*—Frames of Permanent Photographs for decorating the British Workmen's Houses.

MEMORANDUM FOR THE RECORD

DATE: [Illegible] SUBJECT: [Illegible]

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