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CLASS X.

CIVIL ENGINEERING, ARCHITECTURAL, AND BUILDING CONTRIVANCES.

SUB-CLASS A.—*Civil Engineering and Building Contrivances.*

[2226]

ALGER'S PATENT FURNACE COMPANY (Limited), 4 *Victoria Street*, *Westminster*.—Model of an elliptical blast furnace, now erected at Stockton-on-Tees, and in blast.

The advantage which the elliptical blast furnace possesses over other furnaces, consists in its combining large capacity with that degree of narrowness which insures the horizontality of the lines of equal temperature from the tuyères upwards. Thus the whole of the ore arrives in a uniform state of preparation for fusion at a melting zone, possessing perfect uniformity of temperature. The quality of the iron is improved, the descent of the charge more uniform, and there being *two* openings for tapping, one at each end of the ellipse, the furnace is more under control, and bridging, or scaffolding, is greatly diminished. There is a saving of one-third in the cost of construction, one-third in the fuel; less labour is required, and there is, besides, a saving in the blowing. Any ordinary blast furnace can be altered to the elliptical form at a small expense.

[2227]

ALLEN, EDWARD ELLIS, 5 *Parliament Street*, *S.W.*—Corrugated fibrous sheets for roofing, partitions, &c.

[2228]

ALLEN, H., 17 *Percy Street*, *W.*—Double model: a lift for manufactory; ditto for private house.

1. Model of a lift for raising or lowering invalids to the different floors of a house with ease and comfort.

2. The same adapted for raising or lowering goods at a factory or warehouse.

[2229]

ARBRUTH, G. B., & THOS. SCOTT, 18 *Parliament Street*.—Models of iron armour for ships and forts.

[2230]

ARCHITECTURAL POTTERY COMPANY, THE, *Poole*, *Dorset*.—Mosaic, tesselated, and white glazed tiles; patent glazed bricks; and orange-tree tile-tubs.

[2231]

ASHBY, ROBERT, 34 *Smith Street*, *Chelsea*, *S.W.*—Model for fireproof building.

[2232]

ATKINSON, W., 1 *Victoria Street*, *London*.—Portland cement.

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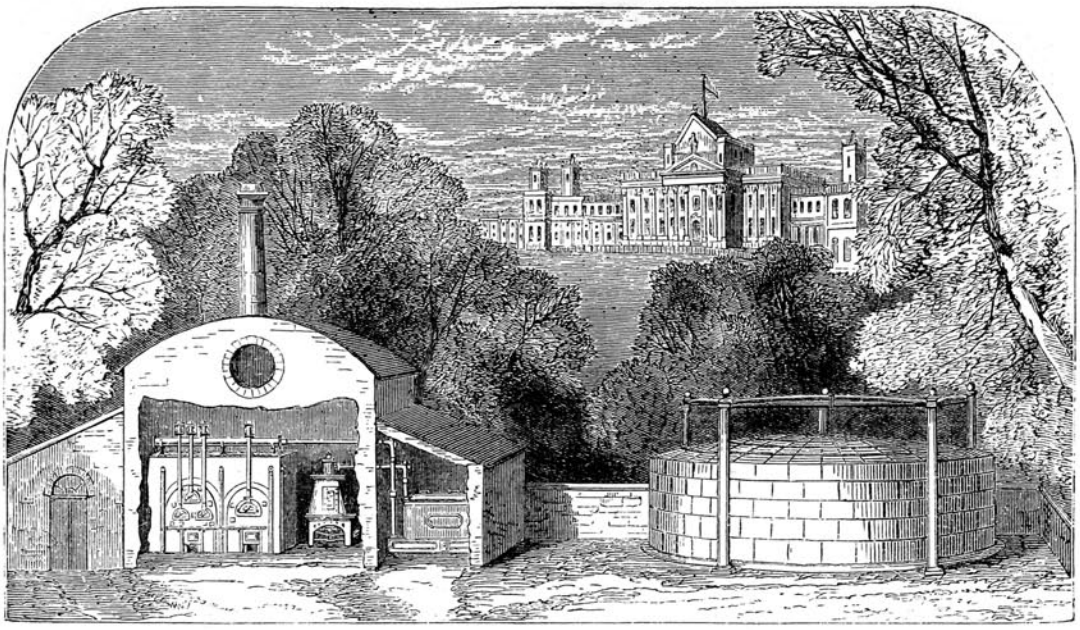
BOWER, GEORGE, *St. Neots, Huntingdonshire.*—Patented vertical gas apparatus and combined purifier, for private use, and for exportation.



GAS APPARATUS AT BLENHEIM.

Of the numerous inventions which have so pre-eminently distinguished the present age, none has contributed in a greater degree to the comforts of civilised life than that of illumination by gas.

In these days of its almost universal adoption in our cities and towns, it is quite superfluous to dilate on its numerous advantages, which must be manifest to all, though their full force can perhaps be appreciated only by those who can remember the sombre appearance formerly presented by the streets of our large towns at night, as contrasted with their present brilliant aspect.

There is, however, a still more extended field for the operations of gas lighting, and much yet remains to be done in our villages, and in the mansions and private residences of the nobility and gentry. It is believed that this is due to certain misapprehensions and not unnatural prejudices which have hitherto existed on the subject, and that when these can be effectually removed, gas lighting will no longer be, in a great measure, confined to cities and towns, but its advantages will be as widely appreciated and embraced as they undoubtedly deserve to be. Its non-introduction into many of our villages has been mainly owing to the belief that it would prove a commercial failure, whereas it has been most conclusively shown by experience, that any compact village of a thousand inhabitants may be lighted with gas, so as to pay a good per-centage on the original capital embarked.

It is only within a comparatively recent period that the prejudices of private gentlemen, as to the advisability or practicability of introducing gas into their dwellings, have been partially removed. By some, danger was contemplated; by others, it was regarded as a nuisance, or as too complex in its management and manufacture; others, again, shrank from it on the score of economy, as involving fearful outlay in plant, and large cost of maintenance; while the possessor of the ornamental domain imagined in such plant an unsightly structure, emitting dense smoke and noxious vapour, giving to the mansion the appearance of a manufactory, and altogether inconsistent with that picturesqueness and quiet which are so generally and justly appreciated in country life. These suppositions are, however, an entire fallacy, for it may be confidently stated, that science has completely removed all ordinary chance of danger, or possibility of nuisance; that on the score of economy, in regard to the cost of apparatus, and the method and expense of making the gas, much has been done to reduce and overcome objections; whilst, by judicious arrangements, and the use of a portable apparatus (such as the one exhibited, which, from its compactness, can be placed in any out-building), nothing calculated to offend the eye, or the most fastidious taste, can be objected to. For works of greater magnitude, a low and secluded position (hidden it may be by trees and shrubbery), is usually chosen; and the requisite buildings may be so designed as to combine the ornamental with the useful.

The above engraving represents the patented apparatus as erected and fixed by the exhibitor for the palace of his Grace the Duke of Marlborough, at Blenheim.

Mr. Bower's inventions, designed for the purpose of removing the objections here alluded to, have been extensively adopted in various parts of Great Britain and the Continent, the following being a list of 100 gas works selected out of a great number of cities, towns, villages, factories, public buildings, and private establishments which have been lighted by him during the past few years. It may be mentioned as a proof of their general applicability, that the necessary apparatus for lighting the railway tunnel now in course of construction under Mont Cenis, has recently been supplied by him for the Italian Government.

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BOWER, GEORGE—*continued.*

CITIES, TOWNS, AND VILLAGES.

Bourn.....Lincolnshire, remodelled.
Beaufort.....Breconshire.
Bishop's Castle.Salop.
Bolsover.....Derbyshire.
Caistor .....Lincolnshire.
Casale.....Piedmont.
Crickhowell.....South Wales.
Coalville.....Leicestershire.
Collingham ...Nottinghamshire.
Donnington ...Lincolnshire.
Dokkum .....The Netherlands.
Gefle .....Sweden.
Higham Ferrars.Northamptonshire.
Hatfield.....Hertfordshire.
Harlingen.....The Netherlands.
Irthlingboro' ..Northamptonshire.
King's Cliffe...Northamptonshire.
Kimbolton.....Huntingdonshire.
March.....Cambridge, remodelled.
Middleham ...Yorkshire.
Milverton .....Somersetshire.
Mountsorrel ...Leicestershire.
Oakham.....Rutland, remodelled.
Purmerende...The Netherlands.—Plant
Potton .....Bedfordshire. [only.
Quorndon .....Leicestershire.
Redbourn .....Hertfordshire.
Repton .....Derbyshire.
Red Hill .....Surrey.
Saffron Walden.Essex, remodelled.
San Sebastian.Spain.
Sandy.....Bedfordshire.
St. Ives .....Hunts, remodelled.
St. Neots .....Hunts, remodelled.
Stevenage .....Hertfordshire.
Swineshead ...Lincolnshire.
Spa.....Belgium.
Syston .....Leicestershire.
Wellingborough.Norths., remodelled.
Whittlesea ...Cambs., remodelled.
Whitwick .....Leicestershire.
Wigston .....Leicestershire.

FACTORIES, RAILWAY STATIONS, AND COLLIERIES.

Abersychan	South Wales	Iron Works.
Allen, J., Esq.	Ivy Bridge, near Plymouth	Paper Factory.
Barrow, R., Esq....	Staveley	Three Coal Pits.
Bolckow and Vaughan	Middlesboro'-on-Tees	Iron Works.
Bayer and Co.	Sourabaya, Dutch East Indies... ...	Sugar Works.
Bolckow and Vaughan	Eston, near Stockton	Iron Works.
Brown, Humphrey, Esq.	Tewkesbury	Silk Factory.
Brymbo Iron Company...	Near Wrexham	Iron Works.
Cocker and Sons...	Hathersage, near Sheffield	Needle Factory.
Castelli, M.	Serravelle, Italy	Cotton Factory.
Combe and Co.	Wolvercott, near Oxford	Paper Mill.
Ebbw Vale Company	Near Newport, Monmouthshire. ...	Iron Works.
Gordon, J., Esq....	33, New Broad Street, London ...	For Export.
Harrison, Ainslie, and Co.	Lyndal, Lancashire	Iron Works.
Hepburn and Sons	Dartford	Tannery.
Italian Government	Montcalier	State Railway Station.
Lansdorff, The Count	St. Petersburg	Cotton Mill.
Moscow Sugar Factory Company ...	Moscow	Sugar Works.
Mancardi, S., Esq.	Turin, Piedmont...	Silk Mill.
Midland Railway Company	Toton, Nottinghamshire	Siding and Station.
Metallic Works Company	St. Petersburg	General Metal Works.
Milne, H. B., Esq.	Gefle, Sweden	Saw Mill for Gas from saw dust.
National Silk Spinning Company ...	Novara, Piedmont	Silk Mill.
Russian Spinning Company	St. Petersburg	Cotton Mill.
Rignon and Co.	Savigliano, Piedmont	Silk Mill.
Sampson Mill Company	St. Petersburg	Cotton Mill.
Schipoff and Co.	Moscow	Cotton Mill.
Smith and Sons	Watford, Hertfordshire	Paper Mill.
Gilineshoff, S. W., Esq.	St. Petersburg	Spinning Mill.
Shute, Thomas, Esq.	Watford, Hertfordshire	Silk Mill.
Saunders, Thomas, Esq.	Dartford	Paper Mill.
Towgood, Messrs., Brothers	St. Neots	Paper Mill.
Towgood, Alfred, Esq.	Helpstone Peterborough	Paper Mill.
Treschow, T., Esq.	Lorwig, Norway	Iron Works.
Tzarskoe Railway Company	St. Petersburg	Gardens and Railway Station.
Taylor and Robinson	Rastrick, Huddersfield...	Woollen Mill.
Tunnel under Mount Cenis	Bardoneche	Italy.
Vitale, Placido, Esq.	Messina	The New Theatre.
Whalley and Hardman	Kirkham, near Preston	Cotton Factory.

PRIVATE ESTABLISHMENTS.

Marlborough, His Grace the Duke of, Blenheim Palace, Woodstock, Oxfordshire.
Westmoreland, Right Honourable the Earl of, Apthorpe Park, Wansford, Lincolnshire.
Roden, Right Honourable the Earl of, Tollymore Park, County Down, Ireland.
Macclesfield, The Right Honourable Lord, Sherborn Castle Oxfordshire.
Ashby, Captain, Nazeby Woolleys, Northamptonshire.
Bolckow, J., Esq., Marton Hall, near Middlesborough.
Benyon, Rev. E. R., Culford Hall, Bury St. Edmunds.
Benyon, R., Esq., M.P., Englefield, Reading.
Fothergill, R., Esq., Abernant House, Aberdare.
Gwyn, Howell, Esq., Dyffryn House, Neath.
Harter, Rev., Cranfield Court, Newport Pagnell.
Haigh, G. H., Esq., Grainsby Hall, near Louth, Lincolnshire.
Ledeboer, J., Esq., Macassar, Dutch East Indies.
Newton, Geo., Esq., Croxton Park, Cambridgeshire.
Pearce, J. D. M., Esq., M.A., Craufurd College, Maidenhead.
Roden, R. B., Esq., Ponty Moil, South Wales.
Stevens, Rev. T., St. Andrew's College, Bradfield, near Reading.
Vaughan, John, Esq., Middlesboro'-on-Tees.
Vansittart, S. H., Esq., Bisham Abbey, Maidenhead.

In reference to illuminating gas it is noticeable, that though many articles, such as oil, peat, resin, &c., readily produce it, the exhibitor and patentee fearlessly asserts, that, after innumerable experiments, and the trial of almost every conceivable plan for generating artificial light, our coal mines furnish the best and most economical materials for the purpose. For, as the illuminating power of gas depends on the relative proportions of its constituents—carbon and hydrogen—and as these are found to exist in coal in the proper proportions, it is obvious that taking into consideration its low cost, and the simplicity of the means required to convert the volatile portion of it into gas, coal is the best substance for the purpose. It is true, for instance, that water,

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BOWER, GEORGE—*continued.*

which is costless, will produce an illuminating gas when decomposed, and its hydrogen liberated and carbonised, but the cost of decomposition for the production of hydrogen—one only of the elements of which it is composed—is actually greater than that of highly illuminating gas produced from coal; and notwithstanding the many attempts to supersede it, it may be emphatically stated, that nothing whatever can in any commercial sense compete with coal, even giving it a range of price far beyond what it is at present.

Having established this fact, it became necessary to devise a cheap, simple, and economical apparatus, and the result has been the exhibitor's inventions, patented in 1852, 1859, and 1860; the last of which (the vertical retort), in connection with the combined purifying apparatus, has been pronounced far superior to all others, in every essential property requisite for the manufacture of gas on a small scale.

These features may be noted in the articles exhibited, viz., the vertical retort or gas generator, with its appurtenances, and the combined hydraulic main, condenser, and purifier, being equal in their conjoint capacity to a power representing about twenty lights. (The gasholder cannot be exhibited, for want of space.)

The gas generator consists of a conical retort, set vertically in an iron case, lined with fire-brick; both ends of such retort are open, the top being surmounted by a hopper, for the purpose of charging it with coal, to be afterwards closed by a luted plug, and the bottom provided with a luted door, having a false bottom or diaphragm projecting about six inches into the retort. This door, when closed, is retained in its position by means of a lever, having a swing catch and wedge; the fire-grate being arranged around the retort, so as to bring the fire itself into immediate contact with its outer surface. The mode of operation is, to heat the retort to a bright red, the bottom door being then luted, and raised to its proper position by means of the lever and catch; the retort is next filled, by the use of the hopper, with the necessary charge of dry coal or cannel, and the top closed with the luted plug. After the lapse of three or four hours, the gas will be extracted, the wedge and catch may be removed, and the door lowered by the lever to the pair of horizontal bars; and being removed, the coke falls out leaving the retort free for renewed operations.

The combined purifying apparatus consists of the hydraulic main, condenser, and purifier, united in one vessel or case, the base of which forms the hydraulic main; and a receptacle for the products, separated from the gas by the condenser, which condenser is so formed that the gas passes around the purifying vessel, in a space, the inner surfaces whereof are exposed to the water, forming the lute or seal for the purifying lid; and the outer surfaces are exposed to the atmosphere.

The purifier is provided with a cover, and four tiers of shelves, or perforated plates, which, when in operation, are covered with lime, and through which the gas percolates.

The gas is brought from the retort by means of a pipe into the hydraulic main, thence passing up and down the spaces forming the condenser, into the purifier, and from thence it is conveyed into the gasholder, ready for use.

The principal advantages of these arrangements for private works on a small scale are:—

1. They occupy but little space, are very simple, and require but little labour or skill to manage.
2. No bricks are required to set the retort, further than the few sent with the apparatus, and these are moulded of suitable shapes.
3. The retort being set vertically, and surrounded by fire, in immediate contact with it, requires less fuel than if set horizontally, and the fire may be lighted and permitted to go out with impunity, the same as an ordinary shop or hall stove.
4. It is adapted for common coal as well as cannel, and may also be adapted for the generation of gas from wood, peat, or oil, in situations where coal is difficult to be obtained.
5. In this arrangement of retort, by merely removing the top and bottom covers, when red-hot, the current of air that passes through, will remove all deposits of carbon from the interior.
6. The whole of the apparatus for removing impurities from the gas by condensation and purification, which by the ordinary process consists of three or four separate and cumbrous vessels, is effectually combined in the limits of one solid base.
7. The retort, when worn out, can be replaced, without requiring a skilled workman to fix it.

[2233]

BALE, T. S., *Mount Pleasant, Newcastle, Staffordshire.*—Mosaic and ornamental floor, wall tiles, and glazed bricks.

[2234]

BARNETT, S., 23 *Forston Street, Hoxton.*—Diving apparatus.

[2235]

BARRETT, HENRY, 12 *York Buildings, Adelphi.*—Model of fireproof flooring.

[2236]

BASFORD, WILLIAM, *Elgreave Street, Burslem.*—Front-facing brick, in connection with walls or fronts of cottages, and other buildings; roof and floor tiles, &c.

[2237]

BEART'S PATENT BRICK COMPANY, *Arsley, and King's Cross, London.*—Bricks and agricultural drain pipes.

[2238]

BELLMAN & IVEY, 14 *Buckingham Street, Fitzroy Square, W.*—Specimens of various imitations of scagliola marble.

[2239]

BETHELL, JOHN, 38 *King William Street, London, E.C.*—Specimens of creosoted woods.

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BROWN-WESTHEAD, MARCUS, *Manchester.*—Patent hoist governor and patent safety railway platform lift.

Fig 1

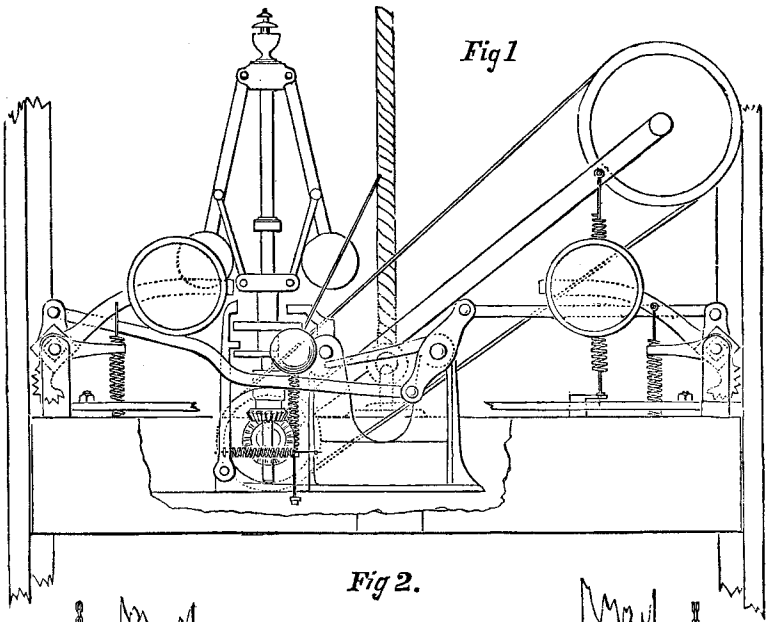

Fig 2.

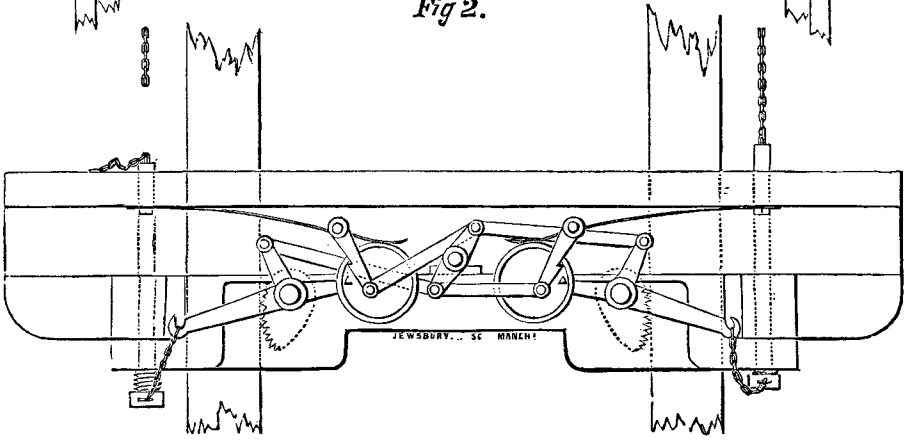

Fig. 1 represents a patented apparatus used in the northern districts of England for preventing accidents to life and injury to property in hoisting and lifting machinery. The machine is attached to the upper side of the ascending and descending chamber or cage. It is simple in construction and easily kept in order, and has already proved itself in many instances to be a secure and efficient apparatus for the purpose intended. It is evident that no matter what the cause of the cage or box travelling at too great a speed, the expansion of the governor from an excessive rate of motion must, per force, operate upon the other portions of the machine, and thus permit the cams or wedges to be instantly projected against the uprights or guides of the shaft or well-hole, and so arrest the box. A small weighted lever falls if the rope of suspension is severed, and thereby catches the box, or cage, within a few inches, and that instantaneously. This is a double security in the event of the rope breaking, as the machine, in that case, does not depend upon the action of the governor alone. It has been proved that the greater the weight of the cage, or box and its contents, the more safely it is secured; for the heavier the load the greater will be the resistance of the cams, as they will take a much firmer hold of the guides or uprights. Some alteration of the plan, as shown n Fig. 1, makes this invention equally applicable to the cages used in coal and other mines, where it is essential that the momentum of the cage should be *gradually* reduced in the event of over-speed. This invention combines the peculiar and important advantage, viz., the springs to insert the cams are not brought into action except at the required time, thereby preserving their elasticity unimpaired. The cost of application to ordinary hoists ranges from £25 to £30, including royalty.

Fig. 2 is a plan for preventing accidents to railway platform lifts. These hoists are extremely dangerous in consequence of the liability of one or more of the suspending chains breaking. By this invention the platform is evenly and simultaneously arrested at its four corners in the event of one or all of the suspension chains being fractured, by too great a load, or from the alternations of temperature affecting unequally the nature of the metal employed in the manufacture of the chains. It is, moreover, advantageous in its application, as the platform can be readily adjusted or repaired whenever requisite without having to stay the platform. Cost of application, including royalty, £75 to £85.

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BRUNEL, ISAMBARD, *Duke Street, Westminster.*—Models of Saltash and Chepstow bridges, designed by late Mr. Brunel.

MODEL OF BRIDGE ON THE SOUTH WALES RAILWAY OVER THE WYE AT CHEPSTOW.

This bridge was designed by the late Isambard Kingdom Brunel, Esq., D.C.L., F.R.S., Engineer of the Railway. It is constructed for a double line, and consists of three side spans of 100 feet each, and one principal span over the river of 300 feet. Each roadway over the land openings is carried between a pair of wrought-iron girders. The intermediate piers each consist of three hollow cylinders of cast-iron, six feet in diameter, filled with concrete. Each roadway over the main opening is carried between a pair of girders of similar construction, 300 feet long, which are supported at the extremities by the piers, and at four intermediate points—two at twelve feet, and two at sixty-two feet—from the centre, where they are attached to two sets of suspension chains, which form the tensional parts of a pair of rigid trusses. In these trusses, the tension delivered by the suspension chains is received by a straight tube of plate-iron, of circular section, nine feet in diameter; which is supported at its extremities on the superstructure of the piers, with its centre fifty feet above the line of rails, and at two intermediate points by vertical struts raised from the suspension chains at the points sixty-two feet from the centre of the span where the girders are attached to them. Rigidity is given to the structure by diagonal chains extending from the top of each strut, to the foot of the other. Each tube where it rests on the eastern pier is carried by a system of rollers, to allow of the expansion and contraction caused by changes of temperature. The weight of iron in each truss is 460 tons. The pier supporting the western end of these trusses consists, up to the level of the roadways, of six cast-iron cylinders similar to those which carry the land spans, and which here penetrate the rocky gravel of the river bed to the rock at eighty feet below high water spring tides. Above the roadway the pier is also of cast-iron, forming two archways, one for each roadway, over which the tubes of the respective trusses rest. The eastern pier is of masonry resting on the rock a few feet below the level of the line of rails. The form of this pier above the roadway is similar to that of the cast-iron pier at the western end. The bridge was commenced in April, 1850, and was completed in three years. On the successive completion of each tube, it was temporarily rendered rigid with chains, and being placed at right angles to the river, one end was supported on pontoons, and the other on a rolling truck. The pontoons were then drawn across the river by warps from the opposite shore. The tube was next lifted into its place on the top of the piers by chain purchases, and the rest of the truss was then completed. The operation of floating was rendered difficult by the great rise and fall of the tide, which is forty-two feet at spring tides. The contractors for the iron work were Messrs. Finch and Willey, of the Windsor Foundry, Liverpool. The total cost of the bridge was £77,000.

MODEL OF THE ROYAL ALBERT BRIDGE ON THE CORNWALL RAILWAY OVER THE TAMAR AT SALTASH.

This bridge was also designed by the late Mr. Brunel. It is for a single line, and consists of two spans of 455 feet each over the river, and seventeen land openings of spans varying from ninety to seventy feet. The land openings—of which there are ten on the Cornwall, and seven on the Devonshire side—form curved viaducts leading to the main spans. Throughout the structure, at a level of one hundred feet above high water, the rails are laid on a ballasted platform of planks carried on cross girders between pairs of plate-iron girders. In the viaducts, the ends of the girders rest on piers of limestone masonry, each pier consisting of two square pillars which spring from a common base, and are united at the top. In the main spans the girders are supported by trusses, in principle analogous to those at Chepstow; but here the tubes which resist the tension of the suspension chains are in section elliptical instead of circular, and in general profile, curved instead of straight, the rise of the curve, being equal to the drop of that of the chains; thus the weight of the girders and roadway rests half on the tube, half on the chains, the girders being carried by vertical struts, placed at intervals of forty feet, diagonally braced so as to give rigidity, and by intermediate attachments to the suspension chains. The weight of iron in each truss is 1,070 tons. The substructure of the piers at the shore ends of the main spans is of granite masonry and brickwork. That of the centre pier consists at the base of a granite pillar thirty-five feet in diameter, resting on a rock foundation eighty-six feet below high water mark, and built to a height of ten feet above it, from which rise four hollow octagonal columns of cast-iron, built up in segments bolted together internally, and which carry the girders on an entablature above their capitals. The superstructure of each pier consists of an archway through which the trains pass, and over which the ends of the tube are carried. The superstructure of the centre pier is of cast-iron, and of the shore piers of masonry with a casing of cast-iron. The shore ends of the tubes are carried on rollers, to allow of expansion and contraction. The centres of the ends of the tube are thirty-six feet above the roadway, and the extreme depth of the truss is sixty-two feet. The lower part of the centre pier, which was the chief difficulty in the construction of the work, was built in a cofferdam or cylinder of plate-iron, thirty-seven feet in diameter and ninety feet in length, closed at the top, strongly stayed throughout, and having its bottom divided into compartments, which were kept clear of water partly by a supply of compressed air, partly by pumping. This cylinder was correctly placed on the rock through the mud which was there, thirteen feet in depth, and which being loaded with shingle ballast, assisted to keep out the water. Each truss was put together on the Devonshire shore of the river. Docks were formed, and pontoons prepared with wooden framings to carry the truss. Warps were led from these pontoons to various points on shore, and to vessels moored in the stream. The operation of floating in each case was performed without delay or accident, and the ends of the tube placed on the piers which had been built up to receive them. The truss was then lifted by hydraulic presses, the piers being built up underneath. The total cost of the whole work was £225,000. It was commenced in the beginning of 1853, and was opened on May 3rd, 1859, by H.R.H. the late Prince Consort, Warden of the Stanneries, by whose gracious permission it was called the Royal Albert Bridge.

These models were made for the late Mr. Brunel by Mr. Salter, of Hammersmith, and are both to the scale of ten feet to one inch.

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[2240]

BOWER, GEORGE, *St. Neots, Huntingdonshire.*—Patented vertical gas apparatus and combined purifier, for private use, and for exportation. (*See pages* 2, 3, 4.)

[2241]

BROOKE, EDWARD, *Field House Fire Clay Works, Huddersfield.*—Glazed sewer tubes, fire-bricks, furnaces, retorts, glass pots, &c.

[2242]

BROWN, JOHN, *Chapel Field, Norwich.*—Models of patent for rendering windows, &c., wind and water-tight.

Windows and doors are by this patent rendered impervious to draft, dust, and other annoyances, without interfering with perfect ventilation. These results are essential to health and comfort.

By this invention, when fitted to shop windows and show-cases, jewellery, silver and plated goods; cutlery, books, lace, and other articles liable to injury from the effects of gas, dust, or damp, are completely protected.

The agent of John Brown is T. Burton, 35, Wellington Street, Strand, W.C.

[2243]

BROWN, R., *Surbiton, Surrey.*—Italian and other roofing tiles; ornamental bricks, red, green, black, and white; ornamental ridge, &c.

[2244]

BROWN-WESTHEAD, MARCUS, *Manchester.*—Patent hoist governor, and patent safety railway platform lift. (*See page* 5.)

[2245]

BRUNEL, ISAMBARD, *Duke Street, Westminster.*—Models of Saltash and Chepstow bridges, designed by the late Mr. Brunel. (*See page* 6.)

[2246]

BUNNETT & Co., *Deptford, Kent.*—Patent revolving iron shutters, and ornamental brass sashes, &c.

[2247]

BURGESS, THOS. H., 4 *Upper Marsh, Lambeth.*—A stand, which will admit of boots being made without sitting.

[2248]

BURT & POTTS, 38 & 65 *York Street, Westminster.*—Patent water-tight wrought iron window and frame.

[2249]

CARTWRIGHT, J. M., & Co., *Swadlincote, Burton-on-Trent.*—Fire-bricks and arches for locomotive engines.

[2250]

CHALMERS, JAMES, *London (late of Montreal, Canada).*—Drawings of proposed channel railway, connecting England and France.

[2251]

CHAPMAN, J. W., *Park Road, Richmond, Surrey.*—Plans of estates, &c.

[2252]

CHAPPUIS, P. E., 69 *Fleet Street, London.*—Patent reflectors for diffusing daylight in dark places, and reflecting artificial light.

[2253]

CHRISTMAS, R., & JONES, 28 *Lord Street, Birkenhead.*—Castellated circular turret, random rubbed; white quartz.

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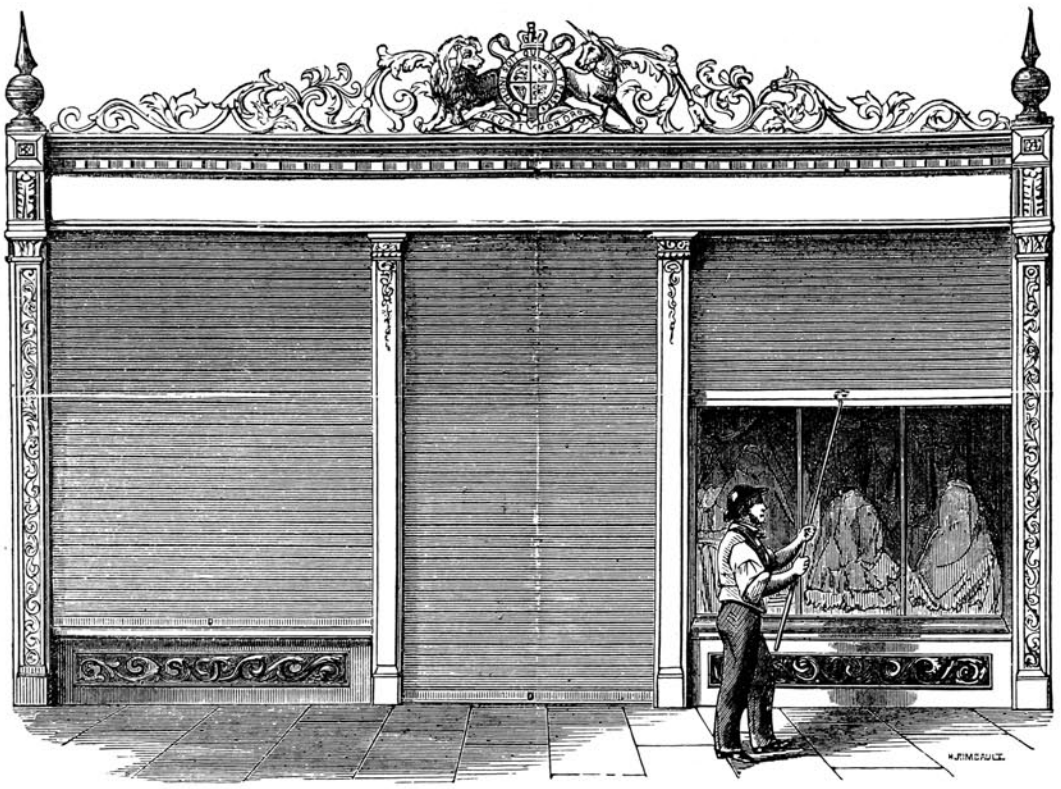
Anonymous
Excerpt
More information

[2254]

CLARK & Co., *Gate Street, Lincoln's Inn Fields.*—Patentees and manufacturers of revolving shutters in steel, iron, and wood, for shop fronts, private houses, fireplaces, &c.



REVOLVING SHUTTERS FOR SHOP FRONTS.

Clark and Co.'s patent self-coiling revolving safety shutters, in steel, iron, and wood, are adapted to close, with security and ease, every description of opening, as exhibited in shop front, Class X. The steel shutter is both thief and fire-proof, and as cheap as the ordinary wood shutters.

STEEL SHUTTER FITTED TO FIRE-PLACE.

WOOD SHUTTER ADAPTED TO BAY WINDOW.

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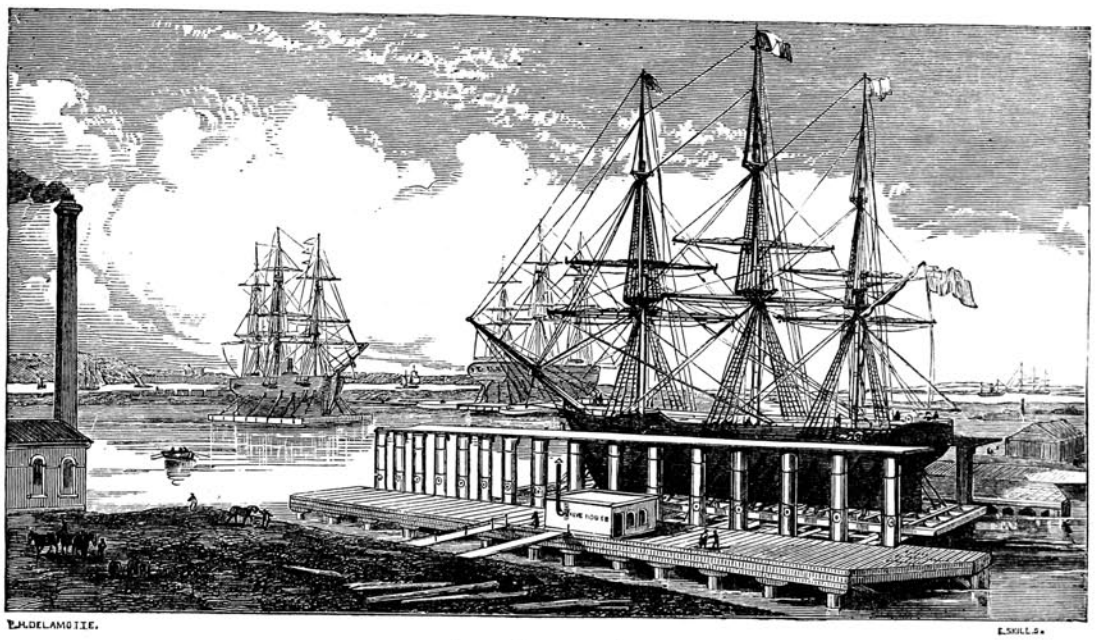
[2255]

CLARK, EDWIN, *Great George Street, Westminster.*—Model of Clark's patent hydraulic graving docks, Victoria Docks.



MODEL OF HYDRAULIC LIFT, GRAVING DOCKS (CLARK'S PATENT), AS ERECTED AT THE THAMES GRAVING DOCKS, VICTORIA DOCKS.

This model represents a plan for docking vessels, patented by Mr. Edwin Clark, and carried out on a large scale at the works of the Thames Graving Dock Company, where it may be seen in daily use.

The system is entirely novel, and differs from an ordinary graving dock in that, instead of the vessel being floated into a pit, and the water pumped out or allowed to run out with the tide, the vessel is raised bodily out of the water, cradled upon a shallow pontoon, on which it is afterwards floated away to any place convenient for its repair. The apparatus for these enormous lifts consists of a series of hydraulic presses contained in and supported by cast-iron columns sunk into the ground in two parallel rows, the space between being sufficient for the vessel to pass through.

From the cross-head of each ram the ends of a pair of girders are suspended; these girders pass across the dock, and form a platform, on which the vessel and pontoon are lifted.

The pumping power is a small steam engine placed near the presses, the communication between it and the presses being through wrought-iron pipes. The engine does not pump direct into the hydraulic cylinders, but into an intermediate valve-chest, by which the raising power is regulated, and the uniform rise of the whole ship and pontoon secured.

The pontoons are large, shallow vessels, constructed of wrought-iron framing and shell, and are divided into several water-tight compartments, in each of which is a valve; they are made of various sizes, corresponding with the weight of the vessels they are intended to carry. The seven pontoons now in use vary from 160 to 320 feet in length, draw from 3 feet to 6½ feet when loaded, and carry vessels of from 500 to 3,000 tons.

The hydraulic rams will safely raise a dead weight of 6,000 tons, but can be adapted to lift any weight.

The peculiarities of this system are the raising the vessel to the level of the workshops and repairing-yards, and keeping it high and dry there in full light, exposed to the drying influences of the air; while, from the vessel being carried above the pontoon, its bottom is more accessible.

The blocking or shoring the vessel, under this system, is most effectually and rapidly performed, the operation being simply the drawing in of blocks fitted to the side of the vessel, which blocks are carried on the wrought-iron transverse girders. The pontoon, being highly elastic longitudinally, accommodates its shape to the keel of the ship, whatever be its form; thus insuring a perfect bearing throughout.

Each pontoon in itself forms a complete graving dock, and one hydraulic lift is sufficient for a great number of pontoons. The cost of a graving dock complete is, therefore, little more than the cost of the pontoon, which, for all ordinary vessels, varies from £600 to £10,000; and the rapidity of an operation is so great, that at least six vessels can be docked and set afloat in an ordinary working day.

The Thames Graving Dock Company, during the three years of their practical working, have most successfully docked upwards of 400 vessels, weighing 220,000 tons.

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[2256]

CLARKE, GEORGE, *Manufactory, South Crescent Mews, Burton Crescent, London.*—Clarke's improved fire escape, in use by the Royal Society for the Preservation of Life from Fire.

The great utility and importance of this machine consists in its extreme cheapness, combined with simplicity of construction, any person being able to work it after a few hours' practice. Its use has now become so apparent that no city, town, or village, and even large manufacturing premises, should be without one.

The main ladder of the escape reaches a height of 33 feet, and can instantly be applied to a second-floor window. Under the escape is a canvas trough, protected from flaming by a copper gauze.

The upper ladder folds over, and can easily be raised by levers to the position represented; and by adding an additional ladder, which is the work of a few minutes, will reach the height of 70 feet.

In cases where gardens are in the front of the houses, and the gates are not of sufficient width to admit the escape, the upper ladders unship by means of shifting levers, and can be used separately.

IMPROVED FIRE ESCAPE.

PRICES :—

Fire escape reaching 42 feet	£45
Ditto, reaching 50 feet	50
Ditto, reaching 60 feet, with copper gauze and shifting levers, with all late improvements	63
Ditto, reaching 70 feet	£73 10s.
Ditto, above 70 feet	£105

From the Report of the Royal Society for the years 1860 and 1861, it appears that their fire escapes, manufactured solely by Clarke, were used successfully at no less than 103 fires, and 155 human beings were rescued from the flames.

[2257]

CLARKE, JOHN VIZETELLY, 251 *High Holborn, W.C.*—Gas regulators and apparatus.

[2258]

CLERK, FRANCIS NORTH, *Mitre Works, Wolverhampton, Staffordshire.*—Metal roofing and galvanized fittings for roofs and buildings.

[2259]

CLIFF, JOSEPH, & SON, *Wortley, near Leeds.*—Clay retorts, fire-bricks, sanitary pipes, chimney-tops, terra-cotta ornaments, &c. (*See page* 12.)

[2260]

COLLA, J. G., 18 *Parliament Street.*—Ornamental tiles, &c.

[2261]

COOKEY, E., & SON, *Frome Selwood.*—Valves for regulating the flow of gas in gas manufactories.

[2262]

CORY, WILLIAM & SON, *Commercial Road, S.*, Owners.—J. H. Adams, 1 Grove Hall Terrace, Bow, E., Engineer.—A float, with machinery for discharging screw colliers and other vessels with great rapidity, in the stream.

This vessel is fitted with Sir William Armstrong's hydraulic cranes, and is provided with other machinery and apparatus for screening the coals when required, and depositing them in barges without breakage. Two steam colliers of the largest dimensions may be discharged at once. By a suitable arrangement of the hatchways and holds of the steamers, three cranes may be worked on each steamer at the same time, and each crane can discharge 60 tons of coals per hour. The owners are prepared to undertake to discharge steamers not exceeding 1,200 tons cargo, in ten hours, night or day. They have similar machinery on fixed buildings in operation at the Victoria Docks.

Builders and owners of steamers can obtain from Mr. Adams the requisite particulars for the adaptation of their vessels.

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