

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Wanted—Good Boiler Floats. Box 498, Bellevue, Ohio
Acker, Merrill & Condit sell Van Beil's "Rye and Rock" to the trade and at retail.

The Common Sense Dry Kiln prevents check, warp, or hardened surface. See St. Albans M'fg Co.'s adv. p. 60.

Wanted.—Responsible parties to make and sell on royalty an improved sash holder. J. Lynch, 52 Suffolk St., Lowell, Mass.

Luminous Paint or Varnish for Clocks, Watches, Signs, etc. Sent by mail for \$1 a package. James Pool, Mt. Carmel, Ill.

Your boiler is predisposed to weakness by thickening of the water or burning of the iron caused by impurities in feed water. They should be removed by Hotchkiss' Meehan. Boiler Cleaner. 84 John St., N.Y. Circulars free.

Moulding Machine.—For Sale, No. 1 12-inch 4-roll 4-side S. A. Wood's Inside Moulder, in good condition. Belcher & Bagnall, 40 Cortland St., N. Y.

For Sale.—Turret Lathe, with Chaser Bar. No. 1 and 4 Root Blowers. B. & W., 261 N. 3d St., Phila., Pa.

Patent for Hoisting Apparatus illustrated on page 38, current volume of SCIENTIFIC AMERICAN, is for sale. Address Geo. Speidel, 933 Buttonwood St., Reading, Pa. J.J. Callow's new grain'g and letter'g catal'g, Cleveland, O.

'Tarred Roof'g, Sheath'g Felts. Wiskeman, Paterson, N.J.

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Abbe Bolt Forging Machines and Palmer Power Hammers a specialty. S. C. Forsaith & Co., Manchester, N. H.

List 26.—Description of 2,500 new and second-hand machines, now ready for distribution. Send stamp for the same. S. C. Forsaith & Co., Manchester, N. H.

Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties.

Punching Presses & Shears for Metal-workers, Power Drill Presses, \$25 upward. Power & Foot Lathes. Low Prices. Peerless Punch & Shear Co., 115 S. Liberty St., N. Y.

The Eureka Mower cuts a six foot swath easier than a side cut mower cuts four feet, and leaves the cut grass standing light and loose, curing in half the time. Send for circular. Eureka Mower Company, Towanda, Pa.

Pure Oak Leather Belting. C. W. Arny & Son, Manufacturers, Philadelphia. Correspondence solicited.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

Wood-Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O.

For Machinists' Tools, see Whitcomb's adv., p. 12.

Experts in Patent Causes and Mechanical Counsel. Park Benjamin & Bro., 50 Astor House, New York.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 10 Cortland St., N. Y.

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsburg, Pa.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr. & Bros., 331 Jefferson St., Philadelphia, Pa.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna lime, crocus, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, Brooklyn, N. Y. Clark Rubber Wheels adv. See page 28.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's adv. p. 29.

Safety Boilers. See Harrison Boiler Works adv., p. 28.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 28.

Rollstone Mac. Co.'s Wood Working Mach'y adv. p. 28.

For Sequeira Water Meter, see adv. on page 30.

Cope & Maxwell M'fg Co.'s Pump adv., page 45.

The Sweetland Chuck. See illus. adv., p. 46.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J. Skinner's Chuck. Universal, and Eccentric. See p. 46.

See Bentel, Margedant & Co.'s adv., page 61.

Diamond Engineer, J. Dickinson, 64 Nassau St., N. Y.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dodgeon, 24 Columbia St., New York.

50,000 Sawyers wanted. Your full address for Emerson's Hand Book of Saws (free). Over 100 illustrations and pages of valuable information. How to straighten saws, etc. Emerson, Smith & Co., Beaver Falls, Pa.

Elevators, Freight and Passenger, Shafting, Pulleys and Hangers. L. S. Graves & Son, Rochester, N. Y.

Telegraph, Telephone, Elec. Light Supplies. See p. 62.

For the manufacture of metallic shells, cups, ferrules, blanks, and any and all kinds of small press and stamped work in copper, brass, zinc, iron, or tin, address C. J. Godfrey & Son, Union City, Conn. The manufacture of small wares, notions, and novelties in the above line, a specialty. See advertisement on page 62.

Gear Wheels for Models (list free); Experimental Work, etc. D. Gilbert & Son, 212 Chester St., Phila., Pa.

Gould & Eberhardt's Machinists' Tools. See adv., p. 62.

The Medart Pat. Wrought Rim Pulley. See adv., p. 61.

For Heavy Punches, etc., see illustrated advertisement of Hillis & Jones, on page 61.

Comb'd Punch & Shears; Universal Lathe Chucks. Lambertville Iron Works, Lambertville, N. J. See ad. p. 38.

Barrel, Key, Hogshead, Stave Mach'y. See adv. p. 62.

For best Duplex Injector, see Jenk's adv., p. 60.

Renshaw's Ratchet for Square and Taper Shank Drills. The Pratt & Whitney Co., Hartford, Conn.

Walrus Leather, Walrus Wheels, Pure Turkey Emery Star Glue for Polishers. Greene, Tweed & Co., N. Y.

Catechism of the Locomotive, 625 pages, 250 engravings. The most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. Send for a catalogue of railroad books. The Railroad Gazette, 73 Broadway, New York.

For best low price Planer and Matchers, and latest improved Sash, Door, and Blind Machinery, Send for catalogue to Rowley & Hermance, Williamsport, Pa.

The only economical and practical Gas Engine in the market is the new "Otto" Silent, built by Schleicher, Schumm & Co., Philadelphia, Pa. Send for circular.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 61. Totten & Co., Pittsburg.

Improved Skinner Portable Engines. Erie, Pa.

4 to 40 H. P. Steam Engines. See adv. p. 61.

Green River Drilling Machines. See ad. p. 45.

Blake's Patent Belt Studs. The strongest fastening for leather and rubber belts. Greene, Tweed & Co., N. Y.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) J. H. writes: 1. I want to make a cylinder of sheet platinum. Can you tell me how I can make the necessary joints so that they will stand intense heat? A. Platinum can be welded upon itself at a high temperature. The metal can be heated hot enough in a good forge fire. It should be embedded in quicklime to protect it from the carbon. 2. Is Professor Dolbear's telephone patented? Your article last week did not state so. A. Yes.

(2) W. H. C. says, in answer to B. W. B., page 409 (4), vol. xlv.: "According to Hager, the 'Encre pour les Dames' (ink for ladies), characters written with which fade out in about four weeks, consists of an aqueous solution of iodide of starch."

(3) E. S. asks for a receipt for making a first class shoe blacking. A. See page 218 (15), vol. xlv. 2. How can I dye glass a blue or red shade? A. Colors are usually imparted to glass in the melting pot: for blue, oxide of cobalt is used; for red, sub-oxide of copper or gold. Glass is stained by painting its surface with a fusible colored glass ground to a fine powder and mixed up with gum water or turpentine, and after drying then heating the painted glass in a furnace until the coating fuses. Collodion, shellac, or spirit copal varnishes, properly colored with one of the coal tar dyes, can in some cases be advantageously employed as a colored wash for white glass.

(4) J. G. P. asks how to dye blonde hair to a light brown. A. The expressed juice of green walnut shells diluted with water is used for this purpose.

(5) C. F. P. asks: How can elastic rubber be melted so as to be run into moulds? A. Rubber cannot be melted as you propose. It decomposes at a temperature high enough to melt it. Pure, unvulcanized gum rubber (caoutchouc) can, however, be softened by a gentle heat (or by hot water) so as to admit of moulding with pressure.

(6) J. E. asks: Is there any process known for hardening oils, say, for instance, tar oils, to thickness of paste, without boiling or soap? A. We know of no way of thickening tar oil or similar oils except by adding to them a sufficient quantity palm oil, lard, or other solid or semisolid substance.

(7) E. H. writes: Please state the difference in your paper of benzene, benzole, naphtha, and methyl alcohol. A. Naphtha and benzene are light products of the distillation of petroleum; the former has the lowest specific gravity. Benzole proper, is one of the distillates of gas tar. Methyl alcohol, or wood naphtha, is an alcohol obtained as one of the products of the destructive distillation of wood.

(8) T. K. writes: I am doing some work in a building where there is a radiator 75 feet long, 10 pipes high, made of 1 inch pipe with a header on each end; it is provided with air valves, and has one-eighth of an inch descent to the foot, and yet it is constantly air bound. It is supplied with steam through a 1 1/4 inch pipe and drained by a 1 inch pipe. If I cut this radiator and make two radiators of it will it remedy this trouble? A. We think cutting and giving the pipes more descent would be effective. 2. Can steam pipes have too much descent? A. No, provided they be kept clear of water.

(9) P. R. writes: 1. I have made a Holtz electrical machine from directions in SCIENTIFIC AMERICAN, No. 16, and SCIENTIFIC AMERICAN SUPPLEMENT, No. 278. I followed directions, and the mechanical part is well done, but I am unable to charge it or to get any trace of electricity. If I have made any mistake it must be about the paper inductors, as I had at first inductors only on the posterior face of the stationary disk and gilt

paper on outside of inductors; but I altered in accordance to your answer to G. W. G., query 29, in SCIENTIFIC AMERICAN, June 18, with no better result. A. With the most perfect of Holtz machines it is impossible to generate a current in the warm sultry days of summer unless the plates are warmed and kept dry. It is probable that your machine would work well anytime after August and before May. If you try it every day through the summer you will discover that it will work on some days quite well and at other times not at all. 2. If the ends of the two paper inductors are flush with the edge of the hole or window, and the two projecting serrated ends of the gilt paper to reach the center of the window, are these two serrated ends to be left apart or pasted together? A. They are pasted together. 3. Please explain the action of the cross arm, G. A. The cross arm equalizes the charge on the revolving plate and prevents carrying the negative charge to the positive inductors, and prevents the positive charge from being carried to the negative inductors.

(10) W. M. asks: Which will stand exposure to the weather, the best zinc or best quality of marble? A. Zinc (if pure), under ordinary circumstances.

(11) F. A. H. asks: 1. In estimating the evaporative capacity of steam boilers, is the surface of the furnace sheets considered more effective than the surface of the flues? If so, what is the accepted ratio? A. Yes, four to six times more effective. 2. In estimating the surface of the flues or tubes, is the internal or external surface to be considered as heating surface? A. External, or water surface. 3. What proportion of the flue or tube surface is considered effective? A. From 25 to 40 feet heating surface to one of grate, depending upon diameter of flues or tubes and length. 4. What is the usual allowance of effective heating surface per horse power? A. From 10 square feet in plain cylinder boilers, 12 square feet in flue boilers, and 15 to 17 feet in tubulars. 5. What are some good reliable hooks on the subject of boilers? A. "Barr on Steam Boilers" would suit you.

(12) G. A. G. writes: 1. I have SUPPLEMENT, No. 252, on telescopes. Will the terrestrial eyepiece, Fig. 7, used with an achromatic object lens, answer for astronomical purposes, as well as the meniscus lens and the eyepiece described and figured on pp. 4015? A. The terrestrial eyepiece is not so powerful as the astronomical eyepiece, but it may be used for astronomical observations. The achromatic objective is to be preferred for all purposes. 2. Please give the dimensions of focal lenses for astronomical eyepiece. A. This information is given in full in the article referred to.

(13) H. W. B. asks: 1. How many cells of gravity battery I need to run the simple electric light mentioned in SCIENTIFIC AMERICAN, vol. xli., No. 18, November 1, 1879, page 274? A. The gravity battery is not adapted to electric light. Use 12 to 18 cells of Bunsen's battery. 2. Also please give simplest mode of making carbon plates or pencils from gas retort carbon. A. Select bright clean coke and pulverize finely. Mix with it a small proportion of finely ground bituminous coal and ram into a mould. Put the mould into an iron box, and surround it with coke dust. Seal the box with clay, and heat to a red heat in a muffle for several hours. When cool soak in thin treacle and bake as before.

(14) A. B. F. asks: 1. Who or what nation or race of people adopted the present mode or style of making figures as is in use generally? The Romans, I suppose, were the originators of the letters for figures. A. Ancient Indians (of Hindostan). 2. Who was the originator of the higher branches of mathematics (algebra, etc.)? A. The originators of the figures. The systems were improved by Descartes, Newton, Leibnitz, Laplace, Euler, and others. 3. How many comets are visible at this time? A. One. 4. Will you please give a good receipt to make sherbet. A. Sherbet is simply lemonade.

(15) E. P. writes: 1. I am building an engine the cylinder of which is 3 1/2 inches by 5 inches. What horse power will it be? How do you find the horse power of an engine? A. See SUPPLEMENT, No. 253, for this information. 2. What size boiler will the engine need? A. A boiler with about 100 square feet heating surface, say, vertical tubular, 32 inches diameter by 46 inches high. 3. What size boat will it drive? A. 26 to 28 feet length by 5 1/2 feet beam. 4. What will be the size and weight of the screw or propeller needed? A. 26 inches to 30 inches diameter by 33 inches to 36 inches pitch. 5. At what speed will it drive a boat of proper dimensions per hour? A. Probably seven miles.

(16) O. R. M. wants a good process of making vinegar quickly. A. What is known as the German process is the most rapid method of making a good vinegar. In this, dilute alcoholic liquor to which one one-thousandth part of honey or extract of malt has been added is caused to trickle down through a mass of beech wood shavings previously steeped in vinegar and contained in a vessel called a vinegar generator (*essigbildner*). It may consist of a large oak hogshead or barrel furnished with a loose lid or cover, a few inches below which is fitted a perforated shelf, having a number of small holes loosely filled with packthread about six inches long, knotted at the upper end to prevent their falling through. Several small glass tubes long enough to project slightly above and below the shelf are also fitted in perforations in the shelf to serve as air vents. The vessel at the lower part is pierced with eight or ten holes equally distributed around the sides at about six inches above the bottom, to admit of the entrance of air. A small siphon tube, the upper curve of which is an inch below the air holes, serves to carry off the liquid as fast as it accumulates at the bottom. The alcoholic liquid at a temperature of 75°-83° Fah., is run in on the shelf, and slowly trickles down through the holes by means of the packthread, diffuses itself over the shavings, slowly collects at the bottom, and runs off by the siphon exit. The air enters by the lower holes, passes freely through the shavings, and escapes by the glass tubes. The temperature within the apparatus soon rises to about 100° Fah., and remains stationary at this point while the action goes

on favorably. The liquid generally requires to be passed three or four times through the cask before its acetification is complete.

(17) G. F. M. asks: What is the capacity of the Corliss engine used in Machinery Hall at the Philadelphia Centennial, also that of the Sound steamer Providence, and of the largest ocean steamer running into New York—I mean the nominal horse power? A. The Centennial engines were 40 inches cylinder and 10 feet stroke, and called 500 horse power. The Providence is 110 inches cylinder by 14 feet stroke, about 2,000 horse power; the new Cunard steamer Servia, it is expected, will develop 10,000 horse power. There are several Transatlantic steamers that develop over 5,000 horse power.

(18) S. M. writes: We wish to make a covering for stacks of grain or hay, etc., and we saw an article in the SCIENTIFIC AMERICAN, giving a method of waterproofing cloth, on page 394, and wish to inquire whether this is one of the best methods to waterproof cloth, and whether it will prevent the grasshoppers and crickets from eating it? A. Dissolve about 8 ounces of soap in a gallon of boiling water (soft), and with this thoroughly saturate the cloth; wring out the excess of the liquid, and digest the cloth over night in a solution of 10 ounces of alum in a gallon of water; wring out, rinse in clean water, and expose to the air until thoroughly dry. Cloth thus treated is not attacked by insects or animals, resists mildew and moisture, and is sufficiently waterproof for the purpose mentioned.

(19) J. F. F. writes: I should like to experiment with the Plante secondary battery illustrated in recent issue, but before commencing should like to ask a few questions: 1. Can I not make the battery by taking two sheets of lead, six inches wide by three and one half feet long, covering with flannel and red lead same as for plates, and rolling them up together? I think of doing this because of difficulty of obtaining square glass jars here. Both sheets would have same surface as ten plates. A. Yes. 2. How many cells would be required to produce the electric light, using one of Edison's lamps? A. Probably 10 to 15. We have no experiments in this direction, and cannot say definitely. 3. About what candle power lamp would you recommend as being best for experiment or use in a room? A. 16. 4. How should the cells be connected to lamp—for quantity or tension? A. Tension. 5. Could I charge them with four to six cells Calland battery? A. Yes; one at a time, but very slowly. 6. Could they be charged all together, or should they be separate? A. See answer above. 7. How long should they be connected with battery to obtain maximum charge? A. It depends on the strength of the battery.

English Patents Issued to Americans.

From June 28 to July 1, 1881, inclusive.

Bags, coating, I. T. Tichenor, Auburn, Ala.
Cigar lighter, W. W. Batchelder, New York City.
Deadeye, W. P. Healey, Massachusetts.
Electric lighting apparatus, J. J. Wood, New York City.
Engine for compressing air, E. Hill, S. Norwalk, Conn.
Exercising machine, J. R. Judd, New York City.
Fare collector, J. J. Greenough, Syracuse, N. Y.
Fog signal, W. B. Barker, Hoboken, N. J.
Fruit storing, G. A. Cochrane, New York City.
Grain treating, T. A. Jebb et al., Buffalo, N. Y.
Hair removing machine, F. Lambert et al., N. Y. City.
Hat bodies, felted, G. Yule, Newark, N. Y.
Lamp, E. P. Follett et al., Rochester, N. Y.
Liquid measure, G. Woolf, St. Louis, Mo.
Saw sharpener, F. Myers, New York City.
Smoke consumer, H. A. Howell, New York City.
Spinning machinery, P. Townson, Thompsonville, Conn.
Steam, appar. for distributing, B. Holly, Lockport, N. Y.
Steam, appar. for distributing, B. Holly, Lockport, N. Y.
Violin, E. Berliner, Boston, Mass.

NEW BOOKS AND PUBLICATIONS.

THE COMPLETE BREAD, CAKE, AND CRACKER BAKER. Chicago: J. Thompson Gill, Manager "Confectioner and Baker" Publishing Company.

A practical hand book for the confectioner and baker, comprising: (I) The science and art of baking; (II) Formulae and memoranda. The first part contains a brief statement of the scientific principles underlying the breadmaking processes, the selection and preparation of materials, the practical operations of mixing, and the construction and use of the ovens and other machinery employed by bakers. Part II contains a great variety of practical recipes, the proportions being usually expressed in terms to permit of easy subdivision or multiplication for smaller or larger batches. Though specially designed for the professional baker the work is likely to be a useful adjunct to every kitchen.

WATER WORKS STATISTICS, 1881. London: Charles W. Hastings.

The first issue of British water works, statistics after the style of Mr. Hastings' compilations of gas works statistics. Returns are given from 134 towns, most of them giving full information touching the source of water supply, quantity, mode of distribution, cost, character of service, price per 1,000 gallons, etc., etc.

DIE DARSTELLUNG DES EISENS UND DER EISEN FABRIKATE. (Manufacture of Iron and Iron Articles.) By Edward Japing. Wien. Pest. Leipzig. A. Hartlebens. Verlag. 1881. 244 pp.

The author of this work has taken great pains to give all information possible in a thorough manner and in precise clear language. The first chapter describes the appearance, characteristics, and classification of iron ores and iron. The second chapter treats of the various methods of producing the different kinds of cast and wrought iron and steel; and the third chapter describes the methods of casting iron and steel, the furnaces used, implements, etc. The remaining seven chapters treat of the manufacture of wrought and rolled iron, sheet iron, boiler iron, wire, tubes, plating tinning, galvanizing, enameling, cutting, punching, annealing, tempering, planing, etc. The last chapter describes the manufacture of small iron articles such as nuts, screws, chains, wire netting, cutting devices, etc. The entire field of iron industry is thoroughly explained, and the publication will be found to be a great help to the young ironworker. The work is provided with numerous illustrations.

THE WILDERNESS CURE. By Marc Cook. New York: William Wood & Co.

The curative value of out-door life in the Adirondacks in incipient consumption of the lungs was demonstrated in the writer's case twenty-five years before Mr. Cook set up 'Camp Lou.' Taken soon enough by one who thoroughly enjoys wood ranging, the wilderness cure is very likely to be a sure cure. But to the vast majority of consumptives the wilderness is the worst possible resort. All the advantages attending tent life in the wilderness—and they are many—can usually be secured within an hour's ride of home, often within a stone's throw, with none of the risks or discomforts entailed by banishment from home and civilization.

SCIENTIFIC INDUSTRIES EXPLAINED. By Alexander Watts. Edinburgh and London: W. & A. K. Johnston. 12mo, pp. 203. 2s. 6d.

It is hard to estimate the utility of a book like this. The descriptions given of the more important applications of science to manufactures are correct, and clear enough to such as are fairly well versed in chemistry. But they are too brief to satisfy such readers, while to the unscientific the style is too technical on the whole to be easily intelligible. Still it may prove a handy reference book to those of liberal education, so-called, whose studies have not embraced much of industrial chemistry and whose library is small.

MECHANICAL ENGINEERING. By Francis Campin, C.E. London: Crosby, Lockwood & Co. 2s. 6d.

No. 223 of Weale's Rudimentary Series; substantially an abridgment of Mr. Campin's large treatise on practical engineering, with some additions and substitutions of recent matter.

THE GAS AND WATER COMPANIES' DIRECTORY, 1881. Edited by Charles W. Hastings, London.

This, the fifth issue of the directory, shows a great improvement in form, and the editor thinks also in fullness and accuracy. It furnishes classified lists of the gas companies of England, Scotland, Wales, and Ireland, and the more important companies of Europe, Asia, and Australia, with statements of capital, officers, etc., etc. The water companies of Great Britain are similarly represented.

GAS WORKS STATISTICS, 1881. London: Charles W. Hastings.

The third annual issue of Mr. Hastings' useful compendium of British gas works statistics. Returns are given from 726 towns, showing tons of coal carbonized, make of gas, illuminating power of gas, price per thousand feet, price paid for public lamps, dividends, etc.

PAPERS READ BEFORE THE PI ETA SOCIETY, RENSSLAER POLYTECHNIC INSTITUTE, TROY, N. Y. Vol. II. No. 2. 1881.

The papers for this issue comprise: The Camber of Bridges, Thos. M. Cleemann, C.E.; the Interoceanic Canal, W. E. Danely, C.E.; Bridge Lines, their Sizes and Bearings, J. A. L. Wadell, C.E.; Rational Fractions, Adolfo E. Besora, C.E.; Note on Gordon's Formula for Long Columns, W. H. Burr, C.E.; The Size of the Angle Block in a Howe Truss Bridge, by Thos. M. Cleemann, C.E.; Discussion of Paper on Braced Iron Piers, by W. H. Burr, C.E.

PAPERS OF THE ARCHAEOLOGICAL INSTITUTE OF AMERICA AMERICAN SERIES, II. By A. F. Bandelier. Boston: A. Williams & Co. 8vo, pp. 133.

The initial publication of the American series embraces two papers: 1. Historical introduction to studies among the sedentary Indians of New Mexico; 2. Report on the ruins of the Pueblo of Pecos. In the first paper Mr. Bandelier gives a critical review of the historical references to the seven cities, caves, or ravines, and their inhabitants; and in the second he recounts his observations among the aboriginal ruins in the valley of the Pecos. He does not attach to the Montezuma tale any historical importance whatever—not even a traditional value.

HAND BOOK OF PRACTICAL LANDSCAPE GARDENING. By F. R. Elliott. Rochester: D. M. Dewey. 8vo, cloth, pp. 96.

A second and improved edition of Mr. Elliott's practical hand book. A brief chapter on the principles of landscape gardening and the treatment of ornamental plants is followed by condensed descriptions of the principal trees and shrubs available for decorative purposes, shade, hedges, screens, etc. Then are given a dozen or more designs for lots and grounds, from a city lot in size to a 40 acre plot, each plan being drawn to scale, with specific directions for the planting of each tree and shrub. Several colored illustrations of trees and flowers serve to embellish the book, which can hardly fail to be useful to householders of moderate means who wish to make the most of their opportunities.

MODERN ARCHITECTURAL DESIGNS AND DETAILS. In ten parts. New York: William T. Comstock. \$1 a part.

The tenth and concluding part of this compilation of architectural details suited to popular styles of house building of the less expensive sort, contains views, plans, and details of a handsome brick and frame cottage, the same for a dwelling in the Elizabethan style, and a number of ornamental designs for ventilating registers, chimney tops, and so on. The entire series comprises nearly 700 details, drawn to a large scale, as are all the plans and elevations. The work cannot fail to be suggestive and useful to all builders of suburban and country dwellings.

MODERN ARCHITECTURAL DESIGNS AND DETAILS. New York: William Comstock. Folio. \$1.

Part 9 of this useful series includes plates 65 to 72, and contains perspective views, elevations, and plans of several artistic country houses, one with Eastlake features, each accompanied by a multitude of details.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

June 28, 1881,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for one dollar. In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Table listing inventions with patent numbers and names of inventors. Includes items like Air brake apparatus, Alphabet blocks, Amalgamator, Animal power, Atomizer for hydrocarbons, Auger, earth, Automatic gate, Axle and box, Axle box, Axle gauge, Axle lubricator, Axles, manufacture of, Bag fastener, Balance with tare device, Ball trap, Barrel, knockdown return, Bath tub, portable, Bearings, making chilled ball, Bed bottom, spring, Bed bottom, spring, Bed lounge, Bed lounge, T. Soden, Belt clasp, Berth lock for sleeping cars, Binder, temporary, Blasting and blasting cartridge, Blowpipe, Boot and shoe crimping form, Boot or shoe, Boots and shoes, manufacture of, Bottle, W. T. Goldsmith, Bottle washer, Bottles having internal stoppers, Bracelet fastening, Brake beam, Brick machine, Brick mould, Broom holder, Brush machine, Buckle, A. B. Wilhelm, Button, O. Ericsson, Button, C. D. Hunt, Candles, manufacturing fatty acids for making, Cane, etc., process of and apparatus for extracting juice from sugar, Car coupling, Car coupling, T. Farrell, Car coupling, W. A. Lovelace, Car coupling, I. S. McGehean, Car coupling, J. W. Page, Car coupling, Thomas & Cowdery, Car coupling, F. P. Wance, Car, stock, Car wheel, Cars, device for unloading, Cars, iron platform for railway, Card and box, sample, Carding machines, mechanism for operating doffer combs of, Carpet and oil cloth fastener, Carpet sweeper, Carriage, E. Delessert, Carriage jump seat, Cartridge belt, Cash carrier, automatic, Catheter, E. Pfarre, Cattle, shield for, Chair for attaching to door steps, Chuck for holding watch bezels, Churn, H. F. Batcheller, Churn, J. A. Werner, Churn motor, Akins & Elmore, Coffee roaster, G. A. Beidler, Coffin dam, J. R. Moffitt, Collar and hame, combined horse, Collar for live stock, Combing machine, Compass, mariner's and azimuth, Coop, poultry, Copper ores containing precious metals, treating, Core boxes and flasks, jarring block for, Corset, E. K. Bullock, Corset, A. B. Curtis, Cotton gin condenser, Cotton picker, Cotton stalk cutter, Crucible and pottery mould, Cultivator, H. W. Chamberlain, Curtains, J. Shorey, Curtain ring, T. Hipwell, Dairy vat, Burrell & Freeman, Dental articulator, Dish cleaner and drainer, Ditching machine, Door hanger, G. R. Kidder, Door hanger, H. M. Landers, Door spring, J. T. Rush, Dredge, vacuum, Dredge winder, Easel, picture, A. Shedlock, Edge setting and heel burnishing machine, Electric machines, switch for dynamo, Elevator stop, automatic, Explosive compound, S. R. Divine, Feed gearing for machine tools, Sellers & Bancroft, Fence, portable, Fiber or paper pulp, reducing wood to fine, File, corn, M. Wilson, File paper, J. A. Welch, Filing machine, endless belt, Fire extinguisher, Fish and game trap, Fishing reel, Flue scraper, boiler, Fork and rake, combination, Furnace, J. G. McAuley, Galvanic appliance, C. J. Heylmann, Galvanic battery, J. H. Cheever, Game board, M. L. Henry, Gate, J. Geib, Gate, Myers & Frank, Gate, W. F. Rice, Glass globes, etc., decorative cutting of polished, Glucose from grain, manufacturing, Glue, apparatus for the manufacture of, Grain drier, steam, Grain drying and finishing wood, composition for, Grappling bucket, Grate, G. T. Ayer, Gun stock, Hape & Oliver, Gymnastium, vaulting horse or buck for, Hame fastener, Hammer, combination, J. Strasser, Harness, J. Truax et al., Harness attachment, D. D. Baton, Harness slide loop, Harrow, sulky, Harvester, R. Dutton, Harvester dropper, Hatch door, elevator, Hay carrier, Hay fork, horse, Hay loader, Heat alarm, Heat conducting vessel, Holdback, A. H. Thomas, Honeycomb carrier, Honey frame, sectional, Hoops, vat for heating and saturating barrel, Horseshoeing bench, Horseshoes, machine for making, Hose clamping machine, Hose, machine for inserting goose necks and couplings into flexible, Hub band and protector, combined, Hydraulic elevator, Hydraulic elevator, S. E. Stokes, Hydrocarbon burning furnace, Infusions, extracts, etc., preparation of vegetable, Injector, steam boiler, Ink, indelible, Ink well, O. Pederson, Iron, manufacture of, Jute, preparing carbolized, Kaleidoscope, Kettle and boiler, combined process, Lacing stud and button fastener, combined, Lamp support, electric, Lantern, hand, Lasting jack, Latch, reversible, Latch, spring, Lighting rod, Locket, G. B. Whitney, Loom shedding mechanism, Lozenge machine, Mash, machine for stirring and discharging, Metal bending machine, Middlings purifier, Milk can, A. O. Peterson, Milk cooling room, Mineral concentrator or dry ore separator, atmospheric, Miter box, Mitering machine, Mole trap, Mordant, Turkey-red, Musical instruments, mechanical, Nailing machine, A. Newton, Nailing machine, G. H. Perkins, Nut lock, J. C. Bloom, Oil press mat, Ordnance, breech-loading, Ore concentrator, Ore roasting furnace, Oscillating chair, Packing, piston, Packing, piston, M. W. Woodruff, Paddlewheel, Painting on fabrics, Paper drying machine, Paper pulp, manufacture of articles from, Paper with wax, etc. machine for coating, Pen, stylographic fountain, Perfume of natural flowers, and apparatus therefor, obtaining, Permutation lock, Photograph burnishing machine, Photograph printing and vignetting, Piano action, C. Zibulski, Picker teeth, die for trimming and cutting off, Pipe hanger, Pipe, bench, S. A. Piper, Planter and dropper, corn, Planter, corn, W. D. Lindsley, Planter, cotton and corn, Planter, seed, R. J. Galloway, Planter, seed, C. C. Hunter, Plow, P. Kessler, Plow, T. E. Jefferson, Plow, sulky, T. E. Jefferson, Plumbers' traps, device for making, Pocket, safety, Potato digger, C. King, Press, J. F. Gubbins, Presses, power movement for, Pressure brake, fluid, Propulsion of ships, hydraulic, Pulp engine, W. W. D. Jeffers, Pulp, machine for moulding barrels, etc., Pump, force, M. Crossman, Pump valve, J. H. Dunlap, Punch, ticket, Gunther & Kowalski, Rail fastening, I. K. Bennett, Railway chair, W. D. Howard, Railway signal apparatus, E. Dunlap, Railway train indicator, T. H. Norton, Railways, electric danger alarm for, Ratchet and clutch device, Rein, driving, Rivet, F. Ott, Rivet, Q. E. Packard, Rotary engine, T. A. Miller, Rotary engine, W. H. Wigmore, Saw mill, C. A. Hege, Saws, machine for sharpening band, Shank creasing, coloring, and stamping machine, Shearing device, W. R. Fowler, Shoe back and counter gauge, Shoe nail, A. Newton, Shovel, spade, or scoop, C. T. Bellamy, Sliding gauge and bracket, C. Boyd, Solar and transit instrument, J. Gardam, Solar camera, H. A. W. Braune, Soldering cylinder, M. J. Stark, Soldering tweezers, L. H. Sanderson, Spinning machine, etc., E. Denby et al., Spool exhibiting case, C. E. Gould, Spooled threads, receptacle for, Squares, jointed pitch board for, Stamp, hand, Gates & Pettit, Station indicator, S. B. Crane, Steam boiler, J. F. McEntee, Steering apparatus, steam, A. Lafargue, Stocking, R. M. Appleton, Stone or rock breaker, P. W. Gates, Stove and furnace door frame, D. M. Knowles, Stove, hot air, Goodrich & Johnson, Stove, hydrocarbon gas, A. M. Brainard, Stovepipe, machine for grooving loose jointed, Stoves, etc., draught apparatus for, Strainer, iron tank, J. Haggerty, Strainer, sink, J. M. Stimpson, Straw burning furnace, J. Walrath, Street sweeping machine, T. Bradley, Sugar, salt, etc., holder and pulverizer for, Suspenders, E. Painter, Tag fastener, T. P. Marston, Telegraph, L. Maiche, Telegraph, duplex, J. M. Stearns, Jr., Telegraph repeater, duplex, D. R. Downer, Telegraph wires, device for deadening sound vibrations of, P. D. Connor, Telegraphic repeater sander, C. G. Burke, Telephone stand, revolving, E. F. Weaver, Telephone switch, M. G. Kellogg, Telephone transmitter, S. Tainter, Tire shrinking machine, A. Kiger, Tire upsetter, B. S. Haskell, Tire upsetter, A. A. Still, Tool, combination, J. Strasser, Toy bank, R. E. Turnbull, Toy, climbing, W. C. Farnum, Toy, climbing or traveling, W. C. Farnum, Toy feudal castle, G. H. Ireland, Toy savings bank, H. Clement, Toy vehicle, folding, G. H. Ireland, Trace carrier, M. K. Marvin, Track drilling machine, Gasset & Fisher, Traction engine driving wheel, K. Schaefer, Transom lifter, F. V. Phillips, Truss, I. B. Seelye, Tubes, welding and sizing, S. P. M. Tasker, Tubing coupling, P. Patterson, Turn buckle, G. S. Rominger, Type writers, wood counter for, C. T. Brown, Undergarment, C. A. Brown, Vapor burner, W. H. Russell, Vapors, cooling apparatus for condensing, O. Braun, Vehicle gear, oscillating, H. Duffey, Vehicle spring, C. C. & J. A. Bishop, Vehicle spring, G. Freeman, Vehicle wheel, T. E. Jefferson, Velocipede, A. Vreeland, Ventilating apparatus, J. F. Hoyne, Volute springs, machine for making, O. Bihet, Wagon body iron, B. Burr, Wagon, lumber, Seifer & Maschek, Wagon top, removable, Bower & Wilkinson, Washing machine, J. M. Champe, Washing machine water heater, Bailey & Perrenot, Watch crown, T. Mueller, Water closet bowl, glass, G. E. Hatch, Water meter, W. L. Horne, Water trough and underground drain, J. G. Brown, Water wheel, C. Dilks, Wells, boring, J. H. South, Windmill, O. T. Chamberlain et al., Windmill, Logan & Kelsey, Wrench, L. Chapman

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DESIGNS.

Table listing designs with numbers and names of designers. Includes items like Cards, receptacle for business, W. T. Mersereau, Carpet, J. Pegel, Emblematic stand or tripod for use by secret societies, L. Goddu, Spoon or fork handle, S. W. Belk, Toy, E. G. Williams, Type, font of printing, C. E. Heyer

TRADE MARKS.

Table listing trade marks with names and numbers. Includes items like Cigars, cigarettes, and smoking tobacco, Bovee & Adams, Cutlery of all kinds, J. Rodgers & Sons (limited), Lard, lard oil, and neat's foot oil, N. K. Fairbank & Co., Liquors, sprituous, Luyties Brothers, Watch movements, Elgin Watch Company