

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.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Steam Pumping Machinery of every description. Send for catalogue.

Wanted.—Foreman for malleable iron foundry. One familiar with the running of air furnaces preferred. Address M. J. C., Letter Carrier No. 72, St. Louis, Mo.

For Sale Cheap.—Patent in the agricultural malleable hardware line. E. L. Bracken, Dawson, Ill.

Electrical Works.—Splendid chance to purchase the oldest telegraph supply depot in Ohio. Best facilities for manufacturing all kinds electrical instruments, burglar alarms, etc. Address M. A. Buell, 144 Superior Street, Cleveland, Ohio.

The New System of Bee Keeping.—Every one who has a farm or garden can keep bees on my plan with good profit. Illustrated circular of full particulars free. Address Mrs. Lizzie E. Cotton, West Gorham, Maine.

Things to be remembered: That the Esterbrook Steel Pens are of standard quality; are adapted to the needs of all writers; are reasonable in price; and are to be had of all Stationers.

Wanted.—Iron castings to make. Give us a chance to make a bid on your work. Lehigh Stove and Mfg. Co., Leighton, Pa.

Wanted.—A first-class Brass Pattern maker as foreman in our pattern room. Must be a draughtsman, sober, and industrious, and come well recommended. State age and salary expected; married man preferred. Address Duggan Parker Edw. Mfg. Co.'s Malleable Iron Works, 806 to 822 South 12th Street, St. Louis, Mo.

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'Frs, 23d St., above Race, Phila., Pa.

Peck's Patent Drop Press. See adv., page 237.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 34 Columbia St., New York.

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

50,000 Emerson's Hand Book of Saws. New Edition. Free. Address Emerson, Smith & Co., Beaver Falls, Pa.

Eagle Anvils, 10 cents per pound. Fully warranted.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 237. Gould & Eberhardt's Machinists' Tools. See adv., p. 237.

For Heavy Punches, etc., see illustrated advertisement of Hilles & Jones, on page 238.

Barrel, Key, Hoghead, Stave Mach'y. See adv. p. 237.

For Mill Mach'y & Mill Furnishings, see illus. adv. p. 236.

See New American File Co.'s Advertisement, p. 238.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 237.

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

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

The Porter-Allen High Speed Steam Engine. South-work Foundry & Mach. Co., 430 Washington Ave., Phil. Pa. Steam Pumps. See adv. Smith, Vaile & Co., p. 236.

Boiler Scale.—Parties having fine specimens for sale or loan, address Jas. F. Hotchkiss, 84 John Street, N. Y.

Farley's Directories of the Metal Workers, Hardware Trade, and Miners of the United States. Price \$3.00 each. Farley, Paul & Baker, 530 Market Street, Phila.

Woodworking Mach'y. Rollstone Mach. Co. Adv., p. 221.

Common Sense Dry Kiln. Adapted to drying of all material where kiln, etc., drying houses are used. See p. 222.

Lightning Screw Plates, Labor-saving Tools, p. 222.

The Best.—The Deuber Watch Case.

Curtis Pressure Regulator and Steam Trap. See p. 206.

The Sweetland Chuck. See illus. adv., p. 206.

Knives for Woodworking Machinery, Bookbinders, and Paper Mills. Taylor, Stiles & Co., Riegelsville, N. J.

The Celebrated Wooton Desk. See adv., page 206.

Comfort Dinner Pails.—Most convenient in use. For sale everywhere. Reardon, Ennis & Co., Troy, N. Y.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 190.

Permanent Exposition.—Inventors' Institute, Cooper Union, N. Y. City. Every facility for exhibition of machinery, merchandise, and inventions. The expense is small—the advantages great. Send for particulars.

Contracts taken to manuf. small goods in sheet or cast brass, steel, or iron. Estimates given on receipt of model. H. C. Goodrich, 66 to 72 Ogden Place, Chicago.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. Complete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Lists 29, 30 & 31, describing 4,000 new and 2d-hand Machines, ready for distribution. State just what machines wanted. Forsaith & Co., Manchester, N. H., & N. Y. city.

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

Magic lanterns, stereoscopes, cond. lenses, etc., on hand and made to order, C. Beseler, 218 Centre St., N. Y.

Railway and Machine Shop Equipment. Send for Monthly Machinery List to the George Place Machinery Company, 121 Chambers and 103 Reade Streets, New York.

25' Lathes of the best design. G. A. Ohl & Co., East Newark, N. J.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J.

"How to Keep Boilers Clean." Book sent free by James F. Hotchkiss, 84 John St., New York.

Engines, 10 to 50 horse power, complete, with governor. \$250 to \$550. Satisfaction guaranteed. More than seven hundred in use. For circular address Heald & Morris (Drawer 127), Baldwinville, N. Y.

Wanted.—Patented articles or machinery to make and introduce. Gaynor & Fitzgerald, New Haven, Conn.

Latest Improved Diamond Drills. Send for circular to M. C. Bullock Mfg. Co., 80 to 88 Market St., Chicago, Ill.

Water purified for all purposes, from household supplies to those of largest cities, by the improved filters manufactured by the Newark Filtering Co., 177 Commerce St., Newark, N. J.

Wanted.—Parties to manufacture baby carriage wheels of iron and steel. Moore, 34 and 36 Elizabeth Street, New York.

Ice Making Machines and Machines for Cooling Breweries, etc. Pictet Artificial Ice Co. (Limited), 142 Greenwich Street. P. O. Box 3083, New York city.

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

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y. Presses & Dies. Ferracute Mach. Co., Bridgeton, 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.

NEW BOOKS AND PUBLICATIONS.

THE MAGAZINE OF ART. Cassell, Petter, Galpin & Co., New York. Monthly, \$3.50 a year.

As its title implies, the Magazine of Art is an illustrated publication pertaining to art and art culture. It is issued in monthly parts, and every number abounds in beautifully executed engravings of famous paintings, interior views of modern houses and ancient castles, and fine art objects of a varied kind. The March number contains among other illustrations of interest several views of the most important and artistic rooms in the new residence of Mr. William H. Vanderbilt, on Fifth Avenue, this city.

THE DECORATOR AND FURNISHER. E. W. Bollinger, 75 Fulton Street, New York. Monthly, \$4 a year.

Some examples of inside decorations for houses, including the arrangement of the rooms, painting of the walls, designs for the furniture, window and hanging curtains, fireplace mantels, wall papers, etc., are illustrated and described in this magazine. The publication treats on all departments of house decoration and furnishing, and is therefore useful to those persons who are building new houses or altering over old ones. The magazine contains valuable suggestions to housewives on embellishing their homes, and rendering them attractive at small cost. The engravings are finely executed, and the descriptive letter press is printed on the page opposite the illustration, or in close proximity to it, so that the eye rests upon the latter while the description is read. Some of the examples of parlor and hall decorations are printed in several colors, which enables a person to see the effect of the different colors as arranged, and teaches them how to form harmonious combinations with other colors. The magazine is useful to architects, house furnishers, and decorators, and entertaining for all classes of readers.

HYDRAULIC MANUAL, CONSISTING OF WORKING TABLES AND EXPLANATORY TEXT, INTENDED AS A GUIDE IN HYDRAULIC CALCULATIONS AND FIELD OPERATIONS. By Louis D. A. Jackson. 8vo, pp. 179. London: Crosby Lockwood & Co.

In the present edition of this standard work, some alterations and extensive additions have been made, although the same general principles have been adhered to that were enunciated in the first edition of 1868; the same limited object has been kept in view; and the same opposition to old hydraulic text books and old formulas is still maintained. The working tables in this edition have been increased from a hundred to a hundred and eighty pages, and enlarged in other respects. They have also undergone some rearrangement, though not sufficient to confuse those accustomed to the use of the tables in their previous form. This work will prove invaluable, as a work of reference, and as a guide in calculations and field operations, to every civil engineer.

MCCARTY'S ANNUAL STATISTICIAN. 8vo, pp. 624. 1883. San Francisco and New York.

This work, now in its sixth edition, is a perfect encyclopedia of statistical information, in condensed form, on almost every topic relating to human progress and events, and pertaining to biography, history, all branches of science, finance, etc. As the author very justly observes, the possession of a copy of this book "will save any pupil, teacher, superintendent, or school officer time, and give him more satisfaction than any similar number of pages in the English language."

BULLETIN OF THE UNITED STATES FISH COMMISSION. Vol. I. 1881. Washington: Government Printing Office.

This is the first of a series of volumes that Congress has authorized to be printed for the purpose of promptly disseminating the large amount of information that is constantly being acquired by the Fish Commission, through correspondence. The present volume contains many announcements that are of considerable importance in relation to the subjects of fish culture and capture.

HANDRAILING AND STAIRCASING. By Frank O. Creswell. 16mo, pp. 95. London and New York: Cassell, Petter & Galpin.

In this little work, which has been prepared to encourage working joiners to study drawing, practical details of stairs are given and explained, and a system of handrailing is introduced which is claimed to be simple and accurate. The book will doubtless serve to remove difficulties from the paths of numerous beginners, and induce many others to study this branch of the joiner's trade.

CHRONOLOGICAL HISTORY OF THE ORIGIN AND DEVELOPMENT OF STEAM NAVIGATION. By George Henry Preble. 8vo, pp. 483. Philadelphia: L. R. Hamersly, 1883.

This interesting volume is a revision and chronological arrangement of a number of "Notes for a History of Steam Navigation" that the author has been collecting for the last twenty-five years, and most of which have been printed in the United Service Magazine during the last eighteen months. The work does not fol-

low all the inventions and improvements in ships and navigation that have intervened, but begins with the first practical use of steam as a motive power for vessels at the beginning of the present century, and shows the progressive advance in steam navigation up to our own day. It will be gratifying to American readers of this book to find how large a share their countrymen have had in the invention of the steamboat.

PRACTICAL MECHANICS. By John Perry, M.E. With numerous illustrations. Cassell, Petter, Galpin & Co., London, Paris and New York, 1883. Pp. 271. Price \$1.50.

This little book is one of the series of "Manuals of Technology," which is edited by Professor Ayrton, F.R.S., and R. Wormell, D.Sc., and is an attempt to place before non-mathematical readers a method of studying mechanics. It will doubtless prove a most valuable aid to the intelligent mechanic or foreman who has not enjoyed the advantages of a liberal education, but who desires to add to his own practical knowledge an insight into the laws that govern matter. The readers of this book are supposed to have some previous knowledge of the behavior of materials and machinery, and the treatment which the subject receives differs from that generally met with in school text books, inasmuch as the author attempts to approach it from the practical side, believing that the most illiterate men may be rapidly taught practical mechanics in this way, for, unlike school boys or college students, the pupils may already possess an excellent foundation on which a superstructure of knowledge may be built. When glancing over the work, the non-mathematical student will probably be frightened by the free use of mathematical formulas, and feel inclined to doubt the assertion made in the preface that it is intended for non-mathematical readers. However, on reading the book carefully it will be found that each point is fully elucidated as it arises, and though a few hints from a teacher might be an advantage at the start, the persevering student will generally succeed in conquering the difficulties alone. The book contains a large number of experiments, which should be repeated by the student with sufficient care to obtain satisfactory quantitative results.

TECHNICAL DICTIONARY—SPANISH AND ENGLISH.

The growing commerce with our southern neighbors, Cuba, Mexico, Central and South American States, in which the beautiful Spanish language is still preserved, and the remarkable industrial progress now going on in Spain, render especially needful a good book of technological definitions in the Spanish and English languages. Mr. N. Ponce de Leon, the well known editor of this city, 42 Broadway, has undertaken to supply this want, and we have now before us the first part, entitled as above. The work is to be completed in two volumes, each issued in twelve parts of about 48 pages, at 50 cents per part. The first volume will consist of English technological terms with Spanish definitions. The second volume will present Spanish technology with definitions in English. The volumes will give the terms and phrases used in applied sciences, industrial arts, fine arts, mechanics, mines, metallurgy, agriculture, commerce, navigation, manufactures, architecture, civil and military engineering, marine engineering, military affairs, railway engineering, electricity, telegraphy, etc.

REPORT OF THE NEW YORK STATE SURVEY FOR THE YEAR 1881. James T. Gardner, Director. Albany, 1882. Assembly Document, No. 94. Pp 94. Maps v.

The report before us shows that a considerable amount of work was done during the year in the matter of triangulation. Twenty-nine signals were erected, three of which were towers 30 feet high, one 40 feet, and another 50 feet. The body of the report consists of tables showing the latitude, longitude, azimuth, etc. of each station and of many prominent objects, such, for instance, as the Catskill Mountain House, High Peak, Overlook Mountain, Union College dome and other points in Schenectady, the old Capitol and other points in Albany, as well as Hudson City. Five large trigonometrical maps accompany the report.

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.

Were new 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.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) P. J.—An ink for type writer ribbons is made as follows:

- Aniline black..... ½ oz.
Pure alcohol..... 15 "
Concentrated glycerine..... 15 "
Dissolve the aniline black in the alcohol and add the glycerine.

(2) L. M. L. says: I have quite a collection of chrysalides, and should like to have your opinion in regard to some good work to assist me in classifying them and the butterflies, when they come out. A. Of general works on North American insects and their transformations we recommend Th. Harris' "Treatise on Insects Injurious to Vegetation," and A. S. Packard's "Guide to the Study of Insects." Of works on the classification and systemization of Lepidoptera we have only the incomplete and now antiquated synopsis of the North American Lepidoptera by J. G. Morris, published many years ago by the Smithsonian Institution and long since out of print. Numerous monographs of single families and genera have, however, been recently published by various authors, but the literature is scattered through the transactions and proceedings of our scientific societies and the publications of the government. We would also recommend C. V. Riley's Reports on the Insects of Missouri.

(3) H. B. C. writes: We have tried to copy some articles, like bright tacks, and followed a recipe which says: "Cleanse the articles perfectly and dip in a solution of 3 pounds rain water and 1 pound sulphate of copper." The copper coats the surfaces nicely enough, but when apparently solid, will peel off like bark, leaving a dirty black surface underneath. And how should one dry articles so coated so as to leave them nice and bright? A. We recommend the use of solution of copper nitrate instead of the sulphate. Dissolve one-half ounce of pure copper in nitric acid, and use the battery. Everything in use must be perfectly clean.

(4) W. W. A. asks: 1. What is the best and cheapest to mix with hard coal dust for fuel? A. The general method of employing coal dust is to compress it into bricks, but this requires machinery. We would recommend that the coal dust be mixed with as little clay as possible, and water, and then made into a paste and dried. 2. Is there anything to put in the inside of stove pipe to keep it from eating through? A. Asphaltum..... 2 lb.
Boiled linseed oil..... 1 pint.
Oil of turpentine..... 2 qts.
Fuse the asphaltum in an iron pot, boil the linseed oil, and add while hot. Stir well and remove from the fire. When partially cooled, add the oil of turpentine.

(5) E. D. T.—To produce a red color on billiard balls, first imbue the balls with a tin mordant, then plunge them into a bath of Brazil wood, or cochineal, or a mixture of the two. Lac dye may be used with still greater advantage to produce a scarlet tint. If the scarlet balls be plunged for a little while in a solution of potash, they will become cherry red.

(6) W. R. P.—The lengths of several large steamers are given below:

- City of Rome..... 586 feet.
Servia..... 533 feet.
Cephalonia..... 440 feet.
Pavonia..... 430 feet.
Gallia..... 450 feet.
Austral..... 474 feet.
Orient..... 464 feet.
City of Berlin..... 459 feet.
City of Richmond..... 450 feet.
City of Chester..... 444 feet.

There are many others over 400 feet in length.

(7) S. H. J.—The sulphocyanide of mercury is made by mixing solutions of mercurous nitrate with potassium sulphocyanide. It forms a white precipitate. The solutions are best made quite dilute before mixing. Use city pressure to feed your boiler, it is best to have a pump in case of emergencies.

(8) C. D. A.—For black ink try extract of logwood, 4 ounces; potassium dichromate, 12 grains; potassium ferrocyanide, 12 grains; distilled water, 1 gallon.

(9) J. H. N. wishes to know (1) what is fluate of lime. A. Fluorspar is its common name. It is a mineral. 2. How prepared? A. It is found in nature, and ground. 3. Will not sulphuric acid direct from the manufactory, mixed with the fluate of lime, answer the purpose of glass etching? If not, how could I concentrate it myself? A. It will. 4. What is white acid used by embossers; is it fluoric acid? A. White acid is fluoric acid. 5. What numbers of the SCIENTIFIC AMERICAN SUPPLEMENT afford the information on etching on glass and also glass painting, and also are such numbers in print, so that I can get them? A. SUPPLEMENT No. 313. Any back numbers of the SUPPLEMENT can be had at this office.

(10) L. D. D. writes: In a number of the SCIENTIFIC AMERICAN, dated January 20, 1883, was an article headed "Sulphurous Acid in Consumption." Can you tell me how it can be produced cheaply and conveniently, so that consumptives can produce it in their own homes? Am I to understand by the article that it can be produced by evaporation on a hot stove? A. Sulphurous acid is prepared by burning sulphur in the air. We would recommend that it be taken only under a physician's direction.

(11) J. C. asks: 1. Can you use in constructing an induction coil wire of the sizes 19 and 29 respectively, instead of those prescribed in your SUPPLEMENT No. 160? A. Yes, but you would get better effects by using a finer secondary wire and a coarser primary. 2. Instead of the naked wire for secondary coil, can I use S. C. wire? A. Yes. 3. May I twist the ends of the two parts of secondary coil instead of soldering; and if they must be soldered, what kind of solder is to be used? A. The ends may be twisted together; it would be better to solder them also. Common soft solder is used for this purpose.

(12) G. W. B. asks: 1. What size wire should the carbon disks be wound with in the Lyons transmitting telephone shown in SUPPLEMENT No. 163, page 2592? A. About No. 24. 2. Should it be silk covered or bare? A. Bare. 3. Would it improve the new form of transmitting telephone, SUPPLEMENT No. 163, page 2593, Fig. 4, to use a piece of platinum wire on the end of wooden spring instead of carbon? A. No. 4. Would it be an improvement to use a small induction coil, the same as with Lyons? A. Yes.

(13) G. R. R.—The theoretical velocity of air flowing into a vacuum is 1,347 feet per second. Practically it is only seven-tenths of this, or about 952 feet per second.

(14) D. F. Co.—The term case hardening is generally applied to the operation of forming a superficial steel surface upon iron. Steel castings are already of the nature of steel, and will bear hardening. There is considerable difference in the quality of steel castings, as made for different kinds of work, and at different works, and also as to whether they have been annealed or not. You will have to make a trial, and harden at the very lowest heat. If the pieces crack, they will have to go through an annealing process of from three to five hours for small castings in an iron box filled with fine sand to exclude the air. Low steel can be case hardened by the methods employed for iron.

(15) J. W. W.—The "squeaking" or jarring noise in a music box is generally due to the absence of the small pieces of quill placed underneath the tongues to arrest them on the near approach of a pin. Have the quills replaced by a competent person, and the noise will probably cease. If the box is one of the cheaper kind, it may be that no provision is made for the quills.

(16) F. L. M. asks: 1. How many cells of battery will it take to work a telegraph line an eighth of a mile long, using a ground wire and having two instruments, one at each end of the line? A. Four cells of gravity. 2. Can I use common wire? If so, what size? A. Use No. 10 iron wire. 3. Can I make a ground wire work by simply putting the ends of the wire in a well of water at each end, without having a piece of zinc at the bottom? A. Unless you put a considerable length of wire in the water, a ground of this kind will not answer.

(17) J. K.—About 166 feet of gas can be made from a gallon of gasoline. Benzine will not answer. Better use some well tried gasoline machine.

(18) H. R. H.—The link motion is a very safe and sure arrangement for quickly reversing engines, and is therefore used on locomotives, hoisting engines, etc. It is not so economical as an adjustable cut off for stationary engines.

(19) F. W. I.—To deodorize petroleum, mix chloride of lime with petroleum in the proportion of three ounces for each gallon of the liquid to be purified. It is then introduced into a cask. Some muriatic acid is added and the mixture is well agitated, so as to bring the whole of the liquid into intimate contact with the chlorine gas. Finally the petroleum is passed into another vessel containing slaked lime, which absorbs the free chlorine and leaves the oil sufficiently deodorized and purified.

(20) G. M. C.—Plumbago or powdered graphite mixed with some oily material is largely used for lubricating purposes. It is difficult to specify the exact proportions of each, but we would suggest experimenting until a suitable mixture was obtained. See article on Lubricants, SCIENTIFIC AMERICAN SUPPLEMENT, January 21, 1882. For leather preservatives that are waterproof, we add the following. See also SCIENTIFIC AMERICAN for May 10, 1883.

- Beeswax.....18 parts.
Spermaceti.....6 parts.
Oil turpentine......66 parts.
Asphalt varnish.....5 parts.
Borax, powdered.....1 part.
Vine twig, black.....5 parts.
Prussian blue.....2 parts.
Nitro-benzol.....1 part.

Melt the wax, add powdered borax and stir till a kind of jelly has formed. In another pan melt spermaceti, add the asphalt varnish, previously mixed with oil of turpentine, stir well, and add to the wax. Lastly, add the color, previously rubbed smooth with a little of the mass. Perfume with nitro benzol and pour into boxes. Apply in small quantities, wipe with a cloth, and brush. Use only once a week.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

W. A. C.—From a superficial examination of the specimen sent, it seems to be nothing more than common clay. An analysis would determine its value, if it has any.—A. B. C.—The sample is rock containing pyrite, iron sulphide, and is of no value.—R. B. I.—The mineral sent is a gold and silver ore; it contains pyrite carrying gold; galena carrying silver, with a slight coating of malachite (copper carbonate). It is worth an assay, which would cost about \$5.00.—J. W. B.—The sample is kalcinite, of value for porcelain manufactures.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

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

April 3, 1883,

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 25 cents. In ordering please state the number and date of the patent desired and remit to Munn & Co., 261 Broadway, corner of Warren Street, 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.

Adds and chemicals, apparatus for boiling, J. Hesch.....275,041
Aerated water apparatus, A. D., Jr., & L. W. Puffer.....275,076

Alphabet block and case, W. E. Crandall.....275,329
Drum, E. Boulanger.....274,900
Drying kiln for bricks, etc., C. Chambers, Jr.....274,907
Drying kiln for bricks, etc., H. Cockell.....274,910
Dust pan, C. B. Banning.....275,012
Dyes apparatus for extracting, G. L. Allen.....274,891
Electric elevator, S. D. Field.....275,179
Electric light circuits, safety self-closing, shunt switch for, E. Thomson.....275,289
Electric machines, armature for dynamo, E. A. Edwards.....275,169
Electric signaling apparatus, automatic, F. B. Wood.....275,006
Electric wires, underground conduit for, H. Clay.....275,023
Elevator. See Electric elevator.
Elevator, W. Goddard.....275,037
Elevator, G. N. Reiff.....275,080
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Engine. See Traction engine. Transportable engine. Wind engine.
Engines, utilizing the exhaust of, D. Renshaw.....274,969 to 274,973
Fabric. See Flocked fabric.
Fan attachment, P. Hebner.....275,208
Fan exhaust, W. D. Smith.....275,087
Fastening for straps, etc., R. G. Hanford, Jr.....275,203
Faucet attachment, Ungemach & Oshe.....274,996
Faucet, self-closing, T. H. Walker.....275,099
Faucet, self-closing, R. L. Webb.....275,300
Feather crushing machine, W. Hammermill.....274,936
Feed water heater and feeder, J. Park.....275,342
Felt upper for shoes or slippers, N. Moulton.....275,250
Felt uppers for shoes or slippers, making, N. Moulton.....275,249
Fence, hedge, W. Young.....275,317
Fence, flushed, W. Baldwin.....274,895
Fence post, F. Brown.....275,131
Fence post, G. Swingle, 4th.....275,286
Fence stay or brace, W. W. Worcester.....275,007
Fertilizers, apparatus for desiccating animal matter for, H. Breer.....274,902
Fertilizers, apparatus for treating animal matter for, H. Breer.....274,901
Fire arrester and fire escape, combined portable, S. Richards.....274,977
Fire escape, D. F. Black.....275,121
Fire escape, W. W. Griffin.....275,197
Fire escape, H. J. H. Schuett.....275,038
Fire escape ladder, W. C. Bush.....275,135
Fire shield, S. Richards.....274,976
Flocked fabric or imitation textile fabric, C. A. Evans.....275,176
Floor, basement or cellar, O. A. Smith.....274,985
Floor clamp, H. F. & A. V. Case.....275,017
Floors, partitions, etc., application of wire gauze in the construction of, J. McCarroll.....275,240
Folding chair, H. J. Harwood.....275,206
Food, process of and apparatus for curing articles of, A. J. Chase.....275,145
Fork guard, T. F. Curley.....275,155
Form, adjustable dress, S. M. Moschowitz.....274,958
Frame. See Net frame.
Fruit, etc., apparatus for bleaching, J. R. Hillman.....275,044
Fruit jar cover, H. A. Hoppe.....275,047
Fur clipping and unhairing machine, T. Rasmus.....275,077
Furnace. See Crucible furnace. Cupel furnace. Gas retort furnace. Puddling furnace. Roasting and reducing furnace.
Furnace grate bar, P. W. Lamb.....274,949
Furnaces, machine for pushing tubes into, E. W. Wolfe.....275,312
Galvanic battery pole, Blackall & Decker.....274,899
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Gate, W. C. Pettis.....275,262
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