

ENGINEERING INVENTIONS.

A pump has been patented by Mr. Edward G. Shortt, of Carthage, N. Y. It is especially designed for use in connection with a direct-acting steam engine whose piston is on the same rod with the pump plunger, the pump being combined with the steam engine as a complete direct-acting pumping engine.

AGRICULTURAL INVENTIONS.

A harrow has been patented by Mr. Nels Johnson, of Fairfield, Bureau County, Ill. There is a stretcher for coupling two or more harrows, the coupling devices being simple, so the harrows can be readily connected or disconnected, with other novel features of construction and arrangement.

A check rower has been patented by Mr. John Hussung, of Shelby City, Ky. This invention relates to corn planters drawn over the field by a team to drop in one or more rows at a time, and provides means so the distances between the hills may be regulated, and a mark made on the ground opposite the hill to indicate its location.

MISCELLANEOUS INVENTIONS.

An irrigating dam has been patented by Mr. Jacob S. Flory, of Hygiene, Col. This invention provides a diaphragm or plate-like dam, of diminishing area in a downward direction, and with a gate in its upper portion, and is intended to supersede former rough and imperfect expedients for controlling water in irrigating ditches.

A method of and apparatus for heating and ventilating buildings has been patented by Mr. Ira J. Ordway, of Chicago, Ill. This invention provides a complete and independent heating apparatus for each room, with inlet and outlet registers within easy reach of the occupant, securing a continuous circulation of reheated air or separately heated fresh air, or both, as desired.

A sliding gate has been patented by Mr. George W. E. Hart, of Modesto, Ill. It is intended mainly for a yard gate, and is to be constructed of palings, wire, or iron, made either as a single or double gate, closing at the middle, is well balanced, works easily, and is not liable to get out of order.

A windmill has been patented by Mr. Joshua G. Benster, of Duncan, Neb. This invention covers improvements in the construction and arrangement of the supporting apparatus, of the frame, and also of the wheel and transmitting apparatus, and the apparatus for mounting and operating the tail vane, to make a simple and substantial windmill.

A worm fence has been patented by Mr. William R. True, of Rocheport, Mo. The rails and posts are held together by a wire and bound in a special manner, whereby the rails are supported in such a way as to give great strength, and the fence is simple of construction.

A draught mechanism for vehicles has been patented by Mr. George H. Chappell, of Huron, Dakota Ter. It is an improved contrivance of lever mechanism, adapted to multiply the force of the drawing power when first taking effect on the vehicle.

A fire extinguisher for railroad cars has been patented by Messrs. James Hocking and Clement R. Jones, of Denton, Neb. This invention relates to devices for discharging a tank of water or other fire extinguisher into a railroad car stove in case of collision or other serious accident to a passenger train.

A shot gun has been patented by Mr. Frank C. Dimitt, of Rocheport, Mo. This invention relates to shot guns with barrels hinged to tip down so as to raise the breech, and has special features intended to make such gun simple, strong, and durable, inexpensive to manufacture, and without intricate parts.

A newspaper file stick has been patented by Mr. John F. Huth, of Norwalk, Ohio. It consists of a grooved rod or bar, a binding blade, a permanent and a removable ferrule, with a snap spring, so combined as to securely hold papers and documents, and with a cover if desired.

A store service system has been patented by Mr. George H. Spring, of Lemars, Iowa. This invention relates to a cash carrier on a suspended horizontal wire, providing new and better means for propelling the carrier, improved detachments for detaining the carriers, improvements on the track wire, with certain devices and mechanical arrangements for the convenience of the cashier's office.

A shot gun attachment for magazine rifles has been patented by Mr. Horace Warner, of Wilcox, Pa. Above the rifle barrel is a shot barrel, with its own special breech block, extractor, and firing pin, with various details of construction to adapt the gun conveniently for alternate use as a shot gun or rifle.

Beam compasses, or an improved trammel and calipers, form the subject of a patent issued to Mr. Emory Patch, of Janesville, Wis. Two blocks of metal are drilled to receive two rods, one end of each being bent to form the trammel points, the opposite end of the rod being pointed to form the caliper points, the rods being so connected that either may be easily moved, and then rigidly clamped.

NEW BOOKS AND PUBLICATIONS.

DYNAMO-ELECTRICITY; ITS GENERATION, APPLICATION, TRANSMISSION, STORAGE, AND MEASUREMENT. By George B. Prescott. D. Appleton & Co., New York.

Of the many books which have appeared on this subject recently, this one of Mr. Prescott is probably the most complete. In its nearly 900 pages will be found descriptions of many machines and devices now quite out of date, but they yet have a certain value as indicating the line of investigation and experiment by which the public has obtained its present knowledge of electrical manipulations; while all the more recent advances in the whole field seem to have received full

attention. The relative efficiency of different kinds of dynamos, and methods of utilizing the currents they generate, the systems in use in Europe as well as here, the regulators and means of measuring the current, and the different electric railways, are described with a detail which seems almost superfluous, except that the subject is one in which so many investigators are interested that even somewhat of iteration is perhaps excusable. Mr. Prescott is a veteran investigator in the field of electrical development, and was a contributor of articles on this subject for the SCIENTIFIC AMERICAN many years ago, when its present importance was only anticipated by a few then generally classed as enthusiasts.

LEISURE HOURS AMONG THE GEMS. By Augustus C. Hamlin. James R. Osgood & Co., Boston.

This book treats more particularly of the diamond, the emerald, the opal, and the sapphire. It mentions with a good deal of detail the principal gems in the world, with critical remarks thereon and on their cutting, and is withal a most interesting volume, presenting a good deal of new matter in a most entertaining style.

LEFFEL'S HOUSE PLANS. James Leffel & Co., New York. Price, \$2.

This is a book for people of limited means desiring to build their own homes. It contains elevations, plans, and descriptions of forty different houses, costing from \$500 to \$3,000 each, and each with sufficient detail to enable an intelligent mechanic to choose understandingly the kind of house he desires within the limits stated.

Received.

FORMATION OF POISONS BY MICRO-ORGANISMS. A Biological Study of the Germ Theory of Disease. By G. V. Black. P. Blakiston, Son & Co., Philadelphia.

THE FALLACIES IN "PROGRESS AND POVERTY." By William Hanson. Fowler & Wells Co., New York.

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.

Important to Manufacturers and Inventors.—A prominent New York engineering firm, having large facilities for introducing and handling articles of merit, desires to increase its line of steam specialties; also special machines or appliances. Goods purchased outright, not sold on commission. Address "Important," P. O. Box 773, N. Y. City.

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Practical Instruction in Steam Engineering, and situations furnished. Send for pamphlets. National Institute, 70 and 72 West 23d St., N. Y.

The Cyclone Steam Flue Cleaner on 30 days' trial to reliable parties. Crescent Mfg. Co., Cleveland, O.

For Steam and Power Pumping Machinery of Single and Duplex Pattern, embracing boiler feed, fire and low pressure pumps, independent condensing outfits, vacuum, hydraulic, artesian, and deep well pumps, air compressors. address Geo. F. Blake Mfg. Co., 44 Washington St., Boston; 97 Liberty St., N. Y. Send for Catalogue.

Quinn's device for stopping leaks in boiler tubes. Address S. M. Co., South Newmarket, N. H.

Mills, Engines, and Boilers for all purposes and of every description. Send for circulars. Newell Universal Mill Co., 10 Barclay Street, N. Y.

Wanted.—Patented articles or machinery to manufacture and introduce. Lexington Mfg. Co., Lexington, Ky. "How to Keep Boilers Clean." Book sent free by James F. Hotchkiss, 86 John St., New York.

Stationary, Marine, Portable, and Locomotive Boilers a specialty. Lake Erie Boiler Works, Buffalo, N. Y.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. The Hyatt filters and methods guaranteed to render all kinds of turbid water pure and sparkling, at economical cost. The Newark Filtering Co., Newark, N. J.

Steam Boilers, Rotary Bleachers, Wrought Iron Turn Tables, Plate Iron Work. Tippet & Wood, Easton, Pa.

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

Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn. For Power & Economy, Alcott's Turbine, Mt. Holly, N. J.

If a invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN Patent agency, 361 Broadway, New York.

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

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.

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.

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

Drop Forgings. Billings & Spencer Co., Hartford, Conn.

Electrical Alarms, Bells, Batteries. See Workshop Receipts, v. 3, \$2.00. E. & F. N. Spon, 53 Murray St., N. Y.

We are sole manufacturers of the Fibrous Asbestos Removable Pipe and Boiler Coverings. We make pure asbestos goods of all kinds. The Chalmers-Spence Co., 419 East 8th Street, New York.

Clark's Rubber Wheels. See adv. next issue.

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

Emerson's 1884 Book of Saws. New matter, 75,000. Free. Emerson, Smith & Co., Limited, Beaver Falls, Pa.

Hoisting Engines, Friction Clutch Pulleys, Cut-off Couplings. D. Frisbie & Co., Philadelphia, Pa.

Barrel, Keg, Hogshead, Stave Mach'y. See adv. p. 270.

Munson's Improved Portable Mills, Utica, N. Y.

Machine for grooving chilled rolls for flour mills. Pratt & Whitney Co., Hartford, Conn.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423 Pottsville, Pa. See p. 141.

Catechism of the Locomotive, 625 pages, 250 engravings. Most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. Send for catalogue of railroad books. The Railroad Gazette, 73 B'way, N. Y.

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

The Porter-Allen High Speed Steam Engine. South-wark Foundry & Mach. Co., 430 Washington Ave., Phil. Pa.

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

Popularity of the Type Writer.

Special Dispatch to THE TIMES (Philadelphia). WASHINGTON, October 5.—Forty feminine manipulators of type-writing machines have been recently examined by the Civil Service Commission, and they have just received notice of the grade to which their proficiency entitles them. It was the first examination of the kind, and was altogether a curious exhibition. The exercises were read sentence by sentence by the examiner, and at each pause the fingers of forty women and girls would fly with almost lightning speed over forty machines. Some who were accustomed to write shorthand from dictation would catch the words while writing, and finish the sentence nearly as soon as the examiner. This act of the Civil Service Commission is suggestive of the rapidity with which the type writer is superseding all other forms of copying. Chiefs of divisions in the various departments are allowed clerks who have been usually stenographers. Now these are being supplanted on every hand by the type-writer, and by the combined stenographer and type-writer.

The Remington Type-writer is the one used by the United States Government. Wyckoff, Seamans & Benedict, 281 and 283 Broadway, New York City, are the sole agents.

**Notes & Queries**

HINTS TO CORRESPONDENTS. Name and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and though we endeavor to reply to all, either by letter or mail, each must take his turn. Special Information requests on matters of personal rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Minerals sent for examination should be distinctly marked or labeled.

(1) J. E. N. asks the processes of making chromate or bichromate of soda and acetate of chromium, using bichromate of potash. A. The manufacture of bichromate of soda is identical with that of the potash salt, except that soda salts are used in its preparation. The process consists of the treatment of powdered chrome ore mixed with soda, lime, and a solution of sodium carbonate in a reverberatory furnace, and there digesting with a hot saturated solution of sodium sulphate in lixiviating tanks. This yields the simple chromate; then by the action of sulphuric acid the bichromate is obtained. The chromic acetate is obtained by dissolving chromic hydrate in acetic acid. We do not understand that it is made directly from the bichromate.

(2) C. W. C. writes: In reference to the purification of water by a "solution of iron," I would like to know what would be the best solution of iron for that purpose. Whether an oxide or simple compound or a salt. A. Iron chloride is probably the best solution to use, but there is very little difference between the action of the various solutions of the iron salts.

(3) W. F. B. asks what degree of heat in a cupola is required to melt scrap malleable iron. Is the percentage of loss in remelting greater or less in scrap malleable than in cast iron? A. There is no foundry practice with which we are acquainted that furnishes data for a categorical answer. Malleable scrap is used only in small quantities with other scrap for pouring sash weights and similar articles.

(4) E. W. writes: I. In your issue of July 28, 1884, No. 28, page 27, in the recipe for Lee & Perrin's sauce, you say "Chutney 1 1/2 ounces." Is this correct? A. The amount of chutney (1 1/2 oz.) given in the original recipe is correct. Chutney is a preparation made in the East, consisting of several ingredients, and an essence of chutney does not exist to our knowledge.

2. Some months ago I noticed something about an instrument by means of which light pictures of any size can be thrown upon a screen at the pleasure of the artist, and there painted or penciled. Please give me the name of the instrument, where obtained, and the price. A. A New York dealer has an instrument called photo-optican. It costs \$35, and is probably what you refer to.

(5) C. T. B. writes: I recently put some coppers into the water standing in the porcelain bowl (white) of my water closet for disinfecting purposes, and in a few minutes poured into the solution some spirits of ammonia, and directly there appeared an irregular dark blue band around the bowl at and near the surface of the standing water. I have since tried to remove this discoloration by applications of oxalic acid, sulphuric acid, and nitromuriatic acid, but with-

out success. What can I use to remove the discoloration? A. It is impossible to understand how the coloration came to exist, but we presume it is due to the action of the ammonia on copper. We would recommend you to try the use of the caustic alkalis, either caustic potash or caustic soda. If they are not effective in the cold, try them hot.

(6) W. P. A. asks if salt water is commonly used in the boilers of small steam launches on salt river, or, if not, what provision is generally made for a water supply? Also, the approximate amount of coal and water consumed per hour on a two horse power boiler. A. Small steam launches usually have tanks for fresh water storage sufficient for from 1/2 to 1 cubic foot per horse power per hour, or about 10 cubic feet for a day's excursion of constant run, requiring about 100 to 125 pounds coal, making about 700 pounds load for fuel and water.

(7) C. W. W. writes: Please name the alkalies prevailing in the alkali lands of the West, and the diseases likely to follow the continued use of the waters therefrom. A. The alkali lands of the West consist principally of soda, both as carbonate and bicarbonate. Lime salts and other salts of soda are present in smaller amounts. It would be difficult to say that any special disease follows the continual use of the water, but it has been surmised that the mountain fever which is taken by the emigrants as they cross the plains results from the use of the water.

(8) D. D. L.—We do not believe any remedies you can try for the cure of corns will be of much avail unless you wear large and comfortable foot coverings. A New York city judge who came to the United States when a young man, once declared that he never had any corns till he came to this country, because he never had any shoes to wear before.

(9) E. E. W. writes: Please give me a recipe for a good polish for pianos and organs, something that will be cheap to make and that will be lasting, and something that will bring out the grain of the wood. A. A fine lustrous polish for delicate cabinet work can be made as follows: Half a pint linseed oil, half pint of old ale, the white of an egg, one ounce spirits of wine, one ounce spirits of salts. Shake well before using. A little to be applied to face of a soft linen pad, and lightly rubbed for a minute over the article to be polished.

(10) J. H. D. writes: Can you make any suggestion as to how we may utilize tin scraps? A. Tin scrap is utilized in the vicinity of New York by the chemical works, who treat it with boiling nitric acid, producing products for dyeing and other purposes. A little is used occasionally by iron foundries to toughen cast iron. It has no commercial value.

(11) W. E. McA. asks about heating a roller rink by steam. Rink is 187 feet by 86 feet, and 13 feet high. What should be size of boiler, and size and number of turns of pipe? A. You will require 4,000 linear feet of 1 inch pipe in coils, around the sides of the rink, for heating, and a 15 horse power boiler.

(12) E. T. Q. writes: In your reply to C. M., in your issue for September 27, you say that a bullet thrown vertically upward would fall back to the point of starting, in a vacuum. In this you forget the revolution of the earth, which would be a disturbing element, and would cause the projectile to fall west of the starting point. A. The bullet as well as the gun, partakes of the motion of the earth.

(13) J. H. R. writes: I wished to increase the pressure on our pump to a point higher than our relief valve could be loaded to. An acquaintance suggested putting on a heavier weight, using the pressure gauge as a guide, ignoring the numbers already on the valve. I claimed that that would be wrong, inasmuch as spring gauges are liable to err, and furthermore the numbers on the lever ought to indicate the pressure at which the valve would relieve itself. Please decide which was right. A. Overloading the lever of a safety valve on a boiler is all wrong; but overloading a relief valve upon a pump for a requirement indicated by a gauge is proper and admissible.

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