

RECENTLY PATENTED INVENTIONS.

Engineering.

ROTARY ENGINE.—George W. Morthland, Lead, South Dakota. In the cylinder of this engine is a wheel secured upon the main driving shaft, the wheel having two pairs of oppositely arranged spring-pressed pistons, sliding in radial recesses, while on opposite sides of the cylinder are abutments, with curved sides, to permit the pistons to pass over them, the middle portions of the abutments being in frictional contact with the periphery of the wheel. The abutments are provided with ports for the live and exhaust steam, and the arrangement is such that the steam always acts on two oppositely arranged pistons at the same time, all dead center positions being avoided.

CUPOLA FURNACE.—James Blakeney, Springfield, Ohio. This furnace has radial tyere openings which gradually increase in width from the inside to the outside, and whose bottoms are obtuse angled, whereby the air blast can readily pass to the center of the furnace from all the points of the wall, while the molten metal is prevented from filling up the tyeres. In the bottom plate of the tyere are also formed transverse pockets leading to passages in the bottom of a surrounding air chamber formed by the enlarged part of the shell for the stack, a pipe connected with the air blast discharging into this chamber.

FURNACE.—Augustus L. Engelbach and Sidney E. Bretherton, Leadville, Col. This is an improvement on a former patented invention of the same inventor, designed to prevent the incrusting of the settler by the molten products, and providing for the ready moving of the settler to or from the heater, if incrustation should take place. The settler is formed of a cast iron box lined with fire clay and provided on its outer side at the corners with slotted lugs and a wheeled frame into which the settler fits, there being vertical corner uprights with pivoted bolts to swing into the slots of the lugs.

GRATE.—James W. Smith, Moscow, Ky. This invention consists of a grate head in sections, each section having solid ends and longitudinal bars integral with the ends, each bar having in its top a deep longitudinal groove for the passage of air. The construction is designed to permit also a ready entrance of air between the grates to penetrate the fuel in all its parts, and to heat air which will travel at considerable velocity through the boiler flues.

HYDRAULIC ELEVATOR.—Charles J. Dudley, Mobile, Ala. This is an elevator of simple and durable construction, and is provided with novel arrangements to vary its lifting power according to the load of the cage, the varying device being controlled by the operator in charge of the cage.

Railway Appliances.

ELECTRIC RAILWAY SYSTEM.—Charles D. Tidale, Boston, Mass. According to this system both rails, or one rail and an auxiliary conductor, may be used for conveying the current for driving the cars. The car truck is provided with three or more insulated car wheels, and furnished with one or more auxiliary wheels for taking the current from one of the rails or conductors and returning it to the other rail. It is designed with this improvement to avoid the necessity of using a trolley wire, main conductors being provided on the ground level, and so arranged as to be free from danger by being crossed by vehicles or otherwise.

RAILWAY SIGNAL COMPENSATOR.—William Daves, Jersey City, N. J. This is an improvement in devices for taking up the slack in signal working wires, so as to compensate for the stretching of the wires and their varying lengths under temperature changes. The construction is very simple and inexpensive, and the parts are so arranged that they cannot well get out of order, while, if either of the operating wires breaks, the semaphore arm will swing to the position of danger.

FENDER FOR TRAM CARS.—Frankly S. Hogg, New York City. This fender is concealed entirely beneath the car platform, and has a rear guard which, should the main fender be elevated by an obstruction working beneath it, would be brought down in operative position between the rails, preventing a person or obstruction from passing beneath the wheels. To the fender are connected spring-controlled plungers having limited sliding movement in bearings on the vehicle frame, and the improvement may be applied to any car without any interfering with the usual mechanism on the car bottom. It does not add to the length of the car, enabling the cars to be stored in as small a space as previously.

Miscellaneous.

ROAD WORKER AND SCRAPER.—Otis W. Stearns, Johnson, Vt. This is a machine with which the road may be scraped and rolled at the same time, the scraper being adjustable beneath the body of the machine in such manner as to carry the material removed from the road in direction of the front of the machine, or more or less in direction of either of its sides. The scraper may be raised and lowered quickly and conveniently, and shifted to stand at any desired angle laterally beneath the body of the machine. The machine is designed to be simple, durable, and inexpensive in construction, and equally well adapted for work in summer and winter.

BICYCLE CRANK.—Ferdinand F. Ide, Peoria, Ill. According to this a curved crank of spring material attached to the pedal shaft and under ordinary circumstances acts like the rigid crank commonly used, but it is designed to straighten out under heavy pressure, thus increasing its length and giving additional leverage, so that the rider's foot travels in an ellipse, and the increased leverage enables him to drive a machine easily up hill. The crank is designed to respond quickly to the thrust of the foot, without transmitting jar to the rider.

FIRE BOX AND GRATE.—Augusta R. Isaacs, New York City. This invention provides an auxiliary fire pot to be introduced into the regular fire

pot of a range, stove, or heater. It may rest upon the bottom of the ash pit of the stove, and be entirely removed in a quick and convenient manner. This auxiliary fire pot has two grates, one or both of which may be removed, one of the grates being at the lower portion of the fire pot and constituting its bottom, and the other being between the bottom and the top, thus providing for the use of a greater or less amount of fuel. One or both of the grates has a rake attachment.

VALVE FOR HYDRANTS.—Christopher H. Watson, Riverside, Cal. This invention relates to valves used in connection with a measuring box for irrigating purposes, and provides improvements whereby the flow of the water from the supply to the box can be conveniently regulated according to the amount of water required for a certain purpose.

NUT LOCK.—Fredrick B. Wallace, Orion, Mich. The nut is perforated at one side of its threaded hole, according to this improvement, and channeled transversely on one face, while an independent locking block is perforated and threaded to conform with the bolt hole in the nut and seated in the channel. A tilting pin fast in the block is fitted loosely in the side perforation of the nut and projects beyond its inner face. The nut and bolt are thus locked without injury to the threads of either, permitting reuse an indefinite number of times.

SULKY.—Gilbert J. Loomis, Westfield, Mass. This invention provides means whereby the body of the sulky may be raised and lowered upon the wheel supports, enabling the vehicle to be used with equal facility with a large or small animal. The invention also provides for the employment of pneumatic wheels, and provides an attachment which will effectually prevent the sulky from being upset in a rearwardly direction.

BRIDLE.—James R. McLeod, Calgary, Canada. This is a harness bridle comprising the usual bit and a continuous cord having its free ends arranged to form the reins, the cord extending loosely through the bit rings, crossing beneath the jaws of the horse, crossing again above the top of the head, extending downward to form the cheek pieces of the bridle, connecting with the bit rings, returning upon themselves and merging in a loop adapted to form a noseband and overdraw and connect with the bit rings. This bridle may be used to render a horse easily manageable with any form of bit.

CLEVIS.—S. E. Bricker, Arco, Idaho. This clevis consists of two members having nearly circular hooks curved in opposite directions and lying side by side, the inner end of one member being provided with a keyhole slot, and a pin or bolt pivoted to one member and provided with a radial flange being adapted to enter the key hole slot of the other member. In practical operation the clevis works substantially like an ordinary clevis made of a single piece, while the parts may be easily separated and as easily locked, so that the clevis may be readily connected with any hauling or other device.

HOOK.—David W. Holden, Gardiner, Oregon. This hook is more especially designed for use with chains employed for logging purposes, and is arranged to conveniently unhook the load while under strain, to obviate backing up to "cast off." A shank is provided with a locking link to engage the hook pivoted on the shank, the latter having on the inside at the pivot end a projection to limit the inward swinging motion of the hook and protect the pivot.

LIGHT DEFLECTOR.—Dexter E. Hawkins, North Attleborough, Mass. This is a device to concentrate the light of a lamp or gas flame, and direct the rays upon the page of a book or on any object of work. In vertical members carried by a suitable base is a lens-carrying frame fitted to slide, with means for vertically adjusting the frame, to which is secured an apertured shield in rear of the lens. The lens is given any desired inclination by simply turning it upon its pivot. The device is very simple and inexpensive, and will not interfere with the stand or pedestal of a lamp in connection with which it may be used.

WALL DESK.—Joseph F. Figgins, Washington, D. C. A case or cabinet to be suspended from the wall or supported on legs has been provided by this inventor, the case having notched sides and a rounded lower piece, a vertically folding lid with projecting strips, and rigid strips on the side of the case, while hinges connect the side and lid strips. When the lid is lowered a desk for writing purposes is afforded, the construction being very neat, simple and compact, and the connection between the desk and the lid is such that a rigid support is attained without the use of chains, legs, or supporting arms.

WASTE PAPER BASKET.—Edward L. Weston, Washington, D. C. This basket is composed of upright strips curved at their ends to form feet and headings, rows of connecting strips in pairs encircling the basket, which is designed to be ornamented by running ribbons around and through the strips, to give it a very ornamental appearance.

ANIMAL TRAP.—Frank J. Bragunier, Topeka, Kansas. This is a simple trap adapted to catch small game alive, and when once set and baited will operate many times without resetting. A tripping platform is located in a bait box, at one side of which is a cage, a swinging door being in the passage, while a spring-revolving shaft in the bait box has arms designed to strike the animal and throw him through the opening into the cage.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

WOOLEN SPINNING. By Charles Vickerman. London and New York: Macmillan & Co. 1894. Pp. xii, 352. Price \$1.75.

The advance of technology is well illustrated by the production of such works as the present. It treats of one of England's great industries, its history and progress and

present aspect. It is fully illustrated, but its want of an index is especially to be deplored, as it would have added very greatly to its value and utility.

DIE PHOTOGRAPHIE IN NATURLICHEN FARBEN. Mit besonderer Berücksichtigung des Lippmann'schen Verfahrens. By Eduard Valenta. Halle a. S.: Wilhelm Knapp. 1894. 20 test figures. Pp. 82.

This book forms the second number of the Encyclopedia of Photography, and treats in a very exhaustive manner on photographing in natural colors, with special reference to G. Lippmann's process.

HOW TO THINK IN SPANISH. By Charles F. Kroeh, A. M., Professor of Languages in the Stevens Institute of Technology, Hoboken, N. J. Published by the author.

As in the author's books on French and German, the aim of "How to Think in Spanish" is to teach the language of everyday life by direct association of complete idiomatic sentences with the student's actions, so as to establish the habit of speaking Spanish without first conceiving the thought in English. Then, by a series of instantaneous mental processes, the student is taught to vary these sentences as a native does by substitutions and additions, so that he will acquire a real command of the language and not merely the ability to parrot a few sentences. The author has made an independent study of what he calls the "mechanism" of these languages and has given adequate practice in every grammatical difficulty.

We are in receipt of the thirteenth part of that handsome and lavishly illustrated quarto, "The Book of the Fair," published by the Bancroft Company, of Chicago. The completed work will consist of twenty-five parts, two being issued monthly, at the price of \$1 a part.

READINGS FROM THE BOOK OF NATURE. By Simeon Mills. Chicago: Charles H. Kerr & Company. 1893. Pp. 181.

SCIENTIFIC AMERICAN BUILDING EDITION.

APRIL, 1894.—(No. 102.)

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- Elegant plate in colors showing a handsome colonial residence just completed at Ashbourne, Pa, for Charles Salmon, Esq. Two perspective views and floor plans. Cost complete \$11,500. Frank R. Watson, Esq., Philadelphia, Pa., architect. An elegant design.
 - Plate in colors of a Chicago dwelling designed for an architect's home, and recently completed at Morgan Park, Chicago, Ill. Two perspective views and floor plans. Cost \$4,200 complete. Mr. H. H. Waterman, architect, Chicago, Ill.
 - Two perspective views, interior view and floor plans of the elegant residence of Judge Horace Russell recently completed at Southampton, Long Island. Mr. Bruce Price, New York City, architect. An admirable design in the colonial style of architecture.
 - An English cottage at Buena Park, Chicago, Ill. Two perspective views and floor plans. Mr. James Gamble Rogers, Chicago, Ill., architect. A unique design in the Gothic style of architecture.
 - A residence at Southport, Conn. Two perspective views and floor plans. A picturesque design in the modern colonial style of architecture. Mr. W. W. Kent, New York City, architect.
 - A cottage at Freeport, Long Island, erected at a cost of \$2,800 complete. Perspective view and floor plan. A unique design. Mr. W. Raynor, Freeport, L. I., architect.
 - A residence at Rogers Park, Ill. Two perspective views and floor plans. Cost \$3,948 complete. An attractive design. Mr. C. W. Mellin, Chicago, Ill., architect.
 - Two perspective views and floor plans of a dwelling recently erected at Rogers Park, Ill., at a cost of \$3,780 complete. A unique design. Mr. Robert Rae, Jr., Chicago, Ill., architect.
 - A cottage at Morgan Park, Ill., erected at a cost of \$3,968 complete. Two perspective views and floor plans. An attractive design, treated in the English cottage style of architecture. Mr. H. H. Waterman, Chicago, Ill., architect.
 - The new St. James M. E. Church at Kingston, N. Y. Perspective and plans. Architects, Messrs. Weary & Kramer, of New York City and Akron, Ohio. Estimated cost, \$70,000. Style of architecture, Romanesque.
 - Miscellaneous Contents: Vibrations of tall buildings.—Artificial stone.—A simple and efficient dumb-waiter, illustrated.—An improved woodworking machine, illustrated.—The New Eber electrical gas burner, illustrated.—P. & B. Ruberoid roofing, sheathing papers, and paints.—Improved wood-working machine, illustrated.—Foot power mortising machine, illustrated.—A large sheet metal ceiling, illustrated.
- The Scientific American Architects and Builders Edition is issued monthly. \$2.50 a year. Single copies, 25 cents. Forty large quarto pages, equal to about two hundred ordinary book pages; forming, practically, a large and splendid MAGAZINE OF ARCHITECTURE, richly adorned with elegant plates in colors and with fine engravings, illustrating the most interesting examples of Modern Architectural Construction and allied subjects.
- The Fullness, Richness, Cheapness, and Convenience of this work have won for it the LARGEST CIRCULATION of any Architectural Publication in the world. Sold by all newsdealers. MUNN & CO., PUBLISHERS, 361 Broadway, 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 the following week's issue.

- "U. S." metal polish. Indianapolis. Samples free.
- Heading machinery. Trevor Mfg. Co., Lockport, N. Y.
- Cheapest Water Power.—See top of 1st column, page 170. Also top of 2d column, page 238.
- Distance Reading Thermometers.—See illus. advertisement, page 256. Ward & Doron, Rochester, N. Y.
- Air compressors for every possible duty. Clayton Air Compressor Works, 26 Cortlandt Street, New York.
- The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.
- Nickel-in-slot machines perfected and manufactured Electrical supplies, Waite Mfg. Co., Bridgeport, Conn.
- Screw machines, milling machines, and drill presses. The Garvin Mach. Co., Light and Canal Sts., New York.
- Centrifugal Pumps for paper and pulp mills. Irrigating and sand pumping plants. Irvin Van Wie, Syracuse, N. Y.
- Emerson, Smith & Co., Ltd., Beaver Falls, Pa., will send Sawyer's Hand Book on Circulars and Band Saws free to any address.
- Split Pulleys at Low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.
- The "Olin" Gas and Gasoline Engines, from 1 to 10 horse power, for all power purposes. The Olin Gas Engine Co., 222 Chicago Street, Buffalo, N. Y.
- Patent for Sale—Stall for comfort and cleanliness of milk cattle. Agents wanted at 50 per cent commission. M. Schembri, 396 Van Buren St., St. Paul, Minn.
- The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y.
- Wanted—A slide valve engine of about 200 H. P. Must be in first class condition. Address, giving maker's name, date, and full particulars, also location, J. B. J., care this office.
- Competent persons who desire agencies for a new popular book of ready sale, with handsome profit, may apply to Munn & Co., Scientific American office, 361 Broadway, New York.
- Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names 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 in this department, each must take his turn. Enquirers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerais sent for examination should be distinctly marked or labeled.

(5989) L. B. asks (1) for directions for putting on shellac or varnish over rosewood stain so as to make it shine and give it a high polish. Would it be preferable to use the best varnish or shellac, and state how I shall proceed to put it on cherry wood so as to give it a glossy and polished like appearance? Also how shall it be rubbed or shined? A. First fill the rosewood, using the following filler: Linseed oil, 1 quart; spirits of turpentine, 1/2 pint; lime, the size of a base ball, broken fine. Let the mixture simmer on a stove, covered over, for two or three hours, then strain through a coarse cloth. It is to remain on twenty-four hours, then rub off with a woolen cloth and polish. Then varnish with the following:

Sandarc.....	6 oz.
Elemi (genuine).....	4 "
Anime.....	1 "
Camphor.....	3/8 "
Alcohol.....	1 qt.

Digest the gums in the alcohol in a corked bottle, in a warm place. Have the wood smooth. No rubbing is necessary; several flowing coats of the varnish should be given, sandpapering between each with fine sandpaper.

2. What voltage would a battery of two cells have, each having two zinc plates and three carbon ones, each 3 1/2 by 2 1/4, connected in series, and state the amperage? Immersed in electropoison fluid. A. 3 to 4 volts. The amperage depends on the resistance of the circuit. On short circuit they should give 6 or 8 amperes for a short time.

(5990) O. C. P. says: I have several small pieces of glass which I wish to color. Can you give me formula by which I can give them durable colors? A. The following is due to Mr. Arthur S. Huey, of Minneapolis: 1. Prepare the glass by thoroughly washing in soap and water and drying. Then dip in bath, made by beating up the whites of two eggs in 1 1/2 pounds or pint of water and filtering, and hang up today. Dissolve the aniline color in photographer's common colodion. Red or blue aniline will form clear solutions, while the green solution will require filtering. Yellow aniline forms a handsome color, but the surface of the glass presents a frosted appearance after the application. Violet and purple colors may be obtained by combining red and blue in different quantities. When the solution is ready, dip the prepared glass bulbs therein, hang up to dry, and finally pass a current through the bulb for