

ENGINEERING INVENTIONS.

A revolving cylinder engine has been patented by Mr. John J. Blair, of Tacoma, Wash. Ter. The piston remains stationary and the cylinder revolves, the steam being admitted into meniscus-shaped spaces between the inner surface of the cylinder opening and the outer surface of the piston only during one-quarter of a revolution, working under expansion during another quarter.

An automatic electric shut off for water and gas pipes has been patented by Mr. Thomas P. Hughes, of Denver, Colo. It has a spring held lever, a connecting lever, and a drop rod interposed between a stop cock in the pipe and the armature of a magnet having an electric thermometer in its battery circuit, so a certain fall of temperature will break the circuit and release the rod, allowing it to close the stop cock and shut off the water or gas.

AGRICULTURAL INVENTIONS.

A potato digger has been patented by Mr. Lyman Norton, of Hartford, N. Y. It has a beam with a pair of curved standards connected at their lower ends by a plate forming a seat for the scoop, having also a curved separating rod and a shoe with hinged flexible arms, whereby the potatoes are separated from the soil as they pass together from the rear edge of the scoop.

MISCELLANEOUS INVENTIONS.

An artist's box has been patented by Mr. George Stirrup, of Brooklyn, N. Y. This invention provides for certain improvements in the construction, arrangement, and combination of parts in boxes which artists use for carrying color tubes, brushes, water, etc.

A hame fastener has been patented by Mr. George W. Greene, of Abington, Ind. It consists, in combination with a stirrup for receiving the hame strap, of a locking lever for tightening and fastening the hame; it is light and strong, easily operated, and inexpensive.

A printing press has been patented by Mr. Theophilus Reichard, of New York city. This invention covers a novel construction and motion in operating the actuating shaft and controlling the motion of the platen in small printing presses to be operated by steam power or treadle.

A till coupling has been patented by Mr. George E. Smith, of Newark, Ohio. It is a pole and shaft shackle, which may be readily connected or disconnected to admit of the change from pole to shaft or the reverse, all rattling being prevented, and no rubber or leather filling being necessary.

A drip cup and binder for paint brushes has been patented by Mr. John T. Sutton, of Urbana, Ill. An elastic binder fits close around the base of the handle and the head of the brush, where there is a drip cup and rigidly attached sleeve, to prevent the paint from getting between the sleeve and handle.

A derrick has been patented by Mr. Chas. F. Ruff, of Phoenixville, Pa. The invention consists principally in providing the derrick with adjustable braces for laterally bracing it, to prevent the derrick from tipping sidewise in either direction, and is alike applicable to hand and power derricks.

A bale tie has been patented by Messrs. Owen P. Brown and William S. Deidrich, of Smithville, Ga. This invention covers a strip with a loop at each end and a hook pivoted at one end, the hook having on its free end a lug, prong, or projection for locking it in place, so the tie can be opened or closed easily and rapidly.

A toy money safe has been patented by Mr. Edward T. Gibson, of Minneapolis, Minn. It has separate chambers for coins of different value, and is intended to cause any coin inserted to deposit itself in the proper chamber, besides enabling a person to ascertain how much money the safe contains without disturbing it.

A leather working machine has been patented by Mr. John A. Pantan, of Quincy, Mass. The object of this invention is to make more convenient the setting and adjustment of such machines as the Fitzhenry and the Holmes, the construction doing away with the counting of threads heretofore necessary in adjusting the parts.

A furnace has been patented by Mr. Thos. C. Zetzsche, of Okawville, Ill. In combination with a cylindrical casing, lugs are made to project from the inner surface to support the grate, and the ash pan is suspended by rods from the lugs, making a furnace for heating kettles, cauldrons, etc., which is simple in construction and saves fuel.

A saddle and bridle for breaking horses has been patented by Mr. Hugh O. V. Kelly, of Virginia City, Montana Ter. The saddle and bridle are strapped together in such a manner as to form a biting and breaking rig for horses and colts, to prevent them from kicking, bucking, and throwing themselves or their rider.

A circular saw mill has been patented by Mr. John H. Jones, of Dardanelle, Ark. The invention covers a stationary frame with saw arbor and pulley, and a sliding adjustable frame with saw arbor and pulley, with vertical standards between, and adjustable tension rollers for the belt, with various novel features in construction and arrangement.

A return registering envelope has been patented by Mr. Jacob M. Crull, of Harrisburg, Pa. It has peculiarly formed flaps, and a fixed pin on which a washer, key, and addressing tags may be fastened, making an envelope more especially intended for use by express companies, and in the postal service for registered letters and packages.

A saw horse has been patented by Mr. Richard Wylie, of Napa City, Cal. It is constructed of two pairs of crossed legs united by a suitable bolt, the legs each being formed of two leg bars with recesses in their inner surfaces, a third leg bar being held between the recessed bars, making a very stiff and rigid horse, which can be quickly erected or folded.

NEW BOOKS AND PUBLICATIONS.

ELECTRICITY; ITS THEORY, SOURCES, AND APPLICATIONS. By John T. Sprague. [Second edition.] E. & F. N. Spon, New York and London.

HANDBOOK OF ELECTRICAL TESTING. By H. R. Kempe. E. & F. N. Spon, New York and London.

THE PARIS ELECTRICAL EXHIBITION OF 1881. Report of Major D. P. Heap, U. S. A. D. Van Nostrand, New York.

Mr. Sprague is a member of the English Society of Telegraph Engineers and Electricians, and has here given the public an eminently practical work. Of the first edition 2,000 copies were sold, and the volume is now greatly enlarged. The book deals with the principles of the study of electricity, rather than making a historical record of facts, the instruments necessary for the understanding of the subject being so far explained that those who have some mechanical aptitude may construct for themselves a great variety of practical apparatus. The thousands of individuals who are now making experiments for themselves in this most interesting field may here find valuable aid.—The handbook of Mr. Kempe, which now reaches its third edition, is for the more advanced student, or the experimentalist who is ready to attempt the more difficult problems in electrical engineering. It describes all the most approved methods of measurement of electrical force, with the apparatus required, cable testing and how faults are localized, specifications for cable manufacture, and system of testing during the manufacture. A diligent perusal of these two books will make the investigator acquainted with most that has been done in the development of electrical science up to date.—The report of Major Heap appears simultaneously with its issue from the government printing office, and apparently from the same plates. It evinces the care and comprehensiveness of scope which have characterized so many former publications from the department of engineers of the United States Army, and forms a valuable part of the record of the world's progress in the branch to which it relates.

ART YEAR BOOK. John Mason Little, Boston, Mass. Price \$4.

This volume is an outgrowth of the illustrated catalogue of the Fine Arts Department of the New England Institute, which in 1883 reached its highest attainment, appearing as a magnificent volume of about seventeen full page etchings, besides a number of albertypes and photographs, all executed in the highest state of the several arts employed in its embellishment. A great number of our cleverest American artists have been engaged on the Art Year Book for 1884, the illustrations of which are taken from subjects exhibited at the last art exhibition of the Institute, Boston. To Mr. Arthur B. Turnure, of the Art Age Press, was intrusted the arranging of the cuts and the printing and binding of the volume, and he has in this succeeded in producing the choicest effect both in arrangement of the engravings and in the binding, the covers being of white parchment bond paper, on which is printed in colors a Japanese design by Mr. Turnure, which adds much to the beauty of the binding.

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.

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A half interest in Patent No. 280,080 for sale cheap. (Horse Power). See cut in SCIENTIFIC AMERICAN July 26.) Address R. F. Rasmussen, Omaha, Neb.

Carbon Plates. Bove, 48 R. R. Ave., Jersey City, N. J. For Sale.—A patent right of Weighing Scales for any purposes. Address T. Ziensch, Dedham, Mass.

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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.

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If an 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.

Guild & 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.

Electrical Alarms, Bells, Batteries. See Workshop Receipts, v. 3, \$2.00. E. & F. N. Spon, 35 Murray St., N. Y.

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

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

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 142.

Curtis Pressure Regulator and Steam Trap. See p. 78.

Brass & Copper in sheets, wire & blanks. See ad. p. 222.

The Chester Steel Castings Co., office 407 Liberty St., Philadelphia, Pa., can prove by 20,000 Crank Shafts and 15,000 Gear Wheels, now in use, the superiority of their Castings over all others. Circular and price list free.

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Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 222.

Heavy Walrus Leather for polishing. Factory supplies of all kinds. Greene, Tweed & Co., 118 Chambers St., New York.

Corundum Wheels; cut faster and wear longer than emery. Pratt & Whitney Co., Hartford, Conn.

Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 77.

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) H. A. S.—Use the solid paraffine for preserving eggs.

(2) C. F. B. asks: Will rubber be affected by direct contact with hot steam? If so, in what way and how soon? A. It becomes hard and inelastic in a few weeks.

(3) H. B. asks for a formula for making ink suitable to print on tin with a rubber stamp. A. Use printer's ink.

(4) S. H.—The gold fish (*Cyprinus auratus*) is a native of China, said to have been introduced into Europe in 1691, thence to the United States.

(5) J. M. S. writes: In a room for public purposes, 43 feet by 54 feet 6 inches inside measure, the ceiling highest in the middle, but not arched, what would be the acoustic properties when the distance between the floor and highest point of ceiling is 27 feet? A. In parts of the room there will probably be considerable reverberation. The general acoustic properties will depend much upon the location of the speaker, the angles of the ceiling, and continuity of sides or position of rostrum.

(6) J. G. E. asks: How are copper tubes bent, say 1 1/4 inch tube in a 5 inch curve? A. Bend after annealing and filling with resin, around a grooved former, then melt the resin out. 2. What is the gauge of copper tubing to stand 120 pounds pressure on the inside with steam? A. Three thirty-seconds of an inch thick.

(7) R. H. C. asks where to get small steel balls, such as are used in the hose carriage wheels. The balls are about three-eighths of an inch in diameter. A. These balls are not on sale. You will have to get them made by a machinist.

(8) A. J. M. asks: To what height will a siphon draw water? When the supply end reaches 33 feet, balancing atmospheric pressure, does not the siphon cease to operate? A. Yes.

(9) H. B. G.—You can make plastic metal, or what are called amalgams, by treating precipitated copper with mercury—2 of copper, 3 of mercury, by weight. You can use the fusible alloy of 1 part each of tin and lead to 2 parts bismuth by weight for casting on gelatine plate. It melts in boiling water. Buy celluloid from the Celluloid Manufacturing Company, Newark, N. J.

(10) H. L. C. asks: 1. Where can the mercury flasks used for constructing boiler shown in SUPPLEMENT, No. 182, be procured? A. Of persons using mercury for silvering looking glasses or other purposes; sometimes of the junk dealers. The flasks are almost all made in Pennsylvania, and cost, new, to the miners, \$1.15 each, second hand ones selling for 80 to 90 cents each. 2. What pressure will they stand? A. They are considered good for a thousand pounds pressure; they are half an inch thick at the top, three-eighths inch at the bottom, and three-sixteenths inch at the sides of the shell.

(11) J. S. H. asks how much coal a steamer burns per day in crossing the ocean, how many days it takes to cross, also the amount of tonnage. A. The first class steamer America burnt about 300 tons a day; the Oregon nearly 350 tons a day; the quickest passages of both have been under six days and a half; the tonnage of the America is 5,528, and that of the Oregon 7,375.

(12) F. A. W. writes: Some time since I read in your Notes and Queries advice to add glycerine to some mixture as a preventive, or partial preventive, against freezing. May I ask how much should be added to say one gallon of water or other fluid to accomplish this object? A. One per cent by measure for each degree of cold below 32°.

(13) J. W. L. asks (1) the dimensions necessary in a balloon to lift 500 pounds, said balloon to be of a conical shape. A. Diameter 26 feet, for hydrogen gas. 2. The difference in the lifting powers of gas and hot air? A. Hot air has very little buoyancy, probably one-fifth as much as hydrogen gas.

(14) S. G. writes: Have trouble with stationary engine—running hot, gumming, etc.; have tried every imaginable way, but have failed. A. You are probably using bad oil. Use the best lard oil or a heavy petroleum oil made for engines.

(15) H. L. asks how many square inches there are in 3 inch safety valve. A. If the opening is exactly 3 inches, the area is 7.0686 square inches.

(16) G. L. T. asks: Which is the best floor for roller skating rink—a cement or hard kiln—dried floor? Which wears out the rollers the quickest? A. The hard wood floor. Cement floor disintegrates and becomes dusty, and then is destructive to the rollers also.

(17) W. S. W. asks: 1. How fast does heat travel? A. It depends entirely on the conductor. 2. Can heat be brought to a focus by passing through a lens? A. Yes.

(18) N. K. writes: If you were to put a 2 inch pipe in a 40 foot well, and put a pump on top of the ground, with the valve 40 feet from the water, would the pump work? If not, how high will the water come up in the pipe? A. Twenty-eight to thirty-three feet is the greatest lift for an ordinary pump.

(19) F. I. P. asks the ingredients of the brown powder used by cigar makers to produce the Madura color on cigars? It is soluble in water or spirits, and is of a mahogany color. A. A solution of an aniline color known as acid brown is the article used. It can be procured of dealers in dyes.

(20) J. I. C. asks what should be the dimensions of valves, ports, and bridges of an engine 24 inches, to run 250 revolutions per minute, also size of pipes and what power should it develop; how large a boiler should be needed, and how large and heavy a fly wheel should be needed, and throw of eccentric, etc.? A. The steam openings should be 1/4 inch by 1 1/4 inches, exhaust 1/2 inch by 1 3/4 inches, bridge 3/4 inch. Steam pipe 3/4 inch, and exhaust 1 inch. Boiler should be 20 inches to 24 inches diameter and 36 inches high, tubular, and have 35 to 40 feet fire surface. Throw of eccentric would depend upon the lap of the valve and mode of connection; if direct, about seven-sixteenths inch. Fly wheel about 18 inches diameter and rim 2 1/2 inches diameter.

(21) W. E. asks for a recipe to soften horse and cow hair. A. Use a solution consisting of 1 ounce glycerine, 20 grains potassium carbonate, 1 salt of tartar to the pint of water.

(22) G. L. F. writes: 1. I want to transmit power by wire rope about 175 yards; can I do it successfully? A. Yes, by making two ropes run over a double carrier wheel in the center. 2. In tarring or pitching felt roof, what can I use to make it set good and hard, so it will not run in hot weather? A. Boil the tar to thicken it, and use all the sand that it will take when spread.

(23) F. D. B. asks: In regard to the manufacture of "potato flour or farina," what is worth per ton, and what quantity of potatoes is required to make a ton of flour. A. The manufacture of potato flour is described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 313, under the title of "Potatoes and their Utilization." Cuts illustrating the articles used in the preparation are there given. Its value in New York is 4 1/4 to 4 3/4 cents per pound.

(24) S. B. B. writes: I have a solution of nitrate of soda which has been made in an iron kettle with a copper worm to heat it. If the solution is allowed to crystallize, the crystals turn blue. I have the same result with a copper worm and lead kettle. I suppose it to be the result of chemical action of the metals. Can you inform me what I can do to cause the copper or lead in the solution to deposit or drop, or to take the color out? A. The blue coloration is probably due to the copper. The latter can be more or less completely removed by being precipitated with iron.

(25) T. C.—Shellac or French spirit varnish with a small quantity of fine lamp black added to it forms a brilliant black varnish, which might answer your purpose.

(26) W. S. B. asks by the use of what acids or tools he can cut a round or oblong hole in a piece of window glass which is about one-sixteenth inch thick. A. Use a copper tube charged with emery and water and revolved in a lathe or hand drill.