

RECENTLY PATENTED INVENTIONS.

Engineering.

ROTARY ENGINE.—Julius M. Farmer, New York City. A revolving disk secured to the main driving shaft carries sets of two cylinders each placed diametrically opposite each other, and connected by a piston rod carrying a crosshead held to slide on a fixed pin arranged eccentrically to the revolving disk, a steam chest being formed on the bearing of the disk and connected by ports with the sets of steam cylinders.

METALLIC RAILROAD TIE.—George W. Thompson, Sag Harbor, N. Y. This invention is an improvement on tubular metallic ties having bearing blocks within the rail-bearing portions, and provides for inserting the bearing blocks in the ends of the ties after the inner bolts have been applied, the heads of the bolts abutting against the sides of the blocks and holding them in position.

RAILWAY SPIKE.—Thomas A. Davies, New York City. This invention covers an improvement on a spike formerly patented by the same inventor, and provides means whereby the spike when driven will be guided diagonally of the tie, its bottom edge being formed to gather the wood fibers and cut them evenly and cleanly.

CUSHION FOR RAILROAD RAILS.—Thomas A. Davies, New York City. This is a hard metal plate having one face covered with soft metal, designed to be placed between the rail and tie, whereby the wear of the fish plates by the abutting ends of the rail sections will be avoided, and the loosening of the joints thereby prevented.

FLOOD GATE.—Jacob Erkmann, Enfield, Ill. It is made with two hinged gates, each provided with roller and inclined ways therefor, a latch for locking the gate, the latch being provided with a float, the construction being such that the gates will open automatically as the water rises and close as it falls, while the gate is not liable to be opened by stock.

BOAT.—Franklin M. Smith, Leaper, Ohio. The hull is made of a waterproof endless web, with paddle sections upon the outside of the web, and endless chains with plates upon its inside, in connection with a pair of shafts with sprocket wheels, the hull itself supplying the means of flotation, while the web constituting its body revolves around the sprocket wheels like an endless belt to supply means of propulsion.

CHAIN PROPELLER.—Franklin M. Smith, Leaper, Ohio. In this propeller paddles are attached to endless chains passing around sprocket wheels, the paddles being braced and held in proper position to secure a hold upon the water, and also enabled to travel around the sprocket wheels with the least friction and cramping strains.

WELL SINKING MACHINE.—Chester A. Overton and Oscar E. Ingersoll, Bliss, Neb. This invention covers a specially constructed sliding support for the tubing of a drilling tool and a perforated pipe forming part of the boring tube and covered by a shell adapted to be cut and raised after the well is sunk to the proper depth, the device effectively furnishing water for the work of the drill.

UNLOADING CARS.—John Scully, South Amboy, N. J. This invention covers an improvement on a machine for such purposes formerly patented by the same inventor, whereby the shovels may be shifted sidewise upon a stationary supporting frame for carrying them to different positions in a car, and from one track to another.

Agricultural.

FERTILIZER APPARATUS.—Stephen V. Mills, Richfield, Pa. A receptacle containing chemical absorbents is connected by pipes with a trough located in the farmyard and a collecting box in the stable, for collecting the liquid manures and converting their valuable properties into drill fertilizers, while preventing overfermentation, etc., of the solid manure of the farmyard.

HOE.—John M. Hefner, Marietta, Texas. The hoe is formed with a curved neck, made broad or deep and thin, with a straight sharp cutting edge, thus forming an upper, thin, independent blade, capable of being filed or sharpened, and making the implement a practically double-bladed one, the cutting edges of the two blades being in crosswise relation with each other.

Miscellaneous.

BREECH-LOADING FIREARM.—Elmore A. Harris, Norwich, Conn. The barrels of this firearm are placed one above the other, there being two rifled barrels, or two shot barrels, or one of each, a trunnion extending from each side of the web connecting the barrels, these trunnions resting in horizontal slots formed in side plates of the stock, while there is a novel arrangement of extractors and firing pins.

PROJECTILE.—Hugo Bischoff, Berlin, and Armand Mieg, Leipsic, Saxony, Germany. The projectile is made of a hard metal casing containing lead or similar material, while a guide ring of soft metal is forced into the hard metal casing, to guide the projectile through the barrel without injuring its grooves.

POUNCING FELT.—Henry G. Wolcott, Matteawan, N. Y. This invention consists in a rapidly revolving flap-like beater for pouncing or finishing irregular shaped articles of felt, by subjecting them while on their lasts to the action of the beater, the flaps or surfaces of which are of a granulated, cutting, and abrading character.

STENCILING MACHINE.—John A. C. Hamill, Racine, Wis. It is for stenciling a pattern on a continuous web, the machine consisting of a perforated cylinder held over a fixed table over which passes the web to be stenciled, while a brush is held in contact with the inside of the cylinder to brush a color or other substance through the perforations.

JUTE STRIPPING MACHINE.—William Menzies, Paterson, N. J. The machine comprises a set of crushing rollers for breaking the butts of the stalks, a revolving drum and a draw frame working in an opening thereof for drawing the crushed butts and the butt fibers down into the inside of the drum, the principal part of the fiber being stripped by the revolution of the drum and wrapped around its outer surface, the machine having various other novel features and being also designed for stripping other fibrous plants.

BUTTON MACHINE.—Clyde J. Coleman, of Gideon, Kansas. This is a machine for threading staple fasteners to buttons and passing the fastener-threaded buttons to a shuttle, which, when filled, will be adjusted to another machine, which secures the buttons by the fasteners to the vamps of boots or shoes or other articles, the machine working automatically.

SASH BALANCE.—James H. Jenkins, Thomasville, Ga. This invention covers a novel method of balancing one sash by the other, dispensing with box frames, cords, weights, and pulleys, and whereby the upper sash may be held at various points of suspension for ventilating purposes.

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NEW BOOKS AND PUBLICATIONS.

CHEMICAL LECTURE NOTES. By Peter T. Austen, Ph.D., F.C.S., Professor of General and Applied Chemistry, Rutgers College, and the New Jersey State Scientific School. John Wiley & Sons, New York, 1888. Pp 98. Price \$1.

In this admirable little work the general subject of chemistry is most graphically treated, and what is ordinarily considered a very dry branch of science is, by the distinguished author, made vivid and interesting. The powers and extent of the science, rather than its limitations, are dwelt upon, and in the text a prophetic view of what chemistry will yet achieve is included. A reproduction of the table of contents will show how completely the subject is covered, and it gives some idea of the condensation to which the matter has been subjected. The book is one for both student and professor, and representatives of both classes may be certain that they will find much new matter in it.

MODERN HELIOGRAPHIC PROCESSES. Manual of Instructions in the Art of Reproducing Drawings, Engravings, Manuscripts, etc., by the Action of Light. Thirty-two illustrations on wood and ten specimen heliograms. By Ernst Lietze, M.E. D. Van Nostrand Company, New York, 1888. Pp. viii, 143. Price \$3.

This work is pre-eminently a practical one. After a short treatise on the theory of the subject and classification of the processes, the practical portion of the work begins. The qualities of paper, methods of sensitizing, apparatus and its use, and the question of exposure are all treated of. Then the different processes are treated, including those with silver, iron salts, and chromium and uranium salts. A very practical table giving commercial and scientific factors of photographic chemicals and a copious index add to the volume of the book. The specimens of heliograms produced by different methods are very interesting. The other illustrations show typical apparatus of the advance type.

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.

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.

Minerals sent for examination should be distinctly marked or labeled.

(61) C. W. W. asks: Is it the custom in the building of high chimneys, say one of 250 feet, to make the flue larger at the top than at the bottom? If so, please state reason. A. Chimneys have been built with a slight inside taper, smaller or larger at top. They are the exception. Parallel or straight on the inside is the general and best practice.

(62) P. W. G. writes: Referring to your issue of October 13, 1888, article on alum baking powders: 1. Is the formula given in avoirdupois or druggists' weight? A. The grain is the same in all systems. The ounce alluded to is the apothecary's or troy ounce of 480 grains. 2. And what is the meaning of the characters thus, 3ii], at the right of the bicarbonate of soda ounces? A. The characters read, "three drachms."

(63) J. S. S. writes: In your issue of October 6, 1888, an article entitled "Manufacture of Light without Heat" says: "The means adopted was the oscillatory discharge of a Leyden jar, whose rate of vibration has been made as high as 1,000 million complete vibrations per second." 1. Is it possible to count as high as 1,000 million complete vibrations per second? If so, with what machinery can it be done? A. The "counting" is not done mechanically, the velocity and number of waves and their length are deduced from experimental observation coupled with mathematical deduction. As a parallel case, consult any good book on physics and see how the number of light waves per second is determined. 2. Can light be produced without heat? If it can, please give an instance. A. Probably not. It never has been hitherto.

(64) A. H. G. writes: 1. What do professional singers use to clear the throat before commencing to sing? Or what is the best known remedy for this purpose? A. Chlorate of potash or common salt may be dissolved in water and used as a gargle. It is far better to use nothing. A person whose throat troubles him when singing probably sings incorrectly, not using the abdominal muscles properly. 2. What should be eaten the last meal before singing? A. Different singers follow different customs. A good meal about two hours before singing is a common sense rule. Apples are considered good, also raw or soft boiled eggs.

(65) E. W. C. writes: 1. Would it be more advisable for a student of mechanical drawing to study books or go into an office? A. You should first study and then try to get a position in an office. 2. If to study books, what to study, and where to get them, estimated cost, etc.? A. We can supply you with many excellent works by mail. We name a few. "Mechanical Drawing Self-Taught," by Joshua Rose, \$4.00. MacCord's "Easy Lessons in Mechanical Drawing," \$2.50 and \$3.50. "Mechanical Drawing" prepared for the use of students of the Mass. Institute of Technology, by Faunce, \$1.25. 3. Are there schools where mechanical drawing is a specialty? A. Mechanical drawing is taught in all of the principal colleges and in many public and private schools all through the United States. Mechanical drawing alone is hardly enough to be called a specialty.

(66) E. A. D. asks: 1. How many standard sixteen candle power (Edison) lamps may be used on the dynamo described in SUPPLEMENT 600? A. The dynamo will run six or eight lamps. 2. Give the measurements by which the machine, if not sufficiently powerful, may be increased in power to use sixteen standard lamps on it? A. Make it one quarter larger in all its lineal dimensions and use one size larger wire. 3. Have you any book on electric lighting? If so, give price. A. We recommend and can supply you with Thompson's "Dynamo Electric Machinery." Price \$5. Herring's "Principles of Dynamo Electric Machines." Price \$2.50. Also Atkinson's "Treatise on Electric Lighting." Price \$1.50. These are all recent works. 4. Is there an explosive called extralite, a later invention than bellite? A. For bellite we refer you to SCIENTIFIC AMERICAN, vol. 56, Nov. 17, 20, and 22. We have no information concerning extralite.

(67) B. R. W. asks the cause of polarization and rapid running down of all forms of the ammoniac batteries. A. The reaction is usually expressed as follows: $Zn + 2NH_4Cl = ZnCl_2 + 2NH_3 + 2H_2$. The hydrogen goes to the carbon electrode or prism and quickly polarizes the battery. The porous cup in the Leclanche couple is filled with binoxide of manganese and graphite. The former is reduced by the hydrogen, and thus prevents polarization. The reaction is as follows: $2MnO_2 + 2H = H_2O + M_2O_2$. Where no depolarizer is used the large surface of the carbon is relied on to prevent too quick polarization, when the depolarization is due to the escape of the hydrogen.

(68) R. E. S. asks (1) if a U-shaped tube, with one arm twice the diameter of the other, is half filled with mercury, and the pressure of the atmosphere is removed by placing the tube in vacuum, will the weight of the mercury in the larger arm raise the mercury in the smaller arm, or will it retain its level? A. The mercury will retain its level in both tubes entirely irrespective of atmospheric pressure. 2. Is there any substance which is a conductor of electricity, that can

not be destroyed by fire (except metal)? A. No: graphite is destroyed by fire only with great difficulty, and is a conductor, though not a good one.

(69) C. F. G. asks: Could any one get a good knowledge of law by studying at leisure time? What law books would be necessary, and where could he get such books? A. Study without court and office practice would be a very imperfect way of learning law. We can supply you with the books free by mail at regular prices. Blackstone's "Commentaries" is the first book to read. This we can supply for \$7.50.

(70) A. B. asks: When it is 12 o'clock noon at Washington what will be the time at other places? A. Ascertain longitude of other places, then for every 15 degrees west of Washington subtract one hour and for every 15 degrees east add same. For every 4 minutes longitude allow one minute time, and for every 4 seconds longitude allow one second.

(71) D. J. W. asks what process cast iron goes through, to give it the appearance of oxidized brass. A. A bronzed surface may be produced on clean iron surfaces or articles by exposing to the vapors of a heated mixture of equal parts of hydrochloric and nitric acids for a few minutes, and then heating the articles to about 600° Fah., to continue until the desired color appears. The objects are then to be cooled and rubbed with vaseline and heated until the latter begins to decompose. If not deep enough in color, repeat the last operation. A bronze colored oxide coating is also obtained by adding acetic acid to the above mixture, with variations in depth of color by varying the proportions of the acids. For the method of applying the "Tucker bronze" so much used on cast iron trimmings, see SCIENTIFIC AMERICAN of August 9, 1884, page 24. Also see "Techno-Chemical Receipt Book" for a variety of receipts for bronzing, browning, and blacking iron and other metals, which we can mail for \$2.

Enquiries to be Answered.

The following enquiries have been sent in by some of our subscribers, and doubtless others of our readers will take pleasure in answering them. The number of the enquiry should head the reply.

(72) Will you please inform me through the SCIENTIFIC AMERICAN if there is a spring, fountain, or lake where petrifying is done? And if there is such a place, where is it? And how long will it take to petrify a cubic inch?—K. C.

(73) Will you kindly inform me the electrical horse power and internal resistance of an accumulator whose capacity is 2 volts and 135 ampere hours? The rule? What is the resistance of an incandescent lamp, 16 candle power, 110 volts, six-tenths of an ampere? Is there not a difference in the resistance of an incandescent lamp hot and cold? I have a small arc light dynamo of five lamps capacity in my store. Can I charge a set of storage batteries with it while it is sup lying current for the lamps? If so, how must I connect them? What instruments must I use, if any?—C. W. F.

(74) I write to ask you if you can give me a little idea as to best way and method, together with the formulas for making bromide prints. I have long sought a good method for so doing, but have never succeeded with them to any satisfaction.—E. A. B.

(75) Please let me know what metals to use and what size strips, and how to put together to make a regulator bar for an egg drawer to an incubator to hatch eggs. Want to set it so that it will work from 100° to 108°, and if heat gets more, so that it will work valves open and turn check burner to lamp. Let me know particularly in regard to making bar, etc.—L. M. C.

(76) Will you inform me through your columns whether there is a relief valve made that will take off back pressure when exhaust is used to heat dry kilns with? Also whether a smaller sized pipe can be used in the kiln than the exhaust pipe from engine, without creating back pressure. How near should fire wall in furnace be to shell of boiler, and whether it should be curved on top or straight?—F. R.

(77) Will you kindly inform a reader of your paper, of a way to recover silver from waste paper and filtering cottons? Also how to take a negative, to use for an etching print direct from a photograph, without drawing.—G. A. T.

(78) Please give me a receipt or method for making gas burn red. I wish to use the receipt for our Christmas tree festivities.—D. A. R.

(79) Can we run a 30 h. p. engine, eight hundred feet from boiler, with 3 in. pipe, by burying it in sawdust or earth, and what pressure should we have on boiler to get 30 h. p. from a 12 by 18 engine? Give us any further information regarding the above that you can.—K. & W.

(80) We have lately erected an iron smoke stack which stands 10 or 15 feet higher than any of the surrounding buildings. Should any precautions be taken to protect it from lightning or to prevent it causing discharges dangerous to the attached and surrounding buildings?—G. A. S.

(81) 1. Is there any way of preventing patent leather from cracking? 2. Is there any way of closing the cracks if the leather is already cracked? 3. In intimately mixing dry powdered niter (6 parts by weight), sulphur (2 parts) tersulphuret of antimony (1 part), is there any danger of an explosion?—S. P. P.

(82) Would you please answer and explain the correct answer to the following problem? Does it require any more power to raise a weight from the ground by means of a rope while standing on a platform 30 feet high than it requires when you are on the ground close to it, provided the total weight raised and all other conditions remain the same in both cases?—J. C.

(83) We have had a discussion as to who invented the telephone. Please inform us as to who did invent it.—C. D. M.

(84) What is a wheel used by lapidaries for cutting hard stone or metals made of, and how is it used?—F. E. W.