

ENGINEERING INVENTIONS.

A sectional steam boiler has been patented by Mr. Lawrence W. Chadwick, of Milnes, Va. This invention covers an improvement on a former patented sectional boiler of the same inventor, and consists in the combination with the vertical pipes of vertical pendent water leg pipes depending from the upper chamber, and having a fire flue through the same and a lateral connection with the other vertical pipe.

A railroad tie has been patented by Mr. Arnold N. D. Delfs, of Bedford, Tenn. The bed pieces are made of beton concrete, so moulded as to have one or more iron rods or wires embedded in the material, extending through the whole length of the tie, to strengthen it, combining concrete, iron, and wood, to make a tie that is strong, sufficiently elastic, and at moderate cost.

A reversing gear for engines has been patented by Mr. Thomas Moore, of O'Fallon, Ill. A spiral shaft is journaled in disks on the shaft, having at one end a crank engaging with an eccentric disk, a spiral shaft passing through a sliding disk on the shaft, so by sliding the disk the spiral shaft is turned and its crank moves the eccentric disk and adjusts it as may be desired.

A car coupling has been patented by Messrs. William H. Adams and James D. Felthousen, of Albany, N. Y. The coupling head has flaring mouths and slots, with beveled forward ends in its upper and lower sides, the hook having a slot in its rear end, with two link seats in its throat and a projection on its lower side, so the coupling will sustain the draught strain securely, and the cars will couple automatically when run together.

MECHANICAL INVENTIONS.

A ring spinning frame has been patented by Mr. Jean B. Rolland, of Paris, France. This invention relates to parts adjoining the spindle, and has for its object to facilitate the stopping of the spindle when it is desired to join or piece broken threads, and to effect the thorough lubrication of the spindle.

A die block has been patented by Mr. Geo. W. Simmons, of Brockton, Mass. It consists of a series of cubical blocks with two central apertures crossing each other, and a bolt passing through one of the apertures, so the blocks may be reversed to present any of their faces to form a new surface.

A bolt dresser has been patented by Mr. Henry Egeberg, of Napa, Cal. It is a machine which can be more conveniently applied to the bolt than the ordinary stocks and dies, and is composed of two hinged jaws having on one end removable dies and at the other end an expanding screw provided with a spring cover, in which dies of different sizes may be kept.

MISCELLANEOUS INVENTIONS.

A surgical device for relief of hemorrhoids and similar affections has been patented by Mr. Lewis Chamberlain, of Tarborough, N. C. It consists of a seat formed with an ovoid, concave, and a central aperture, the size to be proportioned to the individual.

An anchor has been patented by Mr. Peter C. Herman, of Dartmouth, N. S., Canada. The flukes project from the bottom and top surfaces in such a way that, in whatever position the anchor drops, one of the flukes will always catch on the bottom.

A corkscrew has been patented by Mr. Martin F. Williams, of Bastrop, La. In combination with a bracket adapted to hold a bottle is a lever projecting over the bracket and a corkcrew held to turn in the lever, with various other novel features.

A detachable fur collar has been patented by Mr. Charles F. Butterworth, of Troy, N. Y. It is formed of a single piece and made to fold longitudinally, having its skin of increased fullness on one side of the fold, the lining strips being cut and folded to present reverse concaves.

A hydraulic jack has been patented by Mr. Elvath Hall, of Laitingtown, Glen Cove, N. Y. This invention consists of the adaptation of a former patented jack for lifting weights on a plane below itself, thereby greatly extending the applications and uses to which it may be put.

A two wheeled vehicle has been patented by Messrs. Enoch P. Hincks and George H. Johnson, of Bridgeport, Conn. It has a three-sided front, two of the sides of which are doors hinged in the rear to open on or toward the wheels, and the driver's seat is in the rear of the carriage.

A shaft loop has been patented by Mr. Edwin D. Moseley, of Shopiere, Wis. It is made of metal with a convex or rounded inner surface, and has a claw on its upper side, with a billet at the front and one on its under side, the claws being double or single according to the kind of buckle used.

A razor has been patented by Mr. James P. Tryner, of Denver, Colo. This invention consists in mounting one or more set screws on the razor guard, and loosely connecting them with the back of the razor, so that by turning a screw the blade may be adjusted in either direction.

A centrifugal machine for drying hides and skins, spent tan and other matters has been patented by Mr. Emil de Solminihac, of Pont Aven, France. It is a rotary skeleton drum of spaced apart bars having clips or means to stretch the hides or skins upon the circumference, the drum having a wirework lining.

A broiler has been patented by Mr. George B. Siegenthaler, of Wooster, Ohio. This invention provides for a broiler so made that it may be held down in a stove hole closer to the fire than is the case with ordinary broilers, thus enabling meat to be broiled or breadtoasted in less time.

A substitute for caoutchouc has been patented by Mr. John J. Haug, of St. Petersburg, Russia. It is prepared by boiling skins and glycerine under pressure, and mixing with the mass obtained glycerine and chromate or bichromate of potash or other salt acted on by light, with or without the addition of ground cork, ox gall, and color.

A cartridge implement has been patented by Messrs. William G. Jesse and George E. Paxton, of Georgetown, Ky. It is a simple device for removing spent caps from discharged cartridge shells, and reloading and recrimpling the same, the parts being easily separable, so that the apparatus may be conveniently carried by spongesmen in the pocket.

A telegraphic transmitter for unskilled operatives has been patented by Mr. Theodore Ames, of Hackensack, N. J. By this apparatus a person wishing to telegraph depresses the corresponding keys in the same manner as in operating a type writing machine, but the receiver must have a knowledge of the Morse characters.

A corrugated pan for salt making has been patented by Mr. Joseph A. Cook, of Auburn, N. Y. The pan is made of boiler plates or cast sections to be bolted together with longitudinal corrugations, and the salt crystals are drawn from the bottoms of the corrugations by endless belts of cloth or other suitable material, to which are attached cross cleats.

A gas making machine has been patented by Messrs. Abel and Thomas Henning, of Sacramento, Cal. This invention covers novel details of construction and arrangement for an automatically working machine to make gas out of gasoline, feeding itself so as to give a steady supply, and so there will be no danger of any gas escaping.

A drain and sewer pipe has been patented by Messrs. John Cooper and Henry Bieg, of Brooklyn, N. Y. The pipe section has at one end a flange forming a socket with internal annular grooves, and at the opposite end external annular grooves and a tapered neck, so the joints can be well cemented, while the pipe is very strong and durable.

A transom lifter has been patented by Mr. Samuel A. Bishop, of Smithport, Pa. This invention relates to devices for opening and closing transoms, skylights, and other windows that are out of reach, and is a device for holding the transom when closed, to apply power advantageously in opening it, and to hold it braced in the open position.

A brick kiln has been patented by Mr. Thomas M. Bannister, of Lone Pine, Cal. This invention provides for furnaces arranged in the front and rear walls of a brick kiln, with top openings having tilting automatically closing valves, and car tracks arranged along the front of the furnaces, with various novel features.

A fruit jar has been patented by Mr. John J. Quiuby, of Armonk, N. Y. It has a long neck, a shoulder at the bottom of the neck, and two diametrically opposite quadrant ridges a short distance below the shoulders, with a cover having a shoulder and similar ridges to hold the cover on the jar, and close very tightly, to make the jar air tight.

An improved brick wall or pavement forms the subject of a patent issued to Mr. Louis R. Sassinot, of New Orleans, La. The invention consists in forming walled receptacles or chambers by arranging certain of the bricks edgewise, and afterward lining the chambers with a plastic substance, and filling them with a concrete mass having a waterproof surface.

A hame has been patented by Mr. Daniel H. Grant, of Raymore, Mo. It is made in sections arranged to be adjusted edgewise to a greater or less curve to suit the collar and the shape of the horse's neck, the central section having a removable plate and eye or staple for holding the hame tug, the staple being adapted to be adjusted for raising or lowering the draught.

An apparatus for securing animals while being shod has been patented by Mr. James H. Lewis, of Bismarck, Ill. It is made of hinged beams, with posts and braces, with hearings to receive rods attached to the ends of a strap or straps, one of the rods having a ratchet wheel, pawls, and a lever, for tightening and loosening the straps, and supporting or releasing the animal.

A projector stopper for bottles and flasks has been patented by Messrs. Georges Pinaud and Pierre Guichard, of Paris, France. It is a system of stopper and cork to use with all kinds of bottles or flasks, for projecting the liquid, by pressure applied to a hollow India rubber ball fixed to the top of the stopper, whereby the liquid may be projected in one or more jets according to the number of holes in the ball.

A means for assisting persons in putting on outside wrappings has been patented by Mr. Greenup Sutton, of Rushville, Mo. It consists of a frame-work with clamping jaws for holding the coat collar, a treadle for operating the jaws, and hooks or supports for distending the sleeves of the garment, the apparatus being especially designed for feeble persons, cripples, or those not well able to wait on themselves.

An air pump has been patented by Mr. Hermann Meckert, of Hannibal, Mo. It consists of an outer rigid metal cylinder and an inner cylinder of flexible material, impervious to air, secured to one end of the outer cylinder and to a piston working therein, so that when the inner cylinder is being extended air is drawn into it, and by compressing the cylinder the air is compressed and expelled.

A turn table for horse cars has been patented by Charles F. Bollwitt, of New Orleans, La. It has a pivoted locking bolt to engage with catches on the platform surrounding the turn table, a lever being under the locking bolt, which can be shifted by devices operated automatically by the turning of the turn table, and adjusted so as to lock the turn table in any desired position.

An apparatus for distilling low wines has been patented by Messrs. Nels Peterson and Henry Sommer, Jr., of Davenport, Iowa. There is a receiving tub over the still, a charge pipe communicating between the tub and the still, a vapor pipe communicating with the stock tub, and various other novel features to better adapt a distilling apparatus to the manufacture of vinegar.

A truck skid for railroad cars has been patented by Mr. Adolphus E. Kiel, of Montrose, Iowa. It is fitted to slide in ways beneath the car, and tied to it by a chain connected at one end to the skid by a bail,

having a ring at the other end, which slips along a bar fixed to and running crosswise of the car, so the skid may be run out for use at either side of the car, and may be run into the car to receive the load and out again to discharge it.

NEW BOOKS AND PUBLICATIONS.

THE MAGAZINE OF ART (Cassell & Co.), New York, for October is rich in papers and pictures for artists and art lovers. The head of Christ, from a cartoon by Lionardo, illustrates a good article by Julia Cartwright. It contains descriptive and critical text, with sketches of some of the works in the last Royal Academy exhibition. There are several historical articles on art and artists, and the usual good summary of art news in the concluding pages of the number.

SCRANTON, PA., CITY DIRECTORY. Lant & Silvernail, compilers, Valatie, N. Y. The review of the city's growth and the exhibition of its business given in the preface furnish a chapter worthy of remark, even in this fast growing age and country. In 1860 the population was but 9,223; in 1884 it had grown to 67,062. The city is located in the center of a great anthracite coal field, and coal, iron, steel, and lumber make the principal staples, which, with the most ample transportation facilities, seem to give good promise of a continuous rapid growth in the future.

HARPER'S MAGAZINE.

The October number is well stocked with interesting matter, and with its sixty well executed engravings presents a very attractive appearance. The pen of Mr. John Macmullen, who has for a lifetime been engaged in educational work in this city, has produced a most interesting article on the founding of Kings College, which title was the name of Columbia College previous to the Revolution. The name was changed in 1784. Mr. Macmullen gives some very interesting reminiscences of the college and its presidents previous to the Declaration of Independence. According to the writer, the earliest mention of Kings College to be found is in 1703, when the rector and wardens of Trinity Church were called upon by Lord Cornbury, then Governor, to know what part of Kings farm, then vested in Trinity Church, had been intended for the proposed college. To the alumni of Columbia College this well written article will have peculiar interest.

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.

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

Of the very choicest tobacco leaf—choicest because the firm can command it—is made Blackwell's Durham Long Cut. Gentlemen may regale themselves with a pipe, or roll it into fragrant cigarettes. Either way it is the most luxurious of all tobaccos. Trade mark of the Durham Bull.

1 H. P. Horizontal Steam Engine for sale. New; fitted with governor and all fixtures; cost, \$80.00. Will sell at big discount. Address E. T. Shaw, Beverly, Mass.

Blake's Patent Belt Studs, the strongest and best fastening for Rubber and Leather belts. Greene, Tweed & Co., N. Y.

All books and everything relating to electricity cheap. School of Electricity, N. Y.

For Sale.—A patent right of Weighing Scales for any purposes. Address T. Ziersch, Dedham, Mass.

For Sale.—Eighteen volumes of SCIENTIFIC AMERICAN—1866 to 1874 inclusive. Address Box 244, Lancaster, Pa.

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Mechanics and others send for Prospectus. Sons of Labor League, Canton, O.

Shafting For Sale.—Excellent 2d hand, with its couplings and coupling bolts all fitted, true, and polished; with or without hangers, as customer may prefer; any part or all; 14' 4"; 24' 3 1/2"; 21' 2 1/2"; 24' 2 1/2"; 18' 2 3/4"; 12' 2 1/4"; 16' 1 1/2"; 32' 1 1/2"; 58' 1 7/8"; 27' 1 1/2". Send for full particulars and prices per lb., stating size and amount required. Forsyth Machine Co., Manchester, N. H.

For Sale.—Two new, first class engine lathes; each back-g'd, sc-cut, rod-f'd, power cross f'd, compound rest, full counter, friction pulleys, center rest, face plates, etc. One 16' x 26"; \$625; one 16' x 20"; \$416. E. Cornish, Manchester, N. H.

Required.—Cash capital of \$5,000 to advertise and introduce a valuable patented invention for saving power and economy of space in all kinds of Belt Driving machinery. This patent has already been adopted by one of the principal electric light companies of this country, and is in use in England and France. Attention of a manufacturer with the above amount to invest is especially solicited to this splendid opportunity for a good investment. For full particulars apply to S. S. Saper & Co., No. 134 Pearl Street, New York.

Cotton, Rubber, and Leather Belting. Steam Engine Packing of all kinds. Greene, Tweed & Co., 118 Chambers St., New York.

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. Bake 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.

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Brush Electric Arc Lights and Storage Batteries. Twenty thousand Arc Lights already sold. Our largest machine gives 65 Arc Lights with 45 horse power. Our Storage Battery is the only practical one in the market. Brush Electric Co., Cleveland, O.

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

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

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

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

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

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.

Barrel, Keg, Hogshead, Stave Mach'y. See adv. p. 173.

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

Solid and Shell Reamers, durable and efficient. 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.

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

The Porter-Allen High Speed Steam Engine. Southwark 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.

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) M. J. B. writes: Can any of your correspondents inform me how and where an eel was generated? A. The function of reproduction in the eel, and the general structure of the organs concerned in it, correspond entirely with the same points in our other ordinary osseous fishes. Much mystery has been attached to them in past ages, but the advance in accurate knowledge of structure has totally dispelled it. Eels breed as do cod, or perch, or shad. The first accurate description of the female organs was made by Mondini, in 1777, in a paper entitled "De Anguillae Ovaris," which was published in the proceedings of the Bologna Academy. But the structure of the male organs was not fully stated or known until they were worked out by Syrski, in the proceedings of the Imperial Academy of Vienna, in 1874. The one point which doubtless has helped in great degree to continue the mystery is the extreme minuteness of the eggs. They have only about one-tenth to one-thirtieth of the diameter of the eggs of other fishes, and in the leaf-like folds of the ovaries are constantly associated with fat globules, from which it is not easy to distinguish them. The spermatozoa are even very much more minute, and can scarcely be detected except by a practical observer, using a microscope of high power. The male eels are much smaller than the females, and never ascend into fresh water; the eggs are hatched in the sea or brackish water, and the young ascend the rivers in myriads, climbing waterfalls most wonderfully to do so.

(2) F. A. L. asks: What will take off the black stain caused by rubbing a parlor match on a

bronze match box? A. Washing with plenty of clean water, accompanied with mechanical friction, is generally considered the best means of cleansing bronze articles.

(3) O. J. P. asks: Is it best to oil belts running machinery—dynamo for instance? If so, what kind of oil is best, and should it be put on inside (next pulley) or not? A. A little neatfoot oil once in a while, to keep the leather from getting too dry; use as little as possible, on both sides, and give it time to be taken up by the leather.

(4) W. D. S. asks if a diamond shaped block can be made of one piece, having eight diamond faces. A. If you intend to have the diamond shaped faces flat and all of one size, we think it cannot be done.

(5) C. P. writes: I have fixed up an old mahogany desk; after scraping I rubbed it with raw oil and shellac, which leaves it streaked and with a dull surface; what shall I use for a finishing polish? A. Mix equal parts of thick alcoholic shellac, varnish and boiled linseed oil, and shake well together before using. Rub a small quantity of this mixture vigorously over the wood until the desired polish is secured.

(6) W. H. W. says: I see in your paper of August 2, you say 6 square feet of fire surface for 2 inches by 4 inches cylinder. Now for 6 square feet fire surface how large a horizontal boiler should I have, that is, what diameter, what size tubes, what length tubes, and what thickness iron for boiler? A. For your boiler, a cylinder 12 inches diameter, 2 1/2 feet long, with 12 tubes 1 1/4 inches diameter, shell 3/8 inch thick. Heads 1/2 inch thick, tubes in lower half of heads. A miniature of the large horizontal tubular boilers.

(7) J. C. R. asks: How many foot pounds can be realized from one cubic foot of water made into steam and used through a steam siphon? A. From 3,000,000 to 4,000,000 foot pounds theoretically. You will probably not realize more than one-fifth of this in a steam siphon.

(8) C. M. W. asks about a formula for removing blackheads. A. On page 52 of the SCIENTIFIC AMERICAN for January 28, 1882, there is given very fully a description of the method used for the extraction of comedones. The articles there given are not injurious to the skin.

(9) O. S. B. asks how much pressure he would gain under the following conditions: A tight cast iron box is filled with air of 60° temperature, at a pressure of 30 pounds, and the intention is to heat it to 200° of heat. A. Air at 60° and 30 pounds pressure, and of a given volume, if heated to 200°, will increase the pressure to 38 pounds.

(10) H. W. T. asks how to construct a dumb waiter or elevator to elevate one or two hods of coal, say 50 pounds, from cellar to next story above with little exertion of strength. A. These elevators are nothing more in construction than a sort of hung platform or box partly balanced by weights, which most good carpenters understand. We recommend you to consult with some builder in your city. We cannot illustrate it in Notes and Queries.

(11) E. T. F. says: I wish to have some bells cast; how can I make my models out of wood, in order to obtain the desired weight in iron? A. If there are no core prints, the casting will weigh 16 times the weight of the pine pattern, if solid. For core prints and cores deduct 0.26 of a pound for each cubic inch from the completed weight of the whole.

(12) G. H. says: I want to make a telescope with a 3 inch object glass, 48 inch focus. What length should the body be, and would brass tubing an eighth of an inch thick be strong enough? What diameter should the focusing tube be and what length? A. Make the body of your telescope about 42 inches in length, and your focusing tube about 10 inches in length and 1 1/2 inches in diameter. A tube one-sixteenth of an inch thick would answer for the body.

(13) A. A. asks (1) how to make a good and reliable rubber cement for soling and mending rubber boots. A. Dissolve pure, unvulcanized rubber in sulphite of carbon or in benzine of turpentine. 2. What would be the most substantial way of patching rubber, that is hollow with great pressure, like a hose? A. Clean the surfaces thoroughly, apply the cement to the patch and to the surface to be patched, and hold the patch in place with considerable pressure until the cement is set. 3. Could I not dissolve crude rubber with odds and ends of vulcanized rubber and mix with sulphur and other articles, so as to make a solid dough or the composition hard and durable for soles for rubber boots at any thickness I desire? A. Vulcanized rubber cannot be entirely dissolved. It may be softened by any of the solvents of unvulcanized rubber.

(14) S. F. asks how to draw a picture on glass, for magic lanterns—the substances to be used for different colors and the way to use them. A. Very fine pictures may be drawn for the magic lantern with an ordinary lead pencil on ground glass, afterward varnishing the glass to render it transparent. If you desire to make colored pictures for the lantern, you may use any of the transparent tube colors, mixing them with varnish. You will find information on this subject in SUPPLEMENTS, No. 423, 473, and 424.

(15) A. A. S. writes: I recently attended a lecture on "The Great Atmospheric Weight" on the human being. Suppose a man could be so arranged as to have the air entirely exhausted from around his body, can you tell what his feelings would be? Appliances being arranged so that he could breathe. A. He would feel like bursting, if there were time enough of sensation to have any feeling, for the air inside the body would distend all and rupture a great many of the cells.

(16) K. O.—We know of no electric railway velocipede. We think it would hardly be practicable unless you are able to generate current by means of a dynamo as in electric railroads. We do not know that the limit of speed for electric tricycles has been

attained. It depends, of course, upon the power of the engine and the currents applied to it. It will probably require a one horse power motor to drive an ordinary tricycle.

(17) W. C. M.—Benzine or gasoline can be congealed by means of freezing machines, several of which are manipulated by means of ether and ammonia. As far as we can ascertain, the process is not a practical one, as there is no commercial demand for these articles in a congealed form. No acid would be necessary to cause it to resume its normal condition. The action is due to a frigorific and not to an emulsifying agent.

(18) J. S. T. asks if on the coast of this country such fishes are to be caught as the imported celebrated Swedish so-called "delicacies anjovis," and if so, where? A. The menhaden or alewives, found mostly on the coast of Maine and Nova Scotia, are very similar, although usually they are not so choicely put up. 2. Do you know any factory in this country preserving such fishes? A. There are several factories "down East" for putting up these fish, both as anchovies and sardines.

(19) J. W. T. asks (1) for a cement or paste to put patches and soles on rubber boots, and how to apply it so as to be durable. A. Use rubber cement which is, by digesting caoutchouc, cut in fine shreds, with about 4 volumes of naphtha in a well covered vessel for several days. Naphtha should not be used indoors. 2. Is there a work that treats on the shoeing of interfering horses, and if so, where can I get it? A. There is a work by Russell on Horseshoeing, which cost 75 cents, that we can furnish you with.

(20) W. L. asks how to make oxymuriate of antimony, such as used by dyers as mordant for cotton. A. The best method for preparing the oxymuriate of antimony is to boil the commercial sulphide of antimony in fine powder with hydrochloric acid, till the liquid is saturated, hydrogen sulphide escaping all the while; leave the solution to cool; add to it, with agitation, small portions of water till it begins to show turbidity, then filter; mix the filtrate with 5 to 10 times its bulk of water, and wash the resulting precipitate thoroughly with cold water by decantation or on the filter. The addition of a small quantity of water and filtration before the complete precipitation is necessary, in order to remove a small quantity of hydrogen sulphide, which always remains in the acid liquid, but is carried down by the first portions of oxymuriate precipitated and thereby removed; if allowed to remain, it would cause the precipitate to turn yellow.

(21) A Reader writes: 1. I have two light yellow straw hats I wish to dye, one brown and the other dark blue. Will the Diamond dyes do for the purpose, and will the hats be as glossy as new? A. The Diamond dyes are not satisfactory for the purpose mentioned. For brown, dye with Bismarck brown, then immerse in a weak solution of hydrochloric acid to fix the color. For dark blue use a strong extract of indigo. The gloss is produced by varnishing with shellac. 2. How and where are plant bulbs obtained? A. Of agricultural supply and seed stores.

(22) J. T. W. writes: 1. Will the cure, formula, or receipt for removing pimples and blackheads, contained in the SCIENTIFIC AMERICAN for July 5, question 8, injure the skin? A. It is not injurious. 2. Is there any receipt for making imitation gold that will take a good color, and not tarnish, and how should it be melted? A. Oroid gold is made by taking 100 parts of pure copper, 17 of pure tin, 6 of magnesia, 9 of tartar of commerce, 3 1/2 of sal ammoniac, and 1 1/2 parts of unslaked lime. The copper is first melted, and the other substances (except the tin) added, a little at a time, and the whole well stirred for 30 minutes, so as to produce a perfect mixture, when the tin is thrown in and stirred round until melted. The crucible is then covered and the fusion kept up for 25 minutes, and the scum taken off, when the substance is ready.

(23) H. M. writes: I am told that a wheel grease is or can be made from "dead oil," a residue from distillation of coal tar, by some process of using lime with it. Can you give me any light on the subject? A. Axle grease is produced by a combination or variety of saponification between lime and resin; this yields a mixture too hard for use, and consequently it is thinned by means of dead oil, and thus made pliable. About one part of pure slaked lime is used with 10 parts of the resin oil, and a sufficient quantity of the dead oil is added. The latter is generally mixed with a little lime and water first, and then gradually mixed with the resin oil, small portions being used at a time, and the mixing continued until the proper consistency is reached.

(24) M. H. F. asks as to a few methods used in making muclage. A. A good muclage for labels is made by macerating 5 parts good glue in 18 to 20 parts water for a day, and to the liquid add 9 parts rock candy and 3 parts gum arabic. The mixture can be brushed upon paper while still lukewarm. See also the article on Cements, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 158.

(25) C. C. B. asks how to tin small articles, and the price of the material used. A. The "small articles" are presumably of iron. They should be washed in soda or potash water to free from oil, stirred in a bath of muriatic acid, in which scrap zinc has been dissolved, the acid being then drawn off and diluted with water so as to be only slightly acidulous to the taste. Skim the articles from the acid bath, and throw them into a box of powdered resin. Then throw them into a bath of melted block tin; let them remain a few seconds, lift them out with a skimmer, and throw them against a screen of sheet iron to free them from superabundant tin. Good black "strait" or "Banca" costs about 22 cents a pound by the pig.

(26) E. S. K. asks the best way of laying a street railroad on an improved roadway. Have about two miles of track, and have considerable trouble on account of its spreading. A. The practice here for street railroads is to use ties with stringers, all sawed timber, with knees of cast iron spiked to tie and stringer inside and outside of stringer. It is not necessary to have the ties sawed. Small logs with a place adzed off

at each end; or if the stringers are sawed to a gauge size, the ties may be notched to receive the stringers, and a locust pin driven through stringer and tie.

(27) C. L. H. asks how to construct a spur gear pattern, proportion 6 to 1, large gear 36 inches diameter, pinion 6 inches diameter; these gears to be proportioned so as to stand the strain of one engine 6x8 inches, pressure of steam 130 pounds, revolutions per minute 350. How large boiler should two steam cylinders have—6x8, revolutions per minute 300, exhaust into the stack? A. For a pinion upon the shaft of the engine, make pinion 7 inches diameter, pitchline 6 inches diameter, bottom of teeth 4 1/4 inches diameter, thickness of teeth at pitch line one-sixteenth inch less than space between the teeth; width of pinion, 3 inches; multiply by 6 for number of teeth and diameter of pitch line for large wheel; other sizes same as for pinion. For further details we refer you to a small work, "A Practical Treatise on the Teeth of Wheels." You will need about a 40 horse boiler.

(28) A. M. writes: How or in what form can ammonia be employed to raise bread? Is it as carbonate, dissolved in water cold or hot, and has it to be employed in connection with other ingredients? What proportion to the flour? A. By consulting the article by Dr. Graham on "The Chemistry of Bread Making," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 222, you will get at the whole theory of raising bread by means of carbonic acid. The ammonium carbonate is the substance generally used, dissolved in cold water.

(29) H. J. asks (1) the shortest diameter of railroad curves. A. 400' radius on main tracks; 200' radius for terminals—not much used. 2. The largest possible difference of level of two coupled cars? A. About 1 foot with special links; a few inches only with common links or couplings. 3. The maximal compression of buffer springs? A. Spiral springs may be compressed till the wires touch; rubber springs vary widely, according to quality.

(30) G. S. S. asks if there is a tool made for cutting tubes out of a boiler; if not, what kind of a chisel is best to use? Size of tubes, 3 inches outside diameter. A. If the tubes can be dropped to the hand hole, they may be cut off inside of the head by driving an ordinary thin cold chisel through the tube all round. Drop the tube, and pull out at the hand hole. Compress the expanded end of the short end in the head, with calking tool or blunt chisel, and drive it in. If a tube is to be taken out through the tube hole in the head, the end may be compressed with a blunt chisel applied around the end of the tube, and with a narrow cape chisel carefully cut a groove; or in other words, slit the end of the tube in 3 or 4 places, when it will easily compress under the blunt tool so as to allow of its being driven out of its bearing at the other end of the boiler, when it can be drawn out.

(31) J. W. F. says: I am dredging in salt marsh and have to boat my fresh water for boiler a long distance. What is the best form of condenser to condense salt water, and what size is required to furnish a 25 horse power boiler? A. We understand you wish to save the exhaust steam from your dredging engine, which for your 25 horse power boiler will probably use 100 gallons fresh water per hour. For the condensation of the exhaust steam use a coil of wrought iron pipe, called in the pipe trade a pedestal coil, which may be made of 1 inch pipe branching from a header of a caliber equal to the exhaust pipe, with enough pipes from the header to also equal the exhaust pipe area. The coil should contain 400 feet of 1 inch pipe, or 10 pipes wide, 6 pipes high, and 7 feet long. Place the coil in a tank, and circulate the salt water through the tank by means of a pump.

(32) A. B. says: Replying to a correspondent in your Notes and Queries of a recent number, you state the size of a balloon required to lift 100 pounds, filled with pure hydrogen, to be 12 feet in diameter. Estimating on that basis, I find the size required to lift 500 pounds to be 21 feet in diameter, and given the weight of the materials, oiled silk, cords, netting, baskets, etc., at 150 pounds, two passengers 350 pounds = 500. 1. Am I approximately correct? A. Yes. 2. Would it be practicable to condense hydrogen into a suitable receptacle with a hand pump when I wish to descend, instead of allowing it to escape, and allow it to expand into the balloon again when I wish to rise, thus dispensing with ballast? A. We think not. The weight of pump and tank together with their bulk will probably be found an insuperable objection. 3. Could the entire contents of the balloon be condensed when the ascent is finished, and stored for future use? A. Yes, but would cost more than the gas is worth. 4. How much time would it be necessary to occupy in condensing the contents to avoid excessive heat in the reservoir, and excessive cold when expanding? A. This depends upon the size of the pump and power used as well as the time. It is very slow and tedious work by hand power. 5. What is the best material for confining hydrogen under pressure? A. The best material for confining the gas is iron in cylinders. Answer on page 43, July 19, 1884, is correct; a balloon is not always a ball, but holds more than a globe of a given diameter. The rule for lifting power of a balloon is also found in Haswell, page 218, new edition.

(33) C. L. desires to know (1) if there is any place in New York city where I could receive instruction in electrical engineering, on evenings during the winter? A. There is no place where electrical engineering is taught in New York. 2. Also is bee farming in California considered a profitable business, and does it pay with moderate capital? A. Bee farming in California is a profitable enterprise if suitably managed. Helen Hunt gives a favorable account of it on page 814 of the Century Magazine for October, 1883, under the title of "Out Door Industries in Southern California." Success depends upon the individual. The outlay need not be great.

(34) H. H. asks how much power and how large a boiler it would take to run a skiff 15 feet long, and 3 feet wide in its widest place. The skiff is to weigh about 300 pounds without machinery, and to travel about 8 miles an hour. A. Engine 2 1/2 inches cylinder and 4 inches stroke. Propeller 16 inches to 18

inches diameter, and 26 inches to 28 inches pitch. Boiler to have about 65 foot fire or heating surface.

(35) G. B. S. asks: Will you kindly inform me what quantity of liquid slate it requires to make a blackboard four feet high by sixty feet long, and how it is used and quality? A. The Harvard liquid surface slating, to which we presume you refer, is sold in condition to be applied by the brush, and 1 gallon of the paint is sufficient for 2 square yards.

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

Q. & Co.—Bole is a fine, compact, argillaceous earthy mineral which occurs in amorphous masses of various colors, as yellow, black, brown, and bright red, all probably derived from oxide of iron. The substance is probably disintegrated basalt. The expression is quite loosely applied, and the substance used by the North American Indians to make their pipes from was designated as bole. For the putz pomade any soft, fine clay will answer.

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