

ENGINEERING INVENTIONS.

An apparatus for cooling car axle boxes has been patented by Mr. Jerome Eugene Tourne, of New Orleans, La. It consists of pipe connections whereby the exhaust steam is made to flow to the several car axle boxes, and through which also a powerful current of live steam may be directed if desired.

A railway switch has been patented by Messrs. Hugh C. Cannon and Joseph P. Canty, of McArthur, Ohio. It has a radially swinging section, spring tongues, lever, bell cranks and pull rods, making a novel construction of frogless switch, designed to be more effective and reliable than similar devices have heretofore been.

MISCELLANEOUS INVENTIONS.

A holder for collars or cuffs has been patented by Mr. Theodore Gentsch, of Brooklyn, N. Y. It is a simple holder, quickly and easily applied, and will securely attach either a collar or cuff to the proper band of a shirt.

A peach stoner has been patented by Mr. James H. Smith, of Little Rock, Ark. It is strong and simple in construction, and designed to work with great rapidity and certainty, being calculated to stone from three and a half to four bushels of clingstone peaches per hour.

A combined mitten and sleeve for garments has been patented by Mr. George M. Wright, of Shelbyville, Ind. It is made of rubber or similar material, and consists of a sort of glove, so formed and attached to a sleeve that it may be folded back upon the sleeve to constitute a cuff.

An adjustable chair back has been patented by Mr. George J. Shultz, of Avoca, N. Y. Its construction is such that by loosening certain nuts the side bars may be elevated or depressed, and the adjustable section may be conveniently clamped in any position to which it has been moved.

A scroll saw has been patented by Mr. William M. Moore, of Empire City, Col. It is cylindrical, being a round bar with cone shaped and spirally arranged teeth, and spiral grooves impressed into the bar, so that it may be made to follow a great variety of curves running in different directions.

A straw board lining machine has been patented by Mr. Ebenezer Spooner, of New York City. It is for pasting thin paper on sheets of straw board, and is so made that the paste is automatically applied to the web of the paper, and the board and lining material carried forward so that excessive moisture is extracted, and the boards cooled before delivery.

A broom holder has been patented by Mr. Alberto Finks, of New Berlin, N. Y. It is formed of a metal plate, that may be quickly struck or stamped out at one operation, and then bent to proper shape, so that it will rest close against the wall, making a device into which the broom handle can be easily forced, and thus be held out of the way.

A cigar perforator has been patented by Mr. Leman C. Miner, Jr., of Brooklyn, N. Y. Combined with a slotted and apertured casing is a needle working in guides therein, and a spring-actuated lever, having one of its arms projecting through the casing and the other connected to the needle, with other novel features, to facilitate giving cigars a free draught.

A medicated calcimine has been patented by Mr. Thomas E. Costello, of Brooklyn, N. Y. It consists of whitening or Paris white, corrosive sublimate, salicylic acid, and solution of Irish moss, to be applied with a brush in the usual manner, when it dries rapidly without showing laps or seams, and makes a good disinfectant and insect destroyer.

A horse detacher has been patented by Messrs. Walter L. and Philip M. Mitzel, of Felton, Pa. Combined with a singletree having spring-acted bolts at its ends is a retracting cord and a metal bar carrying pulleys for the cord and connected to the singletree and its ferrules, whereby the driver can readily disconnect the traces of a fractious horse from the singletree of the carriage.

A grain scourer has been patented by Mr. David Etnier, Jr., of Mount Union, Pa. Combined with a conveyer and cylinder, and fixed and rotating rubbers, is an annular hood or case surrounding the rubbers, and a brush fastened on the movable rubber, with other novel features, whereby the kernels of the grain will be freed from fuzzy or light particles and scoured properly for grinding.

A tool for making spiral springs has been patented by Mr. Johan T. B. Siden, of Nybo, Waldo, Sweden. It consists of a pair of tongs with its legs united at one end and having threaded jaws, in combination with a holder adjustable in a keeper having a sliding connection with one of the legs, to facilitate the winding or coiling of hardened steel wire into cylindrical or conical springs.

A photographic print washer has been patented by Mr. John T. Long, of Menomonee, Wis. It is a rocking tray, pivotally supported in the lower part of the frame, with forked arms for engaging studs projecting from the side of the print-washing tray for communicating an oscillating motion from the rocking tray to the swinging tray, with automatically operated valves, etc.

A safety mechanism for torpedo tubes has been patented by Mr. Emil Kaselowsky, of Berlin, Germany. This invention provides a mechanism designed to obviate the dangers of admitting compressed air to the tube to discharge the projectile before the cover has been removed, furnishing also the means for releasing or withdrawing the brake blocks or retaining studs.

A wheel and axle has been patented by Mr. John Pettinger, of Santa Barbara, Cal. In combination with a fixed axle are sleeves turning loosely therein and carrying hubs, with a continuous tubular

spindle passed through the sleeves and turning freely therein, with other novel features, making a construction that is very cheap, and in which extreme lightness is combined with the greatest strength.

A stove grate has been patented by Mr. Horace Hatchman, of St. Louis, Mo. It consists of an oblong frame in connection with a series of grate sections or fingers supported at their lower ends by hooks on a cross bar of the frame, and at their upper ends by arms projecting from the upper bar of the frame, being applicable to both heating and cooking stoves, and showing the fire all around if applied for such purpose.

A yard for ships has been patented by Mr. Duncan Campbell, of Fort Cauley, Auckland, New Zealand. It is a tubular yard formed of sheet metal, slotted in the upper and lower side, with a central connecting web or plate extending throughout the entire length of the yard, the ends having removable caps, and rods extending through the upper and lower part of the yard, opposite the slots, to receive double eyes attached to the sails.

A machine for making sheathing paper has been patented by Mr. William H. H. Childs, of Brooklyn, N. Y. It has two rollers, with one or more pieces closely fitting on their upper and inner surfaces, forming with such surfaces a trough or hopper arranged at intermediate portions between their ends, with other novel features, whereby the coating material may be applied more conveniently, as desired, to any part of the paper.

A cordage spinning machine has been patented by Mr. Elisha M. Fulton, of New York City. This invention covers a combination with a spinning or twisting and spinning mechanism of a series of chains, one in front of the other, instead of a single chain, as heretofore, for passing the sliver to the spinning mechanism or its flier, the chains being armed with pins to comb, draw, and take hold of the sliver, and made to travel at different velocities, in order to work a heavier sliver and give more perfect control of the draught. The invention also facilitates the running of the spinning mechanism at a high rate of speed, while producing a uniform cord.

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.

The chief improvements in the 1885 "Trautwine" were those relating to railroad matters. "Rail Joints" and "Turnouts," "Locomotives," "Cars," and "Railroad Statistics" are new. "Trestles" and "Turn Tables" are greatly enlarged.

For Sale—Machine shop plant, in operation. Best tools. Address Chas. W. Griggs, 175 Dearborn, Chicago.

Wanted—One pair of power shears, capable of cutting 2 inch square iron. They must be in good condition. Address the James Cunningham, Son & Company, Rochester, N. Y.

Engines and boilers, 1 to 4 H. P. Washburn Engine Co., Medina, O.

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The Australian-American Trading Co., 20 Collins St., West Melbourne. Sole agencies for American novelties desired. Correspondence solicited. Care of Henry W. Peabody & Co., Boston.

Wanted—A competent man to take entire charge of a factory where metal is cut, stamped, spun, and drawn into various forms. Only parties of practical experience and undoubted mechanical ability need apply. Answers must contain full details, with name and references, otherwise they will have no attention. Address L., P. O. box 2304, N. Y. city.

We desire the services of a thoroughly competent man to take the place of our present secretary, who is obliged to retire on account of ill health, and to assist in general management. Experience and first-class business qualifications will be required, and to the right person excellent inducements will be offered. Great Western Mfg. Co., mill furnishers and manufacturers of general machinery, Leavenworth, Kans.

The Knowles Steam Pump Works, 113 Federal St., Boston, and 93 Liberty St., New York, have just issued a new catalogue, in which are many new and improved forms of Pumping Machinery of the single and duplex, steam and power type. This catalogue will be mailed free of charge on application.

For the latest improved diamond prospecting drills, address the M. C. Bullock Manf. Co., 163 Lake St., Chicago, Ill.

Link Belting and Wheels. Link Belt M. Co., Chicago.

The *Railroad Gazette*, handsomely illustrated, published weekly, at 73 Broadway, New York. Specimen copies free. Send for catalogue of railroad books.

Protection for Watches.

Anti-magnetic shields—an absolute protection from all electric and magnetic influences. Can be applied to any watch. Experimental exhibition and explanation at "Anti-Magnetic Shield & Watch Case Co.," 18 John St., New York. F. S. Giles, Agt., or Giles Bro. & Co., Chicago, where full assortment of Anti-Magnetic Watches can be had. Send for full descriptive circular.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

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Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. \$100 "Little Wonder." A perfect Electro Plating Machine. Sole manufacturers of the new Dip Lacquer Kristaline. Complete outfit for plating, etc. Hanson, Van Winkle & Co., Newark, N. J., and 92 and 94 Liberty St., New York.

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For Sale—Patent No. 360,493. A new Improved Dumping Wagon. For information address John Wagner, Olean, N. Y.

Timber Gaining Machine. All kinds Wood Working Machinery. C. B. Rogers & Co., Norwich, Conn.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Pumps for liquids, air, and gases. New catalogue now ready.

Curtis Pressure Regulator and Steam Trap. See p. 45.

Iron, Steel, and Copper Drop Forgings of every description. Billings & Spencer Co., Hartford, Conn.

We are sole manufacturers of the Fibrous Asbestos Removable Pipe and Boiler Coverings. We make pure asbestos rods of all kinds. The Chalmers-Spence Co., 419 and 421 East 8th Street, New York.

Universal & Independent 2 Jaw Chucks for brass work, both box & round body. Cushman Chuck Co., Hartford, Ct. Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

60,000 Emerson's 1886 Book of superior saws, with Supplement, sent free to all Sawyers and Lumbermen. Address Emerson, Smith & Co., Limited, Beaver Falls, Pa., U. S. A.

Safety Elevators, steam and belt power; quick and smooth. D. Frisbie & Co., 112 Liberty St., New York.

"How to Keep Boilers Clean." Send your address for free 88 page book. Jas. C. Hotchkiss, 33 John St., N. Y.

The Holly Manufacturing Co., of Lockport, N. Y., will send their pamphlet, describing water works machinery, and containing reports of tests, on application.

Niagara Steam Pump. 20 years before the public. Always first premium. Adapted for all purposes. Norman Hubbard, Manufacturer, Brooklyn, N. Y.

Reliable reports and opinions as to infringement and validity of patents rendered by W. X. Stevens, 705 G St., N. W. Washington, D. C. For three years the government expert in patent cases, and twenty years an attorney before the Patent Office.

Machine drawing and designing. A. K. Mansfield, Chicago.

Rod, pin, and dowel machines. 1,000 to 3,000 lineal feet per hour. Rollstone Machine Co., Fitchburg, Mass.

Astronomical Telescopes, from 6" to largest size. Observatory Domes, all sizes. Warner & Swasey, Cleveland, O.

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

Send for catalogue of Scientific Books for sale by Munn & Co., 361 Broadway, N. Y. Free on application.

NEW BOOKS AND PUBLICATIONS.

DESIGNING WROUGHT AND CAST IRON STRUCTURES. Part III. Notes, calculations, tables, and working drawings for a rolled iron girder and flitched beam, with comparisons of strength by various rules. By Henry Adams, M. Inst. C. E., etc., Professor of Engineering at the City of London College. London, 1886. Demy 8vo. 30 pp., with one large plate. Published by the author.

Part III consists of two subdivisions: The first treating of the method of designing girders to support masonry walls. Relation of depth of girder to its strength; the weight relative to area of section, strength of girders by various rules compared, and a masterly description of the method of arriving at correct results by the modulus of section determined by the moment of inertia. Second division treats of a special case of a flitched beam of Canada oak, and cost of painting. It is practically a series of studies upon wrought and cast iron construction, addressed to the architectural and engineering student, and particularly adapted to instruct the novice in the difficult art of constructional engineering. It is the best introduction to the study of the strength of materials we have seen, and the high character of its author will commend the book to the student's careful perusal. A typographical omission occurs on the formula given for the deflection of an I beam under a distributed load; it should read:

$$D = \frac{L^3 Wc}{D^3 B - d^3 b}$$

the term $d^3 b$ having inadvertently been omitted.

** Any of the above books may be purchased through this office. Address Munn & Co., 361 Broadway, New York.

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.

(1) C. W. T. asks (1) a cure for red hands, and also the manner in which it is to be used? A. Take 4 parts glycerine, 5 parts yolk of egg; mix thoroughly, and rub on after washing the hands. A little lemon juice will also assist to whiten the hands. 2. Does borax have an injurious effect if used in washing fabrics? A. It is much used for such purposes, and is not ordinarily injurious.

(2) J. R. J. writes: I have a pair of engines 2 inches stroke, 1 inch bore, of which I want to make a locomotive; will you give the dimensions, to wit, length, diameter, and thickness of copper plate of boiler; length, width, height, and thickness of copper

plate of fire box; length of smoke box, and number of tubes; to burn charcoal; size of rivets; width, depth, and thickness of bed plate and frame of cast iron; diameter and gauge of one pair of driving wheels for high speed; diameter of leading and trailing wheels; diameter of driving shaft? A. Length of boiler 16 inches, diameter of boiler 4 inches, thickness of shell $\frac{1}{8}$ inch, heads $\frac{1}{2}$ inch, fire box 3 inches wide, 4 inches long, 4 inches high, smoke stack 6 inches above top of boiler, 20 tubes $\frac{1}{2}$ inch, rivets $\frac{1}{4}$ inch. Bed frame of small angle iron or $\frac{1}{2}$ inch by $\frac{1}{2}$ inch flat iron. Drivers 5 inches, truck wheels 2 inches, shaft $\frac{1}{2}$ inch.

(3) G. C. S. asks why a gas engine has explosions at one end of its cylinder only, and why not at both ends? A. Principally on account of the complication of mechanism required to secure the double action.

(4) J. E. W. desires a receipt for making a low priced red paste, soluble with water on a brush, to be used with a stencil. A. Take of shellac 2 ounces, borax 2 ounces, water 25 ounces, gum arabic 2 ounces, and of Venetian red a sufficiency. Boil the borax, shellac, and some water until they are dissolved, add the gum arabic and withdraw from the fire. When the solution has become cold, complete 25 ounces with water, and add more red to bring it to a suitable consistency.

(5) W. K. McL. writes: I would like to get a recipe for making a liquid glue or cement for use in a printing office for padding bill headings, note heads, etc.? A. Soak highest grade of glue in water for 10 minutes, and then dissolve to thin consistency; for every fifty pounds of glue add 9 lb. of glycerine. Color with aniline or cochineal, dissolving the coloring matter in a little alcohol before adding to the glue.

(6) E. S. writes: I have a small gas pressure governor containing mercury, which is exposed to the air. Will a thin layer of glycerine on the surface of the mercury be a good way to prevent or retard the evaporation of the latter. Can you tell me of something better than glycerine for the purpose? A. Glycerine is excellent. We can recommend nothing better.

(7) W. A. J.—You cannot effectually restore the depolarizers in a Leclanche battery, as natural binoxide of manganese is used in them. You can boil out the porous cups first with water and then with weak hydrochloric acid, and finally wash in running water.

(8) J. L. P. asks: 1. What fluid or liquid boils at the lowest temperature, and at what degree Fah.? A. The range of boiling points is very extended; hydrogen has been liquefied, and its boiling temperature is several hundred degrees below 0° Fah. The liquid paraffine pentane boils at 100.4° Fah., and a liquid could be found for almost any desired boiling point. 2. What proportion of its bulk will mercury or quicksilver expand if its temperature be raised 100° Fah., say from 20 to 120? A. In absolute expansion about one ninety-ninth of its bulk. 3. Can mercury be kept any length of time in any receptacle other than glass? A. It can be kept in receptacles of iron, wood, gutta percha, paper, and many other materials. 4. Will it evaporate? A. It evaporates a little at the higher summer temperatures. 5. By what law is it possible for a cat, if suspended by her four feet or paws one or more feet from the ground, and suddenly released, to make the turn, and alight square on the feet every time? A. The cat turns by her own muscular force.

(9) Timothy writes: 1. There is a chemical combination with which paper may be saturated, and if the latter is then exposed to a current of electricity, decomposition takes place and a blue mark shows the point of contact. Does the paper require to be moist when the current is applied, or will decomposition take place on dry paper, and about how strong a current is necessary? A. The first compound consists of one part saturated solution of ferrocyanide of potassium, one part saturated solution of nitrate of ammonium, and two parts of water. Some moisture is necessary, but the paper may be practically dry. 2. Is there any chemical combination that will produce a black mark or any other color by electric decomposition? A. A solution of iodide of potassium produces a mark that verges on black, but that is temporary only. For either solution use a current of three or four volts E. M. F.

(10) B. W. E. desires a receipt and method of pickling oysters or shrimps so that they will keep well and for long periods when put up in glass jars or tin cans. A. Take 100 large oysters, 1 pint white wine vinegar, 1 dozen blades of mace, 2 dozen whole cloves, 2 dozen whole black peppers, 1 large red pepper broken into bits. Put oysters, liquor and all, into a porcelain or bell metal kettle. Salt to taste, heat slowly until the oysters are hot, but not to boiling. Take them out with a perforated skimmer, and set aside to cool. To the liquor which remains in the kettle add the vinegar and spices. Boil up fairly, and when the oysters are almost cold, pour over them scalding hot. Cover the jar in which they are, and put away in a cool place. Next day put the pickled oysters into glass jars with tight tops. Keep in the dark, and where they are not liable to become heated. Treat the shrimps similarly.

(11) F. P. P. asks: How much electricity will 1 square foot (surface) of zinc and the same amount of carbon give in a solution of salt and water equal to ocean water? How much carbon should be used to one square foot of zinc? Will copper work as well as carbon, and how much should be used? A. Using carbon, you will get about three-tenths volt, and 1 to 3 amperes through a low resistance circuit. Copper will give considerably less than carbon. Use as much carbon as zinc, or if you prefer it, use one-half the area, and bend the zinc around close to, but not touching, the carbon.

(12) J. G. C. asks (1) what ammonium fluoride is. A. It is a compound of ammonium and fluorine; it can be made by adding hydrofluoric acid to a solution of ammonia (aqua ammonia of commerce). 2. Is ammonium fluoride what is commercially known as white acid? A. "White acid" is the bifluoride of am-