

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 This is for our information, and not for publication.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) F. M. asks why a large quantity of leaf tobacco wet with fresh water gets hotter than the same quantity will, wet with strong solution of salt water. A. Salt is an antiseptic, and retards fermentation. Fermentation is the cause of the heating.

(2) H. V. J. asks: What is the ratio of the length of a vibrating reed, rigidly fixed at one end, to its rate of vibration? For instance, a strip of elastic metal, the length of which is n, vibrates 50 times per second. What will be the length of a strip of the same material, and cross section, to vibrate 200 times per second? A. The rate of vibration varies inversely as the length. In the instance given, the length for 200 vibrations should be n/4.

(3) J. K. asks if there is any way to take pieces of plank apart, after they are glued together. A. Immerse in boiling water or expose to steaming.

(4) W. F. N. asks: 1. What is the temperature of water at its greatest density? A. 4° C. or 39.1° Fah. 2. What is the weight of a cubic foot of water at its greatest density? A. 62.425 pounds avoirdupois. 3. How much is it expanded in heating it to 62° Fah.? A. 100,000 volumes at 32° Fah. become 100,095 volumes at 62° Fah. 4. The current of a battery having an E.M.F. of 1 volt working through a resistance of 1 ohm gives 1 ampere. Now, if the resistance be doubled, what effect will it have on the current? A. Calling the external resistance R and the resistance of the battery R', and the E.M.F. E (in your case equal to 1 volt), the current is equal to E / (R + R'). If R + R' = 1, then the current is equal to 1 ampere. If R + R' = 2, the current is equal to 1/2 ampere. Your question is not clearly stated, as you do not say whether the 1 ohm resistance includes the battery or not. The resistance of the battery cannot be left out of account.

(5) G. W. asks how liquid cherry stain is made, such as furniture manufacturers use. A. Take 3 quarts water, annatto 4 ounces; boil in a copper kettle till the annatto is dissolved, then put in a piece of potash the size of a walnut. Keep it on the fire about half an hour longer, and it is ready to bottle for use.

(6) J. H. T. wants a receipt for making a liquid blacking, that will make a good shine and a quick one. A. Take of gum shellac 2 ounces, and dissolve in 3 quarts alcohol, then add 1 1/2 ounces camphor, and 2 ounces lamp black.

(7) W. C. asks (1) what to use for removing kerosene from an ingrain carpet. The oil is about 115° test. A. Use ether, chloroform, turpentine, or carbon disulphide as a solvent. 2. What is the steam pressure usually used on high and low pressure engines? A. Engines are now built in such variety that it is not possible to give a definite answer. From 30 to 50 pounds would generally be considered a low pressure, and above 70 pounds might be considered high pressure, although many compound engines use steam at a pressure of 150 pounds and over. 3. Can you tell me where I can get a good chemistry? A. Fownes' Chemistry, revised by Watts, which we mail for \$3.75, or Bloxam's sixth edition (just out), which we mail for \$4.50, are probably as good chemistries as can be obtained for the money. They each treat of both inorganic and organic chemistry in a way to be comprehended by any intelligent person, while being very comprehensive in their scope.

(8) B. A. asks how oil-cloth cloths, commonly called oil skins, are made. A. Dissolve together white resin, pulverized, 8 ounces, bleached linseed oil 6 ounces, white beeswax 1 1/2 ounces, then add sufficient turpentine. Apply to both sides of the cloth while it is stretched tight.

(9) A. S. P. asks: Which would be the easiest on a steam pump filling a tank—to discharge the water into the bottom or top of the tank? A. There is less pressure in the flow pipe when feeding into the bottom of a tank. The difference is too small to be perceptible in ordinary pumping, it being only 0.43 of a pound for each foot that the top flow pipe is above the water in the tank.

(10) W. D. W. asks a receipt for the preparation used for blacking brass work, such as the finger buttons of a writing machine. A. Dip the buttons in a solution of chloride of platinum, and heat gently to dry. Two or three dips will give them a black surface.

(11) D. F. F. asks the best method of engraving on brass, by a solution that will not, as nitric acid does, make the letters or design run. A. Probably you make the acid too strong. Try it weaker, and mix 1/2 acetic acid with it for your biting liquid. Also see that you have good wax for ground. Pure asphalt melted with beeswax, equal parts, and put on the warm plate with a pad, makes the best ground.

(12) M. G. W. writes: I notice in a steel rolling mill, salt is thrown on the plates while being rolled, for the purpose of removing scale, etc. What chemical action takes place, and does it not have a deleterious effect on the rolls? A. The action is chemical and mechanical. The salt melts and becomes a flux on the surface of the metal, and in that way assists in making the plate smooth by preventing oxidation. It also used mixed with sand for flux in weld furnaces.

(13) H. W. F.—Images of any material, such as clay, plaster of Paris, or wax, may be coated with copper, and the copper bronzed. The coating will necessarily be very thin, to prevent roughness. Clay and plaster images should be thoroughly waxed on the surface, to give adhesion to the plumbago surface which is necessary for the electro deposit. By care and a slow action of the battery, and proper management of the solution, a sufficient thickness of copper may be obtained to allow of the wax being melted out and the cavity filled with solder, which melts at a much lower temperature than lead, or fusible alloy, or type metal. This has been used experimentally, but we do not know that it is practiced to any extent in the arts. Images and ornaments cast in zinc and electrolyzed with copper, and then bronzed, are largely a trade in Europe and the United States.

(14) J. H. G. writes: I see street dealers using a soldering substance in their work which is melted by an ordinary candle and is used without the aid of resin, acid, or ammoniac, and appears to do good work. Can you tell me anything as to its composition? A. It is bismuth solder. Composition 50 parts tin, 25 parts lead, 25 parts bismuth by weight.

(15) T. P. H. asks: Is there any chemical mixture that will sharpen old files? A. Boil the files in strong soda and water to clean off all grease, oil, or gum. Then dip for a few minutes in a bath of nitric acid 1 part, water 4 parts; the length of time being less on fine files, as your experience may suggest.

(16) G. E. M.—The tides in all parts of the world vary according to the contour of the coasts. The Bay of Fundy is a striking example of an ordinary tide sweeping into a funnel-shaped bay, at the head of which the tide is 70 feet. On the north coast of South America is a fair example of the retarding effect of islands and reefs; the Windward Islands so obstructing the Atlantic tidal wave as to reduce it to from 1 to 1 1/2 feet, while the broad Pacific Ocean sweeps into the recessed bay of Panama a tidal wave of 24 feet. The same effect takes place in Long Island Sound, the tides being less at Martha's Vineyard than at Bridgeport, the narrowing of the sound causing the tide to accumulate at its western end.

(17) J. M. B. asks why it is that it takes so much longer for water to boil or food to cook in a new tin vessel than in an old one. A. Because the new tin is bright and smooth, and thereby reflects the heat instead of transmitting it. Old tin is dark and rough, absorbing heat quickly.

(18) A. H. W. asks if it will require more or less fuel (coal) at a high altitude than at a low one to furnish the same pressure of steam in a boiler, and if there is a difference, what is the ratio. A. The same amount of fuel will be required in either case stated.

(19) L. O. S.—To make a camera obscura see SCIENTIFIC AMERICAN SUPPLEMENT, No. 158, containing illustrations.

(20) J. W. L. writes: I have a horse shoe magnet made of 3/4 by 3/4 inch steel, and 2 1/2 by 4 1/2 inches, the poles of which do not fit the connecting bar. Will it injure the magnetic properties to file or grind it to fit? If so, how shall I renew it? I have for several years been sending yearly packages of my SCIENTIFIC AMERICAN to the Light House Board, to distribute to the light keepers. Is that the best disposition to make of it? A. Your magnet will undoubtedly suffer in grinding the ends. Your disposition of the SCIENTIFIC AMERICAN is commendable.

(21) W. J. H. writes: 1. I have about 700 lb. of fine brass filings and brass dust. What is the best way to melt the dust without burning, etc.? A. Pack the filings and brass dust in a crucible as tightly as possible, and place a little charcoal dust on top. Melt in a brass furnace and pour into an ingot. Better sell it to a brass founder.—It would be a tedious and uncertain computation to obtain the amount of force with which a 2 in. gas pipe will strike the bottom of a bored well containing 1,600 feet in depth of water, and 2,100 feet deep.

(22) A. W. M.—The speed and pitch of propellers for best effect depend largely upon the relative areas of midship section, its form, and the lines of immersion; the whole displacement and area of circumference of propeller being also factors in the computation. Ordinary propeller wheels are made for a speed of from 150 to 300 turns per minute. A speed of 95 feet per second on the periphery of a propeller wheel will cause a partial vacuum, depending upon the speed of the wheel and vessel ahead. Thus a wheel turned with great speed when the boat is fast at a dock loses much of its power by the vacuum sucking the air under the wheel. Wheels are usually of 2 or 3 blades, and for bulky boats have a pitch about equal to their diameter. With boats having fine lines, the pitch may be extended to twice the diameter of the wheel. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 101, 278, 15, 208, for interesting illustrated articles on screw propellers.

(23) T. P.—The pressure per square inch of surface for all boilers is alike for similar pressures by the gauge, but the strain on the cylindrical shells of boilers is in proportion to their diameters. Thus the absolute strain tending to split the shell of a boiler 4 feet in diameter is twice as much as in a boiler of 2 feet in diameter and may be illustrated by laying a stick 24 in. long on two bearings at the end, and one also 48 in. long in a like position. If you place a pound weight on each inch of each stick, you will find that one is carrying twice the strain on its bearings that the other does. Its bearings represent the shells of the boilers. This agrees with actual experiments on boilers.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

February 14, 1888,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions with names and patent numbers. Includes items like Advertising device, Air, carbureting, Alloy, metallic, J. Webster, Amalgamator, W. & G. W. Johnson, Amalgamator, carbon, W. H. Lawrence, Armature coils, frame for winding, R. Eickemeyer, Ash conductor, J. H. Whittle, Axle lubricator, car, S. Hatt, Axle, vehicle, Peckham & Laass, Axles, roller journal for car, Moyer & Youlls, Bag turning, folding, and printing machine, J. W. Wells, Bags or valises, fastening for traveling, H. W. Morrow, Balance spring for window or other slides, G. W. Bishop, Baling press, O. B. Kinnard, Band coupling, C. A. Weed, Band cutter and feeder, O. Anderson, Bar, See Claw bar. Grate bar. Structural bar, Barrel hoop, C. S. Cannon, Bath apparatus, port ble vapor and hot air, J. G. Davis, Battery, See Galvanic battery, Bedstead brace, D. G. Warfield, Bell, electric, J. P. Tirrell, Bit, See Bridle bit, Blast furnaces, apparatus for filling, S. Thomas, Board, See Pitch board, Boats, outrigger for, M. E. Bosca, Boiler, H. Warden, Boiler heads, apparatus for making, H. Warden, Bolt, H. B. Ives, Bolt threading machine, J. A. Beecher, Book protector, P. F. Van Everen, Books, binding blank, T. Beckett, Boot crimping frame, E. Houd, Boot or shoe, G. T. Chapman, Boot or shoe, C. H. Winter, Boots or shoes, tool for inking the sole edges of, F. P. Buzzell, Bottle, ink, E. B. Snedigar, Bottle washer, A. Von Schade, Box, See File box. Knockdown box. Paper box, Brace, See Bedstead brace, Bracket, See Lamp bracket, Brake, Car brake, Breastpin safety catch, J. Johnson, Brick machine, R. N. Ross, Brick machine, reciprocating, J. P. Miller, Bridge, T. D. Brochocki, Bridge gate, draw, D. Greenhoot, Bridle bit, R. O. Burgess, Bridles, overdraw check loop for, N. B. Le Blond, Burner, See Gas burner, Burnishing machine, A. B. Fowler, Button, J. P. Noyes, Buttonhole barring, machine, H. M. Essington, Calculating machine, F. L. Bancroft, Calipers or dividers, J. Stevens, Car brake, automatic, W. B. Turner, Car coupling, G. F. Brown, Car coupling, P. Brown, Car coupling, J. K. Freeman, Car coupling, S. D. Locke, Car coupling, G. D. Pearson, Car coupling, A. Story, Car coupling, automatic, E. Latham, Car, express, J. W. Post, Car heater, Gilbert & Long, Car road, street, W. M. Eccles, Car, stock, R. H. Ripley, Cars, draw gear for street, J. W. Evans, Car gilding machine, Padmore & Gillbee, Carpet stretcher, J. Carter, Cartridge shell, Stiner & Darling, Case, See Label case. Show case, Casting loose pulleys, mould for, J. McCaffrey, Chain, drive, S. D. Locke, Chain wrench, J. H. Williams, Chair, See Office chair, Chimney, adjustable, Jones & Elser, Chronometer escapement, P. T. A. Rodeck, Churn motor, Stuart & Gubbins, Cigar bunching machine, A. Gordon, Clamp, See Saw clamp, Claw bar, W. S. Pates, Clock, secondary electric, W. B. Harvey, Clock striking mechanism, E. Groux, Clutch, friction, J. W. V. Rawlins, Coat hook, C. C. Pierce, Coffin depositor, A. M. Lewellen, Collar pad, horse, F. W. Krause, Comb, J. P. Noyes, Combination lock, O. Volkerts, Compasses, draughtsman's, J. Stevens, Conveyor, A. Wissler, Copper, salts, ores, mattes, etc., in acids, separating precious metals and impurities from solutions of, T. Kiddie, Cork extractor, E. Walker, Cork retainer, Heing & Leidigh, Cornet tremolo attachment, F. Menzenhauer, Corsets, making, Stiegler, Jr., & J. Cargemel, Cotton press, A. D. Thomas, Coupling, See Band coupling. Car coupling. Thill coupling. Water closet coupling, Crusher, See Harrow and clod crusher, Cuff holder, J. D. Hall, Cuffs, making, A. Whited, Cultivator and scraper combined, J. A. Scroggs, Cultivator foot, S. R. Estep, Cultivators, lifting spring for, C. R. Davis, Cup, See Oil cup, Cutter, See Band cutter. Rope cutter, Damper regulator, J. St. Mary, Dental plugger, W. G. A. Bonwill, Display stand, J. J. Anderson, Domino, S. S. Kimball, Door check, S. H. Giesy, Door sealer, S. R. Campbell, Doubling and twisting machines, stop motion mechanism for, H. T. Broadbent, Draught equalizer, A. H. Bales, Draught equalizer, H. McCoy, Electric conductors, support for, M. J. Hart, Electric current indicator, E. P. Warner,

Table listing inventions with names and patent numbers. Includes items like Electric machine, dynamo, R. Eickemeyer, Electric machines, current regulator for dynamo, Crowds & Sutton, Electrical conduit, undergrounded, R. F. Silliman, Electrical conversion, system of, E. N. Dickerson, Jr., Elevator, See Grain elevator. Hod elevator, Elevator carriage, C. Haas, Elevator controlling device, Evans & Schwanhauser, Engine, See Gas engine. Petroleum engine. Steam engine, Extractor, See Cork extractor. Spike extractor, Fare register and recorder, R. M. Rose, Farm gate, J. J. Bughman, Faucet, E. U. Seoville, Feed water heater, G. L. Hagarty, Fence making machine, Heberling & Bernauer, Fence post, J. W. Griswold, Fibrous ware, treating, H. Carmichael, File box, E. E. Baker, File holder, H. C. Yeiser, Filters, apparatus for feeding chemicals to, O. H. Jewell, Firearm, B. Hemming, Fire escape, L. J. Mesner, Fish plate, T. A. Davies, Flanging machine, Ford & Hussey, Frame, See Boot crimping frame, Furnace, See Hot air furnace. Smoke consuming furnace, Furnaces, apparatus for heating blast for shaft, J. L. Thomson, Furnace grate, W. H. Heeson, Fuse, electric, P. G. Gardner, Gauge wheel, D. H. Carpenter, Galvanic battery, T. M. Foote, Gas burner, C. B. Todd, Gas engine, R. F. Smith, Gas generator, A. Weyer, Gas light governor, automatic, Greiner & Grupp, Gas meter, F. M. Towle, Gas regulator, automatic, M. J. Amick, Gate, See Bridge gate. Farm gate, Gate, R. B. Lyon, Generator, See Gas generator, Grain binder, R. Emerson, Grain binders, cord tier for, P. Hanson, Grain elevator, T. J. Underwood, Grain meter and register, automatic, J. G. Wolfe, Grain scouring machine, R. W. Welch, Grate bar, W. D. Cronin, Grinding machine, J. B. Comstock, Harness rosette, J. W. Grummon, Hat and coat rack, W. L. Caldwell, Harrow and clod crusher, J. T. Leighton, Harrow and cultivator, combined, F. Bateman, Heater, See Car heater. Feed water heater, Heel attaching machine, F. F. Raymond, Hinge, gate, J. B. Pugh, Hod elevator, H. Curtis, Hoisting and conveying machine, M. W. Locke, Holder, See Cuff holder. File holder. Trace holder, Hoodwink, Lyman & Johnson, Hook, See Coat hook, Hook, C. C. Pierce, Hoop, See Barrel hoop, Horseshoe, J. B. Finch, Hose, rubber, J. Crampton, Hot air furnace, G. G. Wolfe, Indicator, See Electric current indicator, Inhaler, B. M. Wilkerson, Injector, L. Schutte, Insect screen, J. W. Boughton, Jack, See Lifting jack. Vehicle jack, Jar fastening, J. M. Keller, Joint, See Pipe joint, Key, See Telegraph key, Knob lock, Selleck & Keenan, Knockdown box, H. S. Myerson, Label case, J. H. McCartney, Ladder, J. S. Tilley, Ladle, foundry, Goodwin & How, Lamp bracket, L. P. Pell, Lamp, car, Sherburne & Taber, Latch and lock, combined, J. Adams, Latch, night, W. Bohannan, Lathe, C. H. Russom, Lathe feed, Jones & Rogers, Lead or base bullion in smelting from slag, etc., apparatus for separating, W. B. Devereux, Leather, machine for staking, stretching, and softening, W. M. Hoffman, Level and inclinometer, spirit, E. F. St. John, Lifting jack, carriage, D. Simmons, Liniment, A. E. Banks, Lock, See Combination lock. Knob lock. Nut lock, Locomotive smoke conduit, B. T. Loomis, Lubricator, See Axle lubricator, Match machine, L. Kittinger, Match machine tray, L. Kittinger, Measure, automatic grain, C. W. Hadley, Medical apparatus, electro, T. R. Ten Broeck, Metal working machine, compound, E. S. Babcock, Meter, See Gas meter. Grain meter, Millstone feeder, L. E. Kane, Mirrors and other articles, pneumatic holder for, C. E. Dougherty, Mop and brush, combined, A. W. O'Brien, Mortising machine, R. S. Greenlee, Motor, See Churn motor. Weight motor, Multiple switch boards, long distance connection for, C. E. Scribner, Nail, See Shoe nail, Nippers, cutting, R. H. Johnson, Nut lock, W. A. Jordan, Office chair and operating table, combination, F. E. Graves, Oil cup, E. P. Shaffer, Ordnance, breech-loading, A. Noble, Ordnance, hydraulic loading and operating mechanism for, R. T. Brankston, Ordnance, hydraulic operating mechanism for, C. H. Murray, Ordnance, hydraulic operating mechanism for breech-loading, C. H. Murray, Ordnance, operating, A. Noble, Oven, reel, C. Stewart, Pad, See Collar pad, Paint for coating shins, E. L. Kitchingman, Paper box or rail, S. E. Baker, Paper or other material, fastener or holder for, C. M. Durnil, Pavement, artificial stone, F. F. Gifford, Pencil sharpener, W. N. Wheelless, Petroleum engine, A. Spiel, Pin, See Printing press gauge pin, Pinion cutting machine, F. Leman, Pipe joint, M. C. Bowers, Pitch board, adjustable, G. W. Oliver,