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 This is for our information, and not for publication.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 in this department, 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) E. B. H. asks the actual as well as nominal horse power of engine, cylinder 10 inches diameter, 36 inches stroke, 65 revolutions, and 55 pounds pressure on steam gauge. A. Nominal, 39 horsepower. Actual at one-half cut-off, 38 horse power. The working power depends upon the point of cut-off, which you do not give.

(2) G. K. G. asks (1) a recipe for violet water. A. 6 pounds violet pomade, 1 gallon rectified spirit; macerate and digest in closed vessel for a month and decant. Then add 3 ounces tinc. orris root and 3 ounces cassia spirit to each pint. 2. Also one for polishing nickel stove trimmings. A. Polish nickel plating with rouge upon soft leather or buckskin slightly moistened; finish dry.

(3) C. F. M. asks if oil poured on the top of a gravity battery will prevent the water from freezing. Also from evaporation. If not, what will keep the water from freezing? A. Oil poured upon the top of a gravity battery will, in a measure, prevent evaporation and the creeping of the zinc sulphate over the top of the jar, but it will not keep the solution from freezing. The only safe way of preventing the freezing of a battery is to place it in a cellar, or inclose it in some way to prevent the frost from reaching it. The gravity battery does not work well in a very low temperature.

(4) Q. P. asks: What power could be got from an electric motor, a ten horse power engine being used to drive the dynamo? A. About 50 per cent of the motive power can be realized in the electric motor, provided the dynamo and the motor are of approved construction.

(5) W. J. asks the difference between the common brass wire and the brass wire that door springs are made of. A. The difference is mainly in drawing the wire. Spring wire is drawn hard and not annealed. You can purchase spring wire from all the prominent brass companies.

(6) C. L.—A thermostatic bar is generally made by riveting or brazing together strips of brass and steel. When the bar is heated, the brass expanding more than the steel causes the bar to spring, rendering the brass side convex and the steel side of the bar concave. We do not know that the thermostatic bars are kept for sale, but they are easily made.

(7) F. S. asks a recipe for making the material used to block or stick the heads of stationary together. A. A quarter of an ounce crude gutta percha; dissolve in bisulphate of carbon to the consistence of mucilage. Apply to the edges of the paper where required.

(8) V. S. W. writes: Being desirous of building a small electric machine, I would like to know how many times I would have to increase the drawings in SCIENTIFIC AMERICAN SUPPLEMENT, No. 161, vol. vii., to the best advantage for a 2x4 steam engine. A. We think that the dynamo described in SUPPLEMENT, No. 161, would furnish sufficient work for your 2x4 steam engine, unless your steam pressure is very great. If you desire to make a larger dynamo than that described in the SUPPLEMENT, we advise you to copy one of the more modern machines—Siemen's, Weston's, or Edison's.

(9) S. S. asks: Is there power enough in a bichromate battery of 6 or 8 large cells to run a small incandescent lamp, say of 16 candle power, a Brush-Swan lamp for example? A. We think you would find the resistance of your lamp too great for your battery. There is no economy in running a single lamp by means of a battery.

(10) A Reader asks for a receipt for making white ink, suitable for pen drawing. A. Kilner gives the following: Mix pure freshly precipitated barium sulphate or flake white with water containing enough gum arabic to prevent the immediate settling of the substance. Starch or magnesium carbonate may be used in a similar way. This must be reduced to impalpable powders.

(11) H. W. H. writes: Can you inform me of the property in luminous paint which causes it to emit light in the dark? What chemical reaction, if any, does the paint undergo? A. The luminous property is due to what is termed phosphorescence. It is probably a slow combustion or oxidation. See the article on Phosphorescent Substances, SCIENTIFIC AMERICAN SUPPLEMENT, No. 318.

(12) G. R. F. asks: 1. What is the best liquid to use in a hydraulic lift in frosty weather, when I cannot use water? Would kerosene injure it in any way? A. If you use kerosene or petroleum in your lift, you will require the full quantity necessary for operating it; the only objection will arise from its leakage. Water with 20 per cent crude glycerine will not freeze at zero, and in colder weather will not freeze to give trouble. Whisky has been much used in hydraulic cylinders exposed to low temperatures. Crude petroleum is the cheapest. 2. I am building an ice house; is it necessary or advisable to have ventilation in the roof? If so, why? Will not ventilation promote circulation of air around the ice, and consequently make it waste faster than if would if close or air tight? A. In ice houses the top of the ice is generally well covered with hay or saw dust to keep it from contact with the warm air under the roof. The roof in summer gets very hot from the heat of the sun; the air beneath it becomes much hotter when confined than with thorough ventilation. The roof requires ventilation, not the ice.

(13) W. E. asks: What is used for coating steel mould boards of plows to keep them from rusting after they have been polished? A. Lard oil, tallow, and white lead, about equal parts, brushed on warm, is much used on machinery. If you wish the plows to show the polish, it will be well to varnish the polished parts with a cheap copal varnish thinned with turpentine. Polished hardware is varnished with thin shellac varnish, a little cobalt blue, or other color; the articles to be heated previous to varnishing to about 212°.

(14) J. W. H. writes: It is a common belief that to shingle the hair of children makes it thicker. How is it? A. Professor Wilson in an article on the Hygiene of the Hair, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 102, says: "Cutting does not encourage growth as much as is commonly believed, but it is advantageous in the case of the short, slender hairs, commonly called young hairs."

(15) J. M. L. B.—The flattening of boiler heads is a matter of different practice with boiler makers. Some can turn the flanges without raising the centers, while others manage to warp them, when they are generally straightened cold to avoid the warping effects of heat. If the boring tools are sharp, and lip counter bores used, the plate should not bulge in boring. A bulged head requires tubes of unequal length, which is not good practice. If they become bulged by bad treatment, they should be restored by a better treatment of heating the whole to a black heat or about 700°, and pressing flat upon the flattening plate.

(16) A. A. F. asks: Is there any way to plate or cover a steel knife with tin, or any solution for it? If so, please let me know how to do it? A. Boil 1 ounce cream tartar, 1½ ounces grain tin, or tin shavings, in 1 quart water for an hour. Clean the knife thoroughly, and dip in the boiling solution.

(17) J. F. asks for a recipe for melting rubber. A. Rubber can be melted by heating it over a water bath. In order to get it into a liquid state, however, it is generally brought into solution by dissolving thin strips of rubber in ether, petroleum, naphtha, carbon disulphide, or any other of the numerous solvents. A very full account of the rubber industries will be found in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 249, 251, and 252.

(18) J. E. H. writes: 1. How many horse power will it require to run a dynamo like one in SUPPLEMENT, No. 161, with two incandescent lamps, to light a room 50x100? A. The dynamo described in SUPPLEMENT, No. 161, is too small for your purpose. 2. Which is the best lamp to use with such a machine—the incandescence or the Swan lamp? About how much will one lamp cost me? A. The machine will run two, 3 candle power, incandescent lamps. For the price of lamps address the Edison Company, East Newark, N. J. 3. Can an electro motor be made to run such a dynamo? A. Yes, but the electric current required to drive the motor would operate twice as many lamps as the dynamo driven by the motor. For information on electric lamps consult SUPPLEMENT, Nos. 162 and 370.

(19) P. E. C. writes: I have two good portrait lenses—a quarter and a half Darlot. I would like to use them to improve my magic lantern. Which one should I use, and at what distance from the condensers will I have to nail the board holding the lens? A. The distance between your camera tube and your lantern slide should be about the same as that between the tube and the ground glass in the photographic camera. The quarter tube will answer for ordinary lantern views, and the half tube will do for larger views, provided your condensers are large enough to illuminate them.

(20) R. L. D. writes: I have made a telephone call similar to the one in SUPPLEMENT, No. 162, only used three ounces of No. 30 cotton covered wire on each spool. The current is more than a man can conveniently take if I use wet sponges, but the poles of my magnets are so close together that it is impossible to put the call on the same machine. So I made magnets with five-sixteenths core 1 inch long, and wound three-quarter ounce No. 36 silk covered wire. The call is so weak that if I make a spring light enough so as to work, the slightest jar of the floor will cause the bell to ring. 1. Is my current strong enough? A. Yes. 2. Will the machine I have described generate a suitable current to work a call over a quarter of a mile of wire? (The line is an acoustic cable of three No 22 copper wires twisted.) The telephones work well with this wire at this distance. A. Yes, provided you use a polarized bell. 3. Is there any better style of call than that? A. No. 4. How much No. 36 wire does it require for the magnets in call illustrated in SUPPLEMENT, No. 162? A. About 200 feet. 5. How is the call hammer made to vibrate in the company's telephones? A. The armature is polarized, so that it is alternately attracted and repelled as the current is reversed.

(21) M. M. asks if there is any way of preventing mica from scratching, also if the edge can be made so as not to break or ruffle, if sprung into a bevel. A. We know of no way to treat mica so that it will answer your purpose.

(22) B. P. writes: I have never seen in your paper any reference to a kind of electric light described in my Natural Philosophy as follows: "The brightest artificial light known is made by placing two points of charcoal within an inch or two of each other, and connecting them with the opposite poles of a galvanic battery. The space between the points will be occupied by an arch of flame equaling in dazzling brightness the rays of the sun, etc. The charcoal points never wear away, the battery alone having to be replenished." I would like to ask you what has been found the matter with such lights, or have so much betterones been found? A. You refer to the old experiment of producing the electric arc in a vacuum; it is interesting only as an experiment, and has no commercial value. The ordinary arc lights operate on substantially the same principle, the carbons being arranged to feed as they are consumed.

(23) I. B. writes: I am running a 150 horse power engine; the main belt leads up over head, and sometimes is so highly charged with electricity that, when I stoop down to pass under it. I experience a severe electric shock on the bottoms of my feet, if by chance I step on any nail heads in the floor. Sometimes it causes my hair to rise up on end; at other times it has a reverse action of pressing it flat down. Now can you give me the cause of a belt becoming so charged and discharged? In other words, what is the best and most generally accepted philosophy of this strange phenomenon? A. The electricity of belts is of the same nature as the frictional electricity of the electrical machines, and is supposed to be generated by the friction of the belt upon the pulley, or by the friction of the particles composing the belt as it leaves the pulley. The most acceptable theory is, that the belt acts upon the principle of the electrophorus, and generates the electricity by the act of parting from the pulley. 2. I have a double bell whistle 8 inches diameter, cast brass; with 65 pounds steam, how far should the edge of the bells be from the annular orifices? A. The whistle bell cannot beset exactly without a trial. Steam whistles generally have a screw on the spindle, with jam nuts for adjustment. Set your bell month an inch and a quarter from the orifice, and vary it after trials to suit your taste.

(24) W. R. H. asks for the best method for polishing furniture made of open grained wood. A. A furniture polish which has been recently recommended is prepared as follows: Melt three or four pieces of sandarac, each of the size of a walnut; add one pint of boiled oil, and boil together for an hour. While cooling add one drachm of Venice turpentine, and if too thick, a little oil of turpentine also. Apply this all over the furniture, and after some hours rub it off; rub the furniture daily, without applying fresh varnish, except about once in two months. Water does not injure this polish, and any stain or scratch may again be covered, which cannot be done with French polish.

(25) E. F. F. writes: Is there anything that will stop the disagreeable noise to which the pipes of steam heaters sometimes treat us? The noise is often so loud as to make all conversation impossible, and makes the impression as though the pipes were struck with a hammer. What causes it? A. The water hammer in steam heating pipes is mostly owing to defects in planning the steam and return pipes, either in their position or relative size. Sometimes heating engineers are hampered by architectural conditions. Occasionally engineers are negligent in failing to blow the air out of the pipes. Much of the trouble arises from partially opening or coloring the radiators, causing the water to accumulate in them, when upon fully opening such a radiator the water rushes into the return pipe to disturb a whole building by its vibration. Much more of this trouble occurs in moderate weather, when in most large buildings a large number of radiators are closed or partially so; the connecting pipes leading to such radiators become partially filled with water, the vibration of which causes the noise.

(26) J. L. writes: I find several recipes for preserving eggs, in your paper; I have tried two of them—liquid glass and paraffine. I want to get a recipe for cleaning the shells that will be cheap and quickly done—solvents for the glass and paraffine. A. A little dilute acid or vinegar could be used to cleanse the shell, if desired. Liquid glass is soluble in water, especially hot water. Paraffine is soluble in warm benzine or carbon bisulphide. In SCIENTIFIC AMERICAN SUPPLEMENT, No. 317, several methods of preserving eggs are given. Paper can be paraffined, and the eggs can then be wrapped in that material, but it is not as satisfactory as paraffine or soluble glass; various varnishes are also used, the object in all cases being simply to completely exclude the air from the shell.

(27) D. B. writes: What is the process (if any) by which perfect deodorization of sponge from taste or smell can be obtained? We want them for filtration. A. One of the best processes is said to be the following, which has for some time been in use at Bellevue Hospital: Soak the sponges, previously deprived of sand and dirt, by washing in a one percent solution of potassium permanganate; remove, wash thoroughly, and press. In order to bleach them, continue by placing them in a solution of one-half pound sodium hyposulphite in one gallon of water to which one ounce of oxalic acid has recently been added, and allow to remain fifteen minutes. Remove and wash thoroughly.

(28) J. B. R. asks whether or not the 6 inch pipe from a Sturtevant blower should be smaller near the cupola, that is, tapering like a nozzle, and how much; pipe enters cupola on both sides; and how far from bottom should pipes be for 36 inch cupola? A. It is not necessary to have the blow pipe for cupola tapering. The best practice now is to have a square pipe extending around the shell, and attached to it with mica peep holes in doors opposite the nozzles, the nozzles being only holes through the shell and brick lining, which can be trimmed up with clay at each melting, in the same manner as the draw spout. The distance from the bottom should be as small as the quantity of metal that you wish to accumulate before pouring will allow. Some bed the bottom with sand when they have a small heat, for economy in fuel. You do not say that your cupola is 36 inches inside or outside. If 36 inches inside, you may make the nozzle 8, 10, 12, or 14 inches from bed, according to the manner and amount of work. An economically managed cupola, there of 22 inches internal diameter, turns out from 2 to 3 tons of castings in 3 hours. Depth of bed from tuyere, 9 inches.

(29) Y. C. writes: Professor Angell, on "Sanitary Examination of Drinking Water," published in the SUPPLEMENT of November 8, says that in 437·5 grains of salt there are 265·5 grains of chlorine. I would like to know from whose formula of NaCl he figures this result. Graham gives a table of equivalents, according to which Na has 24 for its number and Cl 36. The Dispensatory says Cl+Na=35·5+23·3=58·8. Josiah P. Cooke, Jr., says Cl+Na=35·67984+23·12016=58 8. Why is it that there are such differences among authorities? In some works we are taught one thing, and in others the reverse; for instance, *ide* and *uret* are said to have different meanings when attached to names, but are used by others in the same names. A. We know that 1 ounce avoirdupois contains 437·5 grains troy. The atomic weight of chlorine is 35·5 for all practical purposes, and that of sodium 23. (According to Roscoe, 35·37 and 22·39.) In regard to the atomic weights, it must be borne in mind that they are deduced from experimental work, and therefore until all sources of error are eliminated they will be variable, and are given differently in works on chemistry, according to the latest data at command when the book was written. It is therefore best for our correspondent to consult the latest books on the subject. Professor Graham has been dead nearly twenty years, and his figures are no more authority on atomic weights than the census returns of 1860 are valid for Ohio to-day. The molecular weight of sodium chloride therefore is 35·5+23=58·5. To determine the amount of chlorine in 1 oz. av. of sodium chloride we employ the following proportion: The molecular weight of sodium chloride is to the atomic weight of chlorine as the weight of the sodium chloride is to the weight of the chlorine:

$$58{\cdot}5 : 35{\cdot}5 :: 437{\cdot}5 : x.$$

x equals the weight of chlorine, approximately 265·5. *Uret* is the old term for *ide*, and is not used in modern chemical text books. The best advice we can give to you is the recommendation to study the science, either with some good text book or under some competent teacher.

(30) J. C. P. says: In your Notes and Queries, November 15, query 32, E C., asks for glossy marking ink for show cards. Lampblack and turpentine will make a mark, and it sometimes stains the card where it should appear clean and white. Asphaltum varnish is the article for marking show cards. The letters may be first painted with India ink and the varnish put over them, but I use nothing but the varnish.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

December 2, 1884,

AND EACH BEARING THAT DATE.

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

Advertising device, automatic, J. W. Fawkes	308,761
Alarm lock, J. W. Kohn	308,678
Alum, manufacture of burnt, W. J. Menzies	308,623
Amalgamator, J. M. Dyer	308,457
Amalgamator, S. L. Trippe	308,642
Anchor, J. T. Williams	308,646
Anvil and vise, combined, J. Austin	308,820
Automatic gate, T. R. Cook	308,752
Axle gauge, H. McQuarry	308,685
Axle setting machine, L. M. Woodcock	308,725
Bag fastener and holder, J. W. Rickart	308,704
Bag fastening attachment, C. C. D'Estaing	308,654
Bag lock, A. Goertz	308,664
Balloon, wedged-shaped air, G. Weliner	308,719
Barrel heads, machinery for moulding, G. W. Laraway	308,616
Bearing, self-lubricating, C. E. Gee	308,838
Bed, folding, R. H. Garland	308,764
Beer, etc., regulating the temperature of, Haley & Roswald	308,666
Bell straps, clasp for sleigh, Barton & Brainard	308,733
Belt, driving, G. Jaquith	308,674
Belt shifter and holder, C. P. Peterson	308,696
Belt tie, R. I. Moore	308,785
Belting, G. M. Rose	308,805
Bicycle, lady's, L. P. Valiquet	308,862
Bidet for commodes, D. Watson	308,717
Billiard marker, check, T. C. Jenkins	308,675
Boiler. See Steam boiler.	
Boilers cleaners, skimmer for, E. W. Vanduzen	308,644
Boiler furnace, Z. B. Church	308,652
Boiler furnace, steam, B. Sloper (r)	10,533
Boiler tube cleaner, H. H. Benedict	308,822
Bolt. See Flour bolt.	
Bolting reel, centrifugal, S. Hughes	308,613
Book corner, protective, J. H. Weaver	308,718
Boots and shoes, manufacture of India-rubber, J. C. Bickford	308,736
Boots, shoes, and stockings, machine for making felt, J. Brandy	308,743
Brake. See Car brake.	
Brush bridle, paint, Barnes & Sibley	308,648
Burnishing tool, W. Gordon	308,604
Bushing for emery wheels, etc., Pulson & Snow	308,854
Button, Richardson & Allen	308,630
Button or stud, G. E. Adams	308,647
Button to boots, shoes, etc., machine for attaching, H. N. Hemingway	308,769
Car brake, K. H. H. Leineweber	308,617
Car brake and coupling, H. L. Pegram	308,695
Car coupling, G. P. Hix	308,611
Car coupling, L. B. Owen	308,852
Car coupling, F. F. Siddall	308,636
Car, railway, G. O. S. Conway	308,830
Car, stock, W. H. Smith *et al.*	308,808
Car, tramway, F. M. Whitehouse	308,816
Carding machine condenser, G. Fowler	308,836