

Business and Personal.

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Diamond Tools. J. Dickinson, 64 Nassau St., N. Y.

Notes & Queries

(1) E. N. asks: 1. Can old work be re-kalsomined? A. Yes, unless too much smoked; in which case it will be necessary to wash the wall first. 2. How can a new patch of plastering in old work be kalsomined so the old and new wall will look uniform? A. Make the kalsomine somewhat thicker than usual, and if necessary apply several coats. Ceilings should be painted.

(2) J. W. G. writes: I want to make some photo-chromos. Will you tell me through your valuable columns what will make the paper transparent? A. Allow the photograph to remain in water until thoroughly soaked, then place it between blotting paper, and let it remain until just damp enough to be pliable. Then coat the face of the picture with good starch paste and lay, face down, on the glass. Commence in the center of the picture and rub outward toward the edges to dispel all air and excess of paste, care being observed not to get paste on the back of the print. While rubbing keep the paper damp with a sponge. When dry lay on a heavy coat of castor oil, and after a time rub off the excess of oil with cloth. After standing a day or two it may be colored. Cover the back with a thin plate of glass, and bind the edges.

(3) F. H. B. asks: How can I make or obtain a clay or other suitable substance for modelling, which will not crack on drying? A. Try adding a little glycerine to the clay paste.

(4) C. N. asks for a recipe for destroying vermin on trees and plants? A. The solution obtained by agitating together a quantity of water and recently slaked lime, and permitting the mixture to stand for a few hours in a covered vessel, is said to be excellent for this purpose, and very cheap. It may be sprayed on and around the twigs, using a small syringe with a finely perforated rose nozzle. A decoction of the dried leaves of the sumac tree is also said to preserve vines and plants from the attacks of insects. The application must be repeated occasionally. Besides these, sulphur, alkaline sulphides, calcium sulpho-carbonate, etc., are used with satisfactory results.

(5) P. E. T. asks what the solution is which is used for crystallizing grasses, bouquets, etc.? A. Use strong solution of gum arabic, white sugar, and salt.

(6) E. T. H. writes: What can I do to keep my hair from turning red? A short time ago it was of a black color, but it is now fading into a reddish tinge. A. The red color may have been caused by free alkalies in the oil or pomatum used, or the excessive use of these in washing. Apply occasionally cologne water mixed with a little vinegar of cantharides, and keep the scalp clean by the use of a stiff brush.

(7) C. C. asks: How can a trace of sewage be detected in well water without going to a costly analysis? What is the nearest distance a cesspool should be to a well 50 feet deep? A. Add to a sample of the recently drawn water enough solution of potassium permanganate to impart to it a faint pinkish tinge. If the coloration disappears immediately, or within half an hour, the water may generally be considered unfit for drinking and cooking purposes. One grain of the permanganate will distinctly color 1 1/4 gallons of pure water. Make a saturated solution (in cold water) add 1 fluid oz. of this to 6 fluid ozs. of the water to be tested, and set it aside for 24 hours; a turbidity or curdy precipitate indicates the presence in the water of organic impurities. See p. 296, vol. 36, SCIENTIFIC AMERICAN. Evaporate a quantity of the water to dryness and heat the residue slowly to redness, noting at the time the character of the residue and odors. It is not safe to trust the water from wells located within 200 feet of a cesspool.

(8) L. F. says: Parties here are selling an article for cleaning windows, etc., which resembles whiting. It is made into balls and colored. Can whiting be pressed into balls, and how is it done? A. We have not seen the preparation referred to. Whiting can be pressed into balls by moistening it with thin gum water.

(9) Onyx asks for a good flavor for cigars? A. Try cascarrilla bark or vanilla bean.

(10) T. E. asks for a recipe for making a cheap sealing wax? A. Resin 4 lbs., shellac 2 lbs., Venice turpentine and red lead, each, 1 1/2 lbs. Mix and melt.

(11) O. W. O. writes: The water we are using for domestic purposes comes from a river on which are several woodworking establishments, and our wood pulp mill is above the locality whence the water supply is taken. The water is drawn from a wooden tank containing three feet of coarse gravel, the supply coming in under the gravel, and the suction pipe of a common double plunger pump being inserted above the gravel or filter (capacity of pump 12 1/2 gallons for each revolution or complete out and return stroke of both plungers). From this pump the water is distributed. This arrangement has been going over a year without the gravel in the filter ever having been changed. Recently the water was drawn off and the gravel washed, since which time the water has had a very milky appearance at times. What is the cause? A. The milky appearance of the water is most likely owing to the imperfect washing and cleaning of the gravel, and the disturbance of the salts or "brack" that after so long an exposure probably coated every grain of the sand. It would have been much better to have provided fresh gravel, well washed, from the bank; and if the water is used for culinary purposes, this had better be done now.

(12) H. L. C., who sent us a photograph of a curiously marked stone, is informed that the corrugations in the stone were doubtless the work of small rills of water on the yielding surface of a fine deposit of clayey soil, deposited behind some dam in a shallow muddy stream. On drying, cracks were formed, and

these subsequently filled with crystalline carbonate of lime, or other substance.

(13) D. H. D. says: How can I set a 21 inch turbine water wheel in a quicksand bottom to a depth of say 2 feet into the quicksand? If I once get the box down and the wheel set, how can I hold it down? The fluid sand pushes it up just as water pushes up an empty barrel. A. You must weight the box sufficiently to keep it down.

(14) D. F. H. asks: How can I construct an electric apparatus for blasting purposes? A. Arrange two pieces of copper wire about 3 inches long, and rather stout, say No. 16 gauge, side by side, and parallel, but separated, and insulated by a strip of wood similar in size and shape to an ordinary lucifer match; bind them firmly by wrapping with cotton thread, and to the two upper ends solder a shred of platinum, or piece of fine platinum wire, so that it will be in circuit between the two copper wires; this constitutes the "fuse," and, when the insulated copper wires, called leading wires, are connected with its two lower ends, it is placed in the cartridge and surrounded with powder; all that is necessary to fire is simply to connect the two ends of the leading wires with a galvanic battery, composed of one or more cells of Grove's battery, when the platinum shred immediately becomes white hot, and ignites the powder.

(15) G. McN. asks for a recipe for making plaster of Paris ornaments? A. They are made of good glue dissolved in hot water containing from five to fifteen per cent of glycerin. Glue thus made, on cooling, gelatinizes, but does not dry or harden.

(16) J. F. T. says: I have a 120 ton schooner. It is necessary for me to go into many small harbors, where I have great difficulty in getting out on account of light winds. Could I have a small steam engine put in, which would not take up much room, that would drive my vessel about 4 or 5 miles per hour? A. You could have auxiliary steam power, with a screw that could either be hoisted or disconnected from the engine. By inserting a notice in our "Business and Personal" column, you will doubtless obtain estimates from reliable builders—or you can entrust the matter to an expert.

(17) C. D. W. writes: I want to make a compound magnet of five on six, and I have some bars of very good spring steel. Will it do, or must I use cast steel? A. Spring steel, after it has been hardened in water, will magnetize very well.

(18) J. W. R. asks: 1. Which is the better positive pole for a single acid battery, a carbon plate or a platinized silver plate? A. A platinized silver plate. 2. Which gives the better results, a bichromate of potash solution or sulphuric acid solution? A. That will depend on the style of battery in which the solution is used; bichromate of potash, or chromic acid, in a weak solution of sulphuric acid, is best for the Grenet battery, whereas a weak solution of sulphuric acid is better for the Smee battery. 3. How can I platinize copper? A. Have it silver plated, then roughen with platinum black.

(19) J. D. S. asks how to determine the slip of side wheels in steamers? A. If you know the distance the vessel runs for a certain number of revolutions of the engine, the difference between the distance passed over by the center of pressure of the wheel and the above is the slip.

(20) J. W. and M. H. ask for opinions on the following assertions: 1. It is not actually necessary in long stroke expansive engines to open the exhaust valve before the stroke is completed. A. It is usually desirable. 2. It is more necessary to close the exhaust valve a trifle before the stroke is completed in order to cushion the piston. A. A certain amount of cushion is generally desirable. 3. It is customary in Corliss engines to open the exhaust valves late in order to make them close early. A. You are wrong.

(21) H. H. C. asks: What is the proper solution for a battery composed of carbon and zinc without the use of the porous cup usually used therewith? A. In a battery composed of a plate of zinc, faced by one or more plates of carbon, a solution of the sulphate of mercury in the proportion of ten grains of the sulphate to the ounce of water may be used; or a weak solution of bichromate of potash or chromic acid in water, to which is added one twentieth of its weight of sulphuric acid.

(22) C. R. P. says: I have a steamboat 53 feet long, 10 feet beam, draught 17 inches. It has side wheels each 6 feet 6 inches diameter; paddles 3 feet long. How wide should the paddles be, and how deep in the water should they run to get the best speed? There are two engines 6 x 18 inches geared to run two and one third revolutions to the wheel's one. A. Make the paddles from 6 to 8 inches wide, and immerse them from 12 to 14 inches.

(23) J. A. K. asks how to remove ink stains from clothing? A. Wash first with pure water, then with soapy water, and lastly with lemon juice, but if old use oxalic acid and wash well afterwards.

(24) D. P. asks: Do you think that the use of petroleum as a preventive of scale is likely to cause foaming in the boiler? A. No.

(25) G. M. asks for a cheap way to build a furnace to melt cast iron; one large enough for 100 lbs. of metal? A. You will find a good description of a blast furnace in the SCIENTIFIC AMERICAN SUPPLEMENT for December 8, 1877.

(26) F. J. S. asks: Can I make my main driving belt run well by carrying from the main wheel (9 feet diameter) to a vertical shaft having a 4 1/2 feet pulley? Distance from center to center of shafts or pulleys about 25 feet, main belt 14 inches wide and 70 feet long. My idea is to do away with gearing and use belting, so that I can ship and unship my mills without stopping. A. You can make this change without any difficulty if the belt is of sufficient size to transmit the power.

(27) E. A. writes: 1. Please describe the nature and workings of the electric pen? A. It is sim-

ply a tube used as a pen, having in it a very fine needle, whose point has a very rapid motion (of 1/2 of an inch) in and out the tube or pen; the needle receives its motion from a little electric engine mounted on the upper end of the tube, and having attached to it two flexible conducting cords, that conduct the current of electricity from the battery that drives it. You simply write with it (as you would with pencil), on waterproof paper, having the needle point against the paper; and the writing consists of an immense number of perforations very close together, caused by the rapid motion of the needle piercing the paper; this motion is so rapid that it does not interfere with the movement of the point over the paper. Now all that is necessary is to moisten one side of this waterproof paper with some fluid color, and enough of the color will strike through the perforations to print one sheet after another of ordinary paper placed under it, and then pressed in a common letter press. 2. Was the enclosed specimen made by its means? A. No.

(28) H. R. & Co. write: Could you please inform us by what plan we could remove the lime from our water which we feed our steam boiler with, as there is considerable deposit of it each time we clean the boiler out? A. The best way to cure this evil is to use water that is free from lime; but as this cannot always be obtained, the only remedy left is to free the water from the lime; and one convenient way to do this is to run the water through two boilers; the first, in which the water is heated to boiling point, serves as a trap for the lime, and the water is pumped from this to the other boiler, which furnishes steam. Can you not collect sufficient rain water to feed your boiler?

(29) C. W. D. asks: In making a pony telegraph sounder or relay, the bobbins or arms of the magnet to be 3/8 inch long and 3/8 or 3/4 inch diameter, what diameter should the iron arms be, and what number wire, and how many courses, must I use to give strong clicks? A. The iron arms of the magnet are called cores, and if the spools are 3/8 inch long and 3/4 inch diameter, they should each be made of a piece of soft round iron, 1 inch long and 1/4 inch diameter; and the spools should be formed of six or eight layers of No. 30 copper wire, either silk or cotton insulation, for a sounder, and of from twelve to fourteen layers of No. 36 copper wire (silk insulation), for a relay.

(30) J. A. C. writes: 1. Will you please inform me what number of copper wire I should use to form the outdoor line connecting two telephones, about 200 feet apart, the helix formed of No. 36 insulated wire wound on (3/8" x 4") round steel magnets? A. Use No. 16 Brown and Sharpe's gauge, of either iron or copper wire. 2. Also if the copper wire outdoor should be insulated or not? A. Naked wire, on glass insulators, will answer. 3. Also, should I use two wires or ground connections? A. Use ground connections, if they consist of either gas or water pipes; if not, use two main lines.

(31) J. W. N. asks (1) for a simple method of treating or tanning sheep skins intended for glove leather? A. The skins are first soaked in water and handled, and are then hung up in a close warm room to putrefy. The exudation is afterwards scraped off, and the skins are steeped in milk of lime for a month or six weeks, after which they are smoothed on the fleshy side by a sharp knife. They are now to be steeped in a bath of bran and water, where they undergo partial fermentation and become thinner in substance. Immersion and agitation follow in a bath composed of 3 lbs. alum and 4 lbs. salt, dissolved in water, per 100 skins. Another washing in another bran and water bath succeeds, and the skins are then trodden in a wooden tub with a solution of eggs in water, previously well beaten up to give them a gloss. The pelts are then drained, dried, and then smoothed with hand irons. 2. Also, how to color the same? A. Stretch the skins and brush them with any strong liquid dye of the proper color, used for cloth dyeing.

(32) W. W. asks for the particulars as to the process that is adopted in New York for bending the plumber's seamless lead traps, that are made from 2 inch and 4 inch lead soil pipe? A. A new apparatus has been devised for bending pipes, which is probably used in the instances you refer to. The pipe is filled with water under heavy pressure, and the tube is then bent without its trickling or becoming otherwise injured.

(33) D. F. asks how to make mercurial soap? A. Beat into a homogeneous mass in a mortar Castile soap, 1 lb.; protochloride of mercury, 1/4 oz., dissolved in 4 ozs. of alcohol.

(34) M. B. asks how to remove yellow iron stains from linen? A. Use hydrochloric acid or hot solution of oxalic acid, washing well in warm water afterwards.

(35) C. L. says: 1. Will you please tell me what is meant in note 4, p. 251, of SCIENTIFIC AMERICAN of October 20, 1877? In describing how to make an induction coil, it says, "use for secondary coil enough wire to bring outside of coil 2 inches from cover." What is meant by the outside of the coil, and what by cover? A. You should read core, not cover. 2. About what number of feet will it take, proportionally, to make an induction coil (for primary No. 16, secondary No. 32)? A. The proportion of primary to secondary wires depends upon the size of core used and the strength of battery employed. For small coils it may be as 1 foot of primary to 15 feet of secondary wire.

(36) E. H. L. asks: 1. What battery power, kind, and number of cells is necessary to run an ordinary sewing machine? A. Twenty cups of gravity battery. 2. How can the power be most conveniently applied? A. Through an electric engine. 3. Please state size and length of core and wire for the electro-magnets? A. That will depend on the style of engine.

(37) H. asks: What is the best length to have my rifle barrel, caliber 1/4", to shoot accurately from 200 to 300 yards? What is the shortest barrel I can use, for that distance, to do good shooting? Which is the best ammunition, metallic cartridge or P. B. for muzzle loader? How short can I have a shot barrel breech loader, 1/4 to 3/4 inch bore, to do good shooting?