

Business and Personal.

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T. P. Pemberton, 37 Park Row, Room 30, New York. Machinery and Inventions illustrated and described.

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Notes & Queries

(1) F. P. asks how to transfer engravings or rather pictures cut from newspapers to glass, for use as magic lantern slides? A. Photography is, we believe, the only satisfactory means. A glass negative of the picture is at first taken, and from this a positive photograph on the lantern slide.

(2) T. Y. R. asks for a process by means of which corkwood can be bleached? A. It is whitened by boiling in hydrochloric acid; or use a strong solution of chloride of lime (bleaching powder) slightly acidified with sulphuric acid. The fumes of burning sulphur, in the presence of moisture, will also answer in some cases.

(3) B. S. asks for a recipe for the so-called diamond cement? A. Soak isinglass in water till it is soft, then dissolve it in the smallest possible quantity of proof spirit by the aid of a gentle heat. In 2 ozs. of this mixture dissolve 10 grains of ammonium, and while still liquid add half a drachm of mastic dissolved in 3 drachms of rectified spirit, stir well together and bottle. For use the bottle is placed in warm water; and as soon as the contents liquefy use immediately.

(4) J. B. asks: How many feet of No. 40 silk insulated wire do I want to make the electric magnet illustrated in telephone in vol. 37, No. 14? A. Two ozs. of No. 40 (Brown and Sharpe's gauge) copper wire, silk insulated.

(5) H. T. wishes to know the value and power of the Trouve moist battery? A. It would require five of them to equal the electro-motive force of one cup of Grove's battery.

How high will water rise in a pipe after all the air is withdrawn? A. About 32 feet, more or less, according to the condition of the atmosphere.

(6) E. H. asks: Why has the brain of a person an uneven surface? A. The greater the number of convolutions the greater is the amount of gray substance and hence the greater is the physiological power of the brain.

What are the functions of the spleen? A. Unknown. Would you advise anything to be applied to the hair (when in good order) except the dry brush and comb? A. No.

(7) J. E. B. inquires: What can I use to coat the barrel of an English rifle, to keep it from rusting? A. Have it plated with nickel, and if the surface is too bright, rub it with chamois leather, moistened with a paste of water and pulverized pumice.

(8) A. B. asks: What is the best way of pickling the castings to get the scale off? A. We have used a pickle of 1 gallon of cold water and 2 ozs. of sulphuric acid, and find that it is inexpensive, and does the work perfectly; the castings must be free from grease or oil, and should be pickled until the scale will wash off, which will take from one to ten hours. Is there anything that will destroy sulphuric acid so that the dust of the pattern in filing will not hurt the eyes? A. Thoroughly wash the pickled castings in cold water and then leave them over night in lime water.

(9) C. B. R. writes: 1. Would Mr. Trouve's new moist battery, mentioned on pp. 323 of SCIENTIFIC AMERICAN do to run a sewing machine? A. Yes. 2. If so, how many cells would it require to take the place of four Bunsen cells? A. About twenty cells.

(10) P. P. asks: How is aerated bread made and is the process patented? A. It is made by forcing carbonic acid gas under pressure into the dough. For illustrations of machinery used see "Knight's Mechanical Dictionary."

(11) G. D. asks: Will you explain in your next issue the proper way of getting the pitch line of cogs? A. The pitch line is at the junction of the flank and face of the tooth and may be marked therefrom.

(12) S. M. H. asks if phosphorus can be made luminous in an airtight bottle, and if there is any substance which is luminous under these conditions? A. If pure air and moisture are present in the bottle the phosphorus will continue, for a time, to glow when seen in the dark. We do not know of a simple substitute for

the phosphorus. A coil of fine platinum wire sealed in a bottle may be made to glow brilliantly by the passage of a strong electric current.

(13) W. M. asks for a recipe for preserving eggs? A. Mix 1/2 pint of unslaked lime with the same quantity of salt, and a couple of gallons of boiling water. When cold put in the eggs, see that they are well covered with the water, and the vessel containing them kept in a cool place. The eggs should be fresh when put in, as one bad one will spoil all.

(14) C. S. asks for a solution of the following problem, namely: The center of the circle is in the circumference of another circle; what must be the radius of the first circle in order that its area shall include the area of the second circle? A. Calling x half the arc in degrees, cut from the given circle by the other, and π the ratio of the diameter to the circumference, the area cut from the given circle =  $(1 - \cos. x + \frac{x \cos. x}{180})\pi - \sin. x$ . If you find x for any given case, which can be computed by approximation from the above formula, the required radius =  $2 \sin. \frac{1}{2} x$ . You will find a demonstration of the above formula, with an example of its application, in Robinson's "Mathematical Operations."

(15) D. R. P. asks: Could you please inform me what a good engraver can earn? A. From \$50 to \$150 per week.

1. Is there any way of keeping India ink in a liquid state for printing and marking with a brush? A. You can buy it in a liquid form, but as when mixed with water it must be kept from air. 2. How can I make a good red ink that will be bright and shiny for the same purpose? A. Cochineal dissolved in ammonia makes an excellent red ink.

(16) S. B. G. asks: How do spiders get the first thread of their webs across between the supports? A. Very frequently they let the wind blow a thread across, which they afterwards strengthen. They are also said to swing across occasionally.

1. How does the outside wheel of a car get round on the outside rail of a short curve without making more revolutions than the inner wheel, or without slipping on the track? A. It does not unless the wheel is coned so that it runs on a portion sufficiently enlarged.

1. Which has the greater range, a short barreled rifle or a long one, each being equal as far as the bar, etc., is concerned? A. Up to certain limits, an increase in length generally produces increased range. 2. Which will shoot the harder, a gun which is patched so tight that no air can pass around the ball, or one which is not patched so tight? A. The first, generally.

(17) J. S. asks for a solution to put on cloth for covering hams to keep flies away? A. Dip in solution of sodium acetate, and after sewing up, in thin milk of lime.

(18) F. L. B. writes: The process of printing pictures from prints, given on p. 343, No. 23, present volume, does not produce the desired effect for me. The ink takes on the paper about the same where it is blank or where it has been printed. What is the reason? A. Try again, your solution is either too strong or too weak; or your roller may have too much ink on it; all the processes of transfer require delicate manipulation.

(19) H. H. asks whether every engineer that is running a stationary engine in this city must have a license? A. Yes. You can get full particulars at Police Headquarters, 300 Mulberry street.

(20) R. S. N. writes: Please advise me what will prevent the foaming of water in boilers? A. Examine the inside of your boiler; it may be incrustated with scale.

(21) L. M. D. asks: 1. Is there such an article as liquid paraffin? A. It is an oil used in England for illuminating purposes; and is a product resulting from the destructive distillation of coal, and from which paraffin may be crystallized by extreme cold. 2. What effect will it have on flowers? A. It is indirectly a vegetable product and might be useful as a fertilizer. 3. What will prevent the leaves of house plants from losing their greenness? A. Sunlight, good earth, and good culture.

(22) J. E. G. asks for a cheap composition resembling silver? A. Tin 3 ozs., copper 4 lbs.

(23) J. H. B. says: I wish to warm a bath room 6 feet x 9, and cannot get a furnace pipe to do it without spoiling the look of the room underneath. I propose to make a coil of brass pipe 1/2 inch outside, 6 feet long, containing 60 feet in all, and using hot water from bath boiler and returning to boiler through circulating pipe, in the same manner as I would run hot and circulating pipes to bath tub. Will this give enough heat for bathing purposes? A. Your plan should succeed, provided a good circulation is secured by means of pipe of large size—this latter requirement being very necessary in heating by hot water.

(24) C. F. H. writes: I have a lot of coke taken from a gas retort. Will you please inform me how I can work it up for carbon for a battery? A. Cut it into slices with a hand saw, or with a circular saw running at a slow speed.

(25) W. B. G. says: My open grate draws nicely. Have lately gone into the room above and cut a hole into same fire and put up a stove in said upper room, with pipe leading into same hole. Stove also has good draft when there is no fire in grate. But when there is fire in grate there is not only no draft to stove but there is a reverse draft through it, so that the smoke and gas from the grate fire fill the upper room and house. Can you indicate a remedy? A. It is a bad plan to introduce a pipe into a fire already appropriated by another fire. However, where it is unavoidable, there should be a piece of sheet iron or cast iron plate inserted vertically in the flue, dividing it into two separate flues for about two feet above the point where the pipe enters it, the bottom being shut off to that part of the flue used by the pipe.

(26) B. F. A. and C. A. K. ask for a simple copper dip or wash? A. Wash the articles clean and dip in rain water 3 lbs., sulphate of copper 1 lb.

(27) S. G. asks: 1. What is best to put on tin roofs and gutters that will be perfectly harmless to cistern water? A. Rochelle ocher is a very clean paint for tin roofs, and is not very likely to be deleterious to water. 2. Do you think it is best to have a second filter (the water entering the same at the bottom and being drawn off for use at the top) in a cistern where it is likely that a heavy rain going through the first filter would wash all the sediment into the cistern? A. It is usual to let the rain water fall into the cistern first and there settle, by which means it is much cleared before passing through the filter. The first filter will not in that case be required. 3. What cement is the most free from taste, or what will cover cement to prevent its tasting? A. There is not much choice in that respect. The application of water glass might cover it.

(28) H. S. asks whether any solid or liquid has a marked affinity for hydrogen over oxygen? A. No.

(29) C. O. says: I have some manilla silk drawers dyed with indigo of different shades. After repeated washing the color still rubs off. What will prevent it and set the color? A. Boil the goods in 4 ozs. alum and 1 oz. cream of tartar dissolved in 3 gallons pure water, expose to the air for some time, boil in fresh water, and repeat the airing.

(30) A. C. L. asks how to make a japan for iron? A. 1. Mix shellac varnish with a sufficient quantity of ivory black or lamp black. 2. Asphaltum 1 lb., melt, then add hot balsam of capivi, and thin with turpentine. 3. Grit lampblack very smooth and add copal varnish to the proper consistence. 4. Asphaltum 3 ozs.; boiled oil, 4 quarts; burnt umber, 8 ozs.; mix by heat, and when cooling thin with turpentine. 5. Amber, 12 ozs.; asphaltum, 2 ozs.; fuse by heat and add boiled oil 1/2 pint, resin 2 ozs.; when cooling add 1 pint of turpentine.

(31) In answer to Z. T.—The liquor from the lower part of the cesspool will be richer in nitrogenous fertilizers.

(32) T. B. asks how to keep the rubber on babies' nursing bottles sweet? A. Wash in pure water after every use; nothing else answers as well.

(33) E. C. N. writes: 1. I wish to make a permanent magnet? A. See answer to No. 40, p. 283, of the issue of November 3, 1877, and to No. 16, p. 289, of the issue of November 10, 1877. 2. Will sulphate of copper and oil of vitriol work well in a battery together? A. Yes, if the battery is formed of a copper tank containing an inner frame of zinc.

(34) D. W. S. asks: How can I clean the dial of a clock, the enamel of which has become soiled from winding? It will not rub off. A. Try a little benzole, quickly applied. Soap and water will often suffice.

I have a medal which I think is pewter; through age it has become coated with a hard black substance. What will remove it? A. Dissolve 1 oz. of sal soda in a quart of water and boil the alloy in this for a few minutes. Rinse with water and then with strong muriatic acid, again with a little water, and rub in soft saw-dust and finally in whiting.

(35) C. M. S. asks how to bronze inks, gold, silver, or any kind? A. Gold ink—Triturate fine gold leaf with little honey, dissolve out the honey with hot water, and mix the gold powder with a sufficient quantity of gum water. Or use (with a gold pen) a strong solution of gold chloride in ether. For silver, use silver bronze powder or mica dust suspended in gum water. For bronze inks use any of the bronze powders in a like manner. It is necessary that the powders used should be very fine.

(36) I. M. asks: What is a good substitute for coppers in coloring fur felts black? A. The following, although not so cheap as the coppers vat, yields a rich, permanent black: Cam wood 8 per cent (8 parts for every 100 of goods). Boil 50 minutes. Then add bichromate of potash, 3 per cent; alum, 1 per cent; argol, 1 per cent. Boil 50 minutes and age over night. Then boil for an hour and a half in logwood 45 per cent; fustic, 8 per cent; sumac, 4 per cent; water, q. s.

(37) P. R. asks how to prepare thin brass that is exposed to an alcohol flame so as to keep a nice surface, not particular about what color? A. You may try the following: Into a suitable quantity of strong water glass solution mix 10 parts black oxide of copper and 20 parts graphite, both ground to a floury powder, and 1 part of Prussian blue dissolved in a very small quantity of a saturated solution of ferro-cyanide of potassium. Heat this and dip it uniformly on the clean work. When dry, brush.

(38) R. P. D. asks if lime placed in a room where polished steel goods are stored, the goods being in paper packages, will have a tendency to prevent rust? A. Caustic lime desiccates the air immediately surrounding it, thus preventing rust. A few table-spoonsful of the powder will suffice for an ordinary show case. It must be renewed occasionally. It is incapable of injuring the goods.

(39) J. J. J. asks for recipes for dyeing blue and dark blue on woolen goods? A. Pale blue—For 50 lbs.: 1 gill sulphuric acid, 3 ozs. extract of indigo, 1 lb. alum. Enter cold with one half of the extract, give the other half when the boiler warms, bring to the spring. Dark blue: Give the goods a mordant of tartar; lift, add a little chromate of potash, again work 15 or 20 minutes, and rinse; next boil in a bath of logwood, adding towards the last a few grains more of the chromate, again boil and finish. The whole quantity of chromate used should not exceed 1/4 oz. to each lb. of logwood taken for the bath.

(40) D. W. J. says: I want to preserve some large insects, such as tarantula, and small animals such as field mice. Can I preserve their shape and color without putting them in a liquid? A. For spiders, puncture them and steep for several days in a strong alcoholic solution of pure phenol, and then in dilute alcoholic glycerin. Or use a saturated solution of salicylic acid in glycerin; dry carefully. Small animals are best treated by the ordinary taxidermic methods—by removing the intestines, brains, etc., and curing the