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 This is for our information, and not for publication.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 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) B. W. B.—Persimmon bark is an astringent, and is said to have been used advantageously in intermittents, and in the form of a gargle in ulcerated sore throat.

(2) G. M. W.—You can become an expert runner by practice only. It is possible that you are not adapted by nature to running.

(3) D. R. R. asks: How many pounds pressure does it require to force water up a half inch pipe, grade 30 feet, distance 300 feet? A. 15 or more pounds, according to velocity.

(4) J. M. H.—While book knowledge is very valuable to mechanical engineering, shop practice is more important. Both are desirable and necessary. There is no end of books which you might read.

(5) C. H. K.—Two and a quarter times as much water will pass though a three-eighth inch hole as through a one-quarter inch hole under the same conditions.

(6) W. F. C. asks if there is any kind of solder that can be used with a soldering iron that will take a plate of nickel and be the same color as the rest of the work. We use high brass and low brass and copper. A. Use pure tin.

(7) A. & C. H. write: We have a horizontal boiler, and the flues leak around the ends, caused by being heated when there was no water in the boiler. How shall we remedy this? A. Get the nearest boiler maker to expand the tubes. Anything that you can put into the boiler to stop the leaks will only be a temporary makeshift, and may give you more trouble in the end.

(8) O. F. asks: 1. What is best for me to use for dissolving the Russian isinglass (that which is used for clarifying purposes)? Alcohol does not seem to answer. A. Try acetic acid. 2. What can I mix with paint in order to produce a lasting and glossy appearance when it becomes dry? A. Use boiled linseed oil.

(9) E. S. writes: In chemistry is there any such thing as atomic weight? And if so, please give the definition. A. Atomic weight is used to designate the weight of any of the elementary substances in comparison with the weight of hydrogen. Thus we accept 1 as the atomic weight of hydrogen, and therefore, finding oxygen sixteen times as heavy, we give to this latter substance the atomic weight of 16.

(10) J. H. J. writes: In your issue of the 14th instant, you give a receipt for making liquid glue, in which you say, "100 parts best Russian glue." Where can Russian glue be obtained? And why Russian? Will not the best American or French answer as well? A. Russian glue is prepared from the intestines of fish, and is considered more tenacious than the ordinary varieties of glue. It can readily be substituted by the commercial article known as "fish glue," which can be procured from any wholesale paint house.

(11) J. B., of the United States Army, asks a recipe for making a brilliant black gloss or polish applicable to black leather belts and boxes, so that they will look well at parades and inspections. Also how the brilliant gloss on patent leather is obtained? A. Boiled linseed oil and lampblack, with a drier, form the base of different compounds for leather dressings, but you had better buy one of the many preparations for your purpose. The patent leather gloss is obtained by baking japan on the leather in an oven, and is a very difficult process.

(12) F. L. asks how to imitate walnut graining. A. Try the following: The wood, previously thoroughly dried and warmed, is coated once or twice with a stain composed of 1 ounce extract of walnut peel dissolved in 6 ounces of soft water by heating it to boiling, and stirring. The wood, thus treated, when half dry is brushed with a solution of 1 ounce potassium bichromate in 5 ounces boiling water, and is then allowed to dry thoroughly, and is to be rubbed and polished as usual.

(13) S. A.—The white Castile soap is probably the best soap known. It consists of sodaand pure olive oil. The olive oil is sometimes substituted in part as follows: Olive oil 40 parts, ground suet and tallow 30 parts each. Caustic potash is used instead of soda, but it is more expensive, and the soap is a softer article. See the articles on "Soap and its Manufacture" in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 308, 325. 330, and 360.

(14) D. H. B.—The pressure of wind at 20 miles per hour is 2 pounds per square foot. As there are some conflicting elements in the computation for your special form of windmill, to determine its power we can only recommend you to make a practical trial, which is far more reliable, and takes in theelements of friction, variable angle of sails, and back action behind the hood, caused by the angular position of the windward arm.

(15) L. M. B.—For the volume of spherical domes—Rule: To 3 times the square of the radius add the square of the height of dome; multiply this sum by the height of dome, and multiply this product by 0·5236, or $3r^2 + h^2 h \times 0{\cdot}5236$. For volume of a cone: Multiply area of base by the height, and take one-third the product.

(16) J. P. S. asks: Would a cornet player be able to use his instrument successfully after having his upper teeth extracted and a false set put in? And are there good players so situated? A. A player having false teeth can use his instrument, but cannot play so well; we doubt if there are any very good players with false teeth.

(17) J. P. L.—To find how much tin vessels will hold, use the following rules: For the contents of cylinders: Square the diameter, and multiply the product by 0·7854. Again, multiply by the height (all in inches). Divide the product by 231 for gallons. For the frustum of a cone: Add together the squares of the diameters of large and small ends; to this add the product of the diameter of the two ends. Multiply this sum by 0·7854. Multiply this product by the height (all in inches). Then divide by 231 for the number of gallons.

(18) P. McF.—The right ascension of a planet is its distance from the vernal equinox or the point in the heavens at which the plane of the ecliptic crosses the plane of the equator measured upon the plane of the equator—the distance being measured in hours, minutes, and seconds, 24 hours representing the whole circle, or 360°. The declination north or south is the distance of a planet from the plane of the equator north or south in degrees, minutes, and seconds, reckoning from 0° at the equator to 90° at the pole. The diameter is its apparent size as seen from the earth in parts of a circle of 360°.

(19) S. L. S.—In regard to throwing two banks across a lake in which other owners might be interested, you should first ascertain what riparian rights you might infringe. The building of a safe dam on soft bottom is a very precarious undertaking; the silt being very mobile will not only move out from under the filling, but will also give no anchorage against the pressure. With a moderate depth of 4 or 5 feet of silt, a row of piles close together across the lake would be necessary to insure a footing. Then fill in with as coarse material as possible, making a hard rammed partition of clay or cement and sand on the pressure side of the pipes. Carry the partition as low as possible or below low water. Sheet piling with two rows of horizontal planking spiked and filled in on each side even with top, with broken stone, makes a cheaper spill than surface planking upon sills as sketched by you. Further, we do not understand from your letter whether it is a natural lake, the widening of a river, or a cut out from some river, all of which should be considered in any plan interfering with water flow. We do not consider that the current or depth that you speak of now interferes with the quality of the ice. You speak of white streaks and clear ice. Our best ice in this market is much marked in this way. These streaks are caused by the condition of the weather in the freezing season, alternate snow and rain, with wind, being particularly detrimental to a clear ice crop.

(20) R. S.—One of the very best scouring pastes consists of:

Oxalic acid	1 part.
Iron peroxide	15 "
Powdered rotten stone	20 "
Palm oil	60 "
Petrolatum	4 "

Pulverize the oxalic acid and add rouge and rotten stone, mixing thoroughly, and sift to remove all grit; then add gradually the palm oil and petrolatum, incorporating thoroughly. Add oil of myrbane or oil of lavender to suit. By substituting your red ashes from stove coal, an inferior representative of the foregoing paste will be produced.

(21) G. W. W.—Dynamite or giant powderconsists of about 75 per cent nitroglycerine and 25 per cent of some absorbent, generally infusorial earth. Its manufacture is attended by many difficulties as well as being exceedingly dangerous, and unless you havehad considerable experience in chemical manipulation, you will be unable to prepare it.

(22) S. J. writes: I set out 50 young apple trees last fall on some sandy soil. Should it be dry next summer, would it be well to lay last fall's apple pomace around them, and how thick would be safe? A. Yes; 4 to 6 in. deep.

(23) W. D. G., Jr., asks: How large a main pipe will be required to supply 6 hydrants and 50 dwelling houses, the water to be brought 1 mile with a 70′ head; the hydrants to be used with a 1″ nozzle, and there being no probability of more than two being required at a time? A. About a 6″ pipe; a smaller one would not give the desired pressure for hydrant uses.

(24) E. F. P. asks for a substance for polishing brass trinkets in a tumbler. A. Use leather scraps or skivings and tripoli, with rotten stone or pulverized pumice stone for first polishing; finish for a shine with rouge and skivings in another tumbler.

(25) T. F. W.—If you require power, it pays to use the exhaust of any engine for heating purposes. Independent of the want of power, and for a small place, a hot air furnace is the cheapest. For large buildings a low pressure steam apparatus has many advantages. Better advise with parties in the steam heating business.

(26) E. P. O. writes: Suppose a cannon is placed on a railroad car so as to shoot perpendicularly into the air, with force enough behind the bullet to carry it a mile high at the rate of a mile a minute, the railroad car also moving at the rate of a mile a minute when the cannon is discharged; how far will the cannon and ball be apart when the ball strikes the earth? A. The question supposes an impossibility; one cannot shoot a bullet to go a mile high at the rate of only a mile a minute; if started at that rate, it would drop to the ground as quickly as a marble snapped from the fingers.

(27) W. D. C.—We do not see how any chemicals can be put on the undressed side of leather to render it capable of being smoothed with emery cloth. The fibrous character of the leather is of such nature that the smoothing is done with a very little grease and rolling, hammering, or slicking.

(28) E. S. T. asks for a good receipt for good office mucilage? Take 2 parts of gum dextrine and add 1 part acetic acid with 5 parts of water. Dissolve over a water bath and add 1 part alcohol.

(29) C. E. O. asks what "Sozodont" is composed of? A. Take of:

Potassium carbonate	½ ounce.
Honey	4 "
Alcohol	2 "
Water	10 "
Oil of wintergreen and oil of rose, to flavor, sufficient.	

(30) B. A. H. asks how to make a polishing paste for blackening and polishing stoves? A. Try the following: black lead pulverized, 1 lb.; turpentine, 1 gill; water, 1 gill; and sugar, 1 oz.

(31) G. G. writes: Some months ago I was shot in the face; it is all healed, but left quite a scar, and in order to hide it, want to raise a beard. I have a growth of hair, but not sufficiently strong, therefore ask you the question if there is a remedy that would force hair to grow, and what it is. A. Where the hair glands have been destroyed, it will, of course, be impossible to produce a growth of hair. The use of borax in the water employed for washing, together with stimulating lotions containing small amounts of tincture of cantharides, is frequently of service. Such a lotion may consist of ½ oz. tincture of cantharides, 2 oz. eau de Cologne, ½ drm. oil of nutmeg, and 10 drops oil of lavender.

(32) G. B. writes: I want to run a short telegraph line (100 yards) between two offices. Please give diagram and principal connections for single line? A. For a telegraph line of the length stated, you may place your battery, sounders, and keys all in one circuit; your ground connections at the ends may consist of wires attached to gas or water pipes, or you may connect your ground wires with metallic plates having about 20 sq. ft. area, and buried in earth that is constantly moist.

(33) F. B. B.—It is not an easy matter to repair a mirror, but if it is silvered with mercury amalgam, you may be able to repair it by cleaning a space on the back of the mirror large enough to remove the scratch, then moistening the amalgam on the back of a piece of mirror with a little mercury, and cutting out a patch from the amalgam so moistened which will fit the cleaned place on the back of your mirror; then carefully slip the patch from the piece of mirror and place it in position on the injured mirror, then place on the back of it a piece of cloth and then a weight. Allow it to remain several days in this condition. If the work has been carefully done, the patch will not be noticed.

(34) F. A. K. asks if the electric current produced by small jets of steam is of any value? A. The electric current produced in the manner described is of no practical value.

(35) W. J. M. writes: 1. I am making some magneto call bells, which do not work satisfactorily on account of the revolving armature, which is of cast iron, becoming charged; how will I treat them so as to prevent this? I have tried many receipts to soften cast iron, but failed. I hope you will send me a receipt that will save me further trouble. A. Heat your cast iron very hot, and bury it in powdered slaked lime to cool. 2. What is the best kind of steel to make the permanent magnets of, such as used in all the telephone call bells? I am using cast steel hardened in salt and water. Is there a better way for doing the same? A. Chrome steel is said to be best for this purpose. Only the ends of the magnets need to be hardened. 3. Is Alvar steel any good for magnets, if so, where can I procure it? A. We do not know of any steel by that name. 4. Have you got a SUPPLEMENT giving full instructions how to construct an electric bath? A. If you mean an electroplating bath, see SUPPLEMENT 310. 5. What is the electromotive force of a single Leclanche cell in volts? A. About 1·48 volts. 6. Would you consider it an improvement on the Grove battery by using a solution of washing soda instead of sulphuric acid? A. It depends upon the results secured.

(36) M. & A.—In hardening such small springs, we suggest the use of a muffle or small chamber made of fire clay in the shape of a half cylinder with one end closed; or iron will answer the purpose, but will soon burn out. Build the muffle in a small brick furnace, so that the fire may be in contact with top and bottom. The springs can be passed into the muffler with a small tongs, and taken out as fast as heated. In this way a dozen or more may be heating at once. Harden in water or oil in the usual way. For drawing the temper, we think there is nothing better than a pot of boiling oil (linseed), in which dip the springs a few seconds until they are of the same temperature as the oil, then quench in hot water, which will leave enough heat in the springs to dry them. For this operation a flat-bottom basket made of wire makes a very convenient way of handling 3 or 4 dozen at once. Some use red hot lead in a crucible for heating articles for hardening. We do not think it best where large numbers are to be handled, as the springs would have to be held under the lead, which might be troublesome.

(37) E. O.—Emery wheels are in common use for grinding tools. A little care only is required to keep the tools from heating, and thereby destroying the temper.

(38) J. H. S.—We know of no remedy for your wet wall but furring off and newly lathing and plastering in the regular way. It is the cold wall that condenses the moisture of the rooms. The kitchen is the principal source of excessive moisture.

(39) W. F. K.—To run your copper into ingots, treat it in the crucible with borax and soda as a flux. Heat the moulds so as to make them perfectly dry before pouring the metal.

(40) C. C. C. asks: Which would be the best test for water works—to have three streams on one main near each other, or three streams on different mains scattered over the town? The mains, 8 in., 6 in., and 4 in., works half a mile from town. A. If you are testing in the interest of contractors, place the trial streams as near the source of supply as possible, and also near the 8 inch main. A fair test will be to locate the streams widely apart on one distributing branch.

(41) G. C.—Coke is supposed to be free from sulphur or other deleterious gases. We have little experience here with coke fired boilers, but learn that in England coke has a high reputation as a steam fuel.

(42) A. B.—Galvanized iron is generally used in damp places. Copper and brass are the only substitutes, both of which are more expensive, their values depending upon the conditions of their use.

(43) W. C. H.—Knife sharpeners and glass cutters are made of fine steel only, and given an extra hard temper. Hard bronze, 75 parts copper to 25 parts of tin, makes a very hard alloy, and can be melted in a brass furnace and cast. It is not as hard as the hardest steel, but will make very good cutting instruments. Can be cast in iron moulds. Iron may be readily brazed in a forge, or if small, with a blow pipe.

(44) J. M. C. asks: Will it destroy the power of a balance wheel by running a belt from it to a shaft? A. It will not. 2. We use a 6 horse power engine set on a cast frame; the fly wheel is 26 inches in diameter, 1½′ inch rim, 5 inch face, weighs about 150 pounds; will it be safe to put on about a 450 or 500 pound fly, or about what size and weight would do? A. If the engine now runs steady or evenly, more fly wheel will not be beneficial. If there is much shafting with pulleys and a belt on the present fly wheel, you will gain nothing by adding another and heavier fly wheel.

(45) A. F. McE. writes: We carry 60 pounds steam on a boiler used to run an Armington & Sims 35 horse power engine for incandescent lighting. The exhaust from this engine is connected into the 8 inch main steam pipe of low pressure heating apparatus, on which we carry a pressure of 7 pounds. Will you please tell me, through the columns of your paper, what is the thermal value of the exhaust of this engine in terms of the total heat of the steam in the boiler, or what part of the energy of this boiler is used in running the engine and what part is available for heating purposes? Temperature of feed water is 60° Fah. A. Your statement does not enable us to give you a clear answer. Carrying 60 pounds pressure in the boiler does not indicate the amount of steam used in the engine. This can only be done by indicator cards, which show the mean engine pressure, together with the speed record. On the other hand, you may be said to be using for heating purposes all of the thermal power generated and passed through the engine, with the only exceptions of the amount of radiation and leakage and the heat value that escapes to the atmosphere after heating the building. If you use all the exhaust for heating purposes without wasting, or, in other words, condense all the exhaust in the heating coils, you may safely conclude that you are running your engine free of cost while so utilizing the exhaust. The only apparent error in your system appears in the large amount of back pressure on the engine. The best examples of exhaust service in this vicinity exhibit a back pressure of 0 to ¼ pound, with the entire absorption of the thermal value of the exhaust in heating buildings.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined with the results stated.

J. T. H.—The earth appears to be a light yellow ocher, too light in color and not possessing sufficient body to be valuable as a paint. For local wants, it could be used as a polishing powder and perhaps for inferior qualities of pottery. Nothing very definite can be said concerning it unless it were first analyzed.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted,

April 14, 1885,

AND EACH BEARING THAT DATE.

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

Alarm. See Burglar alarm. Railway train alarm.
Amalgam strainer, J. Kirby 315,637
Amalgamating pan and settler apparatus for treating ores. M. P. Boss 315,893
Animal shears, G. H. Coates 315,733
Auger anchor, ground, Boehmke & Bohlken 315,593
Axle box, A. Fontayne 315,927
Axle box, car, W. E. Wilcox 315,581
Bag holder and lifter, J. A. Hamsch 315,778
Bag rack, R. E. Williams 315,688
Baking powder, A. Peters 315,830, 315,832
Baking powder, phosphate, A. Peters 315,831
Bale tie, wire, G. Nicholson 315,821
Baling press, J. R. & W. D. Slauson 315,850
Baling press, W. D. Slauson 315,965, 315,966
Baling press, upright beater, J. J. Piatt 315,960
Barbers' chairs, head rest for, T. W. Patterson 315,540
Battery. See Electric battery. Galvanic battery.
Bed spring, L. M. Prowse 315,546
Beehive, J. G. Hubbs 315,505
Beer cooling and preserving apparatus, F. Beisinger 315,699
Beer, manufacture of, J. Von Rose 315,980
Belt fastener, L. W. Herrick 315,781
Belt replacer, J. J. Harnsberger 315,615
Benzaldehyde, production of chlorinated derivatives of, R. Gnehm 315,932
Berth, sleeping car, G. Leve 315,517
Billiard cue chalk, substitute for, A. Peple 315,828
Blind slat fastener, window, J. M. Van Dyke 315,861
Blouse and pantaloon overalls, combined, S. Jacobs 315,506
Board. See Drawing board. Multiple switch board. Wagon scoop board.