Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) C. L. P. asks how to lacquer polished brass at home? If it can be heated on common oven, and about how hot? What to apply and how to apply it and how to prepare it? How hot the article should be, and howlong it should be left before using after lacquering? A. The brass must be perfectly clean; it must be boiled in caustic lye if necessary. Many lacquers are used; half a pound of red lac dissolved in half a pint of alcohol is a good one. Put the article on the top of a stove until moderately heated and then varnish it, keeping it hot. Then dry it by heat.

(2) L. M. asks how to clean and polish cows' horns. A. Rasp the horn with a file to bring it to a smooth, even surface, then scrape with glass in the same manner as a shoemaker scrapes the soles of boots. This if carefully done will leave a fine, clean surface. Then rub with a piece of cloth and electro-silicon wet to a paste with water. Then polish with a cloth and oxide of tin wet with water to a paste. Sometimes the horn is rubbed down for a final polish with French polish instead of the oxide of tin. Whiting and chalk in water is also used.

(3) C. & Sons write: We are running a 5 horse power engine and using only about one-half horse power ordinarily. Would it be practicable to have an air compressor and reservoir, so as not to run our engine every day? If so, please state the most economical kind of air compressing engine and reservoir. A. It is practicable, but we do not think it would "pay;" it would be more advantageous, if you make a change, to substitute a good caloric engine and sell your present engine and boiler, unless you have use for steam for other purposes than power.

(4) A. A. J. writes: If a tubular boiler be set with side walls kept clear away from the shell, say 6 inches, and arched over the top so as to leave a jacket space all round the boiler, allowing the heat to rise from the furnace to the top, and the back end closed above the back arch, so that the draught will be directed properly to the flues, will the heat above the water line be too intense? Will it be injurious to the shell? Is it better to close in at the sides as is usually done? A. It is better and safer to close in at the sides say two or three inches below water line.

(5) F. A. C. asks: 1. Would three-eighths of an inch be thick enough for a 4x6 engine, that is, thickness of cylinder? A. Yes. 2. What size ports should I have for a 4x6 engine with double slide valve? A. Steam $\frac{5}{16}$ inch by 3 inch, exhaust ¾ inch by 3 inches. 3. Is there a patent on the double slide valve engine? A. No. 4. What will be the power of a double slide valve engine 4x6 with 100 pounds of steam and 300 revolutions per minute? A. About 5 horse power.

(6) S. M. H. asks: Could a small boiler, say one horse power, be fed from a reservoir of sufficient elevation so that the hydraulic pressure from the reservoir would overbalance the steam pressure required from the boiler? If so, what height would the reservoir have to be to insure 100 pounds steam pressure? A. The hydraulic pressure must not only be equal to the pressure, but enough more to overcome the friction in pipes and the resistance of the check valve. About 240 feet.

(7) W. J. W. writes: A locomotive with a six foot driver and a 22 inch cylinder, and a locomotive with same cylinder and "5 foot 8" driver—how much more space would the six foot driver cover than the "5 foot 8," both going at their full capacity? A. Assuming that the boiler was the same in both cases, and just sufficient, the 6 foot driver should cover a trifle more space; but if the boiler was of ample capacity, the space covered would be directly as the diameter of the wheels; this is supposing the same number of revolutions made in each case.

(8) H. W. P. writes: I am using in my business a good deal of tea lead, which I buy from junk men; and my object in now writing to you, is to ask if you can give a good recipe for melting and separating the paper from the tea lead. A. To separate the tea lead from the paper, condense the mass of lead in an iron kettle. Put a layer of powdered charcoal over the surface of the lead and cover the kettle as nearly air tight as possible. Place the kettle over a strong fire and allow it to remain until the paper is carbonized and the lead is melted, then stir the mass with a dry stick and the lead will go to the bottom.

(9) H. J. B. writes: I am desirous of obtaining a license to run stationary engines. Can you inform me to whom I must apply in order to be examined for the same? Would the inspector that examines steamboat engineers be the proper one to apply to? A. For your license apply to the inspector who examines steamboat engineers.

(10) W. D. P. asks: Does the size of wheel of a vehicle vary the amount of power required to start a vehicle? If so, please state how. A. It is generally conceded that the larger the wheels the easier the running for vehicles within certain limits as to weight and smoothness of track. As a general practice, large wheels for rough roads are considered the best, as they give a longer tread or bearing.

(11) T. H. B. asks (1) if it were possible to run a train of cars through a vacuum, and to let drop a stone or feather from a window while the train was in motion, would the object reach the ground directly under the place where the window was when it was let fall, or would it be carried forward with equal velocity as train? A. The object would receive an impulse from the motion of the train which would carry it forward with velocity equal to the velocity of the train, while the action of gravity would give it simultaneously a downward motion. Therefore, when it reaches the ground, it will be directly under the window from which it was projected. 2. Is there any more or less water on the earth and in the surrounding atmosphere at the present time than there ever was? What is evaporation? Is it possible to totally destroy water? A. The quantity of water has not changed within a reasonable geological period. In the early geological ages there was more water in the atmosphere as clouds than now, and of course less upon the earth. Evaporation is the absorption of water by the air or atmosphere. Water can be destroyed by converting it into its primary elements, hydrogen and oxygen.

(12) W. W. A. writes: Please give formula for a dry paste for cleaning gold, silver, and jewelry without scouring. A. Polish with whiting and ammonia. It is risky to use any silver soaps or cleaning pastes, as they may contain mercury, which injures the silver permanently. Try a quarter of a pound of jeweler's rouge, three-quarters of a pound precipitated chalk.

(13) J. J. B. asks how to put a surface on soft sponge leather. A. Mastic varnish, rubber varnish, wax, size or glue, and calendering, or polishing with burnishers, are all used for smoothing soft leathers.

(14) S. H. B. asks: What is the difference between "quarter" and "bastard" sawed lumber? A. Bastard sawed lumber has the annual rings parallel with the surface in some part of the board or plank, and is the ordinary method of sawing. Quartering is sawing the log into 4 parts across the center, and then sawing the quarters so that the annual rings will run out to the surface. It is not economical for the lumber producer. Quartered lumber may be made from bastard by culling and sawing out the bastard centers.

(15) W. O. S. writes: I wish to cut with a 20 thread V tap, Brown and Sharp gauge, a cog wheel, that shall have 100 cogs on the circumference. What must be the circumference of the wheel before cutting the cogs? A. The diameter of the pitch line should be $1\frac{\text{ooo}}{\text{1000}}$ inch diameter, to which add five one-hundredths inch for the outside or diameter of the blank. This will represent a proper wheel gear of 100 threads with a pitch of one-twentieth inch. As your tap will not commence cutting upon the pitch line, you will have to use the pitch line diameter for the diameter of the blank. In fact, it is a very difficult mechanical problem to make a tap match the teeth in cutting a wheel.

(16) O. A. G. writes: Will you please inform me what acids or mixtures I should use to give copper a red or variegated appearance, such as is sometimes seen on the ingots of the metal? I want it for ornamental purposes. A. The colors you see on copper ingots are due to oxidation of the metal by the air while the metal is hot. Try heating and evaporating drops of nitric acid on its surface and then heating.

(17) L. W. C. asks: Can you tell me what preparation to use in covering the floor of a photographic dark room that will fill the cracks and render it water tight to prevent the slops from going through and staining the ceiling below? A. Nail a narrow strip of wood around the corners of floor and put down a single sheet of oil cloth that exactly covers the floor. The strips are intended to bend up the edges of the oil cloth to prevent escape of liquid.

(18) E. D. C. writes: I have three presses run by a small engine which I consider good for four horse power under 45 pounds pressure. I do not consider it economical to use steam, and have been trying to secure power from a mill about twelve rods distant, which is run by water. The location is such that shafting on wire cable is not practicable. It has occurred to me that I might lay a pipe, connect it with the boiler, and use compressed air. Would such a plan be feasible? Would the apparatus be reliable? Can compressors be purchased in market? What size pipe would be needed? A. The use of compressed air would, we think, not prove economical or satisfactory. Cannot you bring the water to your place in a pipe and by it run a small turbine? If so, this will be the best arrangement.

(19) D. S. C. asks: What gives the lamp shades used on drop lights the light or white color? Are they glass or porcelain? If glass, what gives the glass the opaque or white color? Is it the peculiar kind of sand used? A. The lamp shades you refer to are of glass; glass is rendered opaque by various ingredients—oxide of tin will produce this effect.

(20) T. J. asks: What is the process of making fine shot of lead and copper? A. By pouring the metal when melted through a strainer of perforated iron, allowing the metal to drop into water at a considerable height. Shot for ammunition is poured in shot towers and falls from 40 to 60 feet. The new way is to drive cold air up the shaft, which cools the shot with a short fall of 20 to 30 feet.

(21) H. E. B. writes, inquiring about the economy of using a side wheel steamer as compared with a screw propeller. I claim that the fastest time that has ever been made on rough and smooth water has been made with a screw propeller, and it did not take any more coal to propel it than a side wheel steamer. The other party claimed that a side wheel steamer made the fastest time on smooth water and used less coal. A. For large boat of light draught, side wheel boats have made the best speed with greatest economy. For small steamers, yachts, etc., the screw has given the greatest speed, but with an enormous power and large consumption of fuel.

(22) H. C. S. writes: Please let me know if there is anything I can wash an iron mould with to help make the iron come out smooth, as the mould is small and the iron chills before the mould fills up; or is there anything I can put in the iron to make it thinner, so the iron will run more freely? A. The iron used in casting the celebrated Berlin ware, consisting of ornaments, charms, chains, and other jewelry, is said to be alloyed with arsenic, but as arsenic is very volatile and dangerous to manage except by chemists, we do not recommend its use. Tin will make the iron more fluid. Use No. 1 iron in a crucible and add when melted 2 to 5 per cent of tin. Use powdered charcoal to keep the iron from decarbonizing. Smoke the iron moulds and heat to about the temperature of melted lead. This may make the casting comparatively smooth, but will not prevent entirely the chilling of the iron. Casting in an iron mould has never been considered very feasible except for chill purposes. Finer surfaces can be had from sand moulds.

(23) F. M. L. writes: Can the business of carpentering, etc., be learned without a practical instructor? If so, what books are necessary for a beginner—the most comprehensive and practical? What will a set of drawing tools cost that are not fine, yet will answer all purposes? A. By studying "Appleton's Cyclopedia of Drawing" you will be able to learn architectural drawing without a teacher. Do not buy cheap drawing tools; better get along with a few and have them good.

(24) C. G. H. writes: Can you kindly inform me of the formula for finding the horse power both nominal and actual of the ordinary locomotive and return flue boiler? In both cases hard wood is the fuel used, and there is a natural draught through a smoke stack 60 feet high. A. To obtain the nominal horse power of a locomotive boiler: Take the whole surface of the inside of the fire box and two-thirds of the internal surface of the tubes, in square feet, add them, and divide by 14,14 being considered the amount of effective surface equivalent to one horse power. The same also for cylindrical tubular and flue boilers with the fire under the shell and returning through the flues or tubes. The whole surface of the under half of shell and two-thirds of tube or flue surface as above. For the actual horse power: The quantity of water evaporated in dry steam per hour indicates one horse power per cubic foot.

(25) E. H. A. writes: I read in one of the scientific papers about an oil for lubricating made with lead and olive oil; now I want to know if cotton seed oil could not be used, and how long should it stand; and if it becomes too thick, what should be used to thin it? A. Cotton seed oil will answer. If it becomes too thick, thin it with kerosene oil.

(26) J. G. L. writes: 1. Would you please let me know how telephone wire is made, and what it is made of? A. Any iron or copper wire, or copper coated iron wire will answer for a telephone wire. The larger the better. No. 12 galvanized iron wire is the standard conductor for telephones. 2. Is any wire of iron or steel with a thick coat of copper used for telephone for electricity, and how then is that thick coat put on? A. The copper coating you mention is deposited on the wire by the galvanic process.

(27) W. G. A. writes: 1. In the telephone described in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 142, do the binding screws, *a*, project through the flange, E, and connect with the diaphragm in any way? A. The binding posts are not connected with the diaphragm, but with the terminals of the bobbin. 2. How much wire should be wound around the spool, D? A. No fixed amount. Fill the spool with No. 36.

(28) T. McK. writes: Please give me the temperature of the water in a boiler when there is 25 lb. steam pressure; also give me the temperature of the water at 75 lb.? A. Twenty-five lb. pressure above atmosphere, 2,665°; and 75 lb., 320°.

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

G. H. T.—It is principally silica. It might be of some value in the manufacture of fire clay articles. It maybe called silicious clay.—W. W.—It is doubtful if it is of any value. Mineral paints are not rare and are low priced.—H. W.—The clay is of very good quality and might be used as fire or potter's clay in the manufacture of common chinaware.—J. W. V.—Probably of little or no value. Analysis of the three, $15 00 for iron only.—E. S. B.—The names of the specimens you sent are as follows: 7. Galenite and pyrite. 8. Pyrite. 9. Galenite. 10. Mispickel. 11. Pyrite.—W. L. B.—No. 1. Iron pyrites. No. 2, ditto in clay nodule. Probably of little value.—D. A. R.—The sample is infusorial earth, composed principally of silica. It is of little use except as a polishing powder or as fuller's earth.

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October 9, 1883.

AND EACH BEARING THAT DATE.

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