Business and Personal.

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Competent persons who desire agencies for a new popular book, of ready sale, with handsome profit, may apply to Munn & Co., Scientific American office, 361 Broadway, New York.

For Sale—Patent No. 494,106, lubricator. Inventors, Vilh. Lohmann and Carl Andersen, Copenhagen. Described in Scientific American, April 8, page 219. Address V. L., P. O. box 2212, New York.

Wanted—A live and energetic man who understands draughting and is capable of supervising mechanical department of a large manufacturing plant. Must be a thorough mechanic. State reference, experience, and salary wanted. Address "Mechanic," P. O. box 773, New York.

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Notes and 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 This is for our information and not for publication.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 Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(4902) J. J. R. says: I have a large windmill, which in good wind gives me 8 horse power. Is it practicable or even possible for me to light my house and barn electrically from this power? A. You can use your windmill power for driving a dynamo for lighting your house; but it will be necessary to use storage batteries in order to secure a steady current. We shall probably publish at an early date an article on this subject.

(4903) J. M. B. asks: Is it compulsory for the patentee of a patent, or the person selling the patent, to have date of patent and name of patentee on the article sold? A. No; it is not compulsory. But if not so marked, if any one should imitate the article, not knowing it was patented, such person would not be held liable for infringement until notified.

(4904) W. W. P.—You can find the current given out by your dynamo by dividing the electromotive force by the resistance. There is no trouble with your galvanometer needle. If you wish to measure the current, you should use an amperemeter, or a galvanometer with a single large bar for a conductor instead of a coil.

(4905) W. H. L., Jr., writes: There was a mistake made in your reply to (4771) W. H. D., March 25, 1893. This is the correct formula: A ⅛ horse power is equivalent to 93 watts, as stated. Allowing an efficiency of 92 per cent (about) = 100 watts.

$$P \div E = C = 100 \div 500 = \tfrac{1}{5} \text{ ampere.}$$
$$E \div C = R = 500 \div \tfrac{1}{5} = 2{,}500 \text{ ohms.}$$

Proof.

$$C \times R = E = \tfrac{1}{5} \times 2{,}500 = 500 \text{ volts.}$$
$$E \times C = P = 500 \times \tfrac{1}{5} = 100 \text{ watts.}$$

(4906) E. E. D. says: I have made the castings and am ready to wind my armature and field magnets for the motor described in SUPPLEMENT No. 600. Everything is to a ¾ scale, that is, I have made the castings, etc., ¾ the size of the original. Please let me know what size wire to use on the magnets and armature respectively, and how many coils on each. Also let me know how many volts the machine, ¾ size, will stand and how many it will take to run it, and how many revolutions. A. If you reduce the size of the wire to ¾ of that given in the article referred to, you will be approximately correct, but a machine of a new size requires not only a great deal of calculation but some experiment to secure the best proportions.

(4907) W. H. S.—The wire will change 0·014 of an inch per rod for each 10° Fah., or 1·4 inches for 100 rods. Its elasticity will keep it from breaking, if not overstretched.

(4908) W. B. says: 1. Could you tell me the power of a water wheel, the diameter of the wheel being 9 inches and of the bucket type, the jet being three-sixteenths inch, and the water pressure being 35 pounds to the square inch? Would the wheel have to be any larger to drive the small hand power dynamo in SUPPLEMENT 161? A. The water wheel, if of the Pelton type, will give you about one-twelfth of a horsepower, and should make 900 revolutions per minute. If you make the jet of good form for velocity and one-fourth inch diameter, it will give the same wheel at the same speed about one-eighth of a horse power, and will drive dynamo illustrated in SCIENTIFIC AMERICAN SUPPLEMENT, No. 161. 2. Could I not use a piece of very soft rod iron instead of sheet iron for the drum armature? A. Any soft iron is good for the armature. 3. Will common soldering acid solder platinum or not, and what acid will? Platinum cannot be soldered like other metals. The parts to be soldered must be made clean and a thin electro deposit of copper made upon the surface, when it can be soldered with tin and the ordinary tinner's acid.

(4909) S. W. L. writes: I inclose a sample of a deposit which formed around the sides of a water barrel during a light rain on night of March 13th. Very heavy, threatening clouds formed about 8 P. M., accompanied by some lightning and thunder, but the rain that fell was very light. This deposit, which looks like sulphur, could be seen everywhere the next morning. Can you tell me what it is and what caused it? A. The phenomenon of showers of sulphur, which has been many times described as falling with rain or during great storms and found floating on water and covering the grass and roofs of buildings, while yellow and sulphurous in appearance, is not sulphur. Accurate researches have proved that this dust is nothing else than the pollen of certain flowers, and of pines in particular, which are swept off by the wind and precipitated by the rain, the nature of the pollen depending upon the vegetation that is flowering in the direction from which the wind blows. In Europe, in March and April, the pollen is supposed to be that of alders and filberts. In May and June, that of pines, elders, and birch. In July, August, and September, that of lycopodium, typha, and equisetum. The dust from sand storms is readily recognized by its gritty feel.

(4910) A. T. B. asks the best mode of mixing and using Portland and Louisville cement, both in dry and wet places, foundations, and floors; the kind of sand and the proportions. Also the best thing to clean and brighten copper. A. Portland cement 1 part, sand 2 parts, broken stone 3 parts, for concrete foundations. For mortar, the same without the broken stone. For floors, first coat as above for mortar, finish with equal parts Portland and sand. Use for all clean, sharp sand. With Louisville and other American cements, 50 per cent more cement than the above. All cements should be mixed with the sand dry, then wet, stir, and use at once. Oxalic acid in water is much used for cleaning and brightening copper.

(4911) F. C. F. says: I am having a hull built for a steam launch, 28 feet long, 5 feet 6 inches beam, depth amidships 29 inches. Will you kindly advise me through your paper the size boiler (horse power), also engine (horse power), to get the greatest possible speed? Also size wheel and number of blades. I would like to get 9 or 10 miles per hour. I also admire an oil, coal, and wood combination. Has that an advantage over steam or oil alone? I would like it as automatic as possible. A. You will require 10 indicated horse power in your engine; cylinder, 5 inches diameter, 7 inches stroke; boiler, 30 inches diameter, 48 inches high, tubular; screw 30 inches, 5 feet pitch, three blades. Hard coal fire for the power you require will give the most satisfactory result. Address advertisers in this journal for details of boat and engine.

(4912) C. H. R. asks: What proportion of silver is held in solution (estimated) by the water of the ocean per ton? What proportion of gold? Has there ever been an experiment on an extensive scale to recover the precious metals from salt water? A. In the SCIENTIFIC AMERICAN of June 18, 1892, you will find an excellent article on this subject. It is calculated that there are 10,000 million tons of silver in the ocean.

(4913) C. P. McC. asks: 1. Why are the carbons of arc lamps plated with copper? A. It makes them better conductors. 2. What is the salt used or substance in nickel electroplating? A. Nickel sulphate, or a double sulphate of nickel and an alkaline metal. Various formulas are given in our SUPPLEMENT, Nos. 210, 310, 436, 755, and 848. 3. Can a person practically run the small motor in SUPPLEMENT 641 with a storage battery? If so, how large a one? A. Yes. Two cells will run the motor. 4. Of what substance is the carbon in the Edison incandescent lamp made? A. Bamboo fiber carbonized. 5. Where may I find information in regard to the explosion of the idea of two kinds of electricity? A. The idea can hardly yet be considered exploded. See Lodge's "Modern Views of Electricity."

(4914) H. L. asks: How will I be able to obtain a black finish on brass tubing that will not scale or knock off? A. Immerse the tube, after being thoroughly cleaned, in a solution of chloride of platinum, which is made by dissolving platinum to saturation, 2 parts hydrochloric to 1 part nitric acid. For other receipts, see "Cyclopedia of Receipts, Notes and Queries," $5, mailed.

(4915) A. H. W. asks what size magnet it would take (size of wire, etc.) and how many batteries to secure a lifting pull of one-half pound one-fourth of an inch, also of one pound. A. Make the core of your magnet one-half inch in diameter, with the spools three inches long, and on the spools wind enough No. 20 wire to make the depth of the wire equal to the diameter of the core. Use four cells of plunging bichromate battery.

(4916) E. L. R. asks: What size pipe must I use to put in an artesian well that brings water within 75 feet of surface, and put into tank 25 feet above, to put into said tank a stream of water from five to six thousand gallons per hour? Can I use a steam jet pump or had I better use a piston pump? What horse power will it require to do said work? What kind of well boring apparatus is cheapest and best to use in boring said well, say 500 feet, through blue marl, or earth formation like that at Niagara Falls? A. You will have to provide for a lift of about 150 feet; this will be too great for a economy in a steam jet pump. For so large a quantity of water a direct-acting artesian well pump will be the most economical. Such a pump with 10 inch steam cylinder, 6 inch water plunger, 24 inch stroke, making 40 strokes per minute, will do the work. With the friction of the moving parts this will require 8 horse power, with a mean steam pressure of 40 pounds per square inch. The well should be bored 8 inches, which will give room for a 6 inch chamber, although the pipe below the bucket may be 4 or 5 inch. If the well is to be tubed, it should be with 7 inch pipe, which, if casing pipe is used, requires the drill hole to be 8½ inches diameter. Rock drilling through limestone and sandstone is quickest done with a diamond drill. The earthy covering of the rocks should be bored out from the inside of a larger tube than is used for the rock work, the large tube being driven down as the boring proceeds. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 156, 157, 158, 159, and 160, for illustrated description of drilling artesian wells, tools, cost, etc., 10 cents each mailed.

(4917) W. W. writes: I want to get at the amount of heat necessary to disintegrate the various gases or odors, and the various plans tried by others. I can handle acid gases, but oily odors are ahead of me so far. A. The odor of oils and animal matter was neutralized in the fat rendering establishments around New York, a few years since, by conducting the odorous gases and vapors under the fire grates. We have no literature on this subject.

(4918) C. D. B. says: I am putting on top of a framework 40 feet high a 35 bbl. tub or water tank, insert a 1½ inch gas pipe perpendicularly in bottom of tank down 2 feet below surface of ground (or 42 feet), then at right angles a 1½ inch pipe from standpipe 300 feet on a level, then turn up 2 feet and discharge the water in open air, how high will it throw the water with fountain head kept full depth of tank, 8 feet? A. The height of a jet from your tank will vary very much with the size of the nozzle. If the water level is 48 feet above a half inch nozzle of good form, your jet may be thrown 38 feet high. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 792, on "The Height of Jets and Fire Nozzles."

(4919) H. M. asks: In case something gets under the check, will the engineer have to draw his fire? A. It is not necessary to draw the fire when the check does not shut after pumping. There should always be a valve between the check and the boiler, which can be closed when the pump stops, or you can keep the pump running slowly. In such emergencies it only requires a little attention to keep the plant running until the proper time for examination of the check valve. It is a very common and proper practice to close the valve between the check and the boiler and clean out the check valve while under full steam head.

(4920) R. M. W. asks: Will you kindly inform me how to find the proper amount of direct radiation to heat a room by steam or hot water? A. The ordinary practice for your climate is one square foot of steam-heated surface to 125 cubic feet of space in room, and one square foot to 100 cubic feet space for hot water. The quantities are derived from deductions and experience. They have been fixed mathematically for different conditions and exposure of buildings and the amount of glass. See Baldwin's work on "Steam Heating," $2.50 mailed, and his work on "Hot Water Heating," $4 mailed.

(4921) W. B. M. asks for the name of the best known filling for lining for small ice box, say capacity of two to three hundred pounds. I have one built of hard oak plowed and grooved, double solid bottom and lid, with two inch space around front, back and sides, latter space filled with pounded charcoal, but fail to get satisfactory results. A. Dry asbestos fiber and mineral wool are the only materials suitable for insulating ice boxes, other than charcoal. They should be lightly packed so as to prevent air circulation, as the air alone is the best non-conductor of heat when confined in small spaces by fibrous material.

(4922) C. F. B. writes: I wish to know the size smokestack for steamer that has two boilers, 103 tubes in each, 14 feet by 2½ inches; the draught goes through the tubes and about half way back under the boilers into stack between boilers. The present stack is 30 feet high, 36 inches diameter, but draught is not as good as desired. Can you tell me what change to make? A. Your chimney is not high enough. By adding 10 feet to the height you will gain 30 per cent stronger draught. Then, by giving the cleaning of the tubes proper attention, you will obtain full duty from the boilers.

(4923) A. E. A. asks: What is the lowest temperature that has ever been artificially produced? Also by whom it was observed and by what process it was obtained. Please mention that temperature according to Fahrenheit's scale and also what it is by the Centigrade thermometer. A. The lowest artificial temperature is —140° C., —220° Fah., with bisulphide of carbon and liquid nitrous acid by evaporation. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 449 and 489, on the liquefaction of gases and low temperatures.

(4924) W. A. P. writes: I am using a tubular boiler and feed with an inspirator; the connection for supplying the boiler with water is on top at the front end, the supply pipe running down between the tubes. The blow-off pipe is at the back end of boiler near the bottom. Now I want to connect another inspirator to boiler. Would there be any objection to connecting water supply in blow off pipe? Of course would connect in such a manner as not to interfere with blow-off. A. There is no objection to feeding the boiler through the blow-off pipe, if the feed pipe has a valve and check valve properly arranged, whether the blow-off pipe is at the front or rear end of the boiler. Feeding through the blow-off pipe is in common practice.

(4925) B. A. C. writes: A few days ago I was assisting an organ tuner, by sounding different notes and chords for him. In our conversation he told me that it was necessary to have the temperature 65° before the organ could be tuned. Why is this? A. As the different materials of which the organ is constructed have different coefficients of expansion, it is obvious that at any other temperature than that at which the organ is tuned, some of the pipes will be slightly out of tune. For this reason the tuning is done at a temperature of 65°, which is about the average temperature of churches or places where organs are used.

(4926) A. R. writes: I want to pump water from a tube 10 feet high through a half inch pipe. What kind of a pump will require the smallest power to do the work? Will a pump which draws the water from the top take less power than one pressing the water from the lower end of the pipe? A. Any hand force pump will answer your purpose. It takes no more power to force than to lift the water.

(4927) W. McV. asks: What kind of cement will stick on a stone wall over whitewash, to prevent the water from coming through? The above refers to the foundation of a flour mill. The river rises in the spring and leaks through the walls of basement, causing considerable annoyance. It is well plastered now, but water seems to leak through and requires the services of a fire engine to keep it pumped out. A. It will be difficult to make such a basement as you describe water tight. It might perhaps be done by carefully pointing the walls with best quality Portland cement, and laying a three inch Portland cement pavement.

(4928) J. F. R. asks the amount of shrinkage that should be allowed for, in making patterns for the eight light dynamo. A. For iron allow 1/16 inch to a foot. For brass 3-16 inch to a foot.

(4929) J. W. H.—For dye vats as you describe, set the glazed bricks as close as possible in a putty made of glycerine and litharge. Mix in small quantities and use at once.

(4930) J. S. asks: What sized propeller would be required to run a 13 foot boat, if the engine is ¼ H. P.? How many miles per hour could the above boat go? A. Your boat will require 10 inch propeller, and may make 4 miles per hour.

(4931) W. R. writes: I am making a small box of aluminum and would like to solder the corners together. Now I ask you, Is there any solder that will hold? If so, where shall I be able to get it? Also, can aluminum be welded or fastened together by heat? If so, what way? A. You can make a solder of tin 3 parts, zinc 2 parts, cadmium 5 parts, to solder with a soldering copper, using paraffine as a flux. Aluminum cannot be welded as you suggest.

(4932) E. E. P. T. asks for a rule for determining the requisite thickness of iron in engine cylinders for different horse powers; average steam pressure, 100 pounds. A. The cube root of the diameter in inches × 0·36 for the thickness of the iron in inches is a good rule, subject to small variations for special service.

(4933) G. E. S. asks how to gild the edges of books. A. White of egg, well beaten up, is the ordinary sticking material used by binders to put the gold leaf on. The leather back of the book is varnished with it, and when dry, a strip of gold leaf is put on the place where the letters or ornaments are to be placed; the letters used are common printing types (they must be new, however, and not been used with printing ink). They are heated a little above the boiling point of water, which is easily tried with a wet finger, and then they are pressed on the gold leaf for a few seconds only, when the heating of the albumen or white of egg under it fixes them to the leather of the book. The ornamental figures used are commonly made of brass and manufactured for the use of bookbinders, while the type is screwed in an appropriate brass or iron holder, with wooden handle. The back of a well bound book being always round, the proper way of putting on the gilded letters and ornaments requires a certain way of manipulation, which it is best to acquire by visiting some good bookbinder's shop in the next large city to see the operation and use your eyes properly so as to get all little details. The sides of books being flat, it is best to put the letters and ornaments under a press. The type is put up in a proper form, it is heated, put under the press with the varnished side of the book, covered with gold leaf on the right place, and the press screwed down. Sometimes the binder puts the strip of gold leaf on the face of the type, in place of on the book. This is equally good, and under certain circumstances preferable. From the "Scientific American Cyclopedia of Receipts, Notes and Queries."

(4934) S. C. S. writes: We are pumping waste sulphuric acid a distance of 1,400 feet, with a rise of about 35 feet, and are experiencing a great deal of trouble with the pumps used, and would like to have some suggestions from you in regard to the matter. The pumps we have been using are built especially for us of so-called acid metal, probably a composition of copper and lead, by reliable manufacturers; but after two or three weeks' service they commence to churn, the water end being so much eaten. We have been pumping about 2,000 gallons per hour, and our line is 2 inch lead pipe, while the capacity of the pump is said to be 5,000 gallons per hour. There may be some dirt in the liquid pumped. What remedy would you suggest to have our pumps hold