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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 This is for our information and not for publication.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 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.

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Minerals sent for examination should be distinctly marked or labeled.

(4713) C. C. says: Am contemplating a cistern on a hill half a mile distant from house, to have 2½ inch pipe to house. Amount of fall 73 feet, object to furnish water for house use and fire protection. What will be probable height stream can be thrown through 1 inch hose with ¼ inch nozzle? Can I throw same size stream, using 1 inch pipe for main? What will be the pressure at house? A. You can throw a ¼ inch stream 38 feet high from a 2½ inch main with stated head. A 1 inch main would be of no value as a fire protection, about 10 feet in height only. For household purposes the 1 inch pipe would flow in all stories, but the friction will give no force to a jet of any value, but will deliver about 7 gallons per minute with an open pipe. When the pipe in either case is closed, the pressure will be 31½ pounds per square inch.

(4714) A. J. V. asks: Is it possible to attain a greater speed with an ice yacht than the prevailing wind? If so, under what circumstances, and what is the best record? A. A first-class ice boat, the ice in fine condition, the wind from the right quarter, will sail much faster than the wind. A wind of twenty miles velocity per hour will drive the boat fifty or sixty miles per hour. The best record we call to mind for an ice boat is 70 miles per hour.

(4715) Gas Producer says: With steam jet discharging fifteen cubic feet of steam, at pressure of 25 pounds per square inch per hour, what should be dimensions and form of a cone to induce blast of air under grates of gas producer, or mixture of air and steam of the proportions of twenty of air to one of steam by weight? With temperature of air at 60° Fah., what should be temperature of this mixed blast, and what pressure, in inches of water, should it develop? A. Steam issues from a finely tapered nozzle at 800 feet per second at 25 pounds pressure and expands to 700 volumes of mixed steam and air from the area of the nozzle. For the quantity of steam, 15 cubic feet per hour, you will need a taper nozzle ⅛ inch diameter, and for its best work and for 300 cubic feet of air per hour, requires a 6 inch tube 30 inches long, delivering the mixed air and steam at a velocity of 6 feet per second and a water pressure of ½ of an inch.

(4716) A. J. B. asks (1) the best way to temper horse shoes and bars for permanent magnets, and if with water to what color? A. Temper to a straw color. 2. Is there any rule (and if so, what) to determine the number of ampere turns necessary to produce a given number of magnetic lines of force in a core of laminated Russian iron or cast iron? A. The rules are rather long to be given here, and should be illustrated by examples. You will find them treated in Sloane's "Arithmetic of Electricity," $1, and also in Thomson's "Electro-Magnet and Electro-Magnetic Mechanism," $6. Either book we can supply by mail. 3. Also the best way of magnetizing permanent steel magnets? A. Simply hold one end against a strong dynamo pole. There are various other ways. You may surround it with a coil of insulated wire or of wire whose convolutions do not touch, and pass a strong current through the coil.

(4717) L. S. S. says: If a train goes 5,000 feet per minute, and another train is behind it, following it at the same rate of speed, they are 50 yards apart, the last train has a cannon; when fired will travel the same speed as the train (the cannon ball, of course); will that cannon ball get away from the last train, or in other words, if a man stood on the rear end of first train, could the cannon ball catch the man if aimed at him? A. Yes.

(4718) J. L. P. writes: I have a ring armature about 2¼ inches in diameter by 2 inches across the face. It is wound with 12 coils of No. 19 magnet wire, each containing about 11 feet or a little more, about 135 feet in all. Do you think it could be used as an armature for a small dynamo? I have a set of field castings to fit, and want to use it for something. A. Your armature will answer for a small dynamo or motor. You cannot, however, expect very much from it. Consult SUPPLEMENT, No. 641, for information as to the construction of a small motor.

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