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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 This is for our information and not for publication.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. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. 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.

(8617) H. N. Co. ask: Can you furnish us with information in regard to dipping small articles in tin ($\frac{1}{2}$ tin, $\frac{1}{4}$ lead). A. For tinning small articles, making them bright and smooth, we advise an alloy of 2 parts tin to 1 part lead. The articles should be freed from grease or oil in an alkali bath, washed clean, and dipped in a solution of muriate of zinc and ammonia, made by dissolving zinc to saturation in muriatic acid diluted with half its bulk of water. Add as much sal ammoniac as the solution will dissolve. This solution may be further diluted with water according to the kind of metal by experience. Then dip in the melted solder quite hot, so that it will drip freely. Withdraw slowly and plunge in clean hot water.

(8618) W. L. W. writes: Referring to an article on page 353 of the May '17 issue of the SCIENTIFIC AMERICAN, concerning power lost in flywheels, I beg to offer some suggestions that would better do away with the friction of the atmosphere referred to. As I understand it, this wheel is simply a balance wheel, and is not used as a pulley also. This being the case, would it not have been better to make an airtight casing inclosing the wheel entirely, with an airtight joint at the shaft, and then pump out the air, creating a vacuum in which the wheel would revolve without any atmospheric friction whatever, and the only added friction would be the slight pressure of the packing boxes on the shaft. The same plan could be adopted where the wheel is used as a pulley also by inclosing both the driving and driven pulleys together with the belt in the airtight case. A. The great difficulty of insuring the maintenance of a vacuum in a large space would probably prevent the success of your plan to incase a driving wheel in a box from which the air is exhausted.

(8619) A. B. and others: Several of our esteemed correspondents call attention to the fact that we only allow the calf, in the problem of which we published a solution under Query No. 8606, to graze in one direction; but as the inquiry was how much can the calf graze over, we answer this also. The calf can graze over three-quarters of a circle with 400 feet radius. It can then graze over a sector on each side of this of almost 60 deg., or two areas each nearly one-sixth of a circle of 300 feet radius. There remains a figure formed by two sides of the barn and the radii of the last arc, 300 feet. Draw a diagonal of the barn, completing a triangle with these radii. The length of this diagonal is found by the rule for the right triangle. It is a little more than 141 feet. The three sides of the triangle are now known, and the area may be found by the rule as follows: From half the sum of the three sides subtract each side severally; multiply together the half sum and the three remainders, and extract the square root of the product. The area of this triangle is about 22,500 square feet. From this take 5,000 square feet, or half the area of the barn, and add to the remainder the two circular parts noted above. When the problem is solved with the aid of trigonometry, the result is a total of nearly eleven acres. No two are likely to obtain exactly the same results, since the retention or rejection of decimals will affect the result. The highest exactness in the result is to be obtained by employing the methods of the calculus.

(8620) J. H. H. asks: 1. Could No. 32 wire be used for the secondary coil in place of No. 30? A. No. 32 wire would be better than No. 30 in the secondary of an induction coil. 2. If so, would the same weight of wire produce a stronger current? A. The same weight of No. 32 would make more turns on the spool and hence give a longer spark than could be made by No. 30. 3. Could a 108-volt incandescent current in the primary coil be used with good effect? A. 108 volts would be too high a pressure to use in the primary of an induction coil. If such a current is employed, it will be necessary to use a rheostat or choking coil to cut down the current taken by the primary. 4. What size wire should be used to carry the secondary current around a room, to be used in initiatory work in a lodge? A. A wire of the same size as the secondary will carry the secondary current anywhere it is desired to produce an effect.

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