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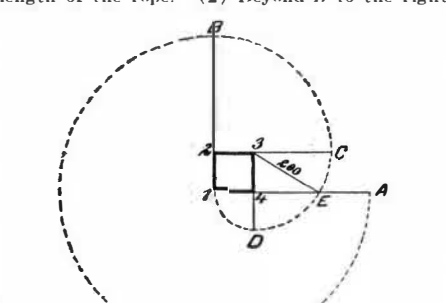
Notes and Queries.

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 This is for our information and not for publication.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.

(8605) A. K. M. asks: 1. Can you let me know the cheapest and most simple way of producing oxygen? A. Oxygen is generated by heating a mixture of manganese dioxide and potassium chlorate in a metal flask. Care is necessary in doing this not to disengage the gas too rapidly and thus produce an explosion of the apparatus. The materials also should be tested in advance to see that they will give up the oxygen quietly and not too rapidly. 2. Can you explain what caused electric sparking at point of connecting 3-inch suction pipe let in from top of tank car containing a mixture of turpentine and naphtha, the discharge pipe from pump leading to large storage tank of several thousand barrels of the same mixture? Also being connected with large storage tanks of gasoline and carbon oil. The suction pipe being of iron, every attempt made to connect would cause heavy sparking, so that the men dared not connect for fear of fire, the temperature being about 15 deg. Fahr., having had cold weather for some time; whereafter the men got a suction pipe of galvanized iron, let it down into the tank car, and in connecting there was no more sparking. A. The charge of electricity was due probably to the very cold air and friction of the pipe and pump. If the liquid was not set on fire by the sparks which passed while the men held the pipe near the tank, it could not have been after they had brought the ends into connection with each other. The danger would then have been over. These oils are not conductors of electricity.

(8606) E. E. R. asks: I would like to have you publish this problem in your query column: A calf is tied with 400 feet of rope to the corner of a barn 100 feet square. How many square rods can the calf graze over? A. Let the barn be represented by the square 1-2-3-4. Tie the rope at 1. (1) The calf can swing from A to B, grazing over three-quarters of a circle whose radius is 400 feet, the full length of the rope. (2) Beyond B to the right



his rope shortens to 300 feet, and he grazes over one-fourth of a circle whose radius is 300 feet. (3) Again his rope shortens to 200 feet with the center at 3, and he grazes around till he covers one-fourth of a circle with a radius of 200 feet; but a part of this is included in the area already covered. (4) To find this part draw the line 3-E, forming the triangle 3-4-E. By trigonometry we find that the angle 3 in this triangle is 60 deg. Hence the angle C-3-E is 30 deg., and the sector of which this is the angle is 1-12 of a circle whose radius is 200 feet. (5) Compute the area of the triangle 3-4-E by the ordinary rule for right angled triangles, and find the total area grazed over by adding the several areas described above.

(8607) E. E. S. asks: 1. What is the best way to mount a map on a muslin backing, and would a window shade be suitable? A. Moisten the muslin, stretch and tack it down on a table. Then wet the map thoroughly and apply the paste evenly over the entire back of the map, being very careful to bring it to the edges of the paper. Now lay the sheet on the cloth and smooth it out and rub it down upon the cloth so as to remove air bubbles and bring it into contact with the cloth. A roller or squeegee such as is used for mounting photographs will enable you to do the job much better. 2. How can I produce on brass the bronze-like finish used on the instruments of surveyors and engineers? A. Bronzing of brass by dipping in a solution of 5 drachms of perchloride of iron to 1 pint of water, until the desired color is obtained; then wash in hot water, dry, and lacquer with a thin shellac and alcohol varnish.

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