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Notes and Queries.

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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 This is for our information and not for publication.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.

(8634) C. W. B. asks: Please publish on what principle of hydrodynamics the ball nozzle works. A. The ball is held in the ball nozzle because there is more pressure on its outer surface than on its inner surface. Hopkins, in "Experimental Science," (\$5, new edition shortly) gives the explanation for the ball held by air in a similar way that the stream of air adheres to and carries away the air in contact with the inner surface of the ball, thus reducing the pressure on that side, and producing a partial vacuum there. The external air therefore presses the ball into the stream of water and spreads the stream.

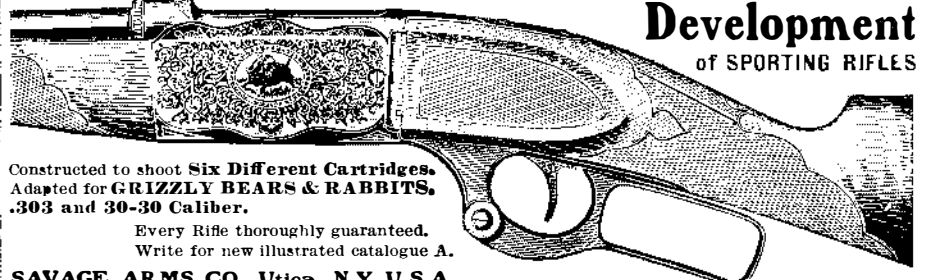
(8635) G. K. asks: Do you know of any means whereby green leaves, such as ferns, smilax, or such as have very thin leaves, can be dyed or dipped in some solution which will keep them near their natural color and also keep them from falling to pieces? A. Plants may be dried without destroying their natural colors in most cases by placing them under pressure between sheets of blotting paper, and frequently changing the papers. The leaves do not fall off with this treatment. 2. Do you know of any means whereby small flowers can be dyed white so as to preserve them to be used commercially? A. Flowers can be bleached to whiteness by sulphur fumes in the same manner as straw is bleached in making hats. We do not know any means of dyeing them white, so as to preserve their beauty of form and appearance.

(8636) B. K. asks: What is the safe gap figured out between line and ground in lightning arresters for 5,000 volts A. C., 2,700 A. C. and 1,000 volts A. C.? A. Foster's "Pocket Book for Electrical Engineers," price \$5, gives the data for the various lightning arresters. Those of the General Electric Company for 1,000 volts are given as having two metal cylinders 2 inches in diameter and 2 inches long, separated by an air gap of 1-32 inch. A low non-inductive graphite resistance is inserted between the arrester and the ground. The arrester for 2,000 volts is made with two spark gaps of 1-32 inch each and a non-inductive resistance. For higher voltages the 2,000-volt arrester is used as a unit, and enough of these are placed in series to make the necessary spark gap.

(8637) B. Y. G. asks: 1. Would you please inform me the exact solutions, in the metric system, for a liter bottle battery of bichromate of potash, liter battery of sal ammoniac, of a liter Leclanche? A. There are many different formulae for bichromate of potash solutions for battery use. They may be said to be about as follows: Water, 100 parts; bichromate of potash, 10 to 20 parts; sulphuric acid, 10 to 25 parts. All parts by weight. The batteries using sal ammoniac generally employ a saturated solution. 2. About how much a Ruhmkorff coil giving a 6-inch spark would cost? A. They are quoted from \$175 to \$70 by different makers. 3. How big a spark is necessary (and how many volts) to see the bones in a hand by an X-ray globe, and how many liter single-liquid bichromate of potash batteries would be needed to make the spark? A. A 6-inch coil will penetrate all but the thicker portions of the body. Four to six bichromate cells should furnish current enough to run it.

(8638) K. K. asks: 1. What is the temperature of steam in the boiler at 80 pounds pressure, and the temperature of the fire underneath the boiler to raise the steam to the temperature, say as an illustration, at 80 pounds pressure? A. Steam in a boiler at 80 pounds pressure has a temperature of 323 deg. Fah. The fire under the boiler may be from 1,800 deg. to 2,500 deg. Fah. 2. In an electric arc, continuous current, if what is termed the "north pole" is presented to the arc, will it (referring to a magnet being presented to the arc) attract or repel? Or does it matter at what portion of the arc same is presented, near + or - carbon? A. The arc is driven in the same direction by a magnet as the pole of a magnet would be by the current. If the magnet attracts the arc when you wish to repel it, use the opposite pole of the magnet. 3. What material is it which, when suspended over a gas jet, and gas allowed to come in contact with it, becomes red hot, igniting gas? A. Spongy platinum is the substance that fires a gas jet.


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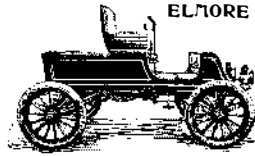
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