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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 This is for our information and not for publication.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.

**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.

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**Minerals** sent for examination should be distinctly marked or labeled.

(7072) R. B. D. writes: 1. Is old lead pipe sufficiently pure for storage battery plates? My battery will not remain charged, and I presume that it is because of local action on the surface of the plates. A. The old lead pipe should work for your battery. Probably there is a short circuit somewhere, either within the cell or between the plate terminals outside. Dampness might be at the root of the trouble. 2. In order to seal my storage cell with a permanent cover I filled the spaces between and around the plates with salt, filling the cell to within three-eighths inch of the top, and then poured a melted compound of paraffine wax and resin over the salt until the jar was full. When the compound was cool I inserted two tubes into the cell and got rid of the salt by passing a stream of water through the cell. Is it probable that the brine would injure the plates in this operation? A. This process should do no harm, provided the salt was all washed out. Otherwise the chlorine of the salt might affect the operations of forming, charging and discharging, or the hydrochloric acid set free might attack the lead and cause undue formation of lead sulphate.

(7073) S. A. says: Please give me a good formula for making white frosting, such as painters use on windows, that will stand a considerable heat. A. Put a piece of putty in muslin, twist the fabric tight and tie it into the shape of a pad; well clean the glass first, and then pat it over. The putty will exude sufficiently through the muslin to render the stain opaque. Let it dry hard and then varnish. If a pattern is required, cut it out in paper as a stencil; place it so as not to slip and proceed as above, removing the stencil when finished. If there should be any objection to the existence of the clear spaces, cover with slightly opaque varnish.

(7074) R. N. writes: 1 I am going to build a two sixteen candle power light dynamo. The dynamo I am using as a model is made to give an E. M. F. of 25 volts and a current of 8 amperes by using 8 pounds of wire No. 14 for the field cores and 1½ pounds No. 18 for the armature. By winding proper sizes of wire on the armature and field cores, any strength of current or potential should be obtainable within limits. 1. Now, I would like to know how many pounds and what size of wire should be used for the field cores and armature to obtain an E. M. F. of 100 volts and a current of 2 amperes. A. A rough, approximate rule to change voltage is to use wire whose cross sectional area is in inverse proportion to the voltage desired. Thus, if No. 14 and No. 18 wire respectively give 25 volts, then apply the proportion cross sectional areas of No. 14 and No. 18 respectively. Cross sectional area of desired wires : : 100: 25. This gives us No. 20 and 24 wire. 2. Could the wire on the armature and field cores be wound in four equal sections and connect these sections either in series or parallel like the armature of the magneto-electric machine in "Experimental Science," page 484, to secure a current of different voltage, say 100, 50, and 25 volts? A. This could be done, but would introduce more complication. 3. Would you advise to soak the wire in a solution of shellac while winding? Would single covered wire be safe? A. Use double covered wire and apply shellac to each layer after winding it on. 4. Please state the relative conductivity of aluminum. A. Copper=1. Aluminum=0·56 approximately.

(7075) C. O. H. writes: 1. I have a telephone line of about a quarter of a mile in length, using the Bell receivers. Every night, as soon as the arc lights in the streets are turned on, there is a peculiar humming noise heard in the telephone. Part of the way the line runs parallel with the arc and incandescent light wires, but not less than 80 or 100 feet from them. What is the cause of the humming, and how can it be remedied? A. The electric light circuit causes the trouble. A metallic circuit will greatly or entirely reduce it. 2. Would there be too much resistance to use transmitters made exactly like the receivers? A. No. 3. Would not the motor in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 641, be much strengthened by filling in between each section of coils on the armature with pieces of sheet iron fitting closely to the core? A. At the expense of considerable additional complication this could be done. It would slightly increase the efficiency.

(7076) R. G. B. says: Can you suggest something that will prevent rust forming on steel surgical instruments? They are used only occasionally (3 or 4 times a week) and are in a dry cabinet in a dry office. It won't do to nickel plate them. A. 1. Clean frequently; after using, clean with dry chamois leather and wipe off with an oiled rag. 2. For this purpose the Lancet confidently recommends a mixture of equal parts of carbolic acid and olive oil, smeared over the surface of the instruments. This plan is much used by medical officers in the navy, and is found to preserve the polish and brightness of the steel, however moist and warm the climate may be.

(7077) D. E. S. asks: 1. Please answer the following questions as soon as convenient: 1. In transmitting music, speech, etc., by telephone would two dust transmitters with 500 ohm induction coils give better results, than one? Could two or more induction coils (500 ohms) be connected up with one transmitter to give loud results, and how connected? A. A single dust transmitter with proper collecting trumpet or cone should answer. We do not advise the use of more than one transmitter. 2. Can a funnel be attached to an ordinary telephone receiver so that all in a room may hear? Is there any loud receiver made? If so, by whom? If not, how could one be made? A. Yes; a large funnel helps, but the sound is apt to be rather weak. The loud speaking telephone of Edison is described in SUPPLEMENT, Nos. 127 and 138; other illustrated articles on such telephones will be found in SUPPLEMENT, Nos. 163, 207, 339, 350, 596, 719, 711, 769, and 997; price 10 cents each. 3. What is considered the best form of transmitter for long distance work—carbon contact or dust? A. The dust telephone. 4. For experimental work, what is the best and cheapest thing that can be introduced into a circuit to add resistance? A. A carbon rod laid in a groove in a paraffined board with sliding contact is excellent. Or simply use iron wire coils, remembering that unless wound anti-inductively, i. e, doubled at center, they will create magnetic fields and affect delicate instruments. By using several carbon rods of different diameters a large range may be secured. See articles on the engineering details of long distance telephones, also the cost of such telephones, in SCIENTIFC AMERICAN, No. 4, vol. 64, No. 2, vol. 66, and No. 2, vol. 72, also SUPPLEMENT, Nos. 822, 836, and 895; price 10 cents each by mail.

(7078) J. J. H. asks for a good recipe for polish for brown russet leather shoes.

A. 1. Soft soap..... 2 parts.
Linseed oil..... 3 "
Annatto solution (in oil)..... 8 "
Beeswax..... 3 "
Turpentine..... 8 "
Water..... 8 "

Dissolve the soap in the water and add the annatto; melt the wax in the oil and turpentine, and gradually stir in the soap solution, stirring until cold.

2. Palm oil..... 16 parts.
Common soap..... 48 "
Oleic acid..... 32 "
Glycerin..... 10 "
Tannic acid..... 1 "

Melt the soap and palm oil together at a gentle heat, and add the oleic acid; dissolve the tannic acid in the glycerin, add to the hot soap and oil mixture, and stir until cold.

3. Oil of turpentine..... 20 parts.
Yellow wax..... 9 "
Common soap..... 1 "
Boiling water..... 20 "

Dissolve the wax in the oil with the acid of the water bath, and the soap in the water; mix the two solutions in a hot mortar, and stir until cold.—American Druggist.

(7079) C. H. B. writes: Is it a poor plan to connect batteries of different kinds, or of different degrees of exhaustion, together in series, and, if so, what constitutes the objection? A. The principal rules for batteries are these: To obtain the maximum current from a given number of cells the internal resistance must be equal to the external. To obtain high efficiency make the internal resistance as low as possible and concentrate the resistance on the work. It is quite immaterial whether batteries of different kinds be mixed as far as the mere question of mixture is concerned. The efficiency will depend on the efficiency of the component cells and no more. Exhausted cells will by their inferiority reduce the quality of the combination.

(7080) R. C. P. asks how a motor may be transformed into a dynamo. A. No change is necessary, except that motors are less critical in requirement, practically speaking, than dynamos, and as built are apt to make poor dynamos. A thicker core, smaller air gaps, cast iron for field core and laminated armature core should be employed in dynamos.

(7081) R. B. W. asks: How many hours in your judgment would six Mesco dry batteries, largest size, continue to furnish a spark of sufficient size to ignite gas successfully in a two horse vapor stationary engine? And would you recommend the use of dry instead of a wet battery? A. We cannot give any satisfactory answer, but would incline to recommend Leclanche batteries in place of dry batteries.


### TO INVENTORS.

An experience of nearly fifty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.


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