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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 This is for our information and not for publication.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. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(5151) C. W. S.—The care of a gravity cell is very simple. Two things are necessary; one is to keep the zinc clean, the other is to keep the line of demarcation of the copper solution and the zinc sulphate about half way between the zinc and copper solutions of the battery. This you can do by regulating the resistance of the circuit. If you find your cells running down too rapidly, connect them up in series of two or three in parallel; if on the other hand, level of the blue liquid rises into close proximity with the zinc, it indicates too much resistance in the circuit, the remedy for which is obvious—to decrease the resistance of the external circuit.

(5152) J. J. M. says: Some time ago I saw a man who made it his business writing names and designs on glassware. I am acquainted with the process using the vapors of fluorine acid, but this man used a fluid with pen and brush. Would you kindly let me know under queries of your valuable paper what kind of a solution he probably used? A. The preparation may be made by mixing sulphate of barium and fluoride of ammonium in the proportion of three parts of the former to one part of the latter, with sufficient sulphuric acid to decompose the ammonium and bring the mixture to the consistency of rich milk. The mixture should be made in a receptacle of lead, and kept in a bottle of the same material, or of gutta percha. Since fluorine preparations have been produced at reasonable prices the decoration of glass by their means has steadily made its way. Etched glass is now to be found everywhere, and glass etching runs glass cutting very hard. It is very easy to understand that well etched objects appear actually more beautiful than those which have been cut. The cost of production is cheaper, and since M. Hock, a Viennese chemist, has given us an elaborate work upon the technique of glass etching, the difficulties attending this kind of work have been reduced to a minimum. As is well known, fluorine acid usually etches smooth, while other fluorine preparations yield a matt surface. The most beautiful ornamentation is obtained when certain parts of the glass surface are rendered matt by means of fluoride of ammonium which has been slightly acidified by means of acetic acid. The matt appearance is not always the same with different kinds of glass, but varies much in beauty. This effect is governed by the composi-

tion of the glass, lead glasses being easily acted upon and furnishing a very fine matt surface. 3. Where it is desired to have the surface of the glass not altogether matt, but shining like ice, as in the case of window glass, this may be attained in a simple manner by placing the glass plate in a perfectly horizontal position and covering it with fine groats. Then very dilute fluorine acid is poured upon it. The groats act as a shield and produce upon the glass raised points.—"Cyclopedia of Receipts, Notes and Queries."

(5153) J. M. says: Will you please advise a subscriber how to finish an oak front to a dwelling that is exposed to the weather, where the finish will stand any reasonable length of time and not come off, bleach out and fade? All fronts to dwellings and stores in this part of the State that I have noticed do not stand the weather. Also please advise how to make a glue that will hold a joint that is exposed to the weather. A. An oak front should be thoroughly oiled with raw linseed oil as soon as finished, and rubbed down with woolen cloths. In a few days, or as soon as the raw oil has struck in and dry enough, apply a coat of boiled linseed oil, and when dry a second coat. A good weather glue is made by boiling the glue with skimmed milk, in the proportion of half a pound of dry glue to a quart of skimmed milk. Swell the glue in the milk before boiling.

(5154) P. McL. writes: I am about to erect two batteries of boilers, four boilers in each battery. Size of first battery 26 feet long by 38 inches diameter, two 15 inch flues in each boiler. Size of second battery 32 feet long by 42 inches diameter, two 15 inch flues in each boiler. Will you please through your Notes and Queries inform me the distance grate bars should be below shell of boiler, also distance from bridge wall to shell of boilers, depth of combustion chamber, and style of back wall, whether straight wall or should it be raked off in front? Boilers to burn Pittsburgh coal and can use all steam they can make. Also please give me height and diameter for iron smoke stack for each battery? A. The grate for soft coal should be 3 feet below boilers in both batteries. Bridge wall, one foot below the boilers. Size of grate for each boiler of the first battery should be 40 inches wide, 4 1/2 feet long. Size of grate for each boiler of second battery should be 44 inches wide, 5 feet long. Bridge wall should be vertical for 9 inches above the grate, then raked off or beveled to the top at about 45°. Iron smoke stack of first battery 38 inches diameter by 60 feet in height. For second battery 44 inches diameter by 60 feet high.

(5155) F. W. M. asks: Is there any need of a flux in casting brass? If there is, what is the best to use? A. No flux is used in casting brass. A little powdered charcoal is put on the surface in the crucible to prevent oxidizing.

(5156) J. J. P.—We do not think a fan blower is adapted to organ blowing, on account of the vibration of the column of air, which would affect the sounds produced by the pipes.

(5157) C. H. asks: 1. I have just made two storage batteries, 4 plates, each 4x5 inches, coated with red lead mixed with sulphuric acid and water. I want to charge them from a 50 volt, 16 candle power socket. Is the voltage too high? A. By introducing your battery, together with some resistance, into your 50 volt circuit, you can charge it. 2. How can I reduce the voltage from the socket low enough to charge the cells to the best advantage? A. Use a wire rheostat or a bank of lamps for resistance. 3. How many gravity batteries will it take to charge the storage batteries so as to burn a 1 candle power lamp 15 to 20 minutes each evening, using the gravity cells during the day time to charge them? A. Four gravity batteries to each cell of sto age battery. The proposed lamp is rather small; you might use 2 or 3 cells with a larger lamp and run it for a much longer time.

(5158) W. M. writes: I have constructed a pair of receivers of the Bell telephone pattern, merely as an experiment. When I tried them I found that the sounds were very low and indistinct. Can you tell me what the cause of this is? A. Possibly you may have placed the diaphragm at too great a distance from the pole of the magnet, or you may have used a weak magnet. Possibly you have not sufficient length of wire on your spools, or the wire may be short-circuited.

(5159) B. M. C. V. asks: 1. What is the rule to know the charging time of a given accumulator? Has the number of plates anything to do with it, or the surface of the plates as represented by square inches? A. Charge your batteries until the positive plates look like wet slate nearly black; when partly discharged they become dark red, chocolate or plum color. It requires about 7 or 8 hours to charge a battery. 2. I have an accumulator for medical use, composed of four separate accumulators to be charged, connected in parallel with 2 Bunsens 20 cells for 8 hours. I want to know how many hours it will take to charge them with 4 telegraph cells? A. Four gravity cells to each cell of storage battery will charge storage cells in about the same time, 7 to 8 hours. 3. I have two large Bunsens (2 gallons) with two zinc plates each; one of the plates in each cell is nearly destroyed by little use. The connections are properly made, the 2 zincs in each cell and one of them with the carbon of the neighboring cell; the plates are thoroughly amalgamated, the screws firmly attached, nevertheless the browsing is very strong in both the mentioned plates. Can you help me with your advice in preventing such a trouble? I use for charging 1 part strong sulphuric acid to 12 of water by volume. A. The only way to prevent the destruction of the zincs is to remove them from the cell when the battery is not in use. 4. How can I know the amperage and amperhours of a given accumulator? A. You can determine this only by trial, or addressing the maker, if it is one which is on the market.

Replies to Enquiries. The following replies relate to enquiries published in the SCIENTIFIC AMERICAN, and to the numbers therein given.

BORING GLASS.—In the May 6, 1893, number of the SCIENTIFIC AMERICAN, a correspondent, M., tells of a very good way to drill glass plate. His method is a good one, but if a saturated solution of camphor in turpentine be used as a lubricant, the drill will cut more rapidly.—C. R. JOHNS, M.D.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

June 20, 1893,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing various inventions and their patent numbers, including items like Adjustable wrench, Advertiser clock, Alarm clock, and many others.

Table listing various inventions and their patent numbers, including items like Fish plate, Fishing rod, Fluid heater, and many others.