Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per Line will be charged.

Notes & Queries

W. T. R. will find directions for purifying mercury on p. 131, vol, 30.—T. T. L. should consult a lapidary.—W. T. C. can waterproof his cloth by the process described on p. 347, vol. 31.—M. A. S. can utilize old rubber by the process detailed on p. 349, vol. 26.—W. J. will find directions for bronzing on pp. 11, 85, vol. 33.—E. J. K. should use marine glue. See p. 42, vol. 32.—McG. B. can cement pieces of marble together with plaster of Paris.—W. W. can dye his billiard balls red by the process given on p. 362, vol. 30.—W. T. B. will find an answer to his query as to church ventilation on p. 356, vol. 29.—R. M. C. will find on p. 74, vol. 31, particulars of the lifting power of hydrogen.—H. H. S. can mold rubber by the process given on p. 363, vol. 30.—L. R.'s trouble with the wind wheel is an optical delusion.—W. F. D. W. can anneal his lamp chimneys by the process given on p. 42, vol. 26.—J. G. G. will find a description of the compression engine on p. 66, vol. 34.—L. H. E. will find an answer to his query as to a cannon on a moving car on p. 273, vol. 32.—W. L. G. can unite glass with brass with the cement described on p. 117, vol. 32.—A. S. can paste paper labels on tin with the preparation described on p. 26, vol, 34.—C. D. T. can bleach straw hats by the process given on p. 11, vol. 32.—C. H R will find a full description of felting processes on p. 50, vol. 34.—D. J. I. will find a description of the tallest chimney in the world on p. 311, vol. 32.—W. C R. will find directions for making furniture polish on p. 315, vol. 30.—C. L. B. will find directions for renovating gilt picture frames on p. 27, vol. 31.—F. W K. will find directions for hardening tallow on p. 202, vol. 24.—H. B. L. can remove inkstains from marble by the process described on p. 58, vol. 30.—G. A. R. will find the table of weights of iron castings in proportion to those of wooden patterns in *Wrinkles and Recipes*.—J. W. C. should consult an oculist.—A. M. M. will find an article as to pressure on slide valves on p. 299, vol. 31.—E. N. C. will find a description of a small furnace for melting brass and iron on p. 235, vol. 32.—M. C. will find directions for making a battery for electrotyping on p. 26, vol. 32.—G. M., Jr., will find on p. 75, vol. 34, a recipe for *eau de Cologne*.—H. B. P., A. S., D. K. H., R. J. W., C. A. S, W. W., W. S., J. D. H., J. B B., J. G., and others, who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) G. W. A. says: I am about to put a flag pole on top of our store, and I am somewhat fearful of lightning striking the pole. How shall I arrange it? A. If you have a good lightning rod on the house, provide the pole with a good sized copper wire and connect the latter to the rod.

(2) H. W. G. asks: 1. Can I deposit aluminum or wrought iron by the electro process? A. It is difficult to do Several processes have been published, but they do not appear to be of any practical value. 2. Can I coat wrought iron with the aluminum by melting and dipping, as with zinc? A. We believe this has never yet been successfully accomplished.

(3) X. Y. Z.—You do not furnish sufficient data to have your question answered with any degree of accuracy. To what use is the flow to be put? How thick are the walls that are to support it? If for warehouse purposes, how high is the story to be for which this is to serve as a flow?

(4) J. W. asks: 1. How can I make one of the ink wheels used on printing telegraph instruments? A. Cut circles of beaver cloth, and place them together until the required thickness is obtained. Fasten with a small bolt and nut. 2. How is the ink put in the wheel? A. The wheels are thoroughly saturated with ink at first, and a little added daily while the wheel revolves.

(5) D. A. W. says: You recently described an electric pile in sesquioxide of iron, having one pole formed of a prism of charcoal, containing sesquioxide of iron in its pores. Is the prism composed of common charcoal, and how is the sesquioxide of iron placed in its pores? A. Charcoal or carbon will answer. Try soaking the carbon in an aqueous solution of the sesquioxide.

(6) C. M. B. asks: 1. In constructing a battery, how must I connect the wire to the disk of zinc? A. By solder. 2. How must I connect the insulated wire to the coil of copper wire, and also to the wire leading from the zinc of the next cell? A. The insulated wire may be connected to the wire coil by solder or by twisting the two ends together. It is usual and more convenient to employ binding screws for connecting one cell with another. 3. What is the most readily obtainable form of insulated wire that I can substitute for the gutta percha covered? A. Gutta percha or kerite is the best covering.

(7) E. B. K. says: I am desirous of constructing an electric light sufficient to illuminate a medium sized room. How many cells of Daniell's battery will it require? A. If a steady light is desired, it will be useless to operate without an electric lamp, and this, as usually made, is a costly apparatus. Forty or fifty large sized cells, of the form commonly called the tray battery, will give a good light.

(8) T. M. B. says: 1. I wish to build a small telegraph from one room to another. How can I soften ordinary round iron for the poles? A. It is not absolutely necessary to soften them, but you can do so by heating them red hot and allowing the fire to die out very slowly while they remain in it. 2. How shall I connect them, and what should they be wrapped with? A. Connect by means of a piece of soft iron, and wrap with copper wire covered with silk or cotton. 3. Please give me full directions for making a small sulphate of copper battery. A. See answer to E. M. C. on this page. 4. How many cells shall I need, and how shall I connect the battery with the poles? A. Four or five cells should be sufficient. Connect the zinc of one cell to the copper of the next in order; join the copper of the first cell to one end of the line and the zinc of the last to the other. Insert the coils of the magnets in the line circuit, so that the current shall traverse their whole length.

(9) G. A. T. says: I made a small induction coil for lighting a gas jet. Instead of putting my iron wires in a bundle in the center of the primary coil, I reversed them, putting the wires outside and surrounding the primary and next to the secondary coil. It works admirably. Has it ever been tried on large coils? A. We believe so; at any rate the idea is not new.

(10) E. M. C. says: 1. How can I make a battery for running a magnetic engine? A. A good form of sulphate of copper battery can be made thus: Fill a large jar about two thirds full with water in which about ¼ lb. zinc sulphate has been dissolved. Place a disk of copper, to which a gutta percha covered wire has been soldered, at the bottom of the jar; suspend a zinc casting or plate from the top, and drop a few crystals of copper sulphate on the copper disk. A wire from the zinc and one from the copper form the poles. The plates should expose considerable extent of surface if large wire is used for the machine. 2. What is the best form of such an engine? A. One of the easiest to construct consists of two electro-magnets, between which a piece of soft iron mounted on an upright is made to vibrate. The upright may be suspended or supported on an axis below. It also carries an attachment by means of which the current is shifted from one magnet to the other as it vibrates to and fro. The magnets are thus charged alternately, beginning with the most distant from the soft iron. Expensive machinery is not required for the construction of such an engine.

(11) F. L. H. says: I have a small electrical instrument known as a vibrating shocker. Will such an instrument give a current with Bunsen's cells, strong enough to decompose water? If so, how many cells will be required? A. Such an instrument, with a single cell, will probably decompose water, but we fear the quantity of the current is so small that the process would be a slow one.

(12) M. A. W. says: 1. In a plate electric machine, how large in diameter should the plate of glass be, and how thick? A. The plates are made of various sizes. One of 12 or 15 inches in diameter, and ⅛ or thereabouts in thickness, will be found easy to manage. 2. What would be best to make the cushions of? A. Make them of leather and stuff with horsehair. 3. Would iron wire $\frac{1}{12}$ inch in diameter do to connect the cushions to the ground? A. Yes. 4. Would an iron rod 1½ inches in diameter do to make the prime conductor of? A. Make the prime conductor of brass or tin tube, about 2½ or 3 inches in diameter, and have the ends rounded. 5. What diameter ought the arms to be, that connect the prime conductor and plate? A. About ¼ inch. 6. Of what metal should the points be? A. Any kind of metal will answer for the collecting points.

(13) E. W. asks: 1. Will a common unglazed earthen cup answer for a porous cup for Bunsen's battery? A. Yes, if not baked too hard. 2. How can I make a piece of wood a non-conductor? A. Soak it in melted paraffin.

(14) P. W. M. says: I read an article in your paper on taking life by electric shocks instead of hanging. I have experimented with a rat. I laid him on a table, and took a coil giving an 18 inch spark. I made connections with his mouth and tail, put on 6 large Grenet cells, and left the current on about 5 minutes, and apparently it did not affect him. I then made the connection through his two ears; this seemed to have killed him; but when I put him in the cage, in 5 minutes he opened his eyes and was as wild as ever. Please explain this. A. We are not in favor of practising cruelty to animals, not even to rats; and we do not wonder that your victim was wild. Had you placed him on a glass or ebonite plate, and arranged the connections so that the full force of the machine should be transmitted through him, we doubt if there would have been any occasion for repeating the experiment with that particular rat.

(15) J. S. asks: 1. What kind of a battery will produce the decomposition of water? A. Two or three ordinary Bunsen cells will answer. The same number of Daniell cells might do, but the action would be much less rapid. 2. How large a battery will cause 9 feet of No. 30 platinum wire to get red hot? A. It will probably require forty cells of Bunsen battery of very low internal resistance.

(16) E. says: 1. have an eight day clock which I am causing to make and break an electric current once every second. What is the proper metal or other substance to use in making the points of contact? How can I make and break the contact infallibly? I want to use the force of the current for lifting when I have the contact made. A. Nothing better than platinum is required for the contact points. If the spark arises from the extra current in the magnet coils, it can be cut off by using a condenser or resistance coil, one terminal of which is to be connected on each side of the break. If a resistance coil is used, it must be adjusted for the particular circuit in which it is to be placed. 2. Is the Hill gravity battery the best? A. Hill's is one of the best forms of the sulphate of copper battery. For light, however, or when strong currents are desired, the form known as the tray battery is better. 3. Is a horseshoe magnet the best form for lifting, and what size of wire will be the best? A. Yes. If the cups are connected in series, the resistance of the wire forming the coils should equal about 12 ohms. 4. How can I produce an electric light to illuminate a circle of 3 feet, to be kept going all night in the most simple and economical manner? A. Perhaps a carbonic acid vacuum tube, as arranged by Gassiot in connection with a small induction coil, would answer. It would certainly be the cheapest. See a description in the "Student's Text Book of Electricity," by Noad.

(17) W. C. A. says: How much wire and of what size will I require for a relay of about 120 ohms resistance? A. Nine ozs. of No. 28 pure copper wire will be about right.

(18) W. E. D. asks: 1. Would 6 pairs of magnets 3 inches long, 1½ diameter, with ½ inch iron for core, covered with No. 23 or 24 wire and placed at equal distances around a revolving wheel be of good proportion and have sufficient power to run a sewing machine if proper batteries were used? A. Ten or twelve bar magnets so placed would answer; we should, however, prefer larger wire, say No. 20, and use six cells, coupled three in series and two in parallel circuit. 2. How does the Eagles metallic battery compare with the Callaud for strength and durability? A. The electromotive force is the same; as a general thing, however, the Eagles battery gives a stronger current on short circuit, in consequence of its lower resistance. 3. Does an ohm denote a unit of power or resistance? A. An ohm is the unit of electrical resistance. 4. In connecting batteries for quantity or tension, would quantity give more power or strength for lifting weights, etc., and tension greater power for overcoming resistance, as on a telegraph line? A. Yes.

(19) H. H. M. asks: How can I fasten pieces of sponge on to rubber, tin, or glass? A. Melt together in an iron pot equal parts of common pitch and gutta percha, and stir well. Use while hot

(20) W. M. says: 1. Suppose I have a 100 feet weight at the bottom of a stream 20 feet deep. What amount of hydrogen would it require to bring it to the surface? A. If the iron weighs 100 lbs. in the air, it will weigh only about 87 lbs. when immersed in the water. As iron weighs nearly 8 times as much as an equal volume of water, in order to balance 87 lbs. of the iron we shall have to displace about 696 lbs. of water. If we should measure our water we would find that it required about 28 cubic inches of water to weigh 1 lb., and consequently our 696 lbs. of water would measure 19,488 cubic inches, or about 11¼ cubic feet. An equal volume (19,488 cubic inches) of hydrogen will weigh 417 grains, or about the same as 1·65 cubic inches water. We must, therefore, add to the above quantity (19,488 cubic inches) sufficient measure of gas to displace about 2 cubic inches of water. 2. What amount of zinc and sulphuric acid would be required to generate the hydrogen in two minutes? A. Good zinc and strong hydrochloric acid would furnish hydrogen in large quantity and quite rapidly; but so much depends upon the apparatus employed, the purity of the materials used, and the temperature at which the operation takes place, that we can furnish you with no definite figures.

(21) H. P. B. asks: Can eggshells be utilized? A. We do not know that they have ever received any practical application in the arts. If obtainable in large quantities, they might be employed for fertilizing purposes.

(22) J. S. C. says: I send you a piece of a brown stocking which we purchased for a little girl 2½ years old. She soon complained of feeling badly, and was slightly sick at the stomach. Her mother took off the stockings, found her feet and legs discolored, and washed them off, and put on other stockings, when she felt better. I should not have thought so much about it, but I have heard of a case of decided poisoning from brown stockings, which had been colored with picric acid. A. The specimen seems to have been dyed with one of the aniline colors. If you will send us a larger piece of the material, we shall be happy to give the substance a chemical examination.

(23) B. C. Jr. says: I want a dye for coloring pine wood green, of a shade like that of trees and plants. A. To 3 pints of strong vinegar add 4 ozs. best verdigris, ground fine, ½ oz. sap green, and ½ oz. indigo. Boil the wood in this for several hours.

(24) R. L. L. asks: 1. How can I make a good waterproof boot grease? A. Take ½ lb. of shoemaker's dubbing, ½ pint linseed oil, ½ pint strong solution of india rubber. Dissolve the whole with a gentle heat (it is very inflammable), and apply with an ordinary blacking brush. One application will insure dry feet for several months.

Of what substances and in what proportions is the camphor barometer made? A. See p. 230, vol. 33.

(25) W. T. asks: If an apparatus made from $\frac{1}{16}$ inch sheet iron be galvanized in every part after completion, will it have a tendency to corrode or rust if worked in either hot or cold water? A. Provided the water is pure, and the iron well galvanized, there should be no appreciable corrosion.

(26) J. D. J. asks: How can I make a phosphorus lamp that will work? A. If a strong solution of clear (not red) phosphorus be made in any of the essential oils, and a thin film of the solution be exposed to the air in a dark room, a strong phosphorescent glow will be observed. Advantage has been taken of this slow but luminous oxidation of phosphorus to construct numerous toys