## 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 This is for our information, and not for publication.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.

(1) H. C. S. writes: To make a dynamo machine like that described in SUPPLEMENT, No. 161, larger, do you make the iron part larger in proportion and work with more layers of wire? A. Enlarge the different parts of the dynamo proportionately.

(2) H. L. B. asks how to connect wires in a battery telephone of three stations using ordinary electric call bells. A. Arrange your line so as to cut out all the telephones, leaving the bells normally in circuit. Any ordinary switch which will cut out your telephone and leave the bells in the circuit will answer your purpose.

(3) J. P. L. asks how the zincs and carbons in a bichromate battery for a small incandescent electric lamp are made. A. The zincs are generally cut from sheets of rolled zinc, but they may be made of zinc cast in moulds. The carbon plates cannot readily be made by a tyro. It is both better and cheaper to purchase them; however, if you desire to try the experiment of making your own carbon, you may select clean pieces of coke, finely pulverize them, mix with a small quantity of sirup or molasses into a thick paste, force the paste into a suitable mould, close the mould, leaving vents for the escape of moisture and gas, place the mould in a muffle or crucible, and cover it with powdered carbon. Heat it till the moisture is driven off and the sirup is carbonized, allow the mould to cool, then remove the plate from the mould, dip it in very thin sirup, dry, recarbonize, and repeat the operation until the plate is sufficiently dense for use.

(4) W. K. D. asks: Please inform me in correspondence column of SCIENTIFIC AMERICAN as follows: 1. The best method of rendering a magic lantern screen transparent, or as much so as white thin cotton fabric can be rendered? A. Coat your screen with a varnish made of Venice turpentine dissolved in a good quality of spirits of turpentine. A sizing of the best white glue with a little glycerine added renders a screen quite translucent. 2. Can I use a 1 inch diameter lens of 3½ inches focus to any advantage in a small photographic apparatus to make transparencies for magic lantern slides, about one inch wide, *i. e.*, the picture on the slide to be that width? What size stop, if any, should I need, and how far from lens should it be placed? Could I make a battery to run Guiscom's electric motor as efficiently as to buy it ready made by them? Also, please say if you know what difference in running power there is between the double induction motor and the V motor made by the Electro Dynamic Company, of Philadelphia. A. Your lens, if of good quality, may be used for photographic purposes in the manner suggested. You should employ different sized stops; a small stop will make a camera work deep and sharp, but slow. You can make your own battery for running your motor. Consult SUPPLEMENT, Nos. 157, 159.—We do not know as to the relative merits of the two motors referred to.

(5) R. B. L. asks (1) how to construct a dry kiln to hold about 5,000 feet of lumber. A. The cost in a drying room for lumber depends upon the method used. If you have exhaust steam, that should be used in preference to live steam. In either case, coils of iron pipe are to be placed near the floor with an open platform above for piling the lumber in a proper sized room for the amount of lumber to a charge. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 375 and 479, for illustrations of drying apparatus. 2. The power of an average man compared with the horse power? A. The power of man at best performance is from ⅛ to ¼ horse power. Average men, one-sixth horse power. 3. What is the best means of transmitting power by pulleys from a horizontal line shaft to one running at right angles? A. A right angle belt is much in use, and gives as good results as any of the special angle couplers in the market. The right angle belt has a quarter twist passing around idlers on a vertical shaft. 4. The best way of constructing a "rumble" for smoothing chair legs and rounds by friction, as is done in a hollow drum, and how full should such drum be filled to give best results? A. A good "rumble" may be made from a large, strong cask by mounting it on a shaft with flanges to bolt to the heads with suitable door. Charge half full with material, and add sawdust or bran sufficient to accomplish the work.

(6) V. E. N.—Choke bore is a slight narrowing of the muzzle of shotguns to prevent the charge from excessive scatter. To be done well, a gun should be choked in boring. A good gunsmith should be able to make a fair job. Barrels are brazed together.

(7) W. S. C. writes: 1. We use shavings for fuel. When we fill up the furnace, sometimes there is a puff, and the smoke will come out round the doors. What is the reason of this? A. Gas is formed, which, mixed with the air, is explosive. 2. What is a suction chamber connected to a suction pipe designed for? A. To ease the motion of the water in the suction pipe and prevent hammering.

(8) G.—The ear drums you ask about sell for $3 per pair, silver mounted. For mending band saws, scarf the ends with a file to make a lap of three-eighths of an inch. Grind a piece of borax on a piece of slate or roughened earthenware, with water, to a paste. Take a piece of charcoal, grind one side flat on a stone, and hollow out a place in the middle a little larger than the width of the saw, so as to let the blowpipe flame go under the saw. Fasten the scarfed ends of the saw (after dipping in the borax) together with small binding wire, such as is used by jewelers. Then fasten the scarfed part of the blade over the recess in the charcoal with wire pins, seeing that the saw is straight. Lay a small piece of coin silver on the top at the edge of the scarf, and with the blowpipe throw the flame under the blade, heating until the silver melts, when it will flow through the scarf and appear on the under side, and your work is done.

(9) J. A. T. asks amount of pressure per square foot with the wind blowing at 20, 30, 40, 50, 60, 70, and 80 miles au hour. A. 2, 4½, 8, 12½, 18, 25, and 32½ pounds.

(10) K. G. McL. asks (1) how to temper clay that is used in making cast iron water pipe joints? A. By thoroughly working with water and fine sand. 2. How to tell tempered clay? A. By its soft, tenacious feel.

(11) F. P.—Valves should have the full area of the suction pipe, and should lift ¼ of their diameter.

(12) F. D. W.—In the vicinity of New York, tin waste is utilized by the chemical manufacturing companies, for the production of tin salts and polishing powders. The tin scrap is boiled in hydrochloric acid, or sodium hydrates, from which are reduced the salts and pigments used in the arts. Do not know of any patents on these processes.

(13) W. T. F.—The difference in pressure between the top and bottom of a boiler is due to the weight of the water, which is about 0·43 pound per inch for each foot in height of solid water. This should make no difference in choice of the place for the entrance of the feed water.

(14) P. L. asks: 1. Will an eight horse power boiler, using steam at 65 or 70 pounds per square inch, run an engine of four horse power (really a six horse engine, but speeded down to four) and heat a room 45x80 feet and room about 25x80 feet, using the exhaust while engine is running, but having pipe connections, so that live steam can be turned in when engine is shut down? The boiler is a first class upright tubular one, having heating surface equal to over eight horse power, and with inspirator. If boiler will not heat rooms and run engine, how large a boiler will it need? A. It requires one-half the power of your boiler to heat the rooms. If you use the exhaust steam for heating, adding a small jet of live steam when required, you may accomplish considerable economy in fuel. For this purpose, better consult with some steam heating engineer as to details. 2. A plumber in this town claims that there is no more heating capacity in steam at 60 than at 8 pounds per square inch. Is he right? A. He is wrong.

(15) W. T. F.—Multiplying the square of the diameter by 0·7854 gives the area of the piston; multiply the area by the pressure for the whole pressure on the piston. To get the mean engine pressure when a cut-off is used requires a special computation, which you may find in Haswell's Engineer's Pocket Book. A steam gauge will not be harmed at 2 or 3 inches from the boiler, provided there is a siphon below it to keep the steam from heating the interior of the gauge. The firm from whom you purchased the gauge will have it tested.

(16) L. J. S.—Cold cellars, as arranged in New York on the plan you state, have a uniform temperature of 33 to 34 degrees Fah. Such cellars have a pipe surface of one square foot to each 10 cubic feet of space, or 1 lineal foot of inch pipe to 3⅛ cubic feet of space. The manner of circulating is of importance. It is desirable that the individual circuit or travel of the brine should not be over 200 feet in length, and that the coils should be so arranged that every pipe shall have an equal circulation. The brine should be kept at near the point of saturation. The ice need not be crushed fine, but rather in lumps, keeping the tank full of ice, with an overflow for the waste brine. The return stream should pour on top of the ice, and the outflow from near the bottom of the tank, with an ample strainer, the salt being fed with the ice. The "tank pumps" are also preferred as a circulating power, as they move nearly twice the quantity of brine with the same size steam cylinder that the power pumps do. Rapidity of circulation is important. The circulating pipes should be covered with frost when the conditions are right. There is no better or cheaper process with chemicals, except with a refrigerating machine.

(17) W. F. B.—A locomotive built by the Baldwin Locomotive Works, for the Central Railroad of New Jersey, has made 75 miles per hour on straight track, with 5 passenger cars. There are other locomotives in England and the United States that can do as well or possibly a little better for short drives. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 231, for a description of the Baldwin locomotive.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined with the results stated.

G. B. C.—Nothing definite can be said concerning the specimen unless it was analyzed. It appears, however, to be graphite. Its value depends upon the extent and availability of the deposit.



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