# Business and Personal.

The charge for Insertion under this head is (me Dollar a line for each insertion : about eight words to a line. Adver tisements must be received at publication office as early as Thursday morning to appear in the following week's issue

"U. S." metal polish. India apolis. Samples free. Best drying machines. S. E. Worrell, Hannibal, Mo. Corliss engine wanted, 100 H P. Must be in good order and cheap. Box 116, Syracuse, N. Y.

Air compressors for every possible duty. Clayton Air Compressor Works, 26 Cortlandt Street, New York.

Screw machines, milling machines, and drill presses The Garvin Mach. Co., Laight and Canal Sts., New York. Wanted-A first class patented lock for folding paper

hoxes. Address Boxes, care of Scientific American. The Improved Hydrauhc Jacks, Punches, and Tube

Expanders. R. Dudgeon, 24 Columbia St., New York. Nickel-in-slot machines perfected and manufactured

Electrical supplies, Waite Mfg. Co., Bridgeport, Conn. Centrifugal Pumps for paper and pulp mills. Irrigating and sand pumping plants. Irvin Van Wie, Syracuse, N. Y.

65 ft. steam yacht, \$3,850; also 25 ft. launch, \$650. W. G. Nourse, assignee for Chas. P. Willard & Co., Chicago, III.

Carborundum—bardest abrasive known. Send for prices of wheels, powder, etc., The Carborundum Co. Monongahela. Pa.

Emerson, Smith & Co., Ltd., Beaver Falls, Pa., will send Sawyer's Hand Book on Circulars and Band Saws free to any address.

Split Pulleys at Low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker. St., Philadelphia, Pa.

Extensive stock of small engines and boilers (stationary and marine). Must be sold. W. G. Nourse, assigned for Chas. P. Willard & Co., Chicago, Ill.

'The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins.

By mail. #4; Munn & Co., publishers, 361 Broadway, N.Y. Patent Electric Vise. What is claimed, is timesaving. No turning of handle to bring jaws to the work, simply one sliding movement. Capital Mach. Tool Co., Auburn, N.Y.

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First class electrical, experimenting, engineering and draughting. New inventions developed. Careful, in-telligent, and confidential work. Henry Van Hoevenbergh, 145 Elm St., New York.

The Fulton Foundry and Machine Works, No. 21 Fur-man St., Brooklyn, N.Y. have resumed operations in all their departments, and request a renewal of custom from former patrons. E. B. Willcox.

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HINTS TO CORRESPONDENTS.

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.
 Ingalries not answered in reasonable time should be repeated; correspondents will be ari nn ind 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.
 Bu yers wishing to purchase any article not advertised in our columns will be turnished with addresses of houses manufacturing or carrying the same.
 Special Writter Information on atters 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.
 Mongreals sent for examination should be distinctly

Minerals sent for examination should be distinctly marked or labeled.

(5887) W. W. asks: 1. I want to make gas from gasoline; will you tell me how to do it? A. By passing air over it enough will be taken up to produce a species of gas. The principal trouble is the chilling of the gasoline by the evaporation. 2. I have the bellows described in "Experimental Science." Can I use it for making the gas by passing a current of air over the gasoline ? A. Yes.

(5888) H. E. R. writes: I am constructing a small storage battery to operate a two candle power lamp. The battery has four cells  $1 \times 1\frac{1}{2} \times 2\frac{1}{2}$  inches. Size of plates  $\frac{1}{2} \times \frac{1}{4} \times 2$ . I would like to use a paste in the cells, as I want to put it on my bicycle. Can youin form me what kind of a paste to use? Will such a battery give eight volts? Will it operate the two candle power lamp, and how long charging will it require for about five hours by a dynamo giving out ten volts ? A. The battery will give 8 volts, and should give amperage at the rate of 1 ampere per 24 square inches of positive plate immersed in a single cell. Thus, if you have but one positive plate in a cell, your amperage will be only about one-tenthampere. Your lamp requires 4'5 to 5' volts and 1 to 11/2 amperes. It will need about eight hours to fully charge the battery. (5889) T. H. P. asks: Will you please inform me of the manner in which telephones should be connected where two instruments are used on each end of a line (metallic circuit), one as transmitter and the other as receiver? A. Connect one terminal of each telephone to A. For dry batteries we refer you to our SUPPLEMENT Nos. 157, 767, also the SCIENTIFIC AMERICAN, No. 20, the line and the other to earth, or if a metallic circuit is used, connect one terminal to each line terminal. It makes no difference in what order the connections are made.

it on, excluding air bubbles. After the varnish is hard, rub off the back of the paper with the wet finger, dry and varnish

(5891) A. H. M. asks: Can you give number of SUPPLEMENT on magic lanterus? A. For magic lanterns see SCIENTIFIC AMERICAN, No. 95, vol. 58, and No. 8, vol. 61; also our SUPPLEMENT for Mega scope, No. 847; Stereopticon, No. 941.

(5892) F. W. C.-The plant sent for name is the long moss, Tillandsia usneisdes.

(5893) W. J. McC. asks: 1. In making storage battery could I make the plates of ordinary would three-sixteenths be better ? A. Three-sixteenths is better. There is no need of casting them. 2. In whatproportion should I mix the sulphuric acid and redlead, with which to coat the plates ? A. Use 10 per cent solution of acid with red lead, enough to make a paste. 3. Why is it better to have more negative than positive plates ? Also, if I have 8 negative and 7 positive plates, each  $7 \times 8$  inches, in each cell, what will be the number of ampere hours of each cell, and how do you calculate them? A. You need plenty of oxidizing capacity. Allow 6 amperes per square foot of positive plate immersed, 4. Could plates one-sixteenth inch thick be used, fastening three of them together to form a single plate ? A. Yes. 5. Could I charge 2 storage cells from 6 gravity cells, and about how long would it take to charge ? A. You would get one-sixteenth ampere; a total time of several weeks. 6. How do you calculate the number of volts necessary to charge a given number of cells ? And does the amperage of the charging current have to be taken into account? A. Allow 5.3 amperes per square foot of positive plate and 214 volts per cell. 7. How thick must the paste be spread on the plates? A. About as thick as a coat of paint. 8. Could I tell by a hydrometer whether or not a cell was charged ? If so, how ? A. Yes. It is charged when the acid isof 1,200 sp. gr. 9. Could you re commend a book on storage batteries where I could find the information requested above ? A. Solomon's "Voltaic Accumulators," \$1.50 by mail. 10. In making a dynamo or motor, if the field magnets were made up of a number of cast plates, say 1/2 inch thick, bolted together, would ityield as good or better results than if they were cast solid ? A. The solid are better for the field. Cast iron is bad for the armature. 11. If the plates were used, would it be better to place paper between them or paint them before bolting together ? A. Armature plates should be of soft iron, with paper interposed. If you use cast iron plates for the armature, then separate with thin paper.

(5894) W. S. says: 1. Give the dimenions of the ship Great Eastern, that is, length, breadth, depth, and tonnage. What was her mission, did she even make any successful voyages across the ocean? Was she propelled by steam or sails or both ? What was her cost? How long in building? A. The length of the Great Eastern was 680 feet, breadth 83 to 114 feet, 58 feet depth. Tonnage 18,915 tons gross register. Cost \$8,750,000. The Great Eastern was built for coal and passenger traffic. She made many voyages, but was never a success financially. The Great Eastern was propelled both by steam and sails. The vessel was six years in building. See SUPPLEMENT, No. 830, for full account of this vessel. 2. What is the average carrying capacity in tons of our modern steamships? A. The average carrying capacity of ocean steamers is now from 5,000 to 8,000 tons. The latest express passenger steamers are from 10,500 to 12,000 tons burden. 3. I have a common white pine door, and while the workmen were putting on an asbestos roof, they let some of the black paint drip on it, and I scraped it off two or three times, and have painted it over three coats of paint, but still it comes through almost as plain as at first. What can I do to remove he trouble? A. Burn off the paint over the spot with an alcohol lamp, then scrub with turpentine and afterward paint. 4. What is the capacity of a round tank, diameter 8 feet, depth 10 feet, the same size throughout? A. 3,756 gallons. 5. What can I put in a tea kettle to prevent scale or to remove same? A. We do not know how you can prevent scale in a tea kettle. Remove scale by scraping witha knife.

(5895) J. E. M. writes: Please inform SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 581, 582 and 583, gives good definition, and if it may be made achromatic by the dimensions given in the article. Also what Probably answer your purpose. power could be applied (the greatest) to a telescope of this description of 4 inch aperture and 48 inch focus, to give fair results ? A. The dialytic telescope has been made of fine definition by good opticians, but amateurs have not had the best results. The central portions of the field may be made very fine in definition, but the chromatic. It is a cheap form and easy to correct by

there are any SUPPLEMENTS treating on the above ques

tions that thoroughly explain them, please give number.

vol. 61, No. 2, vol. 67, No. 7, vol. 68. For gas engines

(5897) G. H. De L. asks: 1. What is

we refer you to our SUPPLEMENT, Nos. 715 and 716.

battery or lamps. The query cannot be answered. 3. In charging a storage battery, how can it be known when it is fully charged ? A. By the strong evolution of gas "boiling," or by the specific gravity of the solution, or by the color of the plates.

(5898) E. W. says: Please inform a reader of your valuable paper how to make a black glossy ink (writing fluid). A. Runge's Black Writing Fluid .-Digest 1/2 pound logwood in fine chips for twelve hours in 3 pints boiling water, then simmer down gently to 1 quart, carefully avoiding dust, grease, and smoke. When cold decant the decoction and dissolve in it by agitation 20 grains yellow chromate of potash; it will then be fit for sheet lead such as plumbers use, or would it be better use. Or 30 parts extract of logwood are dissolved in 250 to cast them ? Also would 1/2 inch be thick enough, or parts of water, 8 parts crystallized carbonate of soda and 30 parts glycerine (sp. gr. 1.25) are added; lastly, 1 part neutral chromate of potash and 8 parts gum arabic, reduced to a powder and dissolved in water. This ink does not attack pens, does not turn mouldy and is very black.

> (5899) F. N. P. says: Please give mea eccipt for artist's canvas, for oil painting. A. 1 part white lead, 2 parts whiting, a small portion of litharge and sulphate of zinc for driers; mix with equal parts of boiled linseed oil and raw linseed, tinted with either brown umber or lampblack, for a neutral ground The canvas is tacked upon a stretching frame, and sized with weak glue size, to which a small portion of zinc sulphate is added. When dry it is stippled over with some driers and raw linseed oil, as thin as possible, not saturated. When very near dry the white lead, whiting, etc., is mixed up very smooth, and put upon it very thin and smooth with a large palette knife, and hatched over with a large sash tool, drawing it across one way and then at right angles until the face presents a face like a piece of fine linen or cartridge paper when it is left to dry.

> (5900) W. J. asks if the bell must be cut out with a switch when using the telephone (de scribed in No. 5 of the SCIENTIFIC AMERICAN) with only two stations. Or could it be used without a switch for cutting out the bell ? A. Your arrangement of telephone as shown in your sketch is inoperative. If you want to leave the call bells in the circuit, place them in series with the telephone. This, however, introduces a resistance which will seriously affect the working of the telephone.

> (5901) W. E. V. asks: 1. I am building motor described in SCIENTIFIC AMERICAN SUPPLEMENT No. 641, but by mistake wound the field in the opposite direction to that given. Will it be necessary for me to re wind it ? A. No. Connect each field terminal to the brush opposite the one designated. 2. I wish to run a row boat with it. In what proportion should the gear whee be, on the motor, to the one on the propeller shaft? A. About 1 to 10. 3. Is the battery described in "Experimental Science," page 408, Fig 403, suitable for running the motor? Is it manufactured? If so, by whom? A This battery will answer for the motor, but any primary battery will be very cumbersome for a boat. For batte ries address Queen & Co., Philadelphia, Pa.

(5902) A. H. W. asks: 1. Can a Sampson battery be made as good as new? If so, how? A. By replacing the contents of the central carbon some improvement should be effected. 2. Would new zincs assist in making it as good as new? A. New zincs are not needed as long as the original ones are intact.

(5903) C. H. writes: I am making an eight light dynamo. Could you suggest an easier and still equally good way of making commutator for the same than the one described in SUPPLEMENT, No. 600? 1 have not the tools for cutting the segments from the copper tubeproperly. A. We advise you to adhere to the instructions. You might use a cylinder of wood with strips of brass let into its surface, but it would be a very inferior construction. 2. What is the relative resistance of iron and copper wire ? I have some No. 18 iron wire. Would that do to make a resistance box in the field circuit of eight light dynamo? A. Iron wire has six times the resistance of copper wire. Your wire will answer the purpose.

(5904) F. R. C. writes: Can you furnish us a formula for solder to use on plates of storage me if the English form of dialyte telescope described in batteries, where they are immersed in the acid, and are subject to the chemical action? A. Use autogenou soldering or lead burning. Very low grade solder would

(5905) A. N. D. asks: 1. How can a continuous current dynamo be connected as a motor to run by the alternating current? A. It cannot be so connect ed. 2. How can a small motor with a laminated arma ture, one about an inch in diameter and three inches long, edges are somewhat defective by aberration, principally Wind the field with No. 18 wire, using nearly 3 pounds, be wound for ten volts and three amperes current? A the range of movement of the correcting lens. Powers up | may have the same resistance, say 1,300 feet No. 20 or enough to give 31% ohms resistance. The armature to 250 may be used on this form of telescope wire. 3. How can a dynamo described in Fig. 496, (5896) C. G. K. asks: 1. How and of in "Experimental Science," be wound to give voltage what a dry battery is made? A. There are many kinds. and current to run four or five motors described above In some the exciting fluid is mixed with plaster of Paris, using laminated armature, using the Edison system of or oxychloride of zinc, in others gelatine or a similar sub- winding? What power would it take to run such a dynastance is used. They have generally carbon and zinc mo? What power would one of the above motors give a electrodes. 2. Will I have to use a spark coil with above A. Use a laminated drum armature and wind with 500 battery to produce a spark sufficient to ignite gas? If so, turns of wire for each volt required. Use wire of how made? A. You need a spark coil. On a core of capacity sufficient for amperage. Thus for 10 volts and iron wire 8 inches long and 34 inch thick wind five 12 amperes you would need 5,000 turns No. 15 wire. For pounds of No. 22 magnet wire. 3. How long will a dry field, if in series, wind to two-thirds the resistance of the armature with the largest wire you can get on. Each of the motors described will absorb 1-34 horse power, and battery last, used with a gas engine? A. It is impossible to say. It might last many weeks. 4. Why are gas engines so expensive ? A. They are complicated in conthe dynamo driving them would absorb about 10 per cent struction and have to be very accurately made. 5. If more per motor.

### TO INVENTORS.

An experience of forty-four years, and the preparation of more than one hundred thousand applications for pa-rents at home and abroad, emaile us to understand the laws and practice on both continents, and to possess un-equaled 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 ex-tensive facilities for conducting the business. Address MINN & (O), office SCIENTIFIC AMERICAN, 301 Broad-way, New York.

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## March 13, 1894,

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(5890) F. E. C. asks for directions for meant by ampere hour ? A. A flow of one ampere for transferring photographs on to glass. A. Flow dammar one hour, or one-tenth ampere for ten hours, and so on. varnish over the plate. Let it dry overnight. Soak 2. How many 8 candle power lamps will an 80 ampere the photograph in water. When the varnish is tacky, hour storage battery ran, and how long will the battery carefully place the photograph on it face down and rub | run the lamps ? A. You do not give the voltage of the being not enough to separate it.

(5906) B. A. asks: Do foundry irons receive their proportions of graphite from the fuel in the process of reducing the ore in the blast furnace, or are there certain ores which produce iron of a fixed percentage of carbon ? What element is there in white iron which prevents the carbon from separating in the uncomhined state ? If this element was removed, would the iron be soft? A. The hardness of pig iron is due to the increase of combined carbon; all of which is derived from the fuel in the blast furnace. White iron may conwain much less total carbon, so that none separates, there