ported from standards attits four corners in such a way that the bed proper may be raised or lowered as desired, while over the bed, and also supported by the standards, is a frame carrying glass panes, preventing insects from falling on the bed, the form of the standards and frame being designed to thoroughly protect the bed against access of insects.

FOLDING BED. — Frank A. Cooper, Brooklyn, N. Y. In upright folding beds this invention affords a construction according to which the "action" is contained entirely in the body of the bed, leaving the casing unobstructed except by the brace rods strengthening the wings and preventing them from spreading. The bed has a weighted folding head rest, the head portion having a pendulum or swinging weight when needed. There are cam grooves in the side rails to receive rollers carried by the brace rod, whereby the bed body is pivoted or hung in the casing, and a removable end wall for each cam groove admits of the body being readily connected with or disconnected from the casing, the removable ends serving as stops limiting the outward movement of the bed when down.

BEDSTEAD FASTENING. — Edwin F. Tilley, New York City. This invention provides a simple form of fastening device for each corner of the mattress frame, to be fitted between and rigidly secured to the contiguous ends of the end and side rails, each device having a block slidably connecting with a corresponding body portion. By means of this device the sections of the bedstead may be easily and securely connected without inconvenience arising from the unevenness of the parts or from the unequal expansion or contraction of the metals. Either section of the fastening is adjustable on the other, not only enabling the fastening to be adjusted for non-uniformity of the post, but also to change the position of the side rail if desired.

LAMP BURNER. — George A. Bodee, New York City. To facilitate lighting the wick of a lamp without having to remove the chimney, this invention provides a burner in which the section of the burner on which the bottom of the chimney rests is formed with a horizontally swinging portion, which may be swung down when the match is to be applied to the wick, a spring holding the swinging section in closed position.

Designs.

PLUMBER'S TRAP. — Fredrick Kirchner, Brooklyn, N. Y. The body of this trap is tapering, being widest at the top and finished off at the bottom with the usual cap, the leading feature of the design consisting in the shape of the body.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co. for 10 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS, ETC.

UNITED STATES GEOLOGICAL SURVEY REPORTS. Mineral Resources, Metallic Products and Coal. Charles D. Walcott, Director. David T. Day, Chief of Division. Washington: Government Printing Office.

In acknowledging receipt of vols. xxvi, xxvii, xxviii, the Director's Report, the volume on Economic Geology and Hydrography, and two volumes on Mineral Resources, of this splendid series of works published by the government, we cannot refrain from expressing, as we have heretofore done repeatedly, our high appreciation of the thorough and painstaking manner in which the work is carried on, and the skill and technical knowledge displayed, as well as our admiration of the luxurious volumes themselves, with their handsome print, wide margins and wealth of beautiful illustrations. The division of Mineral Resources, etc., under the charge of Mr. Day, now occupies two handsome quarto volumes, instead of the single octavo volume required annually previous to 1894, and it is not too much to say that from no other source can so much information be obtained on this great subject as from this series of volumes, commenced in 1883, the last two volumes covering the year 1895. The great scope of the work is realized when it is remembered that it includes metals, fuels, structural materials, abrasives, chemical materials, pigments, etc., while under "miscellaneous" are classified precious stones, mica, asphaltum, asbestos, mineral waters, etc, the principal treatment in each of the more important subjects being by recognized high authorities in each department. For instance, iron ores are written about by John Birkinbine; the iron and steel industries by James M. Swank; copper, lead and zinc by Charles Kirchhoff; petroleum, coke, natural gas, and manganese by Joseph D. Weeks; coal, abrasives, etc. by Edward W. Parker; stone by William C. Day; cement by Spencer B. Newberry; precious stones by George F. Kunz; and mineral waters by Albert C. Peale. The distribution, availability and product, in these several lines of the country's resources, together with the varying causes most generally affecting the demand, are set forth in these volumes from an independent standpoint, quite unaffected by the interests of dealers or promoters, which gives especial value to the figures and explanations.

CARBIDE OF CALCIUM AND ACETYLENE. Paris, France: J. B. Balliere et Fils.

This book is an enlargement of a series of popular lectures on acetylene by M. Jules Lefevre, of the University of Nantes. As a resumé of the experiments which have been tried with this gas and of its practical applications, it is quite complete. The opening chapters describe the various electrical furnaces used in the manufacture of calcium carbide, the different factories where it is made, etc.; while the latter part of the book is given up to the properties of acetylene in both the liquid and gaseous states, its employment for lighting and as a motive power, and its probable use in the future. The author does not think it will supplant ordinary lighting gas entirely, but that its general vogue will be between that of this gas and of the electric light. Owing to the ease and safety with which the gas may now be produced, as well as to the small expense, it will in time be used considerably for lighting small buildings where an isolated plant must be used.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

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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.

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Minerals sent for examination should be distinctly marked or labeled.

(7250) O. S. writes: I have a Ruhmkorff coil for one-half inch jump spark, made by the Varley Duplex Magnet Company. 1. What battery, of the lightest weight and least bulk will give the best spark this coil is good for? A. The kind of battery to be used with your coil depends on the work it is to do. If it is to be used for lighting gas, three to four Leclanche cells ought to work it. If you want it for more frequent use, the battery should be of the bichromate sort, and two to three cells are sufficient. 2. The condenser ought to be of what square feet surface? In measuring the surface of a condenser, will the ends be counted or only the tinfoil between the oiled paper? A. If your coil is a Ruhmkorff coil, you will find the condenser in the box under the coil. The tinfoil for a condenser is measured only between the paraffined paper. The ends which project have little effect. Condensers vary greatly in size. If you need to make a condenser for your coil, you will probably require sixty sheets of tinfoil 5×7 inches. 3. Would it be possible to get sparks at various points from one coil by having different return wires and breaking circuits in the return wire? A. Yes; in using a sparking coil for gas lighting this is the way it is done. The gas pipe answers for the return wire.

(7251) W. M. says: Will you kindly give me some information regarding a formula for a black dip for brass in which ammonia and copper are used? We have an acid dip which is used for this purpose, but believe the other would be more desirable. A. Dissolve in 4⅜ fluid ounces of ammonia ½ ounce of copper carbonate, stirring constantly while dissolving. Add ½ pint of water. The article should be suspended in this solution by brass or copper wires for a short time.

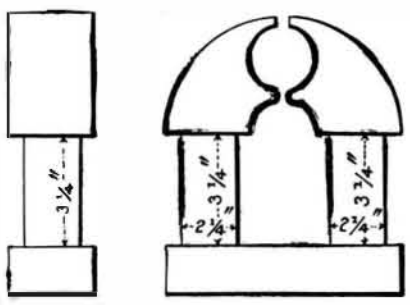
(7252) A. A. U. writes: I have the eight light dynamo and a motor of about the same size. Its field is wound with No. 18 wire, 20 pounds, and the armature with No. 16, two layers, 2 pounds. The dynamo and motor are about 100 feet apart on a No. 8 copper wire circuit. The dynamo has No. 12 on the field and is connected in series. How much resistance ought I to have to start my motor with? I intend to use the motor to run a lathe. A. A resistance of about 15 ohms will be required. It should be put in series with the field of the motor. Run the wire from the dynamo, through the resistance, to field, to armature, and thence back to dynamo.

(7253) H. R. K. writes: Permit me to ask for information regarding the famous eight light dynamo described in the SUPPLEMENT quite a long while ago. Made the machine exactly as described in your paper, but now want to use it as a motor on a 110 volt circuit. 1. What size wire shall I use on a new armature core of same size, and how shall I arrange the field circuits? A. For 110 volts wind your new armature with No. 24 A. W. G. wire, 25 turns in each of the 24 coils. The same field can be used with an external resistance of 750 ohms. 2. Could I not use it as it is by putting lamps in circuit with it? A. The machine can be run without rewinding by using an external resistance, either of lamps or wire, equal to or a little more than that of the machine itself. A resistance box is more convenient than a lamp resistance

(7254) P. C. S. writes: I am making an induction coil with a core 1⅞ in. in diameter and 15 in. long. The primary wire will carry about 8 to 10 amperes and the insulation is tested to 2,000 volts. It has about 100 turns, and is run from an alternating current dynamo. The secondary is about 12 lb. of No. 32, well insulated. About what kind of a current should I use in the primary (in volts and amperes) to get the maximum effect in secondary and longest spark? P. S.—How could I get the current from a 50 volt 1·5 ampere alternating current? If by a transformer, how would it be made? A. If a direct current from a battery is used, 4 to 6 cells of bichromate plunge battery, 1 to 2 quart cells, will answer for your coil. You need to be able to vary the current so as to learn, by experiment, how to get the best spark for any purpose, and the longest spark is not always the best. With a direct current your primary will take about 4-6 amperes and 10-55 volts. With an alternating current you will need a "choking" coil, rather than a transformer. This must be adjusted to the circuit in which it is to be used. The engineers of the system from which you draw your current could probably specify your choking coil for you. See SUPPLEMENT, No. 1124.

(7255) J. S., Montreal, writes: A question has arisen as to which of the following methods would be the best and cheapest for making a wall or division to prevent the transmission of heat or cold. To build the wall with a double air space, that is, with an outer and inner wall some distance apart and a thinner wall intermediate between them empty, but for the air. Or, to build a wall of the same material, leaving the same distance between the outer and inner walls, but leaving no middle wall, the whole interspace being filled with cork cuttings or shavings. A. The three-wall system, inclosing two air spaces, makes the best insulation, but not the cheapest. The three walls, in order to have the proper stability, must make a very thick and expensive exterior wall. The wide space and double wall will be very effective for insulation, if the filling can be properly packed so as to stay in place. The trouble with such filling is its disposition to settle and pack, leaving open spaces. The cost of either method of insulation is, we think, greater than the double wall with narrow clear air space, with a lining of asphalt paper on the inner surface, with 1¼ inch furring and lath and plaster. This constitutes a double air space with an air tight barrier.

(7256) O. T. writes: I have a casting for a dynamo, a sketch of which I inclose. Could you



tell me what sizes and how much wire I should use for the armature and fields for a 50 or 52 volt current (shunt winding) and how many amperes could I get from same; also speed required? Can you give any information in regard to winding of armature, as number of sections and turns on same? A. On the field wind 400 turns of No. 24 wire, B. & S., 200 turns on each side. Make the armature with 16 sections. Wind 20 turns in each section—No. 12 B. & S.

(7257) E. S. H., Illinois, writes: 1. What is your opinion or that of experts regarding the use of castor oil in a locomotive boiler? The water deposits a very salty substance wherever a leak appears and foams very badly; the use of the oil, however, effectually calms the foaming or priming, for it is probably more priming, as great quantities of water were carried over with the steam; so the engine could not be hurried at all. Is it likely to generate a dangerous gas? The water eats the iron very fast. Will the oil prevent that? It is used about a teaspoonful every day. A. Castor oil in boilers produces an effect similar to that of other vegetable oils, in gathering the lime and magnesia salts into cakes or nodules. It may answe the purpose for which it is used, if applied in very small quantities. We advise, if oil is used at all, that the cheaper mineral oil, as kerosene, is preferable. The oil in boilers does not generate a dangerous gas, unless, owing to low water, some part of the tubes or shell is subjected to a heat that will generate a gas by decomposing the oil. The oil will partially neutralize any acid quality in the water. The water of your district contains sulphate of lime and magnesia, and the separation of the sulphur in the form of sulphuric acid, and its action on the iron, is probably cause of the eating away of the iron. For this, we advise use of caustic or sal soda in small quantities, instead of the oil. 2. Again, what would be the highest speed practicable to run a simple plunger pump ¾ inches diameter, maximum stroke 2 inches, pumping a light engine oil at from zero to 500 or 800 pounds pressure? Also best style valve to use. A. For the short stroke pump at high pressure, 75 strokes per minute is allowable. Poppet valves are in general use and are the best for high pressures.

(7258) J. R. D. writes: 1. Give formula of solution used in making solder adhere to copper wire when making joints. A. To a sufficient quantity of hydrochloric (muriatic) acid, add zinc in small pieces, so long as it will dissolve. The resulting liquid is zinc chloride, and is used for soldering tin, copper, lead and brass. 2. Can an electric motor (costing about $1) be wired so as to run reversible? If so, how can this be done? A. The motor will turn in the opposite direction if the direction of the current in the armature circuit is reversed. In so simple a motor run by a battery any reversing switch will answer your purpose.

(7259) A. C. S. says: 1. Please give the full formula for the printing-out plantinotype process. The SUPPLEMENT, No. 1139, gives the following:

Chloroplatinite solution	116 min.
Iron	120 "
Gum arabic	116 "

but does not state the amount of the 10 per cent solution of sodio-chloride of platinum to add to the above. A. Add about 10 minims to begin with of last named solution, and increase amount until the requisite brilliancy is obtained. 2. Can the chloro-platinite of potash and the sodio chloride of platinum be obtained from the photo stock dealers? A. New York dealers can supply you.

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