

Business and Personal.

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The Bradford Board Trade solicits correspondence with manufacturers about to locate where cheap fuel is an object. Address W. W. Brown, Prest'g. Bradford, Pa.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$1; Munn & Co., publishers, 361 Broadway, N. Y.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

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 This is for our information and not for publication.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.

(3414) L. C. says: Please describe the distribution of light round a continuous current arc lamp? How would you proceed to determine the illuminating power of such an arc in any given direction? What is meant by mean spherical candle power? How is it calculated? A. The light of an arc lamp is distributed nearly evenly, except in the shadows of the carbons. The light of a candle is distributed in the same way. When you compare an arc lamp with a candle, the value of the arc light would be given in candle power. Spherical candle power refers to the average of the emission of light in all directions.

(3415) W. M. B.—Sprinkle around the dried leaves of pennyroyal, or use the essence of pennyroyal for driving away fleas.

(3416) C. B. asks about a pair of permanent magnets I construct; they are 10 inches long, 3/8 inch wide, 3/8 inch thick; they are made from best American tool steel and tempered so they will scratch glass, and I had them magnetized on a 300 incandescent electric light dynamo, and they will not pick up a good sized needle. Could you inform me where the fault is—in the steel or magnetization? A. The difficulty with your magnets probably arises from having the temper too high; the magnet should be tempered only at the ends, and the temper should be about the same as that of a cold chisel, that is to say, it should be hardened and drawn down to a purple.

(3417) W. F. D. asks: How can I keep copper wire from turning a dark blue after cleaning it? A. Try adding a little carbonate of ammonia to the water in which you wash your copper wire.

(3418) W. H. W. asks: Will you please inform me through your valuable paper the best way to harden and temper circular saws, the same as the samples inclosed and larger, say up to 1 1/2 inches, and oblige constant reader? The way I harden them is between two cast iron plates with a little oil on the surface, and temper them on the hollow spindle with the end turned down so as to fit the hole in the saws; inside of the spindle is a gas flame, and as the color begins to come on the saws I keep turning them until the required color is obtained, then I lay them on a flat plate with a little oil on it. Even when I get them flat in hardening, they will go out of true in tempering, same as the samples inclosed. One of them is true enough, but the other is very much out. By answering the above you oblige a constant reader. A. In hardening the saws should be carefully dipped plumb edgewise. If they draw or warp, use a smooth hard hammer on a hard steel block or anvil. Carefully hammer the parts that draw so as to make the saw flat. If the center bulges, hammer around the edges. If the edges warp, hammer the center to relieve the strain. The saws will bear the hammering after drawing the temper.

(3419) A. J. B. asks: What constitutes a perpetual motion? I take it a machine that retains its original power is perpetual motion. My reason for asking you is this: I have a water motor that when set in motion drives the water wheel, and the same water is conveyed back to the original starting point, independent of the water wheel, the only loss being by evaporation, which can be overcome by a small feed

pipe. If I have made a new discovery, please inform me in your next issue. A. The apparatus you describe, if operative, would be classed as a perpetual motion. But to us it looks like a no go.

(3420) A. H. M. says: Please give me a good formula for a fixing bath to prevent blisters on best grades of albumen paper. I am troubled some with large blisters that commence forming in fixing bath after they are in it about five minutes and keep getting larger until they are about the size of a dime, and some larger. Toning bath will turn red litmus paper blue. Bath not acid. Very few small blisters appear. A. Make the fixing bath alkaline by adding a few drops of ammonia. It is important that the temperature of the fixing bath be warm or the same as that of the toning bath. Blisters are prevented by putting prints, before toning, in a salt bath. Water 10 ounces, salt 1/4 ounce.

(3421) J. J. R.—The lamprey eel is both a native of the sea and rivers of Europe and America. They are, as the name indicates, rock suckers and live upon the rock moss and algae attached to rocks; were once considered a delicacy and are much used for food. Their habitat in the United States is the rocky shores of the Eastern States. We can furnish "Violin Making, as it Was and as it Is. A History." By Allen. 200 illustrations, \$3 mailed.

(3422) E. W. R. writes: Have you any receipt for killing a small fly insect or borer which works in oak lumber, both in piles and in buildings, where there is not much to disturb them? This fly is very small, light brown in color, and between one sixty-fourth and one thirty-sixth of an inch in diameter and one-eighth of an inch long. It bores very rapidly, and works in our oak flooring, post- and girders, and in the board floors of our warehouse, where there is not much walking and going to disturb them. They will not work in the floor where we are running trucks or walking through it. We have written to a large number of lumbermen, but they know of nothing absolutely practicable for destroying the insects. A great many had heard of them, but had had no experience with them. We have saturated the lumber with strong solutions of salt brine, both hot and cold, and have also limed the posts and girders. It may be that we kill off a great many of the living insects, but if so, we do not kill the eggs, and the insect seems to increase with remarkable rapidity. A. Reply by Prof. C. V. Riley.—The small fly insect or borer which works in oak lumber, as described in your letter, is a common and widely distributed pest bearing the scientific name of *Lyctus striatulus* Melsh. It is properly not a fly but a small beetle belonging to the family Ptinidae. The department is frequently in receipt of letters relating to damage by this insect. It is rather a difficult insect to control, and the remedy I have formerly advised, and which is the only one which seems to promise success, is to pain or coat the timbers, buildings, or stored lumber with kerosene. The insect works near the surface of the wood, and the kerosene will penetrate sufficiently to kill the beetles and early stages. Benzine or gasoline may be used in lieu of kerosene if the latter is objectionable for any reason, but these substances will not be so effective on account of their more rapid vaporization.

(3423) I. B. asks for a definition of one billion and how many figures it takes. A. In France and the United States one thousand millions—1,000,000,000 or 10⁹; in Great Britain one million millions—1,000,000,000,000 or 10¹². The word billion is little used in France, the word milliard taking its place.

(3424) L. J. S. writes: I noticed on some colored bank drafts the figures written in a milky white to protect same from erasing amount. Can you tell me how to prepare such a chemical ink with a similar discoloring effect? A. A solution of oxalic acid in water is used for this purpose. A steel pen should not be used, a gold or quill one is preferable.

(3425) H. D. G. asks: 1. Can a house be lighted successfully with a current from storage batteries? My idea is to have the secondary battery charged during the day by a gravity battery. A. A house can be lighted in the manner suggested. 2. Is it practicable, and would the cost exceed that of gas after the apparatus is installed? A. We think you would find the cost to exceed that of gas, if you count the attendance and deterioration of the plant as items of expense.

(3426) A. J. C. asks how to make a good strong galvanic electric battery. A. For information on the construction of galvanic batteries we refer you to SUPPLEMENT, Nos. 157, 158, 159, and 792.

(3427) C. W. B. asks: What metals, minerals, or materials come the nearest to insulating a magnet when placed before it? A. There is no substance that will insulate magnetism. You can absorb the magnetism by means of a body of magnetic material, but this will always be done with a loss.

(3428) F. S. G. asks: Will you kindly let me know what is the best and latest authority to read on Bessemer steel manufacturing, also something on rolling mill workings, etc.? A. Howe's "Metallurgy of Steel" is the latest and best work, \$10 mailed. "Iron and Steel," by Greenwood. "Rolling Mill Practice." \$2 mailed.

(3429) B. F. H. asks: Can you give me the formula of making coconut butter? Is it manufactured and sold commercially in the United States? If so, by whom is it manufactured? A. For details of the manufacture you may consult the United States Dispensary. It is made by pressing the moistened ground chocolate nut, or by extraction with a solvent, such as bisulphide of carbon, or by simply boiling with water. It is made by chocolate makers, such as Baker & Co., of Boston, Mass.

(3430) W. E. D. asks: 1. Have you ever printed in this paper directions for making an electric motor to be operated by a primary battery, and having sufficient power to run a fan eight inches in diameter at a suitable speed? A. Consult SUPPLEMENT, Nos. 161 and 641. The dynamo described in SUPPLEMENT, No. 161, can be used as a motor. 2. What book will give a good idea of the electrical terms in common use as well

as a fair idea of motors and dynamo machines, their construction and operation? A. Houston's "Electrical Dictionary," price \$2.50, is a good work for terms. "Experimental Science" would be a serviceable book for you.

(3431) W. B. S. asks for the ingredients of the enamel used on sewing machines, or some glossy, black enamel that can be applied with a brush to steel, and does not need baking on. A. We know of no perfect substitute for baking japan. You can approximate it by mixing refined lampblack with quick-drying copal varnish.

(3432) E. H. asks whether one cell of Fuller's mercury bicromate battery 6 by 8 inches will run the small Gramme ring motor satisfactorily, illustrated in your paper published January 17, 1891. A. The Fuller battery is a good one for this purpose.

(3433) W. B. R. asks: Would the boiler mentioned in SCIENTIFIC AMERICAN SUPPLEMENT, No. 182, be suitable for a boat 21 ft. long, 5 ft. beam, 26 in. hold? Engine cylinder 2 3/4 by 4 in. stroke. Would this boiler carry 75 lb. working steam pressure and would it be enough to run that size boat, or would it be better to add 2 to 3 more flasks? What speed could this engine run? What size screw would be required? What pitch and number of blades? Does the government allow the use of said boilers on rivers like the Hackensack or Passaic? Also, would the boiler inspector have to be informed of the same to be necessary to get an engineer's license? A. The engine will run the boat at 6 1/2 to 7 miles per hour, at 300 revolutions per minute. Should have a three-bladed screw, 20 inches diameter, 30 inches pitch. The boiler is safe for 75 lbs., but would do better service with more flasks. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 702, for other styles of small boilers. The government requires license for running on navigable streams. You can get one license as engineer and pilot for a small boat for private use. The boiler you name will pass inspection.

(3434) J. G. says: Please let me know the ordinary pitch of 10 ft. screw propeller, and what would be the distance it would move forward in one, two, and three revolutions, supposing there was no loss from slip. A. Propeller screws are made with a pitch of 1 1/2 to twice the diameter of the screw, according to the kind of service. The travel is equal to the pitch per revolution without allowance for slip. One and a half the diameter for your 10 ft. wheel, or 15 ft., would be well for ordinary boats.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled 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 extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

September 22, 1891.

AND EACH BEARING THAT DATE.

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

Table listing inventions with names and dates. Includes: Adjustable pattern for draughting trousers, Agricultural implement, Air into the lungs, Alarm, Armature for dynamo-electric machines, Ash can, Axle boxes, Axle nut, Axles, Back stay protector, Bag, Baling press, Bar, Barometer, Bath, Bearing, Bearing roller, Bed frame, Bed folding, Bed seat fastener, Bedstead fastening, Bedstead, Bell, Bench dog, Bench hook, Bicycle seat attachment, Bicycles, Billiard table, Binder for papers, Bins, Blancher for celery, Boat lowering apparatus, Boiler, Boiler cleaner, Boiler stay, Bolt header, Boot and shoe cleaning and polishing machine, Butter brick, Camera, Can, Car and door therefor, Car brake, Car coupling, Car coupling, Car coupling, Car guard, Car motor mechanism, Car, railway, Car running gear, railway.

Table listing inventions with names and dates. Includes: Car seat, Car starter, Car wheel, Carbon clamp for arc lights, Carbons, Card cutting machine, Carriage wheel shield, Cash recorder, Cash register, Cask or barrel, Casks, Cattle guard, Cburn, Cigar rolling machine, Clamp, Clamps, Clasp, Clocks, Close, Cock, Coffee or tea, Collar fastener, Compressor brush holder, Commutators, Compound engine, Compound engine, Conductors, Corn sheller, Cot, Coupling, Crucible burner, Cultivator, Cultivator, Curb and gutter, Curling iron, Curry comb, Curtains, Cutter, Cutter bar, Desk and case, Drill, Drill sharpening machine, Dry closet, Dry kiln furnace, Drying apparatus, Dust collector, Dyeing apparatus for woven fabrics, Dyeing apparatus, mechanical, Dynamos, Electric cable, Electric coupling, Electric motor, Electric motors, Electric regulator, Electrical energy of alternating currents, Electrical recorders, Electrical transmission of power, Electro-magnetic device, Electro-magnetic motor, Electro-pneumatic tube system, Electro-therapeutic bath, End gate, Engine, Engine, Envelope blanks, Extractor, Fare register, Feed bag, Fence making device, Fertilizer distributor, Fibrous material, File or wrapper clasp, Firearm, Fireescape, Fire iron stand, Flier, Fly net, Folding rack, Flooring joists, Furnace, Furnace, Game apparatus, Game apparatus, Game apparatus, Game apparatus, Gas and electric lights, Gas burner, Gas burner, Gas engine, Gas generator, Gate, Generator, Gloves, Governor, Governor, Grain, Grate construction, Guard, Gun, Gun, Gun barrel, Hair, Handle, Hanger, Harness, Harvester, Heavy load, Hat band, Hearth, Heater, Hitching post, Hoisting apparatus, Hoisting machine, Holder, Horn, Hoses, Hydraulic press, Ice, Ice, Impact tool, Incubator, Inkstand, Insulating purposes, Insulator, Jack, Jeweler's lathe chucks, Joint, Kilm, Knitted bag, Knitting machine, Knitting machine, Knitting machines, Lamp, Lamp, Lamp guard, Lamp attachment, Lamps, Last, Lasting machine, Latch, Latch, Lath bundling, Lathes, Lead cutter, Lead, Letter box, Lifting jack, Lock, Loom picker, Loom protector, Loom shuttle, Loom whetstone, Low water alarm, Mail bag, Mail bag, Mail bag, Mail pouch, Mail pouch deliverer.

