

Business and Personal.

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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.

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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 10<sup>9</sup>; in Great Britain one million millions—1,000,000,000,000 or 10<sup>12</sup>. 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 lb., 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 various inventions and their patent numbers, including items like 'Adjustable pattern for draughting trousers', 'Agricultural implement', 'Air into the lungs instrument', etc.

Table listing various inventions and their patent numbers, including items like 'Car seat', 'Car starter', 'Car wheel', 'Carbon clamp', 'Carbonyl apparatus', 'Card cutting machine', etc.