Business and Personal.

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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 This is for our information and not for publication.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, ench must take his turn.
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 Scientific American Supplements referred to may be had at the office. Price 10 cents each.
 Broks referred to promptly supplied ou receipt of public.

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 direc tion ? 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 pen nyroyal for driving away fleas.

(3416) C. B. asks about a pair of permanent magnets I construct d; they are 10 inches long, 1/8 inch wide, 3% 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 elec rid 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% inches, and oblige constant reader? The way I harden them is between little oil on the surface iron nlates with a temper them on a hollow spindle with the end turned down so as to fit the hole in the saws; inside of the spin dle 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 of 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, hammen around the edges. If the edges warp, hammer the cen ter to relieve the strain. The saws will bear the ham mering after drawing the temper.

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 to st 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 upportant 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 ¥ 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 algæ 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 diameand one-eighth of an inch long. It bores very ter 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 striatus Melsh. It is properly not a fly but a small beetle belonging to the family Plinidae. 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 gaso line 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 va porization.

(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°; in Great Britain one million milhons-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 ex-

(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 sub stance 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.

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ring, anti-friction, H. T. Shriver	459.8
ring, roller, F. Van Benthuysen	459,7
brace, R. J Morton	460.0
, folding, B. Ringo	459.8
slat fastener, C. N. Rothrock	459.7
Istead fastening, H. R. Robbins	460.0
isteads, bed drawer attachment for, L. Mabee	460.0
alarm C E Carroll	459.7
l, alarm, C. E. Carroll.	460.0

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fair idea of motors and dynamo machines, their	Car seat, G. W. Cushing
struction and operation? A. Houston's "Electrical tionary," price \$2.50, is a good work for terms.	Car starter, H. P. Wayman
xperimental Science " would be a serviceable book	Carboys, tilting support for, W. H. Fales 459,945 Card c tting machine, C. A. Wright
you. 3431) W. B. S. asks for the ingredients	Carriage wheel shield, D. S. Faine
the enamel used on sewing machines, or some	Cash recorder, C. J. Pasmore
esy, black enamel that can be applied with a brush teel, and does not need baking on. A. We know of	Castle guard, surface, Baleb & Bush
perfect substitute for baking japan. You can ap- ximate it by mixing refined lampblack with quick-	Clamps, See Carbon clamp, Railway rail clamp, Clamps, manufacture of, A. A. Strom
ing copal varnish.	
3432) E. H. asks whether one cell of ler's mercury bicromate battery 6 by 8 inches will	Smith
the small Gramme ring motor satisfactorily, illus-	Confee or tea, machine for infusing, L. & A. Chronik
ed in your paper published January 17, 1891. A. e Fuller battery is a good one for this purpose.	Commutator brush bolder, H. H. Blades 459,739
3433) W. B. R. asks: Would the boiler	Compound engine, C. H. Batchellor
ntioned in Scientific American Supplement, No. be suitable for a boat 21 ft. long, 5 ft. beam, 26 in.	Commutators, conductor fastening for, S. H. Short
d? Engine cylinder 234 by 4 in stroke. Would this	Corn sheller, C. B. Bander
ler carry 75 lb. working steam pressure and would it enough to run that size boat, or would it bebetter to	Hose coupling. Pipe coupling. Shaft coup- ling. Thill coupling.
2 to 3 more flasks? What speed could this engine ? What size screw would be required? What pitch	Crucible burner, T. M. Painter
I number of blades? Does the government allow the of said boilers ou rivers like the Hackensack or	Cultivator, wheel, Lindgren & Luitwieler 460,021 Curb and gutter, combined, J. King
saic? Also, would the boiler inspector have to be	ing. Thill coupling. 459,790 Cutivistor, Tripp & Venters. 458,232 Cultivistor, cotton, T. W. Brooks. 459,890 Cultivator, wheel, Lindgren & Luitwieler. 460,021 Curling iron heater, combined J. King. 459,790 Curling iron heater, combined, J. King. 450,750 Curring iron heater, W. V. Baumann. 460,055 Currains, display rack for, J. Strassner. 460,045 Cutter. See Lead cutter. Mica cutter. Cutter are, Brack for A. Strassner. 450,740
ormed of the same to be necessary to get an en- eer's license? A. The engine will run the boat at	Cutter. See Lead cutter. Mica cutter. Cutter bar, Brack & Coy
to 7 miles perhour, at 300 revolutions per minute. aud have a three-bladed screw, 20 inches diameter, 30	Drill, E. Pitts. 460,027 Drill sbarpening machine, J. Gutberlet. 459,331
hes pitch. The boiler is safe for 75 lb., but would do	Drill sharpening machine, J. Gutherlet
terservice with more flasks. See Scientific Ameri- SUPPLEMENT, No. 702, for other styles of small	Dust collector, J. Pratsch
lers. The government requires license for running navigable streams. You can get one license as	Drying apparatus (C. H. Koyl
ineer and pilot for a small boat for private use. The	Electric coupling, F. M. Farwell
ler you name will pass inspection. 3434) J. G. says : Please let me know	W Beeler. 400,078 Electric regulator, J. F. McElroy. 460,059
ordinary pitch of 10 ft. screw propeller, and what	Electrical energy of alternating currents into me- chanical motion, method of and apparatus for converting the, C. S. Bradley
uld be the distance it would move forward in one, o, and three revolutions, supposing there was no loss	Electrical recorder for voltmeters, thermometers, etc., C. W. Ayton
m slip. A. Propeller screws are made with a pitch like to twice the diameter of the screw, according to	
kind of service. The travel is equal to the pitch per	Electro-pneumatic tube system, automatic, W. G. Collins
olution without allowance for slip. One and a half diameter for your 10 ft. wheel, or 15 ft, would be	ten
ll for ordinary boats.	Rotary engine. Steam engine. Engine, J. V. Rice, Jr
TO INVENTORS.	Engine, J. V. Rice, Jr. 459,884 Engine, Thiebault & Harsin. 459,886 Envelope blanks, machine for gumming and feed- ing. S. W. Balch. 460.065
n experience of forty years, and the preparation of	Extractor. See Pen extractor. Fare register, Jeffery & Giering
retban one hundred thousand applications for pa- ts at home and abroad, enable us to understand the	Envelope hianks, machine for gumming and reed- ing, S. W. Balch. stractor. 460,065 Extractor. See Pen extractor. 459,895 Feed bag, Michels & Pauly. 459,755 Feed bag, Michels & Pauly. 459,755 Fence making device, G. Littell. 459,895 Fertilizer distributer, B. F. Martin. 459,755 Fibrous material, drawing head for, Dunham & McKemmie. 460,083
rs and practice on both continents, and to possess un- naled facilities for procuring patents everywhere. A	Fibrous material, drawing head for, Dunham & McKemmie
opsis of the patent laws of the United States and all eign countries may be bad on application, and persons	McKemmie
ntemplating the securing of patents, either at home or road, are invited to write to this office for prices,	Flier, automatic, G. R. Ferrario
ich are low, in accordance with the times and our ex-	Fivnet, horse W. Kootz 460.189
sive facilities for conducting the business. Address	Folding rack, E. J. Tracy
JNN & CO., office SCIENTIFIC AMERICAN, 361 Broad-	Folding rack, E. J. Tracy
JNN & CO., office SCIENTIFIC AMERICAN, 361 Broad-	Fire iron stand, H. M. Pierce
JNN & CO., office SCIENTIFIC AMERICAN, 361 Broad- y, New York.	Fronheiser & Vaughen
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(3419) A. J. B. asks: What constitutes a perpetual motion ? I take it a machine that retain 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

(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 cocoanut 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 Dispensatory. 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 Bu Car Car 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 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