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.

I wish to buy second hand lathes, planers, drills, shap ers, engines, boilers, and machinery. Must be in good order. Will pay cash. W. P. Davis, Rochester, N. Y.

Acme engine, 1 to 5 H. P. See adv. next issue.

Patent Dealers. Street & Fishburn, Dallas, Texas. Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York. Screw machines, milling machines, and drill presses

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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, Pres't, Bradford, Pa. The best book for electricians and beginners in elec-"Experimental Science," by Geo. M. Hopkins

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HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, new attention will be paid thereto. This is for our

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 This is for our information and not for publication.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.
 Beintific American Supplements referred to may be had at the office. Price 10 cents each.
 Books referred to promptly supplied ou receipt of purce.

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 pennyroyal 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 ric 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 iron nistes with a little oil on the surface and 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 center 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 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 ab solutely 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 ergs, 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 Ptinidae. The depart ment 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 mil hons-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 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.

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 quickdrying 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 nentioned in Scientific American Supplement, No. 182, be suitable for a boat 21 ft. long, 5 ft. beam, 26 in. hold? Engine cylinder 234 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 bebetter 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 61/4 to 7 miles perhour, 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 AMERI-CAN 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. savs: 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 11/5 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 nore than one hundred thousand applications for pa tents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be bad 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 MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadvay, New York.

Ga Ga Ga Ga INDEX OF INVENTIONS For which Letters Patent of the Ga Ga Ga United States were Granted Ga Ga Ge September 22, 1891. Go Go Gr AND EACH BEARING THAT DATE. [See note at end of list about copies of these patents.] Gr Gt Gi Gi Gi Ha Ha Ha HH H H

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Fence making device, G. Littell. Fertilizer distributer, B.F. Martin. Fibrous material, drawing head for, Dunham & McKemmie. File or wrapper clasp, W. H. Bell Firegern, revolving magazine, K. Krnka. Firegern, revolving K. G.R. Ferrario. Filer, automatic, G. R. Ferrario. Flug net, horse, W. Kootz. Foloring joists, bridging for, F. H. Moore. Furnace, R. M. Weir. Furnace, R. M. Weir. Game apparatus, F. A. Byram. Game apparatus, J. Fichtner. Game apparatus, J. Fichtner. Gas burner, R. Taral, H. H. Hibberd. Gas engine, rotary, D. D. & J. T. Hobbs. Gas engine, rotary, D. D. & J. T. Hobbs. Gas engine, rotary, D. D. & J. T. Hobbs. Gavernor, seca for gaze. Governor, steam engine, E. Jones. Graver, See Cary guard, Berger & Noel. Governor, etam engine, Piloy, C. A. Barnard. Gate construction, R. A. Palmer. Governor, centrifugal, Berger & Noel. Governor, combined purifying and dust collect ing machine for, C. A. Barnard. Grate construction,	459,383 459,758 459,758 459,066 459,874 459,874 459,874 459,874 459,874 459,874 459,874 459,877 459,888 460,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,055 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,055 469,055 459,888 469,055 459,858 469,055 459,858 469,055 459,858 469,055 469,055 459,858 469,055 469,056 459,859 460,054 459,858 469,055 460,054 459,858 469,055 460,054 459,858 469,055 460,054 459,858 460,054 459,858 460,054 459,858 460,054 459,858 460,054 459,858 460,054 459,858 460,054 459,858 460,054 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 460,05
Fence making device, G. Littell. Fertilizer distributer, B.F. Martin. Fibrous material, drawing head for, Dunham & McKemmie. File or wrapper clasp, W. H. Bell Firegern, revolving magazine, K. Krnka. Firegern, revolving K. G.R. Ferrario. Filer, automatic, G. R. Ferrario. Flug net, horse, W. Kootz. Foloring joists, bridging for, F. H. Moore. Furnace, R. M. Weir. Furnace, R. M. Weir. Game apparatus, F. A. Byram. Game apparatus, J. Fichtner. Game apparatus, J. Fichtner. Gas burner, R. Taral, H. H. Hibberd. Gas engine, rotary, D. D. & J. T. Hobbs. Gas engine, rotary, D. D. & J. T. Hobbs. Gas engine, rotary, D. D. & J. T. Hobbs. Gavernor, seca for gaze. Governor, steam engine, E. Jones. Graver, See Cary guard, Berger & Noel. Governor, etam engine, Piloy, C. A. Barnard. Gate construction, R. A. Palmer. Governor, centrifugal, Berger & Noel. Governor, combined purifying and dust collect ing machine for, C. A. Barnard. Grate construction,	459,383 459,758 459,758 459,066 459,874 459,874 459,874 459,874 459,874 459,874 459,874 459,877 459,888 460,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,055 469,054 459,888 469,054 459,888 469,054 459,888 469,054 459,888 469,055 469,055 459,888 469,055 459,858 469,055 459,858 469,055 459,858 469,055 469,055 459,858 469,055 469,056 459,859 460,054 459,858 469,055 460,054 459,858 469,055 460,054 459,858 469,055 460,054 459,858 460,054 459,858 460,054 459,858 460,054 459,858 460,054 459,858 460,054 459,858 460,054 459,858 460,054 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 459,958 460,055 460,05
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Fence making device, G. Littell. Fertilizer distributer, B. F. Martin	459,758 459,758 459,758 459,066 459,874 459,895 459,874 459,895 459,874 459,895 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,852 459,852 459,853 459,857
Fence making device, G. Littell. Fertilizer distributer, B. F. Martin	459,758 459,758 459,758 459,066 459,874 459,895 459,874 459,895 459,874 459,895 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,852 459,852 459,853 459,857
Fence making device, G. Littell. Fertilizer distributer, B. F. Martin	459,758 459,758 459,758 459,066 459,874 459,895 459,874 459,895 459,874 459,895 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,852 459,852 459,853 459,857
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 Fence making device, G. Littell. Fertilizer distributer, B.F. Martin. Fibrous material, drawing head for, Dunham & McKemmie. File or wrapper clasp, W. H. Bell Fire iron stand, H. M. Pierce. Filer, automatic, G. R. Ferrario. Filer and the state of the sta	459,758 459,758 459,758 459,758 450,066 459,758 459,758 459,759 459,747 459,892 459,892 459,936 459,892 459,937 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,892 459,992 459,982 459,982 459,983 459,984 459,985 459,986 459,987 459,986 459,986 459,986 459,986 459,986 459,986 459,986 <td< td=""></td<>
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(3419) A. J. B. asks: What constitutes a perpetual motion ? I take it a machine that retained 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 specd? 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

cycle seat attachment, Rastetter & Stebolu 400,031	position appricative for electrical, E. Fairig 400,000
cycles, supplemental seat for, F. D. Jones 460,072	Insulator, V. Thomas 459,843
lliard table, W. Buttery 459,957 nder for papers, etc., Fitzpatrick & Ring 469,050	Jack. See Lifting jack.
nder for papers, etc., Fitzpatrick & Ring 460,050	Jeweler's lathe chucks, attachment for, S. C. Wil-
ns etc. construction of walls for. J. Wilson 459,806	cox
ancher for celery, etc., W. A. White 459,504	Joint. See Rail joint. Kiln, S. G. Valentine
at lowering apparatus, J. H. Throop	Kiln, S. G. Valentine
	Knitted bag and making the same, F. Clewley 459,866
iler cleaner F. Trowbridge 459.78	Knitting machine, Gulick & Humpbrey 459,827
11er stav. 'I' Barrow	Knitting machine, circular, B. F. Shaw460,038, 460,039
lt beader. M. D. Luehrs 460,058	Knitting machines, circular plush goods, T. H.
ot and shop cleaning and polishing maching	Worrall
bell A Cook	Kamp, electric, D. Tommasi 459,872
wi handle, P. Lippert 459,933	Lamp, electric arc, Logan & Barley 459,757
wling alley, M. Von Oeven, Sr 460,025	Lamp guard, incandescent, H. H. Hipwell 459,749
x. See Letter box.	Lamp attachment, electric arc, V. Thomas 459,846
 x. See Letter box. x, D. S. Clark. 460,068 ace. See Bed brace. Ratchet brace. 460,068 460,068 	Lamps, manufacture of incandescent electric, T.
ace. See Bed brace. Ratchet brace.	A. Edison 459,835
ake. See Car brake. Vehicle brake.	Last, H. Carmicbael 460,067
ick machine, H. Aiken 459,878	Lasting machine, J. E. Matzeliger 459,899
ace, See Car brake. Vehicle brake. ick machine, H. Aiken	Latch, P. D. & A. Johnson 460,016
190 0 F 919 FM H. T. W118011	
trial yault. Wyatt & Williamson 459,985	Lath bundling and trimming machine, W. E. Hill 460,049
irner. See Crucible burner. Gas burner. Va-	Lathes, attachment for metal working, W.
Dor burner.	Humans 459.867
itter firkin, C. A. Rittenhouse 460,033	Lead cutter, Schraubstadter, Jr., & Schilling 460.035
mera, F. A. Hetherington 460,099	Lead, manufacture of white, D. V. Kyte 459,946
n. See Ash can. Oil can.	Letter box, J. W. Cutler 459,974
r and door therefor, freight, O. P. Hix 459.905	Lifting jack, J. A. Wilks 459,605
r brake, J. Fischer 459.86	Lock. See Hasp lock. Nut lock. Loom picker, Pickles & Horsfall
r brake, J. W. Hartigan, 459,782	Loom picker, Pickles & Horsfall 459,793
r coupling, S. A. Cloud 459,994	Loom protector stopping mechanism, A. B. & H. Taplin
r coupling, C. M. Cole	Taplin
r coupling, S. B. Dover 459,960	Loom shuttles, cop spring for, F. A. Wilmot 459,849
r coupling. H. M. Grover 459, 544	LOOM wert stop motion, F. Lacey 439,841
r coupling, L. L. Weakley 460,101	Low water alarm, N. J. Tllghman 459,919
Ir guard, M. J. Daly 460.082	Mail bag, H. L. Boyle 459.864
r guard, M.J. Daly	Mail bag, C. F. Lighthouse 459,869
r motor mechanism, electric, S. H. Short 461,140	Man Dak, S. D. LOCKE 499,870
r. railway, E. B. Macmillan 459,896	Mail pouch, J. A. Miller
ar running gear, railway, C. M. Sloan 459.796	Man pouch denverer. A. Lunder 400,007

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