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.

"L. S." metal polish. Indianapolis, Samples free, Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J. Smith's Leather Pattern Fillet, Akron, O. Sample free. Handle & Spoke Mchy. Ober Lathe Co., Chagrin Falls, O. For best hoisting engine. J. S. Mundy, Newark, N. J. Heading machinery. Trever Mfg. Co., Lockport, N. Y.

Practical Ammonia Refrigeration. Redwood. Cloth, \$1. Spon & Chamberlain, 12 Cortlandt St., New York. Screw machines, milling machines, and drill presses.

The Garvin Mach. Co., Laight and Canal Sts., New York Centrifugal Pumps. Capacity, 100 to 40,000 gals. per minute, All sizes in stock, Irvin Van Wie, Syracuse, N.Y.

Emerson, Smith & Co., Ltd., Beaver Falls, Pa., will Sawyer's Hand Book on Circulars and Band Saws freeto any address.

Guild & Garrison, Brooklyn, N. Y., manufacture steam vacuum pumps, vacuum apparatus, air pumps acid blowers, filter press pumps, etc.

FREE GROUND GIVEN,

in Phila. suburbs, to large manufacturing plants. Rail-road facilities. Hoffman, 60 and Balt. Ave., Phila.

For the original Bogardus Universal Eccentric Mill, Foot and Power Presses, Drills, Shears, etc., address J. S. & G. F. Simpson, 26 to 36 Rodney St., Brooklyn, N. Y. 'The best book for electricians and beginners in elec-ricity is "Experimental Science," by Geo. M. Hopkins. tricity is

By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y. Woven wire brushes.-The Belknap Motor Co., of Portland. Me. are the patentees and manufacturers of the best woven wire commutator brush on the market, Competent persons who desire agencies for a new opular book. of ready sale, with handsome profit, may apply to Munn & Co., Scientific American office, 361 Broadway, New York.

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



HINTS TO CORRESPONDENTS.

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 This is for our information and not for publication.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 be arin 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.
Bu yers wishing to purchase any article net advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.
Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

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.

magnet be made equally as strong as that of an electromagnet wound by any desired strength ? A. No; an electromagnet may be much stronger.

(6376) E. C. S. writes: In a recent discussion as to the velocity of falling bodies, I made the general statement that all bodies fell with equal velocity, might wind with No. 26 wire and start with a rheostat. recognizing, of course, the apparent exceptions, such as 2. Where can I get instructions for making a voltmeter? feathers, etc. Will you kindly throw some light on the matter, as one of our local scientists maintains that a heavy body will fall with greater velocity than a lighter for making a small fan motor of the alternating inducone. The Encyclopedia Britannica, under the head of tion type? A. For alternating current motors, see our gravitation, states that bodies fall to the earth with equal SUPPLEMENT, Nos. 601, 653, 692, 717, and 944. These develocity, irrespective of material of which they are composed. Upon this and the fact that there is a rule giving the velocity of falling bodies 161 feet for the first second, etc., I base my opinion. A. The law of falling bodies applies to bodies falling in vacuo. In the air a heavy body, ceteris paribus, falls faster than a light one. The Encyclopedia Britannica statement applies to a vacuum. The air offers very high and generally underestimated resistance to falling objects.

(6377) H. A. says: Can you give a good recipe for renewing the ribbons of typewriters with re. cord or with copying ink of different colors ? A. Take vaseline (petrolatum) of high boiling point, melt it on a water bath or slow fire, and incorporate by constant stirring as much lamp black or powdered drop black as it will take up without becoming granular. If the vaseline remains in excess, the print is liable to have a greasy outline; if the color is in excess, the print will not be clear. Remove the mixture from the fire, and while it is cooling mix equal parts of petroleum, benzine, and rectified oil of turpentine, in which dissolve the fatty ink, introduced in small pertions by constant agitation. The volatile solvents should be in such quantity that the fluid ink is of the consistence of fresh oil paint. One secret of success lies in the proper application of the ink to the ribbon. Wind the ribbon on a piece of cardboard, spread on a table several layers of newspaper, then unwind the ribbon in such lengths as may be most convenient, and lay it flat on the paper. Apply the ink, after agitation, by means of a soft brush, and rub it well into the interstices of the ribbon with a tooth brush. Hardly any ink should remain visible on the surface. For col pred inks use Prussian blue, red lead, etc., and especially the aniline colors.

best form of construction. A. Not to advantage. It requires a very long coil and involves loss of efficiency. 2 Your description of the magneto bell requires the L shaped piece which holds the armature to be a permanent magnet. Why is this necessary ? A. To polarize the electro-magnet.

(6379) P. asks: 1. What advantages are claimed for metol as a developer? Could you give me a receipt for a developer containing it, and directions for use ? One with which I can have most control over the plate, and which will keep when mixed for use, as I often want to develop one or two plates at a time. A. Metol is very energetic in its action, has remarkable staying qualities, keeps clear, does not stain the film in the shadows, and is easy to work. The following is a good fermula:

Metel......5 Sodium sulphite crystals C. P......25 5 grains. Water 1 oz.

Dissolve metol first, then sodium sulphite. If kept in a tightly corked bottle, the solution will remain colorless for two or three months. This is a stock solution. To develop a 4×5 plate, take 1¼ ounces of the above, add 34 ounce water and pour over the plate; if fully timed, the picture will gradually appear and rapidly gain density and detail. If the time has been short, add to the solu tion a few drops, four or five at first, of a carbonate of potash solution, prepared by discolving one ounce of potash in three ounces of water. Keep adding a little at a time until the development proceeds rapidly enough to suit. The used developer should be kept in another tightly corked bottle. Eight 4×5 plates can be developed with these 2 ounces of developer. At end of that time development will be very slow and the developer will have a peculiar pungent odor when the nostrils are placed near it. This signifies that it is ready to be thrown away. 2. An easy way of regaining gold from waste toning solution. A. Gold may be recovered from waste toning solutions by adding a solution containing 32 grains of proto-sulphate of iron to every gallon of waste. The gold will be precipitated to the bottom. The clear liquid should be drawn off by a siphon and the residue poured upon a filtering paper and washed by pouring over it boiling water until the wash water no longer produces a precipitate with a solution of barium chloride. The gold is now redissolved with aqua regia and the solution slowly evaporated to dryness over a sand bath. The vellow crystalline salt may then be dissolved in water to make up a fresh toning bath, or put in an airtight bottle. 3. What can I use to finish off the woodwork of a camera (tripod)? A. Fill the grain of the wood with a filler of appropriate color, and when dry give the tripod a flowing coat of shellac varnish,

(6380) C. K. H. asks: 1. What is considered the best material to put between the flooring to deaden sound ? If felt or paper will do, what kind is the best ? The floor is of a hall over a store and is to be sound proof, at the least expense. As parties are figuring on putting in an electric lighting system in the building, a plant of from 100 to 150 incandescent lights, and running same with a gasoline engine will you give an idea of which is the best engine and dynamo for the purpose and the cost of same ? It will require from 10 to 15 horse power we are informed. A. A double floor with mortar between is probably the best sound insulator. For the address of engine and dynamo builders we refer you to our advertising columns. 2. Do you think it practicable to install an electric lighting plant for stores or hall and run same successfully with a gasoline engine ? A. Gaso (6375) T. D. L. asks: Can a permanent line engines have been successfully used for electric light ing; we believe they have proved to be economical.

> (6381) J. H. L. asks: 1. How shall I wind the fan motor described in SUPPLEMENT, No. 767, so as to be suitable for a 100 volt circuit? A. We advise you not to try the motor on a current of such potential. You A. See our SUPPLEMENT, Nos. 556, 552, and 353, for descriptions of voltmeters. 3. Where can I get instructions scribe different motors, but do not give full working details.

(6382) E. P. B. asks: 1 Is it feasible to make a storage battery for electric light work of one lead plate for a positive pole and a single zinc stick for a negative pole? A. This is hardly feasible. 2. State the amperes needed to charge 144 square inches (all told) of positive plate? A. 5 amperes. 3. What is the discharge for the above surface? A. 5 to 6 amperes. 4. Is asbestes a perfect insulator ? A. Nothing is a perfect insulator; dry asbestos is almost a perfect one.

(6383) W. A. H. asks how to wind an induction coil, for use on a Hunning's transmitter. Crowfoot gravity batteries, three in number, to be used. I wish to know size and quantity of wire to be used on both primary and secondary. Which will give best results on Hunning's transmitters-open circuit or gravity cells ? A. Wind primary to 1/2 ohm with No. 24 wire, secondary to 80 ohms with No. 36 wire Blin Boil batteries; the Crowfoots will tend to local action by deposition of copper on the zinc. (6384) A. N. X. asks: To persons using the same living rooms with a victim of consumption, and where cuspidors are used indiscriminately, is there any Bey Bey danger from contagion ? A. There is no doubt that the Bex Bra Bra practice is dangerous. Use individual cuspidors and place disinfectants, such as zinc sulphate, in them. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 782, 824, 959, Bra and 973, for articles on consumption, its cure, prevention. Bri Br● (6385) S. J. R. asks: 1 How can I make a good but in expensive microphone? A. See our SUP PLEMENT, No. 163. 2. I have two Samson batteries on a burglar alarm system. Before retiring last night I tested the alarm and it worked all right. About an hour after I heard a noise resembling an explosion, and opening the closet, in which I keep the batteries, I found that one of But Cat Cal Cal Cal Can Can Can Can them had burst all to pieces, and the fluid was thrown all over everything. A. Possibly the glass battery jar was badly annealed. This or some accident throwing it down are the only causes assignable. (6386) W. H. B. asks how to proportion

INDEX OF INVENTIONS For which Letters Patent of the United States were Granted January 22, 1895, AND EACH BEARING THAT DATE. [See note at end of list about copies of these patents.]

Boi Bel Boc

amount of material, to best adapt it to a battery of known	Car coupling, R. F. Ludlow (r)
amperage and voltage. A. The calculation cannot be made except approximately. The voltage to be devel-	Car fender, Reynolds & Center
oped must be known. Then the size of core and turns of wire must be based on the ratio of 108 lines of force	Cars, construction of railway, B. F. Allen
cut per second for one volt produced. The great	Nicolal
(6387) F. X. W. asks: In regard to eight	Cash register, R P. Thompson
light dynamo in SUPPLEMENT, No. 600, what alterations,	Chill, J. Matheus
into motor, and what horse power would it develop if	Cistern, H. P. Schaefer
used as a motor? A. Wind in shunt. The size of wire depends on the voltage. It would give about one-half	clamp. Clip. See Whiffletree clip.
horse power.	Closed setting mechanism, o. G. Anistrom
(6385) F. W. G. asks how many vol- umes a mixture of gas and air-10 to 1 (at ordinary	Clutch. electrically operated, T. H. Macdenald 532,778 Cock, gauge, J. H. Grubb et al
pressure) makes on explosion. A. It depends on the composition of the gas: from 6 to 10 times the griginal	Coin displayer, T. Carney
volume, but instantly going back to about the original	Cellar, borse, H. G. Stiebel, Jr
(6389) C. R. B. asks: Howmuch rain-	Converter, A. W. Billings
fall a fall of 12 inches of snow would represent, and if	Copper, refining, Nicholls & James
of the annual rainfall ? A. If light snow, it would give	Coupling, See Car coupling. Repair coupling. Thill coupling.
a little over an inch of water. To get accurate results, the snow must be melted so as to give a determination	wright & Morrison
for every snowfall. The value of the snow in water counts as rainfall	Cutter. See Feed cutter. Pipe cutter. Cutter bar, J. A. Knisley
(6390) P. E. A. asks: Can a person see	Disb cleaner, B. Yancey
the stars in broad daylight by descending into a deep well which is in darkness and looking up to the sky?	Deers, etc., device for preventing sagging of screen, W. H. & W. J. Clark. 532,764
How many feet down would a person have to descend?	Drillshoe, grain, N. M. Wig
bottom of deep wells and mines. A hundred or more	Traiten. 532,861 Electric machine regulator, dynamo, L. Bell
reet down is sufficient. Stars of the 3d and 4th magnitude are about as small as thus can be seen,	Electric safety device, C. T. Penton et al
(6391) W. D. asks: What is the process	Steam engine. Vaper engine. Fan attachment, R. Taggart
of cleaning sea shells to make them look bright and clean? A. Dark-colored organic matter on the outer	Feed cutter, L. F. Berneide
surface is first removed by making a thick mixture of one part bleaching powder to two parts of water and	Felting machine, R. Heaten
seaking the shell therein. On removing wash and scrub it Thick incrustations of lime must be picked off with	Fence wire tightener, H. W. Norton
a sharp-edged hammer or some similar tool, and then the	Film bolder, Bartlett & Edgerton
valuable shells may have the face or pearly portion cov-	Fishing net closing and hauling-in apparatus, H. Hommerberg
ered with shellac varnish, which may be removed with alcohol after the acid bath. For strong, heavy shells	Flashlight device, T. H. Macdonald
use 1 acid to 3 of water; for delicate shells use 1 part acid to 10 of water. Dip the shell for a second only.	Furnace. See Automatic stoking furnace. Blast furnace. Crementian furnace.
wash and examine; if not enough, give it a second dip.	Furnace air heating and regulating device, C. Bougier 532,863
way to serve as its handle. The important point is not	Garbage cremation furnace, I. A. Knapp
to let the acid stay long on the shell. For local spots it may be applied with a brush.	Gas, apparatus for manufacturing water, A. G. Glasgow
	Gas engine, F. P. Miller
An experience of nearly fifty years, and the preparation	Gig mill, G. & H. Bauche
or more than one bundred thousand applications for pa- tents at bome and abread, enable us to understand the laws and practice on both continents, and to possess un-	gonerie 532,895 Gold separator, R. Blanchard. 532,943
equaled 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	C. R. Smith 532,920 Governor, centrifugal bigh speed, F. W.
contemplating the securing of patents, either at bome or abroad, are invited to write to this office for prices, which are law in accordance with the times and our ex-	Spacke (r)
tensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broad-	Graphophone, disk, J. E. Wassenich
	White, Jr. 532,931 Harness, C. A. Rahn 532,906 Horvestor carry W. Horris 522,906
INDEX OF INVENTIONS	Hay carrier, P. A. Myers
For which Letters Patent of the	Heater. See Hot water heater. Steam or hot water heater.
United States were Granted	Heisting and conveying apparatus, H. B. Tefft 532,837 Hook. See Meat or other hook. Ring hook. Horseshoe calk sbarpener, E. C. Lainson 532,883
January 22, 1895,	Hot water boiler, M. Furlong. 532,872 Hot water beater, H. K. Tallmage. 532,836 Lee cream freezer, Ottume & Rafe. 532,987
AND EACH BEARING THAT DATE.	Ice making apparatus, W. L. Church
[See note at end of list about copies of these patents.]	Indicator. See Lamp filling indicator. Insect destroyer, Morrill & Morley
Adjustable table, Shear & Quinlan	Insect trap stand, W. L. Peeler
Air brake, car, J. D. P. Schenck	Kiln. See Percelain kiln. Knitting machine, circular, C. E. Kelley
Armature bars for dynamo-electric machines, apparatus for bending, H. Geisenhoner	Hemphill
Armature for dyname-electric machines or 532,795 Armatures machine for accombing lamines of 532,795	Lamp filling indicater, J. C. Miller
J. Ridell. 532,820 Atomizer, T. J. Holmes. 532,827	Lathing, metallic, T. L. Banks
Automatic etoking furnace, I. Bowe	lock. Seal lock. Lock, C. A. Erichson
Batter for oil or artesian wells, W. Plotts	Lock, G. T. Hetzel. 532,877 Lock, J. E. Mitchell. 532,988 Locomotive boiler, J. T. Connelly. 532,768
Barrels, kegs, etc., machine for making, H. Camp- bell 533,034 Battery See Galvanic Lattery	Leep set, A. G. Schmidt
Bean separating machine, D. C. Breed	Lubricater, H. Sims. 532.918 Mail bex, electric alarm, E. C. T. Belding. 532.860 Macaura projector graphic LA Mercenter 532.860
Bed rest, invalid's, R. & R. Wangersheim. 532,551 Berth, self-leveling, W. T. Milligan	Measure register, grant, 5, A. Mer ay den
Bicycle dynamos, frictional driving gear for, E. Tilmann	Mecuanical movement, J. Bacon
Blast furnace, P. C. Reed	Mill. See Gig mill. Mine trap deer, H. Keyes
Boiler. See Hot water boiler. Locomotive	Mirror, metal framed. A. Wanner, Jr 532,928

Aniline black	. ½	oz.	
Pure alcohol	.15	44	
Concentrated glycerine	.15	**	
Dissolve the aniline black in the alcohol,	and	add	\mathbf{th}

glycerine. Ink as before. The aniline inks containing glycerine are copying inks.

(6378) The F. R. Co, asks: 1. Is it possible to charge an electro-magnet with the secondary current from an induction coil? If so, please name the a primary spark coil to get the best results with the least Car

a fastener, J. McCarthy 562,805	Mine trap door, H. Keyes	002.002
d stop, C. H. Kugler 532,974	Mining tool, F. Hardy	532,78
er. See Hot water boiler. Locomotive	Mirror, metal framed. A. Wanner, Jr	532,928
ooiler. Steam boiler.	Mould. See Cistern mould.	
er feeder, J. Austin 532,998	Moulding flask clamp, Van Court & Madeira	532,847
er stays, making. S. A. Pratt 532,816	Motion, intermittent grip device for transmit-	
cutter head, F. H. Richards 532.818	ting, J. J. O'Neill	532,900
k, self-reckoning pass, U. G. & W. F. Beck 533,029	Motor. See Fan motor.	
ling ball, F. D. Hunteen 533,011	Mouse trap, H. Obermeyer	532,986
ling pin, F. G. Dokkenwadel 532,871	Multicylinder engine, L. C. Worron	522,856
. See Mail box. Packing box. Signal box.	Musical chart, R. H. Ingraham	532,964
trimming machine, R. Schleicher 532,915	Nut lock, Davis & Bowers	532,771
cket clamp, A. A. Ball. Jr 532,748	Ore concentrator, J. J. Cranmer	533,002
ke. See Air brake. Car brake. Railway train	Ores or other substances, means for concentrat-	
orake.	ing, Hammond & Gordon	522,956
kes, automatic disengaging device for atmos-	Packing and storing vessel, A. Burson	533.033
pheric, J. Ackermann 532,745	Packing box, G. E. Grimm	532.954
ast supporter, S. Bergheim	Packing box or crate, J. S. & C. W. Reid	532,9 91
k cutting machine, H. R. & J. Van Eyck 532,927	Paddlewheel, feathering, C. A. Long	532,887
oches, jewelry, etc., fastening and attaching	Padlock, master key, J. Roche (r)	11,465
levice for, T. Grainger 533,018	Pan. See Saucepan.	
sh holder, magnetic, J. C. Henry 532,782	Panels, construction of curved and veneered,	
kle, W. A. O Bar 532,898	H. Widdicomb	532,932
kle, suspender, J. McKenzie, Jr 532.806	Paper making machine, R. W. Moncrieff	532,803
let proof shields, material for A. H. J. Appelt 532.857	Pen, drawing, V. Berdelle	532.755
ig, barrel, M. Stangl	Photographic print washer, J. W. C. Floyd	532,775
ton setting machine, J. C. Stevens 532.833	Pianoforte action, A. T. Rousseau	532,912
ton, spring, F. Giles	Pile fabrics, orpamenting selvedge of, P. A. Men-	
inet for holding money, coupons, pass-books.	gers	532,801
ete., U. G. & W. F. Beck 533,030	Pipe cutter, W. W. Tucker	532,845
le grip. M. F. Robinson	Pivoted can. L. O. Brown	532,867
cining machine, W. S. Pierce 532,903	Plane, bench, Traut & Schade	532,842
endar, time, H. H. Norrington 532,810	Planter, combined corn and potato, Colburn &	
generator connection. F. B. Cook 532,769	Cheate	532,767
. See Pivoted can.	Pneumatic transfer tube system, F. W. Jones	532,966
s. etc., closure for, J. Rau 532,990	Percelain kiln. E. M. C. Gendeuin	533,007
brake, G. R. Elliott 533.005	Pot. See Coffee pot.	
brake, railway, C. Matthews	Prescription stand, R. S. Vitt	532,848
coupling, A. D. Alden 533,026	Press. See Cotton press. Soap press.	
	Descure acquister fuid () I Destion	E20 750