(29) M. T. S. says: I am making a machine of cast iron for cutting fruits and vegetables. What paint or varnish should I put on it to keep it from rusting? A. Paints or varnishes will not answer for this purpose. It is best to have the iron nickel or silver plated. See p. 232, vol. 36. "Prevention of Rust on Iron."

(30) G. C. Q. asks: 1. What volume of water in the state of vapor can be absorbed by a given volume of sulphuric acid before the acid becomes completely saturated? A. Strong oil of vitriol will absorb more than twice its volume of water vapor; but as the dilution proceeds, the absorbing power of the acid decreases proportionately. 2. What is the most simple method by which the acid can be rid of the water it has absorbed, so that it is ready to absorb again? A. The only way is by evaporation with the aid of heat in glass, porcelain, or platinum vessels.

(31) G. E. asks: How can I mix paint that will do for painting steam pipes or the parts of an engine which are heated by steam? If I use water color it rubs off; if oil, it turns dark from the heat? A. If you do not wish to use a dark color, mix your paint to a lighter shade than it is permanently to be, and let the heat deepen to the color till it sets.

(32) J. V. B. says, in reply to D. D., who asks what is the cheapest and best preparation for the preservation of shingles: Use 3 lbs. of green vitriol in water to the 1,000 shingles. This preserves the shingles and renders them to a great extent fireproof. Shingles made from wood of evergreen trees are best.

(33) R. B. R. asks: Is there any instrument in which, as in a reservoir, electricity could be stored up, so as to be used occasionally as need might require to produce motion? If I should employ a windmill to generate electricity by a Gramme machine, could I store up the electricity until it acquired a certain and sufficient tension, and then draw from it as I choose, without the necessity of using plates, porous cells, carbons, etc., and without danger? A. No. A battery composed of Leyden jars may be charged with statical electricity, but the quantity of electricity that can be so stored is limited, and it is difficult to retain the charge for any length of time. Low tension electricity, such as is used on telegraph lines, cannot be stored.

(34) J. F. D. says: Some time ago I made a voltaic pile, which I cannot get to work. I put circular blanks, 4 inches in diameter, thus: Copper, zinc, fabric, copper, zinc, fabric, etc., punched holes in center of them, and piled them up around a stick. Please tell me what is necessary to make it work? A. Remove the stick and moisten the pieces of cloth. The shape of the disks does not in any way influence the strength of current. Make the cloth the same size as the disks with which it is in contact. It will require several hundred of the couples to produce a sensible spark.

(35) A. B. asks: How can get I rid of lice in poultry? A. Make the roosts perfectly clean with hot soap and water, and afterwards apply spirits of turpentine or kerosene oil. Also strew some sprigs and branches over the floor of the coop. The building should be kept clean.

(36) S. R. S. says: Having read that an engine has been disabled by putting a bar of soap in the tank, I wish to know what the action of the soap in the boiler was? Did it cause foaming? A. Yes.

How can I take grease spots out of fine felt cloth without injuring the cloth? A. Moisten the spotted parts thoroughly with pure benzole, and immediately cover them on both sides of the cloth with dry pipeclay or tripoli powder. Then place under a weight for some time, and the spots will disappear.

(37) H. E. L. asks: Is there anything that will remove Indian ink stains from drawing paper? A. There is nothing that we know of, except a good steel eraser or sanded rubber. Indian ink contains finely divided carbon, which is unaffected by any ordinary solvent.

(38) J. A. H. asks: What size of wire and how much in length shall I use for magnets for the electro-magnetic engine described in SCIENTIFIC AMERICAN SUPPLEMENT No. 19, to give the most power with a single Calland cell? If I use 2 cells, how shall I connect them? What is the rule for estimating the resistance of batteries and of magnets and other wire connections, in order to proportion one to the other? Mr. Sawyer says, in describing the engine above referred to: "No. 31 wire is the best size for magnets;" you say, in answer to a subsequent inquiry on the same subject, "use No. 18 wire." Can you explain this? A. With a given battery the greatest magnetic effect is obtained when the resistances of the battery and magnetizing helix are equal. The average resistance of a medium size Calland cell in good condition is about 1·5 ohms, consequently the resistance of the helix should be the same according to the above statement, and this is equivalent to about 350 feet of No. 18 or 90 feet of No. 23 pure copper wire. With a Grove cell, large wire and fewer convolutions would be best.

(39) H., I., & Co. ask: Does the putting of concentrated lye in boilers, to soften the scale, injure the iron? A. The lye will have little effect on the iron, but may cause the water to foam.

(40) C. R. asks: How can the lambskin aprons used by freemasons be cleaned? I used benzine; it frees them of dirt, but makes them look dingy and yellow. A. Have you tried soap and water? It is not probable that the benzine would leave a stain on the wool if used in excess. Bisulphide of carbon is among the best solvents for oil and grease, and will perhaps give better results than the benzine. Try also wood naphtha. If too little of the solvent is used, it will only carry the stain from the surface further into the material. It should be observed that all of these oil solvents tend to destroy the pliability of the leather and necessitate its re-priming or oiling after drying.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the result stated:

D. M. B.—It is a coarse sand formed by the disintegration of granite. If you look at it with a strong magnifying glass, or low power microscope, you will find it composed of films of mica, orthoclase, and quartz crystals. It contains some iron oxide and pyrites.—N. B. B. —They appear to be all carbonate of lime crystals—calcite. The varieties of calcite are very numerous and diverse in their diaphaneity, crystalline structure, and color, the variation being due to the different modes of origin and impurities.—W. R. L.—It is graphite or plumbago, mixed with clay.—E. D. R.—We have not been able to classify the shells, as they were very much broken and imperfect.—M. M. B.—It is a hematitic iron ore, containing crystals of iron pyrites. See p. 7, vol. 36. It is of little value.—A., Bros.—It is graphite, an allotropic form of carbon, sometimes called plumbago and black lead. It is found associated with sphene, tabular spar in granular limestones, with pyroxene, spinel, chrondrolite, hornblende, scapolite, syenite, and gneiss, and in some iron ores. It is used for lead pencils, in black-lead crucibles, and as a substitute for oil in lubricating machinery; and it constitutes what is known as stove blacking. It is found in many parts of the United States, and is mined at Ticonderoga and Fishkill, N. Y., at Brandon, Vt., and in North Carolina. Its market price is from 3 to 6½ cents per lb.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

On Flying Machines. By D. J. C.
On Fire Escapes. By J. M. C.
On Interference Colors. By H. M.
On Compressed Air. By F. G. W.
On a Snake-Eating Frog. By C. F. S.
On a Needed Invention. By J. E. E.
On Microscopy. By P. T.
On the Flight of Birds. By J. H. H.
On Cutting Gears. By M. J. S.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Who sells hydraulic rams, and where can circulars descriptive of them be obtained? Who makes steel wire, suitable for spiral springs, to be wound cold? Who sells sal soda and soda ash? Who buys bones, and what are they worth? Who sells machines for setting pins in rubber cloth, for making metallic hair brushes?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

OFFICIAL.

INDEX OF INVENTIONS

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[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired, and remit to Munn & Co., 37 Park Row, New York city.

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9,903.—CARPETS.—A. Baye, London, England.
9,904.—CHAIRS.—P. Diehl, New York city.
9,905, 9,906.—BUTTON CARDS.—J. Fenton, Birmingham, England.
9,907 to 9,913.—OIL CLOTH.—C. T. Meyer *et al.*, Bergen, N. J.
9,914.—ORGAN CASES.—J. R. Lomas, New Haven, Conn.
9,915.—GLASSWARE.—J. B. Lyon, Pittsburgh, Pa.
9,916.—BOTTLE.—E. Raynaud, Paris, France.
9,917.—BAS RELIEF.—G. Beck, Highland, N. Y.
9,918.—BADGE.—J. McCoy, Ypsilanti, Mich.
9,919.—DRESS FRINGE.—M. Blau, New York city.
9,920, 9,921.—CARPETS.—E. Daniel, Paris, France.
9,922 to 9,931.—CARPETING.—J. L. Folsom, Brooklyn, N.Y.
9,932 to 9,935.—CARPETING.—O. Heinigke, New Utrecht, N. Y.
9,936 to 9,940.—CARPETING.—H. Horan, East Orange, N.J.
9,941.—LOCKET.—F. Keller *et al.*, New York city.
9,942, 9,943.—CARPETING.—G. W. Piggott, New York city.
9,944 to 9,946.—CARPETING.—J. E. Rollings, N. Y. city.
9,947.—TOWEL BORDERS, ETC.—R. T. Webb, Randallstown, Ireland.
9,948.—POCKET BOOK FASTENERS.—L. Prahar, N.Y. city.

[A copy of any of the above patents may be had by remitting one dollar to MUNN & Co., 37 Park Row, New York city.]