vanometers? A. There is nothing absolute about a galvanometer, except those of special construction. Generally they have to be calibrated before their readings can be interpreted directly. Galvanometers can be and frequently are (as in ammeters and voltmeters) constructed for uniform readings for given currents. 4. About how many heat units are there in a cubic centimeter of zinc? A. In conversion into oxide it will liberate 12·1 kilogramme calories. 5. I have made the motor described in SUPPLEMENT, No. 783, and it works to perfection, going so fast it hums. Now, as I understand it, the centers of greatest attraction on the field magnets are right next to the coils; therefore, the armature revolves, being attracted on one side and repelled on the other. Am I right? A. Yes. 6. On the motor referred to, one side of the armature is positively and the other side negatively magnetized, is it not? A. Yes.

(4111) W. H. W. asks: 1. Will you please inform me through your paper what is the difference between nitrate of silver and oxide of silver, and how each are formed and what are their characteristics? A. Silver nitrate is a compound of the nitric acid radical and silver, and is made by treating silver with nitric acid. It is a white solid, fusible and known often as lunar caustic. Silver monoxide is a brown powder formed by precipitating the above in solution with caustic alkali. 2. What is the substance called salicylic acid and how formed, and in what way is salacine connected with it? A. It is ortho-oxybenzoic acid, $C_6H_4(OH)CO_2H$. It is made by heating sodium phenate in a stream of carbon dioxide. It occurs free in the flowers of *Spiræa ulmaria*, and as a methyl ether in oil of wintergreen. Salicin is a glucoside, $C_{13}H_{18}O_7$, not directly related to salicylic acid. It is contained in the leaves and young bark of the willow, poplar, and other trees. Your other questions we cannot undertake to answer.

(4112) A. C. writes: 1. Last year bought Hopkins' "Experimental Science." Constructed motor as therein described, page 497, etc., using cast iron magnet; did not double number of coils and convolutions; used field magnet just as it came to me from foundry. Should four volts make such motor move sufficiently to test accuracy of winding and connections? A. The voltage should be sufficient to overcome the resistance of the machine. The amperage must be great enough to produce the power. With an E. M. F. of 4 volts and 4 or 5 amperes the motor should work very well. 2. With what degree of accuracy should halves of magnet be fitted together, and if inaccurately fitted, can failure to respond to four volts be attributed to that cause? A. The joints of the magnet should be as perfect as possible. Your trouble was probably due to insufficient current. 3. What is the difference if, in winding armature, the terminal end of each of the twelve coils comes from the inside (or under) of core in place of from outside, as in illustration, page 500? A. No difference.

(4113) T. D. W., Jr., asks: 1. What kind of battery is required to run the electric tray illuminator as described in the SCIENTIFIC AMERICAN, vol. lxv., No. 21, page 329? I wish to construct one of one or two candle power incandescent lamps. What kind of battery and how much would it cost to run the same for a year? I would not use it every day, but only once every now and then. Sometimes it is a month before I will take a picture. A. Use 4 or 6 cells of Leclanche battery or 3 or 4 cells of Fuller. The cost is very small when the battery is used only occasionally. It would not cost more than 50 cents per year after the batteries are provided. 2. Is the flash made by the flash light (described on the same page as above) instantaneous or does it require a time exposure? Is the lens left uncapped and the flash made, or is the flash made and the exposure made a time one? Also what number of Seed's or Cramer's plates should be used? A. The flash is instantaneous. Use the quickest plates. The lens may be left uncovered. 3. Will beeswax do as well for lining a tray for silvering paper as paraffin? A. Yes.

(4114) J. B. M. asks: 1. I have some statuary made of composition (sample inclosed) having a similar appearance to Rogers groups in finish. The outer coating or finish is wearing off, giving them a soiled, spotted appearance. What can I use to restore this brownish, or drab finish? It is a dead color, not a gloss. A. Give it a coat of paint made of white lead, raw umber, a very little oil and turpentine. Tube colors such as are used by artists can be used after thinning with turpentine. 2. What will restore the gloss to frame work of a type writer that has become dull? A. A thin coat of hard drying japan varnish. A fine quality of furniture varnish with refined lamp black added is sometimes used.

(4115) J. A. P. writes: 1. I have a boat 12 feet long. What size motor would it require to run it 5 or 6 miles per hour? Would two simple motors like those described in Hopkins' "Experimental Science" answer? A. You will hardly get more than three miles an hour with the simple motor. 2. How many cells storage battery would it require? A. 12 cells. 3. How many square feet of positive plate would it require to each cell? A. 2 or 3 square feet. 4. How can I anneal cast iron? A. Imbed in blacksmith's cinder and oxide of iron and heat in closed iron boxes to redness for several days. 5. How much current does a storage battery receive in circuit with a 16 candle power 110 volt lamp? A. Half an ampere.

J. N. L. says: Kindly give me a receipt for an ink eraser in liquid form.—C. R. D. says: Will you please give me a good receipt for making soldering fluid to be used in jewelry?—F. C. A. says: Tell me of a cheap substance that can be melted and run into moulds and become hard like rubber when cold.—A. F. J. says: Will you please let me know how to dissolve amber in some quick drying solvent, so as to dry about as quick as shellac in alcohol?—G. B. B. asks for a copying paper.—J. H. says: I noticed the article on cement for metals made of zinc oxide and zinc chloride. Won't you kindly let me know how it is prepared?—W. W. G. says: Please inform me what is generally used in making plaster of Paris moulds, and how to mix it.—C. A. B. asks: Can you inform an old reader of what that compound is, and the manner of making it, that rubber hand stamp manufacturers use to take their impressions of the type in?—W. B. R. asks: Can you tell us in your paper the kind of rubber cement that is used on the back of felt letters by which they are stuck to cloth, simply by running a hot iron over them? What is the cement made of and how is it applied to the felt? —W. M. says: I should like to know of some washing preparation.—C. J. M. says: Please answer through your Notes and Query column how to make colored crayon for the purpose of rough sketching on paper.—A. D. says: If it is not outside your province, will you kindly give me the recipe for making koumiss out of cow's milk?—P. C. asks for a reliable washing compound.—G. W. S. asks for a formula for a benzine-resisting preparation to apply to corks.—F. C. & Co. ask for a burnishing ink for the use of shoemakers.—A. B. C. says: 1. Please inform me how carbon paper such as used with the typewriter in making transcripts is made. 2. How can typewriter ribbons be renewed or re-inked?

Answers to all of the above queries will be found in the "Scientific American Cyclopedia of Receipts, Notes and Queries," to which our correspondents are referred. The advertisement of this book is printed in another column. A new circular is now ready.

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AND EACH BEARING THAT DATE.

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Refrigerator, C. F. Paige 470,167
Refuse carrier frame, J. W. Zimmerman 470,093
Register. See Pool game register.
Regulator. See Windmill regulator.
Riveting machine, M. Arnold 469,891
Rivets or bolts, making, E. Sears 469,724
Roads, machine for making and repairing, M. G. Bunnell 469,771
Roller. See Gate roller.
Rope oiling device, J. A. Hopkins 470,000
Rotary engine, W. S. Lycan 470,064
Rubber, T. C. Bronson 470,101
Ruler, paper cutter, and blotter, combined, W. J. Stanton, Jr. 469,915
Saddle, B. P. Blood 469,867
Saddle, harness, I. S. Remson 469,979
Safe, L. Simmons 470,017
Safe, burglar proof, T. M. Martin 469,971
Sand drier, G. D. Grannis 469,939
Sand raising apparatus, A. McDougall 469,841
Sash balance, G. C. Gardner 469,690
Sash cord fastener, G. L. Fowler 469,689
Sash cord fastener, R. M. Gardner 469,691
Sash fastener, E. L. Badgley 469,769
Sash, window, J. B. Cohen 470,139
Sawing machine, wood, J. P. Currie 469,734
Scaffolding, J. Anderson 470,032
Screwdriver, F. A. Howard 470,001
Screwdriver, J. W. Jones 470,055
Separator. See Grain separator.
Sewing machine feeding mechanism, R. G. Woodward 470,092
Shaft coupling, J. T. Ferres 469,780
Shaper, C. Douglas 469,852
Shears, W. Wilkinson 469,988
Sheet metal binding pieces, machine for making curved, J. H. Williams 469,763
Sheet metal cones, method of and dies for forming, F. Hart 469,785
Sheet metal vessels, die for manufacturing, F. W. Judd 469,741
Shingle machine, W. J. Perkins 469,976
Shipping package, C. L. King 469,744
Shoe clasp, P. Clifford 469,935
Shoe horn, N. A. Dickinson 470,109
Shot gun, magazine, W. H. Ostrander 469,900
Shutter bower, H. V. Demarest 469,834
Signal. See Gong signal. Railway signal. Railway switch signal.
Signals, compensator for, J. J. Turner 470,148
Signaling apparatus, W. B. Chalmers 469,961
Signaling device, train, J. Lynch 470,065
Sizing compound, A. Steinhauser 469,954
Skiving machine, J. R. Scott 470,015, 470,016
Sliding gate, A. Wilkinson 469,848
Smoke and spark arrester and conductor, I. J. Hartford 469,969
Smoothing iron electrically heated, W. Mitchell 469,792