## Notes & Queries

W. T. A. will find a description of rosin oil on p. 266, vol. 31.—L. H. R. and G. B. T. will find formulas for safety valves on p. 330, vol. 32.—H. J. C. will find a rule for ascertaining the increase of temperature of air by compression on p. 133, vol. 33.—A. E. B. can silver looking glass by the process given on p. 234, vol. 30.—L. M. P. will find directions for waterproofing paper on p. 146, vol. 31.—A. M. will find a recipe for a fine boot blacking on p. 283, vol. 31.—M. P. will find directions for bronzing brass castings on p. 283, vol. 31.—C. C. H. will find directions for annealing lamp chimneys on p. 42, vol. 26.—C. H. F. will find directions for photographing on wood in *Science Record* for 1874, pp. 187, 188.—B. C. will find full directions for molding rubber on p. 283, vol. 29.—H. P. D. will find directions for making a polishing starch on p. 203, vol. 31.—G. M. P. can repair rubber hose by the method described on p. 203, vol. 30.—G. A. P. can japan small iron articles by the process described on p. 208, vol. 26.—W. R. McF. can rid his house of ants by the process given on p. 319, vol. 32.—A. B. S. & S. will find that a gold lacquer for brass is described on p. 362, vol. 30.—A. G. A. will find a recipe for marine glue on p. 43, vol. 32. Fish glue is described on p. 408, vol. 24.—B. F. will find directions for gilding picture frames on p. 347, vol. 31.—R. B. R. will find a formula for ascertaining the power of a windmill on p. 241, vol. 32.—E. R., A. E. H., and E. R. will find directions for preserving natural flowers on p. 266, vol. 31.—E. C. L. Jr. will find a description of the process of cutting gears on screw-cutting lathes on p. 187, vol. 29.—W. S. H. will find directions for putting gold lacquer on tin on p. 139, vol. 32.

(1) C. B. R. asks: If the electricity generated in a Rhumkorff coil were changed into electro-motive force, would there be a greater amount than was developed in the battery used to run the coil? A. There would not.

(2) F. C. asks: 1. In a copper and zinc battery, should a wire be attached to each of the plates, and the ends of the wires be connected; or should the wire leading from the copper plate be connected to the zinc by the binding screw? A. A wire should be connected to the copper and another to the zinc. 2. How is the circuit made? A. The circuit is made by connecting the two wires together. 3. When 1 part oil of vitriol to 10 or 12 parts water is used, how long is it before such battery is ready for use? A. The battery will be ready for use as soon as it is set up. 4. If the zinc weighs 1 lb., how much should the copper plate weigh? A. A thin sheet of copper will answer. 5. Can the copper plate in a battery be used a second time? A. Yes.

(3) F. C. S. asks: How long will a well tempered compass needle retain magnetism? A. It would depend upon the quality of the steel and the care with which it was used. It is impossible to state the time without knowledge of the facts.

(4) S. W. says: My battery jars are covered with a coating that breaks off and crumbles easily. It is white in the gravity batteries, and blue in the Daniell. What are the cause and the remedy? A. The white deposit is sulphate of zinc; cause of its formation is that the solution is saturated. Remedy, dilute the solution with water. By painting or greasing the top of the jar, the tendency to creep over will be removed.

(5) A. E. P. asks: 1 I propose laying a telegraph line, ½ a mile long, with No. 23 wire. How many cells of Callaud's battery would it require to run it, the wire in the magnet being No. 21? A. Twelve. 2. Would it be better for that distance to use finer wire on the magnets? A. Yes. 3. What size would be best, and how much should be on each magnet, there being only two sounders in the circuit? A. Use 500 turns of No. 28.

(6) A. W. C. asks: What is the process of deodorizing alcohol? A. Spirit of wine, brandy, or alcohol distilled over soap lose their empyreumatic odors and tastes completely. At about 215° Fah. the soap retains neither alcohol nor wood spirit. The soap employed should contain no potassa; it must be a hard or soda soap, and ought to be completely free from fatty acids or fluids, otherwise it may render the product rancid and impure. Common soap made from olein and soda has satisfied all the conditions in practice. If this soap be employed, it will be better to add a little soda during the first distillation. Thirty-three pounds of soap is enough for 100 gallons of empyreumatic brandy. Attwood's patent alcohol is deodorized by distillation over permanganate of potash.

(7) J. A. asks: 1. How much (length or weight) fine wire is absolutely necessary for a machine to give a shock that can be sustained comfortably, say 200°? A. From 1 to 3 lbs. 2. Is it necessary to have two thicknesses of wire? A. Yes.

(8) L. K. Y. asks: How is wood naphtha made? A. See p. 138, vol. 33.

1. In what way is perchloride of iron made? A. Dissolve pure protoxide of iron in dilute muriatic acid, and crystallize the salt out by evaporation of the solvent. 2. How can I make nitrate of iron? A. Dissolve pure iron or its oxides in nitric acid until it will dissolve no more; filter the solution and evaporate to dryness over a water bath. The residue should be redissolved in hot water and the solution again filtered and evaporated as before, in order to remove any basic salt that may have formed, and as much of the superfluous nitric acid as possible.

What do you mean by a primary coil and a secondary coil? A. See p. 115, vol. 33.

(9) W. E. E. asks: What cement or putty is best to use on a chamfered slate joint which is exposed to the sun's heat, cold, etc.? A. The form you have adopted for the joint is not very favorable for retaining the packing; a better form would be that of a plain butt joint, and this would be still better if provided with a firm blade between to receive the packing of each slab alone, independent of the adjacent one. We know of no cement that will answer your purpose so well as one formed in great part of asbestos. Of course the composition of the best of these, such as have been proved of value in practice, is not divulged by their proprietors. We understand, however, that they are furnished as articles of commerce.

(10) H. C. B. says: We have a dispute as follows: I affirm that to make an inside chaser from a hub to chase a right hand inside thread correctly, a left hand hub must be used, or, in other words, a right hand hub will make a left hand inside chaser. I do not affirm that the thread cannot be cut with either; but, that the thread may have the correct pitch, the left hand hub must be used. Am I right or wrong? A. Right. For complete explanation, see No. IV. of "Practical Mechanism."

(11) I. H M. Jr. asks: How can I print from a plate of bichromated glue (acted on by a photographic negative) on common paper, with printer's ink? A. Coat evenly a glass plate with a strong solution of gelatin in water, and when dry, flow over this a filtered solution of bichromate of potassa in water. Expose this to strong sunlight for a short time. Repeat this operation—with gelatin and potash bichromate, as before—several times until a good background of insoluble gelatin bichromate is obtained. Then prepare the plate in a darkened room as at first, and expose under the negative as in solar printing; an exposure, with a good light, for from fifteen to twenty minutes is usually sufficient. On removing the negative, place the bichromate plate immediately in a large quantity of clean cold water in a dark place, and allow it to remain immersed several hours. The water should be changed in the mean time, in order that all the unchanged gelatin bichromate should be completely dissolved. The film may then be removed from the glass plate, dried, and mounted on a slab of lead or zinc for printing.

(12) A. B. C. asks: How can I toughen steel tools, such as gravers, etc, to make them retain a good sharp edge for cutting gold and other metals? A. If you use any of the best grades of tool steel, and leave them hardened right out, without drawing the temper at all, your gravers will stand and cut well.

(13) F. H. of Berlin, Germany, asks: Which electromagnets will be the strongest of these two: One has one coil of thick wire, and the other has two or more coils of thin wire wound around it. The sizes of the magnets as well as the weight of the copper in the wires are supposed to be the same in both cases, as well as the current used for magnetizing. A. Probably the single coil of thick wire. It would depend, however, upon the resistance of the wire and battery. When the resistance of the wire and battery are equal, the maximum magnetic effect is secured.

(14) L. N. B. asks: 1. How can I nickel plate bars of iron 3x1½ inches? A. Various solutions for nickel plating have been suggested, but perhaps one of the best, at least one highly recommended, is that containing the double salt of nickel and ammonium. This is prepared by dissolving 1 part by weight of sulphate of ammonia and 2·13 parts sulphate of nickel, in sufficient water to make a saturated solution, a little more water being added afterwards to prevent any tendency to crystallize. Considerable trouble is usually experienced by the amateur in his efforts to obtain a good deposit. The principal difficulty, however, consists in the management of the operation, and the necessity of employing a proper anode, which is rather hard to obtain. The anode should present a surface in excess, if anything, of that of the object to be coated, and the battery power must be carefully regulated to the work required. Unless this is done the deposit is apt to contain gas, which is always evolved in greater or less quantities with the deposition of nickel, and this is liable to make the deposit porous or flaky. A good plan is to use two or three Grove or Bunsen in series, until a slight coating is obtained, after which a single Smee cell, of proportions depending on the size of the object to be coated, should be used to complete the operation. It is well, also, to keep the solution alkaline by adding a little more ammonia from time to time. 2. What battery is the best for such purposes? A. The Smee.

(15) V. C. asks: How must I proceed to repair the soldered parts of double-barreled guns, using no tools but the copper bit? A. Clean the parts to be soldered, and apply to them muriatic acid which has been killed with zinc. Warm the parts, and solder in the usual way with fine solder.

(16) C. A. says: In your paper on the slide valve, by Joshua Rose, he leads me to infer that an engine, when just beginning to take steam, should have its exhaust port about two thirds open In looking at our valve and the ports in steam chest, I find that ours is not more than one fourth open. The engine makes a groaning noise when loaded or partly so. What had I better do to ease it a little? Would it be best to lengthen the valve? A. Your valve should be lengthened. At least ¼ inch more lap should be added to each end: this involves the necessity of a new eccentric to increase the valve travel, which should not be less in your case than 3½ inches.

(17) L. says: I have a lathe, the spindle of which revolves in a very soft and fusible alloy. As the bearing has worn out of true, I wish to cast a new one. What is a good alloy? A. You cannot do better than use the best grade of Babbitt metal; or mix and use the following: Zinc 17 parts, copper 1 part, antimony 1½ parts.

(18) H. S. asks: What is the pressure of water per foot of current of a river 10 feet deep, moving at 5 miles per hour? A. The pressure will vary with the depth, and may be best ascertained by making a piece of board a foot square, and suspending it like a swinging sign in the river current. A cord attached to opposite points of its surface and to a spring balance will practically answer your query.

(19) C. H. W. asks: Please give me the proper size of propeller, engine, and boiler for a boat 36 feet long, 6 feet wide, drawing 1½ or 2 feet of water. I want the boat to go at a speed of 16 miles an hour. A. Most builders would hesitate to guarantee such a speed for so small a boat, at least without the inducement of an extraordinary price.

(20) E. P. says: In your issue of August 28 you say: "Ice boats very frequently travel faster than the wind that drives them." I, with several other engineers, would be glad if you would give us the facts or philosophy on which this statement is founded. In our view, it is plain that, if a boat moves faster than the air around it, its sails must displace the air in front of them. Nowhere does it get the force to do this? The proposition that a moving body which gets and retains its force and motion only from the moving air can do this, involving as it does the corollary that the pressure of the air in front of the sails is greater than the pressure behind them, appears to us to be an absurd idea which we cannot for a moment believe that you would entertain. A. This ice boat question has been frequently discussed in our columns, and explanations given with diagrams showing the lines of the forces and why the boat moves faster than the wind. Our esteemed correspondents are referred thereto. Consult, for one example, page 170, vol. 28. But if any of them are unable by a study of the theory to satisfy themselves of the fact, we advise them to construct an ice boat this winter and try the experiment practically. They will find that, with a properly constructed machine, skilfully steered, in a wind moving say thirty miles an hour, they can travel from forty to fifty miles an hour, or more, according to the state of the ice. If prevented from experimenting, let them read the New York daily papers which in winter contain frequent accounts of ice boat regattas on the Hudson river, giving the velocity of the wind and the increased speed of the boats over the wind.

(21) J. M. C. asks: How can we Texas farmers destroy the countless swarms of rabbits which nearly destroy our growing crops of wheat, and make sad havoc among our garden stuff? A. Enclose a space with wire netting, leaving room for the rabbits to enter, and bait it with carrots. In the winter, large numbers can be attracted to a spot by this means.

(22) J. E. P. asks: Do you know of any preparation to cover a rough laid brick wall with in place of mastic? A. To stucco a rough brick wall, make a mortar consisting of 1 part lime to 2 parts sand; add water and work it up thoroughly. But to make reliable work, the lime and sand must be of the best, and properly prepared before being mixed. Take a good fresh stone lime; slake it just sufficient to make a fine dry powder and not a paste. Throw this powder against a ¼ inch mesh wire screen; what passes through is fit for use, the remainder should be rejected. The sand must be of the sharpest, screened to a uniformity of size, and washed thoroughly clean of all mud and dirt. Clean the walls of all loose dirt, mortar, etc., with a stiff broom. Then apply the mortar in two coats; the first a rough coat to bring the wall to a fair surface, and the second a finishing coat. Put on the second coat before the first is entirely dry. Also, put in a little cream water color, to as to set with the stucco. The wall should be protected at top by a projecting roof.

(23) J. V. H. says: I find that the lead pipe carrying off water from my bath and washstands is becoming clogged up. Can you tell me of a remedy? A. Pour a little strong ammonia down the pipe.

(24) F. L. says: 1. I have an engine 3 x 6 inches, and intend to run a propeller 30 inches in diameter. What size of boiler would be suitable? A. A tubular boiler 28 inches diameter by 4 feet high would probably be large enough. 2. I have an awning for a boat. How can I make it waterproof? A. Cover it first with a solution of soap, then with a solution of alum.

(25) E. C. A. says: I am continually seeing statements to the effect that, during a thunderstorm, the electricity passed down the lightning rod, escaping into the ground. Is not the reverse the case? Does not the electricity pass from the earth up the rod and neutralize the electricity of the cloud overhead? If not, why not put a ball on the upper end of the rod and point the lower, for has not experiment demonstrated that electricity will flow off a point with more rapidity than off a round surface, and the reverse in passing on? If this be not the case, what is the necessity of placing balls on the posts of an electrical machine and points on the ends of the spokes of an electrical wheel? A. It is conventionally assumed that the current always passes from positively to negatively electrified bodies, so that what we call its direction depends altogether upon which is the positive and which the negative body. As a matter of fact, the atmosphere is usually positive relatively to the earth; but it is evident that the action of the clouds upon each other, under the influence of different currents of air, may result in charging them with opposite electricities. When the conditions are favorable, they then act inductively on the earth, the positive cloud inducing a negative charge in the portion directly under its influence, and the negative cloud a positive charge. If a rod is present or the degree of electrification is sufficiently great, a discharge takes place from the earth to the cloud in one case, and *vice versa*

in the other. It is not correct, therefore, to say that the discharge is always in the same direction when referring to any one rod. Points receive and give off charges more readily than surfaces do. It is in consequence of this fact that round surfaces are used with the electrical machine, and points with lightning rods, the object being an accumulation of electricity in one case and its dissipation in the other.

(26) J. W. S. asks: How can I render pasteboard uninflammable? A. Soak your pasteboard in a solution of tungstate of soda, and dry in the sun.

(27) E. C. A. asks: 1. Have there ever been any experiments made to ascertain the relative size of the atoms of various substances? Respecting the constitution, shape, size, and absolute weight of elementary atoms, chemists know nothing; but they have proved that the atoms of hydrogen are lighter than those of any other element, and they have discovered how many times heavier each elementary atom is than an atom of hydrogen. Thus, we know how many times heavier an atom of carbon is than an atom of hydrogen; and the so-called atomic weight of carbon is a statement of its atomic ratio. 2. Do all atoms weigh the same, or do they vary in different substances? For example, does one atom of aluminum weigh the same as one atom of platinum? A. They vary; hydrogen being 1, aluminum is 27·48, and platinum 197·88.

What do the best authorities decide is the cause of gravitation? A. It is an inherent property of every particle of matter in the universe to attract every other particle, with a force directly proportioned to the mass of the attracting particle, and inversely to the square of the distance between them. A satisfactory hypothesis has never been offered in explanation of the cause of this universal attractability of matter.

(28) B. asks: Can earth and calcareous sand, containing from 10 to 30 per cent of sulphur, be separated by any other method than the Sicilian kiln or *calcaroni*? If so, where can I find the process? A. Consult Wagner's "Chemical Technology," pp. 194 to 199. See also p. 296, vol. 31 of the SCIENTIFIC AMERICAN.

(29) S. L. L. says: I have been trying to obtain oxygen gas from water by means of sulphuric acid and chloride of lime. I knew that the sulphuric acid would unite with the lime, setting free the chlorine, which, uniting with the hydrogen of the water, would, I thought, permit the oxygen to pass through a capillary tube, and be shown by the application of flame. I saw the gas rise in the tube: but it would not affect the flame when a match was applied. What was the reason? A. Your reaction simply gives you sulphate of lime and chlorine water. Under the existing circumstances, the chlorine does not attack the hydrogen.

(30) C. L. asks: What is oxphosphate of iron? A. There is no such substance.

What is the process of condensing milk? A. See p. 343, vol. 30.

(31) C. P. W. says: I. What is the green substance that is formed when unbrowned coffee is put into the white of an egg? A. It is a compound resembling tannate of gelatin. 2. In Youmans' "Chemistry," it is stated that tea arrests transformation; in a work entitled "Foods," it is stated that tea hastens transformation. Which is correct? A. The best series of experiments on this point are by Julius Lehmann, who found that the use of tea and coffee as articles of diet appeared to exercise an important influence in retarding the waste of the tissues of the body.

(32) T. F. H. says: I have a set of silver articles with black wooden handles which have turned brown in color by being buried in a damp bank vault. What can I use to stain the handles black and restore the polish? The wood is very hard, I presume ebony. A. Dip the handles in a boiling solution of weak caustic alkali, to dissolve all the grease; dry, and apply a solution of nitrate of silver. It will be necessary, often, to apply two or more coats of the nitrate of silver.

(33) J. E. asks: Is there any perceptible shrinkage in gas in consequence of the gasometer pit leaking and being renewed with water? In other words, does fresh water require to be saturated to a certain degree with gas before the gas holder will rise, a portion of gas being absorbed every time more water is added? A. There will be a slight absorption of the gas by the water. The two principal ingredients of coal gas are hydrogen and marsh gas, and 1 cubic inch of water absorbs 0·0015 cubic inch of hydrogen, and 0·035 cubic inch of marsh gas. There will be no stoppage in the rising of the gas holder on account of this slight absorption.

(34) A. S. asks: What will remove mud spots from heavy black silk? A. The safest plan is to wash carefully with good soap.

(35) C. A. F. asks: 1. Is cow or horse manure better for lettuce, beets, cucumbers, etc., and why? A. The latter, as it is more highly nitrogenized. 2. In what kind of soil should musk melons be raised? A. A rich sandy soil.

I recently purchased a fine specimen of calamine, purporting to come from Arizona. Does that territory contain that mineral? A. If so, it must be in a new locality as yet unknown to mineralogists in the East.

(36) C. L. asks: What are the methods of obtaining the silicious and aluminous ethers? I believe they were discovered some few years ago (6 or 7) by Mr. Theophile Zchweskofski. A. Dibasic silicate of ethyl ($2C_4H_5O, SiO_2$)$_2$ is formed by adding alcohol gradually to chloride of silicon. A powerful reaction occurs: hydrochloric acid is evolved in abundance, and a colorless liquid is obtained, which, when submitted to distillation, at first evolves hydrochloric acid; but the boiling point rises rapidly until it reaches 330° Fah., at which temperature pure dibasic silicate of ethyl distils over. It is a limpid liquid, of a pleasant ethereal odor, and a hot taste resembling that of pepper. It is combustible, and burns with a flame of dazzling whiteness, depositing pulverulent silica. The composition of this body is remarkable, 4 volumes of vapor being produced from the compound, $C_{16}H_{20}Si_2O_8$: favoring the hypothesis of the tetratomic character of silicon, with an atomic weight of Si = 28. This ether is not miscible with water, but is decomposed by it, with the separation of gelatinous hydrate of silica. Silicic ether ($C_4H_5O, SiO_2$) is a second ether, containing only half the quantity of oxide of ethyl that is present in the foregoing compound. It may be procured by acting upon alcohol of specific gravity 0·833 with chloride of silicon, and distilling. The dibasic silicate is formed at the same time, and the first portions of the distillate consist entirely of this compound; but by degrees the boiling point becomes higher, and when it reaches 660° Fah. the pure monosilicate passes over. The dibasic silicate of ethyl is, in fact, transformed into the monobasic silicate by the action of the water present in the dilute alcohol, occasioning the decomposition of the dibasic silicate into the monosilicate, while alcohol is set free. If more water be added, a viscous compound is obtained, which, according to Ebelman, contains a third ether, with twice as much silicic acid as the foregoing one. Aluminic ether or aluminum ethyl, Dr. Cossa states, can be prepared by causing aluminum to act upon stannethyl. For further particulars of processes, consult Wurtz' *Dictionnaire du Chemie*, vol. 1, p. 1,352.

(37) J. E. L. says: I have an article of pearlash containing 14 per cent of phosphate of potash. What will be the most economical process for separating it from the carbonate? I desire to get a perfectly pure carbonate, and to utilize the phosphate. A. It cannot be done cheaply. It would be necessary to convert one of these soluble bodies into an insoluble, and then reconvert it into the original condition.

(38) H. R. P. asks: What effect does chocolate have on the system? A. Chocolate, when properly prepared, is considered by physicians as a very wholesome and nutricious substance.

(39) J. H. M. asks: Can ammonia be distilled or obtained from common sea weed? A. Ammonia can be obtained by distillation, in closed vessels, of organic matters containing nitrogen. A large amount is obtained from the refuse product of the distillation of coal for the manufacture of gas. Among the products are water and a considerable quantity of carbonate and hydrosulphate of ammonia; the ammoniacal salts become dissolved in the water, and constitute the ammoniacal liquor of the gas works: this liquor is saturated with sulphuric or hydrochloric acid, and thus the sulphate or muriate of ammonia of commerce is procured.

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

G. W. H.—No. 1 is impure limestone. No. 2 is argillaceous shale colored by red oxide of iron (the blue portions by carbonate of copper in traces). In some pieces the amount of iron is considerable. No. 3 is the same but with less iron.—J. M. H.—You had better consult the druggist from whom you obtained the pills.—J. R.—No. 1 is sulphide of lead with silex. It has been fused previously. Of No. 2 the part insoluble in acid is silex: the remainder is composed principally of iron with some alumina. No. 3 is quartz and sulphide of iron. No. 4 did not arrive. No. 5 is sulphide of iron partly altered to oxide.—B. F.—No. 1 is chlorite rock. No. 2 is quartz rock. No. 3 is steatite rock with quartz vein. No. 4 is talcose schist. No. 5 is talcose schist with talc. No. 5 is quartz with chlorite and decomposed micaceous schist. No. 7 is quartz rock. No. 8 did not arrive. No. 9 is a jaspery quartz. No. 10 is quartz rock with traces of iron and manganese. Although some of these specimens have the appearance of gold bearing rocks, the fact could be ascertained only by assay on a considerable quantity of ore.—G. P. L. R.—No. 1 is decomposed granite. No. 2 is white porcelain clay.—A. W. D.—It is hornblende, containing silica, alumina, lime, magnesia, and iron, but is not of value.—J. B.—It is milk quartz and is not valuable.—A. J. G.—Gold is not present.—G. H. C.—It is pyrites.—P. H. L. and J. I.—It is iron pyrites, of little value.—C. R. T.—It owes its peculiar character to a large percentage of red oxide of iron.—A. T. H.—It is a variety of granite rock, and may be used in building.

## COMMUNICATIONS RECEIVED.

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

On Cotton Mathematics. By H. V. M.
On a Power Manual. By A. S. R.
On Astronomical Calculations. By S. D. S.
On Heating Churches. By J. I. S.
On Wagon Wheels. By P. K. W., and by G. A. G. Jr.
On the Keely Motor. By F. W. Jr.
On Electric Force. By F. S. P.

Also inquiries and answers from the following:

J. B. N.—J. B.—E. L. E.—W. R. H.—G. E.—I. E. 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.

Enquiries 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 the best washing machine? Whose is the best cross-cut saw? Why do not makers of magic lanterns advertise in the SCIENTIFIC AMERICAN? Is there a really fireproof and burglar-proof iron safe? What does a Rhumkorff coil, capable of giving a 12-inch spark, cost?" 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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