Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion. If the Notice exceeds four lines, One Dollar and a Half per line will be charged.

Notes & Queries

J. H. P. will find something on images on the retina on p. 193, vol. 36.—R. S. B. will find something on iceboats sailing faster than the wind on p. 107, vol. 36.—S. E. will find something on burning gas as fuel on p. 390, vol. 33.—J. O. C. will find an article on setting wagon axles on p. 299, vol. 34.—J. J. K. will find an answer to his question as to a cannon on a car on p. 273, vol. 34. The pressure is greater on the bottom of the boiler by the weight of the contents than it is on the top.—S. will find a description of the art of taxidermy on p. 159, vol. 32.—C. C. S. will find that waterproof glue will make a watertight joint between cork and cloth. See p. 43, vol. 32.—A. F. B. can copper iron wire by following the directions on p. 90, vol. 31. To nickel iron wire, see p. 186, vol. 34.—T. E. will find a recipe for a liquid bronze for brass on p. 51, vol. 33.—J. A. R. will find directions for making durable whitewash on p. 133, vol. 34.—F. G. T. will find a recipe for a mucilage that will not mould on p. 196, vol. 34.—J. R. will find a description of the manufacture of earthenware on p. 191, vol. 32.—R. S. will find a description of a battery for plating on p. 26, vol. 32.—J. M. W. will find on p. 341, vol. 27, directions for making hydrogen. For making oxygen, see p. 75, vol. 32. To make carbon plates for batteries, see p. 187, vol. 32.—J. A. L.'s queries about a hole and its plug are merely questions of definition. There is nothing to be decided in them.—R. M. C. will find directions for ebonizing wood on p. 50, vol. 33.—E. H. M. will find instances of spontaneous combustion mentioned on pp. 343, 368, vol. 34.—J. W. S. will find directions for preserving eggs on p. 306, vol. 34.—A. B. C. will find instructions for tempering rock drills on p. 202, vol. 31.—A. L. is informed that we cannot answer legal questions.—R. P. P. will find something on wooden railroads or tramroads on p. 324, vol. 29.—G. A. C. will find a recipe for blackboard composition on p. 299, vol. 28.—H. A. will find directions for enameling metals on p. 203, vol. 29.—W. H. B., J. H. W., Y. I. W., J. H. N., J. L. G., G., J. McB., and others, who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) C. A. W. asks: How can light-colored kid gloves, that have become spotted with sea water, be dyed any other color than black? A. They can be dyed to any of the darker shades in the usual way. See p. 166, vol. 28.

What is the best thing with which to clean silver or silver-plated ware that has become black and will not brighten up with whiting? A. Use tripoli powder, mixed with a little olive oil if necessary.

(2) E. A. F. asks: Is there any process by which the liquid that drops from stovepipes can be removed from carpet? A. Use plenty of soap and water.

(3) J. S. S. asks: Is woolen clothing healthy? Fine soft wool, unless colored, will shrink; and cloth made from coarse hairy wool is too heavy to wear in the summer, and will irritate the skin and give those who wear it a cold in the fall when they put it on, and again in the spring when taken off. Clothes made of cotton can be more thoroughly washed and boiled than those of wool, and are they not more healthy? Is not white clothing healthier and more comfortable both in summer and winter than colored? A. As a general rule, light woolen clothing, if clean, is more healthy and a better protection against colds, from sudden changes of temperature, than cotton or other vegetable fibers. In winter, dark or black clothing is best, as it is warmer than light. In summer, light colors should be worn. Some woolen fabrics, dyed with some of the coal tar colors, when permitted to remain for any length of time in direct contact with the moist cuticle, have produced poisonous effects; but not otherwise. It is for this reason advisable to use only undyed fabrics for underclothing.

(4) H. H., Jr., asks: Are there any chemicals by which glue can be made into a paste, to be used (cold) for closing quarter cracks in horses' feet? A. Heat the glue for some time in strong estacetic acid, and evaporate in the air until of the consistence desired. Such a solution of glue will not gelatinize. It dries rapidly, forming a stronger and more flexible joint than ordinary glue.

(5) J. E. M. asks: Why is it that, in a window fitted with alternate panes of blue and white glass, the former become quite warm in the sunshine, while the temperature of the white glass remains almost, if not altogether, unchanged? A. Clear glass permits the passage of all the rays of the spectrum, while blue glass intercepts all the rays except the blue. The destruction of these luminous rays determines their conversion into sensible heat, which is absorbed and radiated from the surface of the glass. The heating effect of this absorption is intensified, from the fact that the sensible heat rays of sunlight preponderate in the lower or red end of the spectrum, which is, in the present instance, intercepted. The darker the color of the glass, the greater will be the amount of heat developed.

(6) L. H. R. says: I have a flute of 8 lever keys that was laid away for about two years; at the expiration of that time I found it so dry that all the joints were loose. I oiled it several times, so that it is now perfectly tight; but I find that I cannot blow the lower notes at all, and can only blow the upper ones with great difficulty. After wetting the inside with water, it fills perfectly easily until dry again; but I am of opinion that this operation will, in time, have a damaging effect. Can you inform me how the difficulty arose? A. The wood has probably become rough on the interior and the bore distorted by excessive desiccation. Free all the cavities from dust, and rub the instrument inside and out with a little warm glycerin.

(7) W. L. D. asks: I dissolved a bit of German silver in nitric acid in a test tube; it gave a greenish blue solution, and after diluting with water I dropped sulphuric acid into it slowly, which threw down a white precipitate. When this was completed, I immersed a copper plate, which threw down a gray metallic powder. What was the chemical action, and what were the several precipitates? A. It is probable that the alloy, or the water you added to the solution, contained lead in some form, which, combining with the sulphuric acid, produced an insoluble sulphate of lead. The deposit on the copper may be metallic arsenic from the impure nickel used in the alloy.

(8) E. C. M. says: I have a walking cane of whalebone about ½ inch thick; it was set with little ivory points to represent knots, but these are falling out and the bone cracks and splits. I know that this cannot be helped; but how can I prevent it from further breaking and scaling? A. Try impregnating it with a little warm glycerin.

(9) H. B. C. asks: Can I make a crucible, that will stand a white heat, of water lime or quicklime, either alone or by mixing with something, such as sand or plumbago? A. Small crucibles cut out of pure caustic lime are sometimes used; but if not heated gradually and uniformly, they are apt to crack. A crucible moulded from lime, made plastic by the addition of water, will crack and fall to powder in the process of dehydration, by heat or otherwise. Moulded with sand it would fuse into a hard glass at high temperatures. Plumbago cannot be formed with lime into a crucible.

(10) J. S. says: Balsam of fir will render paper translucent. Pitch does the same in a pine plank. Why is this? A. For the same reason that water, filled with bubbles of air, loses its transparency. Neither paper nor wood is a homogeneous substance; but both become nearly so by impregnation of the fibers, and filling the interstices with translucent resin.

(11) J. R. A. says, in reply to E. A. W., who asks how to remove the clinkers from stove linings: When you have a good fire, cover the coal with three inches or more of oyster shells, and let the fire burn out, and burn the shells; you will be able to remove the clinkers, without the aid of mechanical means or injury to the firebricks, on the following morning.

(12) B. H. S. asks: 1. Of what is lightning composed? A. As to the precise nature of electricity, nothing definite is at present known, other than that it is a peculiar motion, analogous to that of heat, of the atoms in their molecular groupings, within the body which is electrically excited. In the case of lightning, the clouds, the air, and the moisture which it contains, and the surface of the earth, constitute the bodies excited. It has been shown that the cause of the electrical excitation in our atmosphere is due to a disturbance of the normal statical equilibrium by the translation of aqueous vapor from the earth's surface, and its subsequent condensation in the form of clouds and rain in the cold upper regions of the atmosphere. 2. Why are metals conductors? A. The metals are generally better conductors of electricity than the non-metals, owing to some, not yet well understood, arrangement of their molecules, which facilitates the transmission of the motion throughout the material. 3. Which is the positive pole, and which the negative, of a battery? A. The positive pole, or electrode, of a galvanic battery is the upper end of or connection with the negative plate of the cell—in the Daniell's, gravity, and similar zinc-copper batteries, this is the copper; in the Bunsen, or bichromate cell, it is the carbon plate. The negative pole, in all present forms of batteries, is the zinc.

(13) L. C. J. says, in answer to J. H. W.'s query as to ice in a sand mould: I wish to inform him that the ice under his loose sand had melted to some extent, and the hot coal and iron came in contact, or his sand was insufficient, or not well packed or rammed. The safest plan is to have the floor beneath the cupola dry or comparatively so; but in the event of water or ice being under the cupola, put under the dry sand just before dropping the bottom.

(14) J. S. M. says: Having accidentally broken a small cast iron gear wheel, I tried to solder it with soft solder, using muriatic acid (diluted with an equal quantity of water, after having taken up all the zinc it would) as a flux, but the solder would not unite with the iron. I then added some sal ammoniac, but with the same result. I also tried to make a mat joint with tinfoil, clamping the parts together, but it all ran out. I heated the wheel in the stove and also with the blowpipe; and after several attempts I gave the job up as a failure. Can you tell me what the trouble is? A. A. You will find it impracticable to solder your wheel together unless you galvanize the surfaces.

(15) W. H. H. says: 1. Your paper of February 10, says: "Dissolve crude rubber and shellac in naphtha." I put them separately in bottles, and set them in warm water. The rubber dissolved, but the naphtha did not. What is the reason? A. We do not understand you. Coal tar naphtha is a volatile liquid. The powdered shellac may be dissolved in it by heat and agitation. 2. How are the rubber bands sold by stationers joined together? A. By pressing the ends of the rubber band together before vulcanizing.

(16) B. F. asks: 1. The iron won from waste tin plates, even when absolutely free from tin and acids—which after chemical analysis contains no tin—gives in the blooming forge a cold short iron of little value, though the material employed for the plates must have been a very good one. Can you give reasons for this singular experience? A. A determination of the percentage of carbon in the iron would very probably reveal the cause. 2. Is there any way of treating this iron differently, so as to obtain a better material? A. It may be improved by re-puddling.

(17) R. E. B. asks: How can I prepare paper so that, when burned, it will leave a perfume similar to that from pastiles or fumigators? A. Take cascarilla bark 8 drachms, gum benzoin 4 drachms, yellow sanders 2 drachms, styrax 2 drachms, olibanum 2 drachms, charcoal dust 6 ozs., niter 1½ drachms, mucilage of gum tragacanth, sufficient quantity. Reduce the substances to a fine powder, form into a paste with the mucilage, coat the paper with this, and dry in an oven.

(18) F. G. H. says: I have 25 gold fish in a bath tub. What steps shall I take to make them breed? A. The gold fish (*cyprinus auratus*) seldom deposit spawn when kept in vases or aquaria. In order to secure a supply, the young healthy fish must be placed in reservoirs of considerable depth, in some places, at least, shaded with water lilies and constantly supplied with fresh water. When the spawn is deposited, it rises to the surface, and should then be collected and exposed to the sunlight until vivified by the heat. Care must be taken to collect the spawn as soon as it rises to the top of the water, as otherwise it will soon be destroyed by the fishes themselves. The spawning season of the fish is usually in or about the month of May. The Chinese, who bring gold fish to great perfection, feed them with small balls of paste, which they scatter into the water occupied by the fish, who greedily devour them. Large quantities of gold fish spawn are annually collected along the banks of the "great river" (Yang-tse-kiang) by throwing mats or hurdles across the current.

(19) J. J. K. asks: What is used to color maps pink, yellow, green, and pale blue? A. Use water colors diluted to the required degree of paleness, with a little ox gall mixed with them.

(20) C. A. H. asks: How can I make a galvanizing surface smooth, and crystallize it after it comes from the kettle? A. The *moiré* appearance of galvanized iron is produced by first tinning the sheet. Half fill a wooden bath with dilute solution of muriate of tin, prepared by dissolving metallic tin in concentrated hydrochloric acid; this will take two or three days. Use 2 quarts of this solution to 300 quarts water for the bath. Put in the bottom of the bath a thin layer of finely granulated zinc, and then on it a cleaned iron plate, then a layer of the zinc and another iron plate, and so on alternately till the bath is full. The zinc, the iron, and the solution constitute a galvanic battery, and a coating of the tin is deposited on the iron plates in about two hours. Have ready a wrought iron bath containing molten zinc, covered with a layer of powdered sal ammoniac mixed with some earthy matter. In the bath, beneath the surface of the zinc, arrange two iron rollers, tightly compressed together, to be turned by a crank attached to one of them. Take the plates out of the tinning bath one at a time, drain them, and pass them while wet between the rollers in the zinc.

(21) A. E. D. asks: Can you give me any information concerning the putting up and mode of application of Turkish baths? A. The theory of the Turkish bath is to relieve the body of foul matter by creating a profuse perspiration, and then washing the skin in the usual way. Tepid water, used in the washing, closes the pores, and a cold shower or plunge bath creates a glow on the skin and stimulates the whole body. The perspiration is produced by the bather sitting in a room heated by hot dry air till moisture exudes from every pore. The matter brought to the surface by this means is frequently large in quantity.

In the SCIENTIFIC AMERICAN SUPPLEMENT, p. 774, you give an illustration of a pneumatic pen. How is the ink or color spread? A. The ink should be spread with a small brush, such as is used for marking linen with a stencil plate.

(22) J. C. asks: What isthmus, if any, connects Nova Scotia peninsula to New Brunswick? A. There is an isthmus 15 miles wide between the two countries. It has no specific name that we know of.

(23) H. M. C. asks: Given the three sides of any triangle, what is its area? A. Construct the triangle; let fall a perpendicular from the apex to the base. Base × half the perpendicular = area.

(24) B. A. F. asks: What would be the pressure in a steam boiler when the heat indicated by a thermometer is 320° Fah.? A. Seventy-five lbs. to the square inch.

(25) C. H. A. S. asks: Does the exact center of an iron shaft turn, if it be placed in a lathe? A. The center of a shaft is an imaginary line, which is stationary. Any part of the shaft that has breadth or thickness rotates.

(26) A. L. W. asks: Please give me directions for brazing small pieces of thin brass together? A. Use a solder composed of copper 1 lb., zinc 1 lb. Or one of copper 32 lbs., zinc 29 lbs., tin 1 lb.

(27) G. T. asks: What is the easiest and quickest way to make small electrotypes? A. Mould the object, previously brushed over with plumbago, in a wax made of wax 3 parts, and stearin 1 part. Brush the mould with plumbago with a soft camel's hair brush. Then deposit a coating of copper by electricity as described on p. 405, vol. 32. Back the copper deposit with type metal.

(28) J. L., of Manchester, England, asks: What are the compositions and mode of use for japanning or black enameling tea trays, coal vases, etc.? A. To make good work, the metal plate should be primed with stiff size mixed with whiting. Clean the plate, and brush the priming on, let dry, polish with fine glass paper, and apply another coat; let dry, and then smooth with a moist sponge. For a black japan ground, use shellac varnish with ivory black, using finally, for a polishing coat, seed lac varnish. Harden the varnish by means of a hot oven.

(29) J. W. B. asks: How do glass sign writers give a mirror-like finish to gold and silver letters? A. Use gold and silver leaf. Take a little fine isinglass, as much as will lie on a five cent piece, and dissolve in a little boiling water. Add as much alcohol as there is water, and strain through silk. Paint the letters on a sheet of paper with Brunswick black; fix the paper, with the writing reversed, on the glass. Use the isinglass solution as a mordant, laying it on with a camel's hair pencil, and then apply the gold leaf. Place the glass in a warm room; and when the gilding is dry, rub over with a piece of cotton wool. Pass a flat camel's hair brush, moistened with the isinglass solution, lightly over the gold letters; let the solution be hot for this operation. A second coating of gold leaf will improve the work.

(30) W. F. P. asks: How can I keep lice, etc., off geraniums? A. If the plants are in a greenhouse, fumigation with tobacco smoke is the best remedy. Tobacco stalk refuse can be used for the purpose.

(31) C. C. H. asks: How can Babbitt metal be united with cast iron in a journal box, so that it will not be loose? Can it be soldered? A. You may solder your box with ordinary solder, and then pour the Babbitt metal. A better plan is to drill small holes at various angles in the box, then pour your Babbitt in, and it will be firm. It is not unusual to rivet the Babbitt by hammering it when cold.

(32) W. H. asks: 1. How are slots in common wood screws cut? A. By special machinery. 2. Are they cut before the screws are threaded, or after? A. After they are threaded. 3. How many can be done in a day? A. It depends upon the size and the kind of machine used: from 2,000 to 20,000 per day.

(33) W. H. M. says: I have a common tinner's fire pot in which I burn common nut coal, as there is no charcoal to be had here. Placed horizontally through the fire pot are two sheet iron tubes about 1¼ inches in diameter, into which I place my soldering irons to be heated. I find, after heating them two or three times, that a scale forms on the copper tips, so that they have to be tinned several times a day. Can you tell me the cause of the scale forming on them, and how I can prevent it? A. Your soldering irons either get too hot, or else your solder is not fine enough.

(34) J. C. K. asks: Which is the most economical motor to drive a small lathe for turning

wood, a steam engine or an electrical machine? One horse power will be sufficient. A. A steam engine is more economical than an electric engine.

Which is the best oilstone, Arkansas or Turkey? A. It is a disputed point as to which is the best. Of Arkansas stones, the most transparent are usually the best.

(35) H. H. P. says: I am manufacturing solid cast steel cultivator shovels, and want the best recipe or preparation to harden them in so as to not warp and crack them, and to harden at as low a heat as possible? A. In tempering, all depends upon the nature of the steel. You will probably find brine at about 100° Fah. answer your purpose. The brine may be made of ½ lb. salt per gallon of water. Dip slowly edgewise and deep, and then hold the shovels still in the water.

(36) A. T. says: I have a small steam pump and have cracked one of the steam ports, which is of cast iron. Can I stop that crack so that it will not leak? A. Fill the crack with fine cast iron filings well wetted with water and sufficient sal ammoniac (powdered) to just cause the mixture to heat. If the crack is large, caulk the mixture in; if not, a thin sheet plate may be screwed on in addition to using the mixture.

(37) C. R. H. says: 1. I have a casting of brittle type metal to which I wish to give a light brown color. Is there any acid or pickle in which I could dip it? A. Try a strong solution of sulphide of soda or potassa in hot water. 2. Can you give me a good recipe for copperplating type metal? A. Clean the type perfectly, attach it by means of a copper wire to the negative or zinc pole of a strong battery, and immerse the type in a strong solution of sulphate of copper in water. Place a small sheet of clean copper in the sulphate of copper bath with the type (they must not touch), and connect this by means of a copper wire with the other pole of the battery. Under the above conditions, the type will speedily become covered with a film of metallic copper. Great care is necessary in cleaning the type to remove every trace of oil and rust, otherwise the deposition will be unequal or will drop off.

(38) P. L. D. asks: 1. Which size of locomotive cylinder is best for passenger traffic, everything else being equal, a cylinder 17 inches in diameter and of 22 inches stroke, or 16 inches in diameter and of 24 inches stroke? A. The 16 x 24 is generally considered preferable. 2. Which is the best for both freight and passenger traffic, everything else being equal, 16 inches diameter of cylinder, 24 inches stroke, and 5 feet diameter of driver, or 17 inches diameter of cylinder, 24 inches stroke, and 5½ feet diameter of driver? A. The 16 x 24 inch cylinders with 5 feet driving wheels.

(39) J. R. McN. says: I have read your article headed "Bell Metal." How are the metals melted and mixed? A. Use a blacklead crucible and a small crucible furnace with a good draught. Fuse the copper first, then add the nickel in small grains, and proceed as directed in the recipe. Stir the fused alloy from time to time with a stick of green wood.

(40) H. A. W. asks: 1. How fast is an iron turning lathe required to run when turning 1 inch wrought iron? A. At about 130 revolutions per minute? 2. How fast should a wood turning lathe run when turning 2 inch hard wood? A. It may run at speeds varying from 200 to 4,000 revolutions per minute, but about 1,000 is usual on an ordinary lathe.

(41) J. G. says: We have been making a few board rules for our own use, What is the best stuff to blacken the figures with? A. Use black japan varnish. It is usually applied with a stencil and brush.

(42) J. B. C. asks: What is the best method of testing the value of precious stones? A. Precious stones are usually recognized by color, shape, hardness, specific gravity, etc.

(43) S. & R. ask: Which would be the simplest and most durable way to raise a column of water, 1 foot in diameter, to the height of about 40 feet, and how much power would it take? A. We think a pump would be the cheapest and simplest device. The power will depend upon the amount of water lifted. The pressure per square inch will be about 17·5 lbs., exclusive of friction.

(44) E. H. says: I am about to build a boat on the following plan: She is to be a double ender propeller, with 40 feet keel, of 13 feet beam and 5 feet hold, with a shaft running through the whole length and a wheel on each end, to be used as a ferryboat. Her draught is not to exceed 4 feet. Do you think a boat on that plan and those dimensions will succeed? Will she steer well, and will the engines work all right, the shaft running the whole length of the boat? A. We do not see any impracticable features in the plan, although we are not sure that it is the best that could be devised.

(45) M. B. says: 1. We have a well 10 feet deep and 106 feet from the house; we want to draw the water from this well by a cast iron cistern pump and a 1¼ inch lead pipe; this lead pipe has to make a bend upward under the house of 10 feet to connect with pump. Can we draw water such a distance by said pump? A. With a good pump the plan is practicable. 2. Would a lead pipe of the above size collapse? A. Make the bends with as large radii as possible, and be careful to straighten the pipe before laying it. It will, of course, be desirable to use heavy pipe.

(46) E. R. says: We are building a steam yacht 40 feet long and of 8 feet beam, for which we have a double engine with cylinders of 5 inches bore and 6 inches stroke. We would like to know the size and form of boiler best adapted for the engine. A. You can use a vertical boiler, 40 inches in diameter, and 6 feet high.

(47) J. S. says: Since the Ashtabula bridge disaster, there is a great deal said about iron becoming crystallized from repeated vibration, caused by jars, strains, etc. In that sense, is the term "crystallized" used correctly? Is not iron in all conditions crystallized? As I understand it, the strength of iron depends on the perfect cohesion of the crystals which compose it. By jar, vibration, strain, and constant use, the cohesion of the crystals becomes impaired, and the strength weakened; and in that condition I think it wrong to call it crystallized. A. The term is correct as describing the appearance of the iron. Good iron when broken looks fibrous, or somewhat as if it were made up of very fine wires.

(48) J. L. N. says: We have an engine with cylinder 28 inches in diameter and of 6 feet stroke, running 28 revolutions per minute, geared (with cog gearing) into a countershaft running 56 revolutions per minute. We increase the speed of our engine to 46 revolutions per minute, allowing the countershaft to remain at the same speed (56 revolutions), shall we consume more or less fuel? A. Without knowing more particulars, we cannot answer this question positively; but the chances are greatly in favor of a less consumption of fuel, if the change is made.

(49) W. D. C. says: I have a waterfall of 75 feet of a constant stream of water that will fill the space of 1½ inches square. Is there any kind of arrangement by which I can get power from said waterfall, and how much? A. Probably a water wheel will be the most convenient machine for utilizing the power of the water. You will find the advertisements of reputable manufacturers in our columns.

(50) D. H. says: On p. 241, vol. 32, you give 6 angles for slats of a windmill, and there are but 5 sails or slats on each arm of the mill. Please explain. A. You cannot have examined the article very carefully, as the figure shows 6 slats or arms, and the proper angle for each is given below.

(51) W. F. W. asks: What is the correct definition of the word compound, as applied to steam engines? Does it include simply that class in which the exhaust steam from one cylinder is utilized in a second, or would two high pressure engines, connected with a common shaft, and whose cranks were keyed at right angles with each other, also come under this head? A. Your first definition is the one commonly applied to compound or two-cylinder engines. The other describes what are usually called double engines.

(52) R. E. McC. says: Some mechanics and I have disputed about a dead center in a revolving shaft. I claim that there is no such a point in existence; but we cannot agree on it, so I appeal to you for an answer. A. If you speak of the ordinary piston and crank connection, it is well known that there are several points called dead centers, for the reason that at these points a pressure applied to the piston produces no effect on the revolution of the shaft.

(53) C. E. H. says: In small yacht engines, running as high as 300 revolutions per minute, can the feed pumps be advantageously worked from the crosshead as in slower moving engines, or is it necessary to work them slower by means of intermediate gearing? A. The pump can be worked at this speed, but it generally requires larger connections.

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

J. E. S.—It is sandstone, containing crystals of millerite, a sulphide of nickel.—T. D. H.—It is a poor variety of fireclay, containing much sand and iron. It is probably worth about $3.00 per ton in New York.—J. R. B.—It is an impure clay, silicate of alumina.—D. A.—It contains mica and sesquioxide of iron.—F. E. S.—The soft argillaceous material contains clay, carbonate of lime, and magnesia, colored with sesquioxide of iron and chromium, and mixed with sand. The other is Niagara limestone, and may be employed for building purposes or as a source of lime.—F. A. S.—It is a piece of red jasper containing a small quantity of gold. It would require a quantitative analysis to determine the percentage of metal in the ore.—W. R. L.—It is graphite of good quality; graphite and plumbago are different names for the same substance.—J.—Your specimen contains manganese and iron.—C. J.—It is sesquioxide of iron with clay.

A. B. asks: How is the cut which runs around the tops and backs of violins made, and how is the wooden thread inserted in the same? How is the deep staining varnish put on, so that the grain of the wood may be seen?—H. A. asks: Please give a recipe for making paste for whitening leather military belts?—C. F. S. asks: How can I keep goats from peeling the trunks of apple trees?—W. S. G. asks: How can I press hay into small blocks, to burn in a stove?

COMMUNICATIONS RECEIVED.

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

On Electrical Experiments. By J. D. W.

On the Steam Engine of the Future. By J. C. S.

On Materialism and Spiritualism. By J. T.

Also inquiries and answers from the following:

I.—C. H., Jr.—M. C.—C. Y. G.—C. C. D.—W. C. F.—R. B.—J. T. S.—C. H. W.—R. K.

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 plumbago, for stove polish? Who sells a steam engine, small enough to run a single sewing machine? Who rolls weldless steel tyres? Who makes earth-boring tools? Who makes paper barrels? Who sells small water wheels for running sewing machines, and who sells electric motors for a similar purpose? Who exhibited dental suction disks at the Centennial? Who sells small engines, suitable for pleasure boats? Who sells electric batteries, for plating?" 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

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

February 27, 1877,

AND EACH BEARING THAT DATE.

[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.

Air compressor, G. H. Reynolds ... 187,906
Alkalies, recovering, J. W. Dixon ... 187,751
Ash sifter, T. H. Badger ... 187,801
Axle boxes, making, G. A. Morse ... 187,722
Baggage check guard, D. Untermeyer ... 187,942
Bale tie, B. Hempstead ... 187,758
Base ball, D. Hale ... 187,848
Bed bottom spring, Clements & Fowler ... 187,815
Bed bottom, spring, J. F. Coder ... 187,816
Bed bottom, spring, Gruwell & Newhouse ... 187,846
Bed bottom, spring, S. P. Olney ... 187,892
Bedstead, invalid, J. Q. A. Sargent ... 187,777
Bee hive, A. H. Russell ... 187,911
Billiard table, J. Marsden ... 187,878
Boat knee, D. True ... 187,939
Bolting reel, Bennett & Smith ... 187,805
Box for case hardening, J. Greene (r) ... 7,533
Box nailing machine, A. P. Goodhue ... 187,843
Branding stamp, J. D. Trapp ... 187,785
Broom hanger, W. Altick ... 187,797
Bung cutting machine, M. H. Wiley ... 187,951
Burglar proof safe door, H. Herman ... 187,708
Butter box, N. Waterbury ... 187,945
Butter dish, A. C. Townsend ... 187,784
Can for oil, etc., J. G. Evenden (r) ... 7,531
Can, metallic, G. H. & J. H. Perkins ... 187,902
Car axle box, J. Elder ... 187,835
Car brake, Laubach *et al* ... 187,718
Car couplings, E. T. Hopkins ... 187,854, 187,856
Car, safety, J. Johnson ... 187,761
Car springs, E. J. Horner (r) ... 7,536, 7,537
Car starter, M. V. Drake ... 187,832
Car starter, E. R. Stillman ... 187,781
Car windows, casing for, C. H. Shattuck ... 187,736
Card board, illustrated, G. T. Clare ... 187,704
Chair commode, W. H. Bricker ... 187,701
Chair, folding, E. W. Vaill ... 187,787
Chair, folding, J. A. Ware ... 187,944
Chair, nursery, E. S. French (r) ... 7,532
Cheese, making, L. B. Arnold ... 187,798
Churn, O. Chase ... 187,812
Churn, S. E. Frazier ... 187,754
Churn, J. B. Sweetland ... 187,933
Churn dasher, G. D. Woods ... 187,955
Churn, reciprocating, B. Janson ... 187,864
Churn, reciprocating, J. M. Welch ... 187,954
Churn, rotary, E. Rhoades ... 187,907
Cloth, measuring, C. B. Allyn ... 187,798
Coal, cutting, H. F. Brown ... 187,702
Coal, mining, C. L. Driesslein ... 187,752
Coffee mill, D. W. Parker ... 187,898
Corn crib, C. E. Davis ... 187,750
Corn harvester, J. Pleukharp ... 187,903
Corn sheller, J. M. Hawley ... 187,850
Cotton cleaner, Taliaferro & Kline ... 187,782
Cotton press, A. H. Chetlain ... 187,814
Counterfeit coin detecter, J. A. Thompson ... 187,936
Counterfeit coin, detecting, T. J. Towsey ... 187,938
Cultivator, H. H. Pattee ... 187,899
Cups, cover for, H. H. C. Arnold ... 187,799
Curry comb, J. N. Rundle ... 187,912
Curtain fixture, A. H. Knapp ... 187,868
Curtain fixture, W. C. Sharp ... 187,918
Curtain spring balance, A. H. Knapp ... 187,867
Curtain roller, extension, T. Nowell ... 187,724
Desk, drawer, E. N. Doring ... 187,829
Disinfecting compound, H. J. Bang ... 187,802
Door latch, W. A. Barlow ... 187,698
Door spring, G. E. Sutphen ... 187,738
Draftsman's instrument, A. Langerfeld ... 187,871
Earth auger, G. G. Collins ... 187,705
Earth auger, I. Hoover ... 187,759
Egg carrier, G. D. Willis ... 187,952
Egg holder, P. M. Leprohon ... 187,872
Engine, vertical portable, J. S. Schofield ... 187,917
Exhaust nozzle, T. Shaw ... 187,780
Feed cooker, J. P. Martin ... 187,877
Fence, barbed, A. J. Nellis ... 187,723
Fiber, etc., softening, W. Maynard ... 187,882
Fluting iron, T. E. King ... 187,715
Fruit drier, L. Granger ... 187,844
Fruit drier, automatic, J. H. Reynolds *et al* ... 187,905
Fruit jar, A. Dickey ... 187,827
Fulling mill, C. T. Colby ... 187,820
Furnace doorway, J. T. Smith ... 187,922
Furnace for brick kilns, J. Old ... 187,891
Furnaces, heating, etc., W. Woolcock ... 187,743
Gas as a fuel, utilizing, W. Hainsworth ... 187,756
Gas, making, S. C. Salisbury ... 187,734
Gas retort cover, P. Munzinger ... 187,768
Gas shade holder, T. F. McGann ... 187,765
Gate, N. M. Bell ... 187,804
Glass, moulding, S. Oakman ... 187,725
Glove, etc., fastening, T. Masac ... 187,879
Grain separator, J. D. Van Dusen ... 187,739
Grasshopper killer, C. Hoos ... 187,855
Grinding machine, Owen *et al* ... 187,770
Gun carriage, T. O'Bryan ... 187,890
Hand rubber, H. Carter ... 187,811
Harness trimming, G. F. Eberhard ... 187,834
Harrow, I. Shupe ... 187,919
Harrow, rotary, W. T. Nichols ... 187,769
Harrow, wheel, W. Whipple ... 187,741
Harvester, F. Bramer (r) ... 7,539
Harvester, A. Campbell ... 187,809
Harvester rake, H. H. Bridenthal, Jr ... 187,700
Harvester reel, Coddington & Kennedy ... 187,749
Hat pouncing machine, E. B. Taylor ... 187,783
Hay loader, D. F. Roach ... 187,908
Hoe fastening, J. H. Starnes ... 187,925
Hoisting apparatus, J. J. Endres ... 187,836
Horse blanket clasp, A. Z. Neff ... 187,888
Horse hay rake, Lufkin & Allen ... 187,876
Horseshoe, Billings & Decker ... 187,699
Horseshoe nails, making, R. E. Cady ... 187,808
Horseshoes, making, C. H. Perkins ... 187,727
Hose, inserting rings in, S. H. Loring ... 187,875
Hull of vessel, W. B. Whiting ... 187,742
Hydraulic elevators, E. H. Hunt ... 187,710, 187,711
Indicator, Curtiss & Curtis ... 187,829
Insect powder machine, P. Kitchell ... 187,717
Jelly glass, W. C. King ... 187,714
Jib sheet traveler, J. D. Drinker ... 187,831
Kerosene burner, E. J. M. Becker ... 187,803
Knitting machine, W. H. Abel ... 187,696
Knob latch, M. C. Niles ... 187,889
Lamp, L. J. Atwood ... 187,800
Lamp, J. Lewtas ... 187,764
Lamp, R. S. Merrill ... 187,766
Lamp burner, W. L. Carter ... 187,810
Lamp, cast metal, L. P. Fries ... 187,839
Lamp chimney and shade, T. S. Atterbury (r) ... 7,529
Lamp extinguisher, B. H. Robb ... 187,910
Lamp for carriages, G. E. Whitmore ... 187,949
Lamp, kerosene, S. Dodsworth ... 187,828
Lamp reflector, W. D. Cummings ... 187,706
Last, L. Darozir ... 187,824
Lasting jack, C. H. Collins ... 187,819
Lathe, D. Heer (r) ... 7,535
Lawn mower, T. Coldwell ... 187,818
Lifting jack, C. Gaillard, Jr ... 187,707
Link, detachable, S. Stevens ... 187,927
Lock for sliding doors, R. W. Semple ... 187,735
Lounge reversible back, J. Sullivan ... 187,932
Lubricator, J. Harper ... 187,849
Lumber, resawing, S. Putnam ... 187,904
Mail bag, F. R. Hunt ... 187,862
Meat, fluid, J. L. Johnston ... 187,865
Meat, preserving, W. Stone ... 187,930
Middlings separator, G. T. Smith ... 187,923
Miter box, J. M. Jones ... 187,712
Molding machine, S. Sawyer ... 187,914
Mop wringer, C. A. Libby ... 187,873
Motive power, J. Gross ... 187,845
Mowing machine, F. Bramer (r) ... 7,540
Mowing machine, A. Stevens ... 187,737
Musical instrument sheet, P. B. Hoyt ... 187,860
Neck tie holder, F. Hovey ... 187,858
Neck yoke ring, C. Shuman ... 187,920
Nutmeg grater, J. R. Hughes ... 187,861
Oatmeal machine, A. J. Ehrrichson (r) ... 7,542
Optic illusions, producing, C. W. & O. McGlennen ... 187,884
Ore separator, W. M. Courtis ... 187,821
Overalls, C. B. Moulton ... 187,767
Packing, oil pump, T. B. Kelley ... 187,762
Paint mill, J. F. Walter, Jr ... 187,788
Pantaloons, S. Deutsch ... 187,826
Paper box, B. Osborn ... 187,895
Paper, damping, S. W. Wilder ... 187,790
Pattern, composition, C. H. O. Radde ... 187,728
Pavement, concrete, Stafford & Phillips ... 187,926
Pen and pencil case, C. M. Johnson (r) ... 7,538
Pen holder, D. H. Murphy ... 187,887
Picture exhibitor, S. A. Peden ... 187,726
Pipe tongs, St. John, Robinson & Shepard ... 187,928
Plow, T. E. Kersh ... 187,763
Plow, T. Wiard ... 187,950
Pocketbook fastener, J. H. Jantzen ... 187,760
Pocket book frame, T. Schimper ... 187,779
Potato digger, etc., G. S. Pickett ... 187,772
Printing, mould for color, C. H. O. Radde ... 187,729
Printing press, Braunsdorf & Kaiser ... 187,806
Printing press, C. H. O. Radde ... 187,730
Projectile, C. E. Ball ... 187,746
Propeller, chain, W. B. Whiting ... 187,948
Pulley and shaft connection, R. H. St. John ... 187,929
Pulley block chain, B. Arnold ... 187,745
Pump, G. W. Holmes ... 187,852
Pump, M. D. Temple ... 187,934
Pump, chain, W. H. Rutan ... 187,733
Pump, W. H. Lang ... 187,719
Pump force, C. Green ... 187,755
Punch, hand, H. F. Osborne ... 187,896
Quilting frame, M. A. Mills ... 187,885
Refrigerator, F. A. Thompson ... 187,935
Retorts, preventing carbon in, W. Karr ... 187,866
Roofing composition, J. C. Cheatham ... 187,748
Roofs, etc., watertight, E. Waters ... 187,740
Saccharine syrup, H. B. Blackwell ... 187,747
Saccharine solutions, making, A. Maubre ... 187,881
Sample card, S. Gutmann ... 187,847
Sash balance, J. Houriet ... 187,857
Saw gummer, J. M. Smith ... 187,921
Saw handle, crosscut, J. Neimeyer (r) ... 7,543
Sawmill carriages, operating, M. Lally ... 187,870
Saw sharpening, P. D. Robbins ... 187,909
Saws, setting, D. W. Turner ... 187,940
Scales, grain, P. H. Cherry ... 187,813
Scissors, reversible, T. A. Kelly ... 187,713
Screw fastening, coffin, J. McCarthy ... 187,889
Screw propeller, W. F. Tyson ... 187,941
Screws, shaving heads of wood, H. A. Harvey (r) ... 7,534
Seat, folding, A. B. Cogswell ... 187,817
Seed drill, J. H. Sale ... 187,913
Seeder, O. Perry ... 187,901
Sewer cleaner, H. Allen ... 187,795
Sewing machine, W. G. Cummins ... 187,822
Sewing machine, W. Esty ... 187,837
Sewing machine, Leavitt & Drew ... 187,874
Sewing machine quilter, J. Douglass ... 187,830
Shade holder, B. B. Schneider ... 187,778
Shawl strap handle, W. Kirk ... 187,716
Sheet metal, spinning, J. E. Wells ... 187,946
Sheet metal vessel, Milligan & Booth ... 187,886
Shoe last fastener, S. Brumley ... 187,807
Shoe nails, making, L. W. Austin (r) ... 7,530
Shoe tip, S. Prior ... 187,775
Skate, J. Adair ... 187,697
Slate pencil sharpener, T. B. Merrill ... 187,721
Stall floor, G. S. Young ... 187,794
Stave jointing machine, Hazard & Greenwood ... 187,757
Steam boiler, G. M. Kraft ... 187,869
Steam boiler heater, etc., A. de Beaumont ... 187,825
Steam and vacuum pump, J. E. Gary ... 187,841
Stove, car, J. H. Prentice ... 187,774
Stove polish, D. W. Parker ... 187,897
Stove shelf attachment, S. L. Yourtee ... 187,744
Straw cutter, L. Winslow ... 187,791
Stump extractor, J. & W. H. H. Hollen ... 187,709
Table caster, H. A. Dirkes (r) ... 7,541
Teapot, E. Oliver ... 187,893
Ticket case, F. R. Wolfinger ... 187,793
Tire tightener, T. A. Frakes ... 187,838
Toaster and broiler, J. E. Wickham ... 187,789
Tobacco, liquids in, Smith & Messinger ... 187,924
Tube welding attachment, C. Tolmie ... 187,937
Turbine water wheel, M. V. Drake ... 187,883
Type mould, T. Mason ... 187,880
Umbrella tip cup, T. G. Hojer ... 187,853
Under waist, S. F. Follette ... 187,840
Valve gear, engine, J. C. H. Stut ... 187,931
Valve gear engine, S. H. Wheeler ... 187,947
Vapor burner, F. A. Sawyer ... 187,915
Vegetable cutter, Reitz & Eichholzer ... 187,731
Vehicle wheel, J. E. Howell ... 187,859
Ventilating and warming, T. Winans ... 187,792
Vest and shirtfront, Loffler & Weil ... 187,720
Wagon bolster, stay rod, C. A. Weed ... 187,953
Wagon brake, R. Hurd ... 187,863
Wagon brake, J. M. Van Derzee ... 187,786
Wash board, D. I. George ... 187,842
Watch cases, making, F. Ecaubert ... 187,753