

Business and Personal.

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For Sale—Singly or half, a number of U. S. Patents; also perfected, patentable Inventions, big and little. Address J. B., 1444 S. 16th St., Philadelphia, Pa.

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More than Ten Thousand Crank Shafts made by Chester Steel Castings Co., now running; 8 years' constant use prove them stronger and more durable than wrought iron. See advertisement, page 173.

Skinner Portable Engine Improved, 2 1-2 to 10 H. P. Skinner & Wood, Erie, Pa.

Split-Pulleys and Split-Collars of same price, strength and appearance as Whole-Pulleys and Whole-Collars. Yocum & Son, Drinker st., below 147 North Second st., Philadelphia, Pa.

Yacht and Stationary Engines, 2 to 20 H. P. The best for the price. N. W. Twiss, New Haven, Conn.

Emery Grinders, Emery Wheels, Best and Cheapest. Awarded Medal and Diploma by Centennial Commission. Address American Twist Drill Co., Woonsocket, R. I.

To Clean Boiler Tubes—Use National Steel Tube Cleaner, tempered and strong. Chalmers Spence Co., N. Y.

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does not give the length of his crank arm nor the speed at which the car is to run.—T. H. C. will find something on the use of zinc in boilers on p. 36, vol. 32.—E. E. P. will find directions for building a refrigerator on p. 251, vol. 31.—C. E. C. is informed that steel has been used for making boilers. As to flow of water through pipes, see p. 48, vol. 29.—H. L. C. will find directions for polishing shirt bosoms on p. 203, vol. 31. To clean kid gloves, see p. 283, vol. 30.—W. D. can use aquarium cement on his wardrobe case. See p. 202, vol. 28.—A. B. will find a recipe for Babbitt metal on p. 122, vol. 28.—T. A. B. is right as to the size of the drill asked for by W. H. R. The  $\frac{1}{8}$  drill would be about  $\frac{1}{16}$  smaller than the  $\frac{3}{8}$  hole.—H. & W. will find a good recipe for a depilatory on p. 229, vol. 28.—W. S. F. will find directions for nickel plating on p. 174, vol. 30.—I. A. H. is informed that the lava gas tip is made by a patent process.—B. F. F. will find something about the Australian colonies of Great Britain on p. 161, vol. 36.—H. L. C. is informed that we do not recognize his coin from the impression he sends.—D. F. H. will find an answer to his query as to large and small wagon wheels on p. 91, vol. 36.—H. Y. D. will find directions for making hydrogen on p. 341, vol. 27.—B. H. W. can mount photographs by following the directions on p. 91, vol. 31.—J. W. B. will find a recipe for an aquarium cement on p. 202, vol. 28.—M. C. will find a recipe for mucilage on p. 202, vol. 31.—J. S. R. will find an article on American graphite on p. 55, vol. 25.—L. J. D. will find a recipe for a bright bronze on p. 51, vol. 33.—C. L. T. should read our articles, now in course of publication, on straightening metal plates.—O. S. is informed that we have no means of verifying the sea serpent story.—A. J. P. and R. W. C. will find a recipe for baking powder on p. 123, vol. 31.—E. J. will find a recipe for black enamel on iron on p. 208, vol. 26.—J. D., Jr., will find an answer to his query as an alloy that will expand on cooling on p. 138, vol. 36.—T. S. V. will find a recipe for cement for patching leather boots on p. 119, vol. 28.—J. H. W. will find a description of an incubator on p. 273, vol. 33.—C. R. will find a recipe for artificial marble on p. 57, vol. 28.—H. J. D. will find directions for French polishing furniture on p. 11, vol. 32.—J. M. T. will find a formula for safety valves on p. 363, vol. 29, and for horse power of engine on p. 33, vol. 33.—G. W. W. will find a recipe for a depilatory on p. 107, vol. 30.—C. B. W. will find directions for re-tinning tinware on p. 139, vol. 36.—J. M. C.'s device is not a perpetual motion, as it depends on heat for its power. As to the flight of birds, he forgets that the atmosphere rotates as well as the earth.—W. B. will find something on the retina of the eye on p. 20, vol. 32.—C. H. S. will find directions for making artificial meerschaum from potatoes, etc., on p. 307, vol. 34.—F. L. will find directions for coloring gold chains on p. 43, vol. 30.—H. J. D., S. H., J. F. L., T. M. F., J. H. N., W. B., B. L., E. E., R. S., P. W., 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) G. O. E. asks: 1. What would be the effect of the explosion of 40 gallons each of pure oxygen and hydrogen, contained in gas bags like those used with the oxyhydrogen stereopticon? A. A mixture of oxygen and hydrogen in the proper proportion is as powerful an explosive, in proportion to its specific gravity, as nitro-glycerin. The explosion of such a quantity of the mixture as you mention, in an ordinary apartment, would endanger the building. If the gases are not mixed, there is no danger, as neither of them alone is explosive. 2. Is there no way of preventing the possibility of such an explosion? A. With suitable safety bottles between the gas reservoirs and jet, and with equal pressure in each reservoir, there is little or no danger under skillful manipulation.

(2) J. M. A. says: I find an apparent contradiction between two standard authors as to the definition of "living force." Bartlett's "Analytical Mechanics," page 45, says: "The living force of a body is double the quantity of work expended by its inertia while it is acquiring its velocity." This author represents the living force by  $Mv^2$ . In Peck's "Mechanics," it is stated, on page 187, that "the expression  $\frac{1}{2}Mv^2$  is called the living force of a body. . . . The living force of a body is the measure of the quantity of work expended in producing the velocity." Thus one author places the measure of the living force at twice the amount of the other. Why this discrepancy? A. Professor Bartlett's definition is probably the most generally accepted; but there is good modern authority for the other. It is a case of definition, about which authorities are apt to differ. All agree that the energy is  $\frac{1}{2}Mv^2$ , while some consider that double the energy is an imaginary "living force," and others do not.

(3) C. asks: What kind of dye is used in coloring rattan for fancy chair seats? A. For blue, sulphate of indigo, partly saturated with an alkali. For scarlet, lac dye used with tin salt as a mordant. For red, dye with madder, using tannin and alum as mordants. For black, impregnate with acetate of iron and boil with a decoction of madder and logwood. For green, boil with an alum mordant and then with sulphate of indigo, and a little fustic or quercitron. For yellow, use an alum mordant and dye with fustic. The coal tar colors may also be employed for this purpose.

(4) J. C. P. says: 1. I wish to build a tug boat for the purpose of towing barges laden with oyster shells. The barges are 30 feet long by 10 feet wide, and 3 1/2 feet deep, and will hold 7 or 10 tons of shells. What size should the steam tug be to tow such barges at the rate of 3 or 5 miles per hour? A. If you only mean to tow one barge at a time, an ordinary row boat, 18 to 20 feet long, fitted with engine and propeller will answer very well. 2. What are the constituents of oyster shell lime? A. An analysis of oyster shells by Schosberger shows that they consist of three layers, as follows: 1. Inner layer, the so-called mother-of-pearl. 2. Brown hard scales, forming the outer edges of the successive laminae of the outer shell. 3. A chalky layer, interposed between the laminae of the shell. The first of these contains: Carbonate of calcium 94.7, organic matter 2.2, other salts and loss 3.1. The second contains 89.1, 6.3, and 4.6, and the third 88.6, 4.1, 6.7 of these ingredients respectively. You should consult our advertising columns for addresses of dealers and manufacturers.

(5) A. J. K. says: In the glass sand business we have during winter to dry all our sand. I dry it now on a floor, drying 15 tons in 10 hours. Is there an apparatus that we could use that would keep the sand in one place and save the work of shovelling it off the floor? A. For similar purposes the material to be dried is caused to pass, by means of continuous bell buckets, through the extended flue of a small brick furnace. This method has succeeded very well, and is employed extensively for the drying and roasting of certain ores, etc.

(6) J. J. asks: How can I unite a set of vulcanite teeth that are broken, that they may stand the saliva and heat of the mouth? If I knew how to make the vulcanite that the teeth are set on, I think I could have mended them with it. A. Mix dry caoutchouc with half its weight of flowers of sulphur, and thoroughly knead the mixture on a plate of warm metal. Heat the teeth to a temperature of about 212° Fah., join the fractured edges with a little of the caoutchouc dough, moistened with a drop or two of bisulphide of carbon, and expose the whole to a temperature of about 200° Fah. for 2 hours. At the expiration of this time, raise the temperature to 300°, and maintain it constantly at that for 4 hours more. When cool, the joint will be found firm, and may be trimmed with a sharp knife.

(7) W. R. T. says, in answer to C. S. D., who asks as to what is the best wood for a guitar: My experience shows basswood to be best. Either use the wood in pieces, or get a strip of a sufficient length, and steam it so that it will not break.

(8) J. A. M. says: I have a 26 inch under runner burr, and the spindle heats when the stand is full of oil, so that I have to stop. There is no grit in it. How can I remedy it? A. Make your spindle cone-shaped at the end, like a lathe center.

(9) J. N. P. asks: 1. What is draw-filing? A. Draw-filing is filing with the length of the file at a right angle to the motion of the file, the latter being held in both hands and made to cut on both strokes, by which process the file cuts more smoothly.

What is a shaping machine, or what is the difference between a shaping machine and a planer? A. A shaping machine is a machine for planing iron. In a shaping machine the slide carrying the tool travels, the table holding the work being stationary. In a planing machine the head and slide are stationary, while the table carrying the work travels back and forth.

A friend of mine has been working for years on a machine to be enclosed in a caisson, and let down in a cistern, claiming that the water of the cistern will run the machine and pump a continuous stream out of it at the top as long as there is any water in the cistern. I have tried to convince him that he is trying to make a perpetual motion, but he says he is not. A. Such an apparatus would be a perpetual motion.

(10) C. R. S. asks: 1. Which is the most powerful and economical for a road locomotive, a double engine of 8 horse power in each cylinder, connecting on the same driving shaft, or one single engine of 16 horse power? A. The double cylinder would be the best. 2. How large should the boiler be? A. Consult a manufacturer.

(11) J. C. M. asks: How can the amount of friction of a valve on its face be ascertained, if we have the pressure of steam per inch and the area of the surface occasioning the friction? The answer should designate the number of lbs. applied to the valve rod necessary to move the valve. A. The precise pressure cannot be calculated because it depends upon the fit of the valve to its seat.

(12) E. H. M. asks: What kind of curve is best to use in bent arm gears? A. Various shaped curves are used, all serving equally well. Of what size should master taps be? A friend says that they should be of the same size as working taps, while I hold that they should be  $\frac{1}{2}$  of an inch larger. A. Master taps for tapping dies should be from once to twice the depth of the thread larger than the bolt the die is intended to cut.

(13) L. M. C. asks: If a locomotive is running on a down grade (the drivers, of course, having a forward motion) without working steam in the cylinders, the throttle being entirely closed; if the engineer throws back the reverse lever so that the backing eccentrics work the valves, what would be the result? I read some time ago that air would be pumped through the steam pipes into the boiler and thus increase the pressure. But how is any air going to enter the boiler, the throttle being closed? A. The piston would draw air from the exhaust, and pump it partly back through the exhaust and partly into the steam chest.

(14) J. J. asks: Will a well constructed condensing engine of 5 inches bore and 12 inches stroke, cutting off at  $\frac{1}{4}$  stroke, with a steam pressure of 100 lbs. (which would be 25 lbs. at end of stroke, and an average of about 57 lbs.), give as much power as a compound engine taking the same amount of steam? A. No. The compound engine would give most power.

(15) G. E. C. says: I read that to reverse a stationary engine the eccentric should be turned half way round on the shaft from where it stood. I claim that it will not do to turn it exactly halfway round, and other engineers dispute this. Please let me know. A. If the valve has no lead, the eccentric may be turned halfway round on the shaft to make the engine run the other way. But if the valve has lead, the eccentric turned halfway round would set the valve wrong to twice the amount of the lead.

(16) O. J. says: You are doing the community a good service in pointing out the poisonous character of the fumes of the colored fires ordinarily employed, and the dangers that may arise to delicate constitutions by their use. With a view of introducing some mixtures that seem to be free from injurious ingredients (sulphur and antimony and arsenic compounds being eliminated) and producing fumes not even so annoying as tobacco smoke, I append the following formulae, and send you samples of two different red fires: Red No. 1: Chlorate of potash 16 parts, nitrate of strontium 30 parts, lycopodium 3 parts, sugar of milk 2 parts. Red No. 2: Chlorate of potash 1 part, nitrate of

strontium 8 parts, shellac 2 parts. Green No. 1: Chlorate of potash 9 parts, nitrate of barium 30 parts, lycopodium 3 parts, sugar of milk 2 parts. Green No. 2: Chlorate of potash 1 part, nitrate of barium 8 parts, shellac 2 parts.

(17) J. F. asks: Please tell me how I detect tellurium in ores, and in what minerals it is chiefly found? A. Metallic tellurium is a tin-white, brittle substance, with a metallic luster, and a specific gravity of 6.25. It is never found free in Nature, but usually in combination with either bismuth or gold and silver. With bismuth, it constitutes the mineral known as tetradymite, which has a steel-gray color and a high metallic luster. Tetradymite occurs in tubular crystals or foliated masses, which mark paper like black lead. Tellurium, in combination with gold and silver, forms the mineral sylvanite, of metallic luster and steel-gray color. When fused on charcoal it yields a light yellow, malleable globule, which contains 1 part telluride of silver and 2 parts telluride of gold. Metallic tellurium has, at present, no place in the arts, and finds a market only in the preparation of mineral and other scientific cabinets. Its price is quoted by dealers in rare metals at about \$8 per ounce or \$90 per pound.

(18) E. C. H. asks: 1. Is cast cast-steel suitable for laps and dies for steam pipes, and for other kinds of screw-cutting? A. Yes. 2. What is the shrinkage of cast cast-steel, and of malleable iron? A. It is very irregular, differing according to the size of the casting. 3. How much larger should the tap be for cutting open dies than the bolt that the dies are to be used on? A. About  $\frac{1}{2}$  times the depth of the thread larger.

(19) J. D. E. asks: Why could we not make a telescope on the principle on which the Huyghenian eyepiece is made? A. Because the chromatic and spherical aberration cannot be corrected by such a combination of lenses.

(20) W. W. H. says: I wish to stain some windows for a church. Please give me a recipe for making a good imitation of colored glass. A. You cannot stain the glass without removing it from the window, but you can imitate the stained glass by means of transparent colors applied as paints. For this purpose, use such colors as Prussian blue, gamboge, and carmine. These will give you the three primary colors, and by their mixture the other tints may be produced. Apply with a brush, and use any transparent varnish, such as dammar, as the vehicle.

(21) E. R. asks: Is there any liquid cement, that is less expensive than shellac, with which I can cement together fine white sand or pulverized pumice-stone? A. Common rosin dissolved in naphtha, with the addition of a little gutta percha to render the resulting cement more binding and less brittle, is a preparation at once strong, cheap, and waterproof. It may be concentrated to any consistency by evaporation of the solvent.

(22) J. F. S. asks: How can I recover sulphuric acid from waste, after the washing of nitro-glycerin? A. There is no method sufficiently economical to be of any practical value for this purpose. The concentration of the acid by the evaporation of the diluent would be tedious and expensive. If the solution is not too dilute, the greater part of the sulphuric acid may be removed as sulphate of lead by agitating it with the proper quantity of dry lead carbonate, allowing to settle, and subjecting the dried precipitate to dry distillation in stoneware retorts heated to bright redness.

Please tell me of a simple and cheap method of making glue? A. Gelatin or glue exists in many animal tissues, as the skin, cellular membranes, tendons, and ligaments, and forms the framework of bones, horns, hoofs, etc. It may be separated and dissolved out from these by protracted boiling with water. The aqueous solution, when cooled, gelatinizes; and when this jelly is dried, it constitutes ordinary glue.

(23) S. J. T. asks: What form of coupling is the most durable and best adapted to run the line shaft of a threshing machine cylinder, 700 or 800 revolutions per minute on an angle, say, of about 30°? A. Use an ordinary universal coupling.

(24) W. W. asks: 1. Please give me the philosophy of the expansion of steam in the cylinder of a steam engine. Why does a cylinder 7 feet long and 3 1/2 feet in diameter, other things being equal, give a power twice as great as a cylinder of half that length, although the surface of the pistons is the same? A. The power of an engine is the resultant of three data, pressure, distance, and time. If a piston has 1,000 lbs. pressure on it and moves 3 1/2 feet in 1 second, it has half the power of one that has 1,000 lbs. pressure and moves 7 feet in 1 second. 2. Is the pressure on the piston, after it has passed 6 feet from the starting end of the 7 feet cylinder, any greater than it was when it had reached a point 1 foot from that of starting? A. Yes, unless the steam is cut off before the end of the stroke. If the steam follows the piston full stroke, the power will increase in proportion to the length of the cylinder. If the steam supply is cut off before the piston reaches the end of the stroke, the steam will expand and lose pressure in proportion to the increased space it occupies.

(25) M. S. D. says: For the information of the correspondent who asked as to twisting augers, allow me to say that the blade or twist of the common carpenter's auger is made by drawing the iron or steel out nearly flat, something like the blade of a table knife in shape, but thicker through the center than at the edges, as wide as you want the cutting size of the auger to be, and a little longer than the twist is to be when done. This is then heated; the cutting end or head is clamped in a vise; and the workman, holding the other or shank end with tongs, twists it over from right to left by hand. It is afterwards made true by means of crimp dies rapidly opened and shut upon it. The head is struck out in a die afterwards.

(26) C. W. H. asks: What paste or glue will fasten paper firmly to iron and stone? A. Melt together equal parts of asphalt and gutta percha. Use hot. The surfaces to be joined should be perfectly clean and dry.

(27) G. S. W. says: About 4 feet square of our flooring, with about 15 inches thick of sawdust between

Notes & Queries

A. B. S. will find directions for making an aeolian harp on p. 330, vol. 26.—A. F. B. can copper iron wire by following the directions on p. 90, vol. 31. To silver it, use the preparation described on p. 299, vol. 31.—C. D. is informed that we do not know of the offer of a premium for a method of crystallizing maple syrup.—H. B. B. and many others should read our article on the horse power of an engine on p. 33, vol. 33.—E. T. will find directions for building a hen house on p. 139, vol. 36.—T. C. will find something on the formation of butter in the process of churning on p. 119, vol. 30.—T. F. M. will find a good recipe for ice cream on p. 251, vol. 28.—J. W. B. will find on p. 253, vol. 30, a recipe for paste for fastening paper to tin.—C. W. D. will find on p. 123, vol. 31, directions for bluing steel.—W. W.

it and the ceiling below, has been saturated with neat-foot oil. What can we do to prevent spontaneous combustion? A. It is better to remove the danger by substituting a new floor; but if this is not practicable, saturate the floor as thoroughly as possible with a strong solution of washing soda in lime water.

(28) C. R. asks: Is there any preparation that will hinder the decomposition of gelatin when used for moulds and often remelted? A. Try the addition of a little lime.

(29) F. P. W. says: I have spilt some black ink on my carpet. Please tell me how I can get it out without injury to carpet? A. If the ink is of the same kind as that used in your letter, it cannot be removed without destroying the coloring matters of the carpet.

(30) W. H. asks: What are the causes of the formation of lead ore, to the best of your knowledge? A. You do not state which ore of lead. Galena was probably formed by the fusion of oxide of lead in contact with sulphur, from which it crystallized.

(31) S. W. asks: What are the names of the elementary bodies discovered since 1869? A. The element gallium, discovered by Lecoq in 1875, is the only one.

(32) L. F. B. says: In answer to J. J. S., and others, you say that water boils at 184° on the St. Bernard. This mountain is 8,400 feet high. Are you right? A. The Swiss St. Bernard is 11,080 feet in height.

(33) W. C. L. asks: Does galvanized iron attract more cold than copper or other metals? A. If we understand you, the metal that is the better heat conductor will condense most moisture upon its surface; in this respect copper far surpasses galvanized iron. If copper be taken as 100, galvanized iron equals about 16 in the scale of conductivity.

(34) J. asks: Is there any substance which, if dissolved in alcohol and applied in solution to surfaces of raw, light-colored woods, such as ash and maple, will give them a luster and make the grain more apparent without changing the color? A. A filtered solution of pure, bleached shellac in alcohol will do this, or a very thin varnish of mastic. Such woods darken by age; this cannot be avoided.

(35) B. H. L. asks: What liquid could I use, that would be cheap enough, to kill weeds without injuring wood, so as to sprinkle 2 or 3 miles of plank road without hastening the decay of the wood? A. A sprinkling of crude carbolic acid would, in great part, accomplish this, without injury to the planking.

(36) E. A. W. asks: How can I remove the clinkers which accumulate on the brick linings of cooking stoves? A. These are due to the presence of alkalis or lime and sand with the coal, which become fused together, forming a glass which constitutes the adhering clinker. It can only be removed by mechanical means, but may be avoided by using only fuel free from these impurities.

(37) G. H. A. asks: 1. Is there any extract of lime that will answer the purpose of fresh slacked lime for a preservative, and not make anything that is immersed in it look limy? A. There is no extract of this kind. 2. How can I, after leaching the lime and getting the strength out of it, make it so that anything immersed in it would not show the lime after taking out and drying? A. The excess of adhering lime may be removed by immersing the substance, after digesting in the lime water, in pyroligneous acid; or the lime water may be acidified with the wood vinegar.

(38) W. L. I. says: I want to lift water to a height of 46 feet, then convey it to a tank distant from the well 45 yards. I have plenty of power with which to run any kind of pump. Can I get one to lift water to that height? A. There are pumps made especially for such situations, that can be driven by belts, gearing, or lever connections, as may be most convenient. It is not our custom to recommend special manufactures in these columns; but if you will make your wants known under the "Business and Personal" heading, you will open communication with the proper parties.

(39) H. D. D. asks: How can I calculate the dimensions of a boat to carry a given weight? A. Find how many cubic feet of water the boat displaces at different assumed draughts, and the product, in any instance, of the displacement multiplied by 62, gives the number of lbs. the boat can carry at that draught, including its own weight.

(40) F. R. R. S. asks: From what depth will a steam siphon draw water perpendicularly, and to what height above the siphon can the water be forced? A. It can draw about as far as a good suction does, and as ordinarily arranged does not force the water, but could easily be made to do so to a height depending on the pressure of steam.

(41) T. R. R. asks: Could you give a short table showing the rate at which atmospheric air is increased in temperature by sudden compression, as well as the increased pressure per inch, starting at about 60° Fah.? A. The following figures are taken from a table published by Professor Thurston in the Journal of the Franklin Institute:

Table with 3 columns: No. of atmospheres, Degrees of temperature Fah., Lbs. pressure per inch. Values range from 1 to 10 atmospheres.

(42) A. R. asks: What would be the power of a 100 lbs. fly wheel attached to one end of a horizontal shaft, worked by hand? A. The actual energy of such a wheel depends upon its dimensions and velocity, the general rule being:

Energy = Moment of inertia x (angular velocity)^2 / 64.4

(43) H. H. asks: 1. Is steam visible in a boiler? A. No. 2. Does water boil in a boiler when there is a pressure of steam? A. There is no violent

ebullition unless the pressure is practically removed. 3. How large a boiler is required for a 40 horse engine? A. One capable of evaporating from 10 to 60 cubic feet of water per hour. 4. What size of steam pipe is required for a 20 horse engine? A. Make it about 3/4 the diameter of cylinder.

What size of balance wheel would a person want for a 22 inch circular saw? A. None will be required in general, except the pulley on the saw mandrel.

(44) J. J. T. says: What is the cause of the knocking in a water pipe? I am running a 20 horse engine, and the pump is attached to the crosshead; the feed to it is 3/4 inch lead pipe with an air chamber on it; the discharge pipe to the boiler is 1 inch, with an air chamber. When pumping, the feed pipes make a fearful noise, as though some one were hammering it. A. The area of the suction pipe or suction valve is probably too small, causing the valve to have too much lift; and its violent closure causes the noise.

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

G. M. S.—No. 1 is pyrolusite, a gray ore of manganese. No. 2 is chalcophyllite or copper in combination with arsenic acid. No. 3 is quartz. No. 4 contains calcite and apophyllite—carbonate of lime and silicate of lime and potash.—E. M. P.—Your powder consists principally of some organic body; but the quantity was so small that we could not determine its nature.—D. A.—It contains mica and sesquioxide of iron.—J. R. B.—It is an impure clay—silicate of alumina. You did not pay the postage on your specimen.—A. D. G.—No. 1 is mica schist. No. 2 appears to be cassiterite (oxide of tin). Send a larger specimen.—F. W. M.—It is iron pyrites. See p. 7, vol. 36.—E. T.—Your mineral seems to be a piece of scoria from some furnace. It contains iron, sulphur, lime, and a large quantity of carbon.—B. H. L.—Your specimens are basalt and graniferous rock.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects: On a Geographical Question. By P. G. On the Distances of the Stars. By W. W. On Shipping Nitro-Glycerin. By C. L. K. On a New Car Coupling. By the O'K. McK. On Civilization. By T. R. V. On the World's Age. By A. F.

Also inquiries and answers from the following: J. C.—W. A. M.—Y. S.—J. M. P.—N. S.—J. B. H.—O. O. F. Z.—J. H. G.—A. B.—T. W. P.—H. A. H.—H. C. H.—A. G.—R. T. G.

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 sewing machines? Who sells blue glass chimneys? Who makes artificial limbs of hard rubber? Who makes artificial eyes? Why do not makers of artificial stone advertise in the SCIENTIFIC AMERICAN?" 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 6, 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.

Table listing inventions with names and patent numbers. Includes items like Adding pencil, Advertising, Animal substances, Animal bones, etc.

Table listing inventions with names and patent numbers. Includes items like Button, Vose & Southwick, Buttons to cards, attaching, A. Brear, Car brake, atmospheric, W. Loughbridge, etc.

Table listing inventions with names and patent numbers. Includes items like Loom, H. D. Wood, Lubricated moulds, producing, C. S. Brooks, Middlings separator, P. Muller, Milk pan, Smith, Ryer & Clark, etc.

DESIGNS PATENTED.

- 9,729.—COOK RANGE.—J. Beesley, Philadelphia, Pa. 9,730.—SLEIGH BELLS.—A. A. Bevin, East Hampton, Ct. 9,731.—PAPER BOX.—N. D. Bill, Springfield, Mass. 9,732.—PICTURE FRAME.—J. J. Gray, Boston, Mass. 9,733.—PAPER BOXES.—L. P. Heath, Springfield, Mass. 9,734.—TYPES.—J. Herriet, New York city. 9,735.—TYPES.—H. Ihlenburg, Philadelphia, Pa. 9,736.—WIRE TABLE MAT.—C. E. Peirce, Lowell, Mass. 9,737.—PAPER WEIGHTS.—A. C. Smith, Jr., N. Y. city. 9,738.—STOVES.—N. S. Veecher et al., Troy, N. Y.

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