## Notes & Queries

E. J. T. will find directions for painting tin roofs on p. 202, vol. 30.—G. D. can remove colored writing ink from paper by the process given on p. 410, vol. 32. Water may be purified by the process given on p. 387, vol. 33.—S. H. will find a description of a process for canning green corn on p. 234, vol. 33.—G. G. M. P. will find a description of a tracing machine (pantagraph) on p. 179, vol. 28.—W. R. will find directions for using the lactometer on p. 208, vol. 34.—C. O. R.'s device for improving a vertical boiler is not new.—W. E. S. should address Seth Green, Esq., Rochester, N. Y., as to trout culture.—J. A. G. can ebonize wood by the process described on p. 50, vol. 33. Shirts may be highly finished by the method described on p. 213, vol. 34.—H. P. S. will find directions for silver-plating without a battery on p. 399, vol. 31.—W. F. R. is informed that the sparks from a leather belt in motion are electricity. See p. 10, vol. 34.—C. M. will find a recipe for filling for wood on p. 315, vol. 30.—P. B. T., G. M. G., S. H. W. J. K., B. L., and H. T., 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) J. L. W. says: If we use a plain iron pipe in drive wells, in some localities, it will run into holes in about one year; in others it will last a little longer. Why does the pipe not wear out sooner than the pipe 8 or 10 years ago? A. The new pipe may be driven through dissimilar strata of earth, and thus subjected to different conditions from the old; or the old may have holes in it also, but the rust and compact earth around it close them so that they do not show. Rubber coated pipe is now used for gas when laid in the ground, and might be serviceable for drive pipe.

(2) J. E. M. asks: Will it do to cement on soft sand walls in a cistern? A. Dig your cistern in a circular form and cut the sides as true and smooth as you can; put on the cement all in one coat about one inch thick, and float it down to a very smooth surface.

(3) E. A. V. says: A refrigerator is built of brick. It is 4 feet square, and 5 feet 6 inches high inside. The wall is 10 inches thick, having a hollow space of 2 inches wide in the wall. It is cemented on the inside. The room has no ventilation, and the ice melts very fast. How can it be made to work? A. The heat is most probably derived from the earth at the bottom of the refrigerator, and through the brick wall, where the isolation is not perfect. A wooden lining set off from the wall 2 or 3 inches, and up from the bottom the same, and a little ventilation, would most likely improve it.

(4) S. & P. M. Co. says: In the manufacture of artificial stone from Portland cement, we use wooden molds and coat them with shellac varnish; but it becomes soft in a short time. Is there anything that we can coat them with that will become hard and resist the action of the cement? A. Glycerin is sometimes used for plaster molds, but more usually a mixture of lard and oil.

(5) F. N. R. says: Please tell me how I can make a good galvanic battery without many cups. A. Get a glass jar, and at the bottom of it place a circular piece of copper to which a gutta-percha-covered wire has previously been attached. Let the wire be long enough to extend five or six inches out of the jar. Fill the latter, about two thirds full, with water, in which a quarter of a pound of zinc sulphate may be dissolved. Then suspend a piece of zinc in the jar so that its upper surface is just below the level of the water. When this has been done, drop crystals of copper sulphate (blue vitriol) in the jar, taking care that none remains on the zinc. About half a pound will be enough to start the battery; more may be added from time to time as needed, but care must be taken that the blue does not extend quite up to the zinc. A wire leading from the zinc and the one from the copper form the poles. The number of cells required for any given case, as well as their arrangement, will depend upon the work to be done.

(6) J. B. asks: Can shellac be dissolved in sulphuric ether by heat? A. No. It can be dissolved by the alkalies and by aqueous solutions of borax.

(7) H. S. J. says: 1. Please give me the value of paraffin as an insulator, counting shellac as 1,000. A. We do not recollect ever having seen a statement of the relative values, but believe that paraffin stands a very little below shellac as an insulator. 2. In the chloride of silver battery described on p. 390, vol. 33, do you mean that each cell is equal to 1·03 of Daniell's? A. Yes. 3. How many cells of this battery would be necessary to produce a powerful electric light? A. That depends upon the resistance of the battery, which, we believe, is high; consequently the number of cells would be considerable. We have, however, never experimented with it.

(8) E. W. asks: Is there an equal amount of fertilizing material in old dry bones and in green ones? A. The difference is in the loss of nitrogenous compounds arising in the decomposition of the fatty and other matters. The percentage of phosphate of lime in the two cases is the same.

(9) T. K. asks: Do wire hair brushes make the hair stiff and harsh? A. The excessive use of a stiff brush should be avoided, as it irritates the scalp and promotes the formation of dandruff. We have found that thorough cleansing of the hair with tepid water and pure white Castile soap (the soap being completely removed by rinsing with pure water) once in two or three weeks, and thoroughly rubbing the scalp and roots of the hair with hair oil, will keep the head clean and the hair soft and free from dandruff.

(10) J. A. G. says: What can I use to prevent the disintegration of rubber hose? A. Try the following: Flow the interior of the tube with a solution of strong glue in water, and immediately afterwards with a strong solution of tannic acid in water. India rubber is partially dissolved by kerosene oil.

(11) A. B. asks: What is the reason of the heat produced when lime and water are mixed? A. When two liquids or a solid and a liquid combine to form a solid body, the action is always accompanied by a considerable evolution of heat. As might be expected, the contrary is the case when a solid passes into the liquid form, as in the case of ice and salt. When caustic lime is mixed with about one half its weight of cold water, the lime and the water combine to form a white dry powder (which is the hydrate of lime), and the heat that is evolved by the chemical combination is often sufficient to ignite gunpowder.

(12) C. P. says: In November last I was traveling in the west, and the prairie fires had spread over hundreds of square miles, and the ground was black. During the bright daylight, the ground was continuously spread over with a gossamer covering of spiders' webs for miles and miles. Whence came the multitude of insects that spun the webs? A. The fire had been superficial and would not have destroyed the germs of vegetable and animal life concealed beneath the surface.

(13) F. W. G. asks: What is the best method of polishing hard rubber? A. Use pumicestone and rottenstone. Some varieties of hard rubber goods are given a natural polish by the presence in their composition of bodies similar to asphaltum.

How can I stain pearl to an color? A. We have never heard of this having been done.

(14) W. W. B. asks: How many lbs. of marble does it take to make 100 cubic inches of carbonic acid gas? A. About 200 grains.

(15) B. G. asks: 1. Please tell me the amount of correction to be applied to an aneroid barometer for an altitude 6,000 feet above sea level. We have a mercurial barometer from which to make the adjustment. A. The adjustment is best made directly from the mercurial barometer itself. Graduate your aneroid according to the readings of the mercurial, or (by observation) make a table of comparative values. 2. Water boils here at some 11° below the temperature required at sea level. By the same rule, should water freeze at a different temperature than at sea level? A. The freezing point is not displaced in any appreciable quantity.

(16) A. B. says: Galvanized iron nails throw the putty when the latter is made of lead. Would a putty made of zinc do better? A. Yes, try it.

With what, better than with white lead paint, can wood be coated to render it impregnable to water? A. Fill the pores of the wood with a good covering of shellac varnish.

(17) B. V. P. asks: Is there any way to avoid the use of sulphuric or other acid in wire drawing? A. The acid pickle may be omitted, but if so the tool is in danger of being rapidly corroded by the scale of oxide formed on the surface of the wire during the operation of annealing. Wash your wire immediately as it comes out of the pickle in alum water, and dry as quickly as possible. This method, if the acid used is free from copper, will, in most cases, be all that is required. Another method is that of neutralizing any of the acid liquor that adheres to the wire after removal from the pickle by means of a weak lye, washing with water, and drying quickly. The wire should not be allowed to remain, while moist, in contact with the air any longer than possible. Sawdust may be used for absorbing the moisture, but in some cases it will be found advisable to employ good lime instead.

(18) J. W. L. asks: What cheap stuff can I use to dye hemp or feathers to a deep red or scarlet color? A. Use aniline red.

(19) T. W. A. asks: Can you give me any information in regard to the manufacture of illuminating gas from fine sawdust? A. Very rich illuminating gas may be obtained from wood by subjecting it to destructive distillation in retorts similar to those employed in the production of coal gas. It has been found necessary, however, in order to convert the empyreumatic vapor that first passes over into a permanent gas, to pass the vapor through tubes heated to redness. The gas thus obtained contains a larger proportion of carbonic acid than coal gas, and consequently requires a larger percentage of quicklime for the elimination of this impurity. It is, however, free from sulphur and ammonia compounds. Wood gas requires larger burners than coal gas because of its greater specific gravity. If this precaution is not taken, the luminosity of the gas flame will be greatly reduced.

(20) J. M. N. asks: What is the best way of protecting the iron bottom of an aquarium from rust? A. Mastic varnish will answer the purpose very well.

(21) S. W. N. asks: What is a good stove polish? A. The best stove polish is the purest graphite, ground very fine and mixed with a little alcohol or vinegar; the addition of other carbonaceous substances only injures its polish and refractory qualities. The plumbago now employed is in many cases adulterated with finely pulverized gas carbon, which, although it resists high temperatures, detracts greatly from the polish.

(22) P. A. says: If I have an inverted siphon, one end being larger than the other, filled with water and closed at each extremity with a closely fitting piston, and a weight or pressure of 100 lbs. be applied to the larger end, what will be the amount of pressure at the smaller end? If applied at the smaller end, what will be the pressure at the larger end? A. The pressure per square inch will be the same at each end of the tube, so that the total pressure will be in proportion to the area.

(23) H. B. asks: How can I make the mixture of clay that is used in the place of firebrick for stoves? A. Fire clay is a common article of trade. When required for use, it is mixed with with a little water, kneaded into a thick dough, and used at once. The clay is sometimes mixed with a little plaster of Paris, and alum water is occasionally employed in place of clear water.

(24) J. M. asks: Is there not a method by which rock can be blasted by electricity? A. Not by electricity alone. Gunpowder and gun cotton can be fired by electricity, and dynamite and nitro-glycerin by a suitable percussion cap ignited by an electric current.

(25) J. D. G. says: 1. I wish to warm several chambers and a bath room. Is it practicable to do it with 1 inch iron pipes of water, passing through 2 stoves with constant fire, water being supplied from a barrel on the second floor, passing down to stoves on first floor, thence up to the chambers, and back to the barrel? A. It can be made to work if properly set. The pipe in the stove should be in a spiral coil, the water from the reservoir entering at the bottom and the warm water passing out at the top; set the coil against the lining of the fire chamber, and let the coal lie in against it. The reservoir should be 4 or 5 feet higher than the highest part of the pipe, and the pipe so set that the water will all drain back to the lowest point at the stove, where a faucet should be provided to discharge it when required. A coil from the same pipe could be placed in a second stove, providing regard is had to discharging the same as above. The water in the reservoir will become heated, and with proper pipes could be supplied to the bath tub, etc. 2. What surface of pipe would be needed in each 100 cubic feet of space in the rooms? A. One foot of radiating surface to every 50 to 100 cubic feet of air, according to the conditions of exposure to winds, etc.

(26) L. P. L. asks: What is best to prevent sourness in mucilage made of gum arabic and water? A. Try a few drops of oil of cloves.

(27) A. O. W. asks: 1. Does wind affect a thermometer? A. If the glass bulb of the thermometer be perfectly dry, its indications will be the same whether the surrounding air is in motion or at rest. The truth of this is very easily demonstrated by experiment. If we moisten the bulb of the thermometer, however, we shall find that the temperature indicated will be decidedly lower when the air is in motion than when at rest. The difference in the indications is dependent upon the rapidity with which the water on the exterior of the bulb is evaporated. The analogy between the human body and the wet bulb thermometer in this respect is obvious. 2. How much colder is it at the surface of the earth than 5 feet above, in the shade? A. Practically the difference is very slight, and the difference is by no means uniform. 3. How can I make a rain gage? A. The cheapest form of rain gage we know of is that composed of a graduated bottle, having a narrow neck with a perforated stopper, through which passes the leg of a glass funnel, the mouth of which is of known area. For one of the best forms of pulviometer, see p. 150, vol. 34.

(28) A. L. S. asks: How can I make a good liquid acid for soldering iron? A. Dissolve zinc in hydrochloric acid until it will hold no more.

(29) B. asks: Is it possible for a lady to attain proficiency in the arts of engraving, etching, and carving without a master? A. There are many artists of both sexes who, having natural ability, have made great progress in these arts with little or no instruction except what is gained from books and diligent practice. The demand for art workers is increasing, and is likely, in the future, to be great enough to insure remunerative employment for really capable persons.

(30) W. X. C. asks: How can I wash printer's rollers? A. When printing ink was made with burnt linseed oil, as it should be, a little pearlash lye would clean any roller fresh from the press, and dried ink could be removed with a little turpentine. But the inks of the present day are many of them, made with mineral oil: and caustic lyes and petroleum benzine, with much labor are required to clean rollers or type.

(31) F.E.H. asks: What size of wire is best for a magnet (½ inch core) to ring a small bell? A. No. 18 copper wire will be found about right.

(32) W. P. D. says: 1. What should the power of the telescope of an ordinary spectroscope be? A. That depends upon the class of work required. 2. What should be the length of the collimator tube? A. It should be the focal length of the lens for parallel light. 3. What should be the length of the slit? A. About $\frac{3}{10}$ of an inch. 4. Should the lens in the collimator tube be achromatic? A. It is not essential: but the lens must be free from spherical aberration.

(33) A. W. asks: Of what size and how far from an objective, consisting of 3 plano-convex lenses of $\frac{3}{16}$ inch focal length, should a diaphragm be? A. That can only be determined by trial. Some objectives do not require any diaphragm.

(34) B. C. says: 1. I wish to make a magic lantern. Can you tell me the best size of lenses to use, both condensing and objective, to throw a picture on a screen from 10 to 30 feet away? A. Use 4½ inch condensers with objective of 1¼ inch aperture and 6 inches focal length. 2. What change is made in the lenses to throw the picture farther away? A. Only a change of focus. The farther away, the larger the pieture. 3. Do the burner and the centers of the lenses require to be in line? A. Certainly.

(35) J. C. W. asks: What has become of the Keely motor? I hoped that there was something in it, as, allowing for large exaggerations, I did not think it possible that lawyers or men of standing in society could or would suffer their names to go forth to the world in connection with a humbug of such magnitude. What has become of it? A. Echo answers: What?

(36) E. asks: Is it possible by the use of prisms to so decompose or separate the prismatic rays of light as to enable the photographer to take pictures in colors? Chromos were first made by adding one color at a time. Why may not the rays of the camera be tinged by passing through media of prismatic colors superimposed on each other? Experiments in this direction will, I believe, yet solve the problem which has so long baffled photographers. A. The difficulty in photographing colors is not in the manner of lighting the subject, but in the fact that the photographic chemicals are insensitive to all colors except the blue and violet.

(37) M. J. M. says: I have a small stream of water carrying about 20 cubic feet per minute, in which I can obtain a head of not over 2 feet. Can I raise with such a head water enough for family use, with an hydraulic ram, to the hight of about 20 feet, say about 10 or 15 gallons per hour? A. This should be done without difficulty.

What is the rule for setting thimble skeins on axles? A. Perhaps some of our readers will give this correspondent the benefit of their experience.

(38) F. G. asks: 1. Is there any work in the English language that gives formulæ for grinding and arranging the lenses in modern compound microscopes? A. "The Microscope and its Revelations," by Dr. W. B. Carpenter. They are ground like all other lenses. 2. Can I get optical glass, both crown and flint, of uniform refractive power, whose index of refraction has already been ascertained with sufficient accuracy on which to calculate the curves of lenses without testing each piece separately? A. We do not think you can; but you can get glass of known specific gravity, which will enable you to form some idea of its quality.

(39) E. L. H. says: We differ on ventilation under the roof. One wants to ventilate directly through from the gable ends. I want ventilators in the ceiling, constructed so that they can be closed when desired, with an escape out through the steeple. Which will be the best? A. Your plan is the best; but it is also necessary to have openings near the floor as a part of a good system of ventilation. These should be arranged so as to prevent drafts as much as possible.

(40) E. L. H. asks: Are we to understand that you are opposed to arched ceilings for churches? We are building a church which is to be 50 x 76 feet x 35 feet, ceiling to be arched, having a spring of 9 feet, and paneled, commencing at the spring of the arch. The ribs forming the panel will be 24 inches deep. It will require some 5 or 6 of these ribs to give the desired finish, forming continuous panels from spring to spring of the arch. We desire your opinion. A. It is true that arched ceilings have proved to be subject to echoes more than those of other forms, but this seems to be governed somewhat by the hight of ceiling, low ceilings being apparently more subject to them than high ones. An arched ceiling is more objectionable still, on account of its tendency to thrust out the side walls and thus to cause a settlement. This has occurred in many cases where the buttresses were insufficient or entirely wanting, and where no tie rod or beam extended across the church at the eaves.

(41) H. C. D. asks: In making malleable cast iron it is melted in an air furnace. When it is put in, it is a gray cold blast charcoal iron. It remains there until it changes from gray to white. Does it contain more carbon when it is white than when it is gray? I think it does, for ir it remains in a little too long it becomes steel, which we can take to the blacksmith's fire, and draw and temper. A. The white contains the least carbon.

(42) G. L. P. Jr. asks: 1. Where can I get information as to making models and patterns for casting small steam cylinders and other articles? A. Consult our advertising columns. 2. What should be the length and breadth of ports, measuring on the cylinder face, of a cylinder, the bore of which is 2¼ inches and the stroke 4½ inches? A. Make your cylinder steam ports ¾ long and ⅛ inch wide, the exhaust port ¼ wide, and the bridges between the ports ⅛ wide. 3. What should be the size of the slide valve for same cylinder? A. Valve ⅜ wide, with an exhaust port barely ⅛ nch wide.

(43) R. C. asks: At how many revolutions per minute can we run a grindstone 6 feet in diameter with 8 inches face, with perfect safety? A. You may run it safely at 300 revolutions per minute.

(44) M. R. asks: 1. How old is the earth according to geology and astronomy? A. The age of the earth cannot be fixed, as its proved antiquity is so great that many cycles of ages, more or less, are of little consequence. 2. How long has it been since man made his first appearance on the earth? A. No one knows. The answer to the previous question applies to this one also.

If on a solid wheel, 4 feet in diameter, the point half the way (or 1 foot) from the center travels through only half the space in the same time that a point furthermost from the center does, is there not good reason to believe that there is a point in the center that does not move at all? A. There is in every rotating body, theoretically, a point of no rotatory motion. But it is a point, "without parts or any magnitude."

(45) H. H. A. says: I have a pump with 1¼ inch suction and 1 inch discharge pipe. At a very low speed it works well; but with full head of steam, it does not half fill the pump, and thumps badly. Is the suction pipe large enough? A. No. Make it 2 inches in diameter.

(46) W. F. S. asks: 1. Of what alloy shall I make a lead wheel on which to polish cut flint glass stoppers? A. Use old type metal. 2. How will I prepare the rottenstone to use with it? A. You had better purchase it already prepared. The back numbers you ask for are out of print.

(47) A. asks: Please inform me of the rule for determining the diameter of a wheel when number of teeth and pitch are given. A. Multiply the number of teeth by the pitch on the pitch line, and divide by 3·1416. The quotient is the diameter at the pitch line.

(48) J. E. H. asks: How is it that telegrams can be sent two ways over one wire at the same time? A. The instruments are so arranged that the current sent does not affect the receiving instrument of the station sending. This is effected in various ways. One of these consists in winding the magnets with double coils, the convolutions of which are put on oppositely; or the connections are so made that the result amounts to the same thing. One end of one coil is connected to the line wire: one end of the opposite coil, to the ground, through a resistance equivalent to that of the line; and the other ends of the coils are joined together. The junction is then connected to the transmitting apparatus. When a current is sent out it divides where the two coils meet, half passing through one coil to the line, the other half, through the opposite coil and resistance, to ground. As the half currents are oppositely directed in the two coils, the action of one neutralizes that of the other, and the iron cores remain unpolarized. The half current which goes to line passes on to the receiving instrument at the distant station, and, if the key at that point is open, goes through one coil of the instrument, thus producing a signal. There may also be a time, in simultaneous transmission, when the received half current passes through both coils of the home instrument. It will be observed, however, that, for such a case, the convolutions of the coils supplement each other; but at the same time, the current must pass through the extra resistance, so that while the number of convolutions is doubled, the current is reduced one half by this added resistance, and thus the effect remains as before.

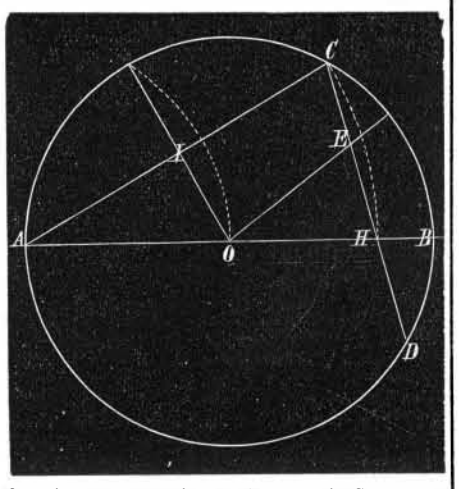
(49) A. I. says: Please give me a recipe for making the black composition that picture frame moldings are coated with. It is afterwards easily polished with a rubber to a jet black. A. Make your frames of plaster of Paris mixed with thin glue water. When dry, cover them with size and lampblack, and varnish with the following composition: Boil turpentine until it becomes black, and sprinkle on it 3 parts amber in fine powder to 1 turpentine. When the amber is melted, add some sarcocolla and more spirit of turpentine, and stir the whole. Strain the mixture, mix with ivory black, apply in a hot room to the plaster frames, and place in a heated oven. Two or three coats will be necessary.

(50) G. P. S. says: I have a zinc and carbon battery, the carbon plates of which are supported by copper connections. I find that the acid creeps up on these connections and corrodes them. What can I use to prevent the corrosion? A. The best plan is to deposit copper on the end of the carbon and then solder a wire to the deposit. First heat the end of the carbon and touch the part just beyond where the copper is to extend (about half an inch from the end) with a piece of paraffin, taking care it does not run up the part to be deposited on; should it do so, however, it may be driven off by a strong heat. When cold, cut a few scores in the surface to give a hold to the copper, and drill a hole through, in which fix firmly a copper wire projecting on each side. With a warm iron, spread a good film of paraffin from the line of intended coppering as far down the carbon as the part to be immersed in the liquid of the battery when working. Connect a wire to the carbon by a screw clamp, and insert in a copper solution, arranging at first for a quick deposit. When a good deposit is made, drill a few holes right through copper and carbon, soak in water to remove any absorbed copper salt, and dry it thoroughly. Now tin the part to which the connecting wire is to be soldered and stand the carbon with its coppered end in melted paraffin till its upper part is well saturated. When the connection is soldered, a coating of paraffin may be spread with an iron over the copper and all parts of the carbon not intended to be acted on by the liquid.

(51) J. M. W. says: 1. It is universally accepted that a current of electricity on a wire is only complete when the metallic circuit is complete, and that a wire of 400 miles in length in reality is 400 miles of electricity. What becomes of the charge when the circuit is broken? Does it return to the battery and replace itself as before starting out upon its journey? This does not seem possible when we consider the amount of surface in both battery and wire. For instance, the surface of 400 miles of wire exceeds many times that of a battery consisting of 200 cells of gravity. What becomes of all this amount of force? A. The current circulates only when the circuit is complete; but it is not essential that the latter should be metallic. If the circuit is interrupted, when insulation is perfect, the conductor on each side of the break assumes a charge proportionate in magnitude to its surface, and its potential is equal to that of the battery.

(52) S. asks: Is there in existence a white cement for outside building purposes capable of standing the weather? A. Portland cement is probably the lightest: it is advertised in our columns. Ordinary hydraulic cement will make a light stucco by using white sand or a good lime paste with it. The lime paste may equal in volume the cement paste.

(53) H. C. N. says: I send you the following simple method of ascertaining the sides of some inscribed figures. Its simplicity will recommend it to your readers. Set off the radius, B C;




then from center, A, at distance, A C, cut off A H, equal to A C. Draw C D through H. The rest explains itself. A C is the side of an inscribed trigon, C D is the side of a square, D E the side of a hexagon, A I the side of a heptagon, O E the side of an octagon, D B the side of a dodecagon.

(54) J. M. W. says: 1. There are 9 or 10 wires feeding from two Callaud batteries; both take earth from same ground wire. If we adjust closely, we get a cross from either of the 9 wires. We did not have this trouble on same wire with an acid battery. Is this a feature of the Callaud, or is the defect at the point of junction with the ground wire, or is it in the ground wire wholly? A. No. The ground wire may be faulty; but it is more probable that defective insulation is the cause of the phenomenon. 2. Working a wire 400 miles in length, will it improve its working condition to use condensers at each terminus? A. No.

(55) J. M. W. asks: 1. Is the conductivity of a wire altered by expansion and contraction other than by tightening the connections at time of contracting? A. As the temperature rises, the conductivity becomes less. 2. In speaking of low and high resistance, is the term low used to designate resistance from 1 upwards, and high resistance the amount of interference it is capable of overcoming? A. Low and high resistance are relative terms; 1,000 ohms would be called exceedingly low resistance if it referred to the insulation of a mile of telegraph wire. 3. Common line relays are measured and marked like this: 75 ohms, 100 ohms, 130 ohms, etc. Is the one of 130 preferable to the others for intensity of attraction, and more suitable for general use? A. It would be more suitable for average telegraph lines; but these matters depend altogether upon the circuit in which the instruments are to be used. 4. I have a battery constructed as follows: The glass cell is 3 inches in diameter and about 4 or 5 inches high. In the bottom of this, I place a piece of cast iron, and suspend a disk of copper, both connected with insulated wire. I then fill up the cell with a strong solution of lye from wood and coal ashes. I get a pretty good current from it. Is it of any value? A. Very little.

(56) G. C. N. asks: Please tell me of some harmless substance by which light brown hair can be changed to a golden color. A. A dilute solution of chlor-nitric acid (*aqua regia*) applied as a hair wash will effect this. A similar preparation of peroxide of hydrogen may also be employed. But we cannot recommend the use of either. Any one who knows of a better recipe will please send it to box 773, New York city.

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

L. B. D.—The explosion was most probably caused by marsh gas or light carburetted hydrogen. This gas likewise forms the chief part of fire damp.—C. W. G.—It consists of oxide of iron, alumina, and silex. For anti-incrustators, see our advertising columns.—S. F. S.—It is yellow and blue clay. You might, with profit, see how it will stand heat.—D. T. G.—No. 1 consists mostly of silex, silicate of alumina, and carbonate of lime, nothing to render it more valuable than any common earth. No. 2 is a fine white clay, remarkable for its small percentage of combined water. Try its capabilities in the way of absorbing grease stains, drying up and disinfecting foul places, and similar uses. No. 3 is inspissated bitumen. You ought to be able to make use of it in manner proposed. No. 4 is rather doubtful. It contains a small percentage of oxide of iron. No. 5. The magnetite will all be swept out by a magnet, and the rest are quartz grains and hyacinths.—The spider from Jacksonville, Fla., has been handed to a distinguished entomologist for examination.—M. P. C.—It is celluloid. See p. 23, vol. 33.

W. A. F. asks: Will some one give a plan for straightening wire, from No. 16 to No. 8?—F. A. R. asks: How can I calculate the number of bushels of shelled corn contained in a crib of any certain size, the corn being on the cob?—G. M. Jr. asks: How can I make Cologne spirit?—J. W. B. asks: How can I put a fine black finish on gun work?—J. C. W. asks: How large a cube can be cut out of a ball 12 inches in diameter?—W. J. says: I am about to construct a flouring mill. Will some one tell me the size and length of reel, and number of cloth, which will make the most merchantable flour?—L. M. H. asks: Would lin wood do for building a boat 20 feet long?

## COMMUNICATIONS RECEIVED.

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

On Cheap Postage. By C. E. H,
On Superseding Steam. By H. C. D.
On the Post Office Department. By J.
On Explosives. By J. N. K.
On Frost and Waste Heat. By T. P.
On Creeping Rails. By L. D. W.
On a Blowpipe. By C. H. H.
On Bone Black. By F. L. B.
On Steam Domes. By T. H.
On the Years of the Planets. By J. H.
On Electric Organs. By T. G.

Also inquiries and answers from the following:

A. K.—A. C.—A. W.—K. S. D.—E. H. C.—G. C. P. Jr.—J. F. M.—B. F. G.—A. B. P.—L. C.—J. S.—J. H. R.—J. L.—J. S. T.—J. W. G.—A. L.—W. S. B.—D. R.—W. M. W.—M. McD.—H. F, G.—E. R. G.—I. J.—W. F. W.

## 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 machinery for making flour sacks, and paper bag machines? Who sells meteorological instruments? Who makes large weight power machines? Who makes an artificial hand, which a disabled man can attach to the stump of his fore arm, so as to carry pails, etc.?" 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

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**March 7, 1876,**

**AND EACH BEARING THAT DATE.**

[Those marked (r) are reissued patents.]

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