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E. T. C. can remove rust stains from calico by the process described on p. 148, vol. 27.-G. F. can fine his ale by the recipe given on p. 75, vol. 31 - G. W. P. will find directions for making a good blackinkon 203.vol. 29 - M. will find details of a millstone cement on p.346, vol.30.-S. will find directions for making gutta percha varnish on p. 379, vol. 30.-J. M. W. does not forward any description of the invention on which he asks an opinion, but merely testimonials as to its mer its.-W. P. B. and many others will find booksellers' addresses in our advertising columns. -J. S. B. will find full directions for tinning cast iron on p. 76, vol. 80.

S. T. B. says: A French chemist says: "By fabricating coke, nitrogen can be made." What is the meaning of fabricatingcoke? A. It means the making of coke by expelling from coal the principal gaseous and liquid matters that it contains. In the manufacture of gas, the coal is placed in retorts and heated; and when the gas passes out of the coal, the residue remaining in the retorts is called coke.

F. B. C. asks: What are ocher and umber? A. Ocher is a variety of fine clay containing iron. The common colors are yellow and red, the latter being col-ored by sesquioxide of iron, and the yellow variety by the hydrated sesquioxide. Umber is an ocherous ore of iron, of a brown or blackish brown color, consisting of oxide of iron, oxide of manganese, silica, alumina and water. They are found principally in Europe, al-though they are widely distributed. The ocher is found in beds some feet in thickness, which lie generally above the colite, and are covered by sandstone or quartzoze sands, more or less ferruginous, and are accompa nied by gray plastic clays, of a yellow or brownish color: all of them substances which contribute moreor less to its formation. There are many large mines of it in this country, at Bennington, Vt., and in various otherplaces. Umper is found in Europe, especially in quantities. They are used as pigments, and as dryers in varnish ; also, sometimes, in coloring porcelain.

J. C. W. asks: 1. When a person is writing several hours every day, inhaling the air from ink which is drying so near him, does he receive into the lungs and the blood any thing from the ink which may have a deleterious effect upon the heart or any other organ? A. Not from any of the common inks, 2. If only pure water evaporates from ink, would that moisture be likely to affect the lungs of any person bending over the drying paper from morning till night? A. No. 3 According to the sense of smell, when ink is free-ly used, the indications are that something more than pure water rises from ink in drying. If injurious to health, what would be its specific effect? A. Not in jurious to health any more than minute particles of dust and saline matters, or traces of organic matters re-ceived from other sources.

P. H. S. asks: Can a calcium light be made so as to be carried in the hand on a foggy day? A. It has not, nor ever can be until some simpler form of apparatus is invented, which will combine the advantage of compactness with the ability to furnish cheaply the continuous flow of gases necessary.

positive pole of the battery is placed so as to dip into You again write to us without giving your name the solution ; the object to be platinated is placed by a

wire in connection with the zinc or negative pole, and also placed in the solution. If the battery be not too strong, in a few minutes the object will be coated with platinum.

W. H. C. Sr. says: There is a man in our neighborhood who says that, if a boiler with both heads out were set up on end in a body of water (it matters not of whatdepth, provided the upper end is above way not or whatdepth, provided the upper end is above wa-ter and the lower end sunk in the mud deep enough to prevent water from leaking in), when the boiler is pumped clear of water, the boiler will rise from the mud immediately after being pumped out and refill. I contend the centrary. Who is right? A. We incline to your opinion. It is an experiment that can very read ily be made with a piece of tin pipe.

D. K. S. says, in answer to J. J.K.'s question in regard to the British man of war sunk at Hell Gate about 1747: I would state that it has been visited by divers for several successive years; with what success as to money obtained, I cannot tell. It is buried deep in the mud and difficult to get at, and can only be visit-ed in good weather and at certain times of tide. I have several relics in my possession which were taken from her.

J. O'D. asks: I have often felt the want of ventilation in railway cars, and I have wondered why the companies did not do something towards remedying the evil. But I am not surprised now, having read your article on the subject in a recent number. I was not aware that so many methods had been tried without uccess. Would it not be well for the companies to of fera prize for a successful invention, that would bring shi the inventive talent to bear on the subject? We should then, I believe, soon have a good method of ventilation. A. The suggestion of our correspondent is an excellent one. Let the rail way companies unite in offering a prize say of fifty thousand dollars, and loubtless the desired invention would be forthcoming.

J. H. McD. asks: The follower on a steam ingine of 32 lnches diameter (of a condensing engine on a steam boat), pulled off the follower bolts, nuts, and fastenings with it, and broke the cylinder, as the piston was coming up with the steam under it, and a vacuum of 26 inches over it (on the follower). It is a disputed question whether the vacuum on the top of the follower had any tendency to pull the follower, or in any way remove it off its scat. A. It did not have any tendency to pull the follower, but did render it easier for the folower to be pushed by the pressure on the other side.

S. F. R. asks: If there is a certain quanti-ty of waterina boiler, and that amount of water be converted into steam, would there be the same amount of water when condensed if there were no means of escape? Is there any decrease in water by boiling it? A. Tnerewould be the same amount afterwards as before, under the given circumstances.

H. L. K. asks: 1. Is an artesian well sunk in the same way and by the same apparatus as a common drive well? A. Not generally. Artesian wells are usually of such depth as to require the hole to be bored by a boring designed for the purpose; whereas the hole of a drive well is commonly made by driving the tube jnto the ground. 2. Is the same kind of piping used in both? A.No, the pipe for artesian wells is put together in sections, in consequence of the extreme length; the pipe for a drive well, being short, is usually in one piece oneendbeing closed and pointed so as to enable it to drive. 3. What is the diameter of the pipe used in sinkng an artesian well? A. The size varies from 2 to 5 inches, as a rule.

W. H. K. Jr. asks: What ought be the thickness at top and at bottom of two square brick stacks, respectively 100 fect and 140 feet high, each having an 8 inch square flue for the entire hight? A. For the 100 feet stack, make the walls 8 feet thick at bottom and 16 inches thick at top, the brickwork being of hard brick and cement mortar.

A. L. D. M. asks: I have a boiler 56 inches long and of 28 inches diameter, with 20 tubes of two inches diameter; the dome is 16x20 inches, of iron $\frac{1}{2}$ inch thick. How many pounds steam will be safe to work at highest rate? A. About 50 lbs. per square inch.

M. H. R. says: To become a surveyor, is it necessary to study at a university? If not, what should I do to become one? A. It would be better for you to botainsomeinstruction at a good engineering school. But many surveyors learn their profession by actual practice in the field (which, of course, would be neces sary after leaving school) without the preliminaryed ucation of which you speak. If you are determined to become a good surveyor, you are pretty certain to suc-ceed, whichever course you take.

H. C. T. asks: I wish to supply a tank,sit-uated ontop of a levee, with water from a river, the tank being 100 feet from the river, the levee sloping supplying the tank, by machinery? A. An ordinary steam pump, if the quantity of water required is small, and a centrifugal pump, or well designed pumping engine, for small quantities.

F. G. H. asks: If a toy balloon were cut loose to go whither it would be blown, what would be the result? Will balloons burst if they rise as high as possible? A. Yes ; but they seldom reach a sufficiently high altitude, because of the loss of gas.

address.

M. P. S. says: Your repeated cautions in regard to lightning rods lead me to ask your advice through your columns upon the following points :] have crected at my country residence a water tank and fixtures of rather novel construction. At one corper of the house, I have placed an old cylinder boller, about 30 feet long and 3 feet diameter, standing on end. resting on brick foundation. The upper head has been removed, making a huge water tank. The top projects above the eaves of the roof, but not higher than the peak. It is encased in an ornamental frametower con-necting with the main building. I propose to keep this tank filled with water by force pump from the well. It isnow cmpty, however. From this tower, iron water pipes lead to the kitchen and bedchambers, and also to the cast iron force pumpin the well, and probably 10 feet down into the water. The house has two ordinary lightning rods on chimneys, leading to the ground on theopposite side of the house. 1.Is this arrangement dangerous? A. The arrangement as described is not to be called exactly dangerous, but might be made much better by a little change. 2. Would lightning be attracted by the large mass of iron of the boiler, rather than by the lightning rods, which are higher? A. If, as would appear, the iron tank is in excellent connection with the ground, it is quite possible that lightning mightstrike it or some of the pipes running from it in the house in preference to the light ing rods. 3. If struck, would the light ing follow the mass of fron to the ground, or pass through the pipes into the well, or enter the chambers through the discharge pipes? A.lf thetank or its connections were struck, the lightning would, without doubt, go to the earth and not into the house. 4. Would it be advisable to put a lightning rod on the outside of the tower leading to the ground? A. A lightning rod on the tower should beput into perfect a inglating found the tower should be ut has precedent before the period metallic connection with the tank, and need not extend below its upper edge. Let the tank and water pipes, in other words, be the lower part of the rod. 5. Would not this last tend to attract the lighting, and in such case would not the electricity be likely to leave the rod and enter the boller with same effect as it no rod were there? A. Both your suppositions in this paragraph are correct. 6. Will not this large mass of iron resting on the ground and this indirect water connection answer the purpose of a conductor ? A. This question is alreadyanswered in No.4, assuming that me pire into the wellisin perfect metallic connection throughout, with no rustor cementjoints. Red lead is an admirable insulator. In the way of advice we would $s_{4}y$: Connect all your lightning rods together, and also to your iron tank and water, gas, or other pipes, not by separate connections, but so that there is some connection betweer all as high as possible. If you have a metal roof connect all rods with it. If not, connect them by a good sized conductor running along the ridge of the roof. Bear in mind that, to carry off the heaviest lightniug flash known, a copper rod one luch in diameter is not considered too large, and, though of course such flashes are of very rare occurrence, they may come. Hence the great value of uniting your different rods high up. Read our article in vol. 29, p. 26, and our edi-torial remarks upon a letter, p. 144 of the same volime.

J. E. J. asks: Will acid dissolve resin with-out destroying its natural qualities? If so, what kind of acid? if not, what will? A. Rosin, or colophone, is a mixture of several resinous acids, namely, phenic, sylvic, colophonic, and sometimes also pinearic acid. It is soluble in nitric acid, but in dissolving suffers decomposition. It is soluble in alcohol and may in this state be used as a varnish. It is soluble also in the lkalies

S.C.J. asks: In your book of instructions for obtaining patents, there is a recipe for making ma-rine glue: Take 3 parts gum shellac, 1 part caoutchouc, dissolve in separate vessels in ether free from alcohol, applying a gentleheat. I have been reading that if the odor of cther is inhaled, it will produce insensibility, etc., and great care should be taken not to pour it out with a flame below it, otherwise an explosion of a dangerous character might ensue. "Mixed with certain proportions of air, it forms a highly explosive com-pound."-(Zell's *Encyclopædia*). I wish to make some marine glue, but must confess I an afraid to use ether fi it is so dangerous, and would be greatly obliged to hear from you further about it. A. There is no necessity in this experiment of pouring the ether out over a flame, or of inhaling it in large enough quantities to produce any effect. Place the ether In bottles, into which drop, respectively, the requisite quantities of shellac and caoutchouc.

C. D. F. asks: 1. Why is it that, when I adjust a telegraph sounder so that, when the circuit is closed, the armature touches the wagnet, it (the arma ture) will still stick to the magnet when I break the circuit? A. Because of the residuary magnetism in the soft iron cores. The armature should never be allowed to touch the poles of the magnet. In ordinary telegraph sounders, set screws are used, to limit the movement of the armature in both upward and downward motion. 2. If, as you say in a late number of your paper, short, thick cores in electro-magnets give greater attractive power, why are such cores used in telegraph instruments? A. They are used for the very reason stated, namely, because of the better results obtained. 3. In making a blue vitriol solution for a Danell's battery, how much vitriol should Iuseto a quart of water? A. As much as it will dissolve. 4. Will a

(Fan Blast), Portable and Station ary. Keystone Portable Forge Co., Philadelphia, Pa.

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How can a pattern of a pot be drawn, the bottom to be 7 inches in diameter, the top 3% inches across.and what confused. See Warne's "Sheet Metal Worker's Assistant."

Can colored candles be made to burn with a flam of the same color? For instance, for red, nitrate of strontium might be dissolved in boiling alcoholand the wick soaked init. Boracic acid might be used for green. Can the colors be intensified in any way? A. We doubt very much as to whether the object desired green. can be accomplished, for various reasons, and certainly not in the way you speak of, from the fact that strontiumnitrate is nearly insoluble in alcohol, consequently very little effect would be produced by a wick steeped in so weak a solution. So also, with boracic acid, which even in the mest concentrated solutions, only tinges the edge or border of the fiame.

How can I deposit a thin coat of platinum on meta bya plating process? Can I put it on as a wash, after dissolving in nitro-muriatic acid? A. Your best meth od would be that of electroplating; the best solution to employ is the nitro-mutistic, to which sufficient sods is added to render it neutral. The object to he coated should be cleansed by potash before the process is com-

R. K. asks: The lightning rol on my house runs underground several feet. Would it be any advantage to put a wheelbarrow full of wrought or cast iron turnings at the end of the ro ', letting it bed itself in them? A. It would undoubtedly increase the safety of your house if you place a mass of conducting mate rial.as you propose, into connection with the lower end of your lightning rod. Better dig a trench and spread the iron along in it.

J. J. S. asks: Is magnetic iron sand worked practically at any place in the United States? In Vermont we could obtain large quantities daily. Being very pure, it would be an inducement to establish works. A. Not to any extent. Much iron sand is tit aciferous, and it would be necessary before mining to see whether it was all magnetite, or contained an inju rious amount of titaniferous iron.

E. C. M. asks: Would a boiler be subject to damage by having a slight blast underneath? If so to what extent? The blast is to be used for the purpose of smelting ore. A. It is not usual to employ a blast of the bottom of the bollers. Two probabilities present themselves. First, that the blast would increase the rapidity with which the boiler would burn out. Sec. ond, that if your blast were mixed with the products of combustion, it would be injured so faras its further menced. A fine platinum wire connected with the employment in the smelting of ores was concerned. rounding air: and if the shell be strong enough nota

leather cup instead of a clay porous cup in Daniell's sattery make more electricity? A. The porous cup is only an accessory in the battery, and takes no part in the generating of the current. A cell in which the cur is of unoiled leather is said to have less internal resistance than one in which an ordinary earthen ware cup is used.

S. F. says: I wish to suggest a form of bal-loon which may be worth experimenting on, and which I believe has not yet been proposed. I have frequently observed that metallic shell ware, and all descriptions of sheet metal work constructed with a view to light. ness and strength are dependent upon the use of cuived. duted, or corrugated surfaces for their power to sustain pressure. It is wonderful what an enormous pressure a simple convex lid or covering for any light tin vessel will sustain. It is of course possible to estimate ow much weight it must bear-a convex shell of a given thickness, and proportion of arc of circle-and to ascertain the relative resisting powers of various metallic shells. Now this appears to me to be a feasihle suggestion to make : That a balloon be constructed in the globular or oval form, from sheet metal as thin as possible : this vessel to have but oue aperture, condegree of rarity such that the specific gravity of the halloon and its contents be lesstban that of the sur-