Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) E. S. asks: Could you inform me of some simple way to make a furnace capable of melting brass or copper, and what should be used for fuel? A. A small cylinder stove lined with fire brick makes a very good furnace for melting brass, and will also melt copper if you have a good draught. If your wants are small, you may easily find a second-hand stove of sheet iron with a lining already in that will answer your purpose. Use ordinary anthracite coal of good quality. Do not have a crucible of more than one-third the diameter of the inside of the stove. Build the fire as in any stove, and set the crucible in, filling coal all round it. Use a pair of tongs with the ends bent sidewise, so as to handle the crucible easily.

(2) A. B. C asks whether it is scientifically true that there is an *equinoctial* storm. A. It is customary to call any general storm occurring any time within a month of the equinoctial passage an "equinoctial." It is only accidentally coincident with the sun's crossing of the "line." Sometimes the season passes without an "equinoctial."

(3) M. G. F. asks: Can you inform me of the ingredients and the process for making soda water, so extensively used as a summer drink? A. Soda water, so called, is a solution of carbonic acid gas under pressure in water. The gas is evolved from a mixture of marble dust and oil of vitriol in a peculiar apparatus for the purpose. For the sirups used in flavoring this soda water, see SUPPLEMENT No. 77.

(4) M. E. W. writes: I have a telescope with a 1⅝ achromatic object glass, focus about 25 to 30 inches, with celestial eye-piece, power 146 times. In using it for star gazing, they look upside down. Could I attach a terrestrial eye-piece to remedy this? and could I see Jupiter's moons and Saturn's rings with the telescope, if I used a terrestrial eye-piece? If so, please let me know the size and power of eye-piece I would need, and if I could attach it to the one I have? A. If your telescope of 25-inch to 30-inch focus bears a power of 146 times, you ought not to complain of the objects being upside down, as all astronomers see them in that position, and get used to it. A terrestrial eye-piece will only magnify from 20 to 40 times in your telescope. You could, of course, have one fitted to your telescope which would do excellent work on terrestrial objects, but would lack brilliancy and power on celestial objects; would show Jupiter's satellites, but would not give satisfaction with Saturn.

(5) L. D. A. asks: 1. What height can water be raised with a siphon above its level? A. Safely about 18 or 20 feet. 2. Can I raise water 25 feet with 3 feet fall with a hydraulic ram, and are they durable? A. Yes, if you have plenty of water to work the ram, but the quantity raised will be not more than one-tenth or one-twelfth of that used in the ram.

(6) O. H. G. asks: Of what material should the reservoirs for the acetate of soda stoves be made? Will tin or sheet copper do, or must it be something stronger? A. Galvanized iron will answer best.

(7) M. O. asks: 1. For a cheap and practical method for preserving flowers. The flowers I would like to preserve are tulips, hyacinths, and crocus. How long will these preserved flowers last? A. Dip them in a concentrated solution of arseniate of soda. It is very poisonous, and care must be used in employing it. 2. How to polish some black walnut boards. A. Use pure linseed oil, to which may be added five to ten per cent of fine shellac varnish. Rub on with a cloth until the polish is obtained.

(8) J. W. B. writes: 1. I would like to know how to make good moulds to cast small articles for the trade, such as broom hangers, and small novelties generally. I have tried the alloy mentioned in SUPPLEMENT No. 17, of antimony 1 part and tin 4 parts; but the antimony did not mix with the tin, and is too malleable for my use. The antimony that I used was a black powder. Was it right, and what was the cause of my failure? A. You probably used an ore of antimony; the sulphuret pulverized would be a black powder. Metallic antimony is a hard brittle shining metal and almost white, and makes a fine alloy with tin for your purpose. You may have to send to Philadelphia or New York for the metal. 2. How can I solder the ends of two wires together to make a good smooth joint? A. Scarf your wires and tin them together with a copper soldering iron. If you want a very strong joint, use silver solder, with borax as a flux. You will require a blowpipe flame for this.

(9) W. S. P. writes: 1. Suppose a steam pipe, say 3 inches diameter, should have iron cast upon its end, so as to close the end and come up on the pipe say 1¼ inch—the pipe having a thread cut or being battered so as to give a hold to the casting—would the pipe leak steam at, say 100 to 125 pounds pressure? If not, would the joint be durable? A. The chance of making a tight joint would not pay for the trouble—it is very uncertain, and entirely ignored by those who make such joints as a business. Cut the threads and screw the caps on. 2. I wish to carry wheat from one bin to another, distant about twenty yards, bringing from first bin to fan mill on about same level, then to second bin, about six or eight feet higher. I want to do this by pneumatic process, for the whole affair must be very light and portable, suitable for one or two horse power, and able to handle two tons per hour, and adjustable to different situations. I do not know what kind or size of fan would be proper, or whether the bin must act by *suction* altogether, or will a blast entering pipe at same place and distance as the grain do as well? In case of using suction, how is the grain at delivery end prevented from entering fan? A. Your plan for transferring grain by pneumatic blast or suction is not feasible to any extent, except for the purpose of cleaning the grain. One to two horse power will not do work with a fan worth considering.

(10) W. J. W. asks: Is it possible for a human being to be suspended in the air without some mechanical or electrical aid. I claim that it cannot be done merely by one person having some mesmeric or other influence over another. A. You are correct. There are various agencies, mechanical and others, whereby a human being might be suspended in the air without visible attachments or connections with any adjacent object. No known "mesmeric" influence will do the business.

(11) C. G. asks how muriatic acid is produced. A. What is known as muriatic acid consists of a solution of water and hydrochloric acid gas, which latter has a strong natural affinity for water. Hydrochloric acid gas is made by mixing common salt and sulphuric acid, and heating the mixture. The resulting gas is brought into contact with water, which absorbs the gas with remarkable avidity. One pint of water, it is said, will absorb four hundred and eighty pints of hydrochloric acid gas, the resulting mixture forming 1⅔ pints of what is called muriatic acid.

(12) E. L. C. writes: I have this fall put in a hydraulic ram, which works under 16 feet head and throws water 110 feet high. Now, when I first start the ram it works all right and throws up a good stream of water, but after a day or two the discharge grows smaller, and about the seventh day stops. The ram keeps at work the same all the time, and the only way that I can start it is to take the ram to pieces; but there seems to be nothing wrong except that the globe or air chamber is full of water. Is this the cause, and how can it be helped? A. The fault is in the air vessel losing its air. About eighteen inches from the air vessel drill an air hole, about one-eighth inch diameter, in the top of the supply pipe. This will keep the air vessel supplied.

(13) C. W. C. asks: What is the relative torsion of common iron shafting, machine steel, cast steel, compressed steel, cold rolled shafting? A. The relative torsional values of the various kinds are estimated as follows: Ordinary turned shafting equals 1; cold rolled shafting, 1·10; machinery steel shafting, 2; cast steel shafting, 3. We know of no tests of compressed steel.

(14) L. C. V. writes: 1. I have a small model engine, 1½ inches bore, 3 inches stroke. What size boiler do I need, running engine at 300 revolutions per minute, steam pressure 40 to 50 pounds? A. A boiler with about 40 feet fire surface, if tubular. 2. Will not copper make a better boiler than common wrought iron, and is one-eighth inch thick enough for perfect safety? A. Not so strong as iron. One-eighth inch, if of iron, is thick enough, if no more than 16 inches diameter. 3. In making a copper boiler, which is best, riveting or brazing? If rivets, what size is best? A. Riveting; diameter of rivets, five-sixteenths inch. 4. What will be the power of the above engine; it is perfectly made and new? A. A little over two horse power. 5. Where can I get directions for making a cheap telephone, working distance, 300 yards? A. See SUPPLEMENT, No. 142.

(15) G. C. A. asks: Is there any form of electric light in which there are two parallel carbons separated by plaster of Paris only? If so, what is the mechanism? What is the method employed of electric street lighting in Paris, France? A. The Jablochkoff electric candle is made in the manner described. It is used in connection with an alternating current machine It is used in Paris, and in other places.

(16) E. A. B. asks if coke burned in a Baxter furnace, two horse power, will be more liable to burn out iron sooner than coal or hickory wood. Coke is cheaper and more easily obtained, and is free from soot and smoke. A. It will not, unless burned with a very strong draught. It is less injurious than coal.

(17) A. G. asks: 1. Why does Dittmar powder, which is as strong as black powder, not give so loud a report as the black powder, and why does it give a long fire after being loaded in a shell for a couple of weeks? A. This is on account of the grain the powder possesses. The varieties of powder of this manufacture are so various that your mention is too indefinite. 2. Is there any book published that treats on gold, silver, and nickel plating? A. SCIENTIFIC AMERICAN SUPPLEMENT, No. 310, also "Galvanoplastic Manipulations," by A. A. Fesquet.

(18) T. F. writes: I am about to make four pricking wheels. Teeth apart, one 1 inch, one ⅞ inch, one ¾ inch, one ⅝ inch; would like to make them all one size—2 inches diameter. Can it be done? A. You cannot make the four pricking wheels of the same size. The following sizes are as near 2 inches diameter as possible:

For the 1 in.,	6	teeth,	6	in.	cir.	÷ 3·1416 = 1·909 in. dia.
" " ⅞ "	7	"	6⅛	"	"	÷ 3·1416 = 1·949 " "
" " ¾ "	8	"	6	"	"	÷ 3·1416 = 1·909 " "
" " ⅝ "	9	"	5⅝	"	"	÷ 3·1416 = 1·772 " "
Or,						
" ⅝ "	10	"	6¼	"	"	÷ 3·1416 = 1·989 " "

(19) E. S. inquires on which of the two pulleys will a 1½-inch leather belt drive best, grain side next to pulley, a leather covered pulley or one covered with rubber, speed of belt 250 feet a minute. A. Your belt will drive best upon a pulley covered with rubber. From experiments, a leather covered pulley with leather belting is 50 per cent better than an iron pulley with the same stress; while a rubber covered pulley with same belt and stress showed 100 per cent gain over the leather covered pulley, and 250 per cent over the iron pulley.

(20) J. B. asks: In the Blake transmitter which is correct—for the current to go from the battery to primary of induction coil, thence to transmitter and return to battery, or from battery to transmitter, thence to primary of induction coil and return to battery; and with the receiver which is correct—from the line wire to the secondary of induction coil, thence to receiver and to ground, or from line wire to receiver and to secondary of induction coil, and to ground. Please let me know the correct way. A. In either case the manner of connecting up is of no consequence.

(21) T. S. asks: 1. Is celluloid, that so much used artificial ivory, a good insulator of electricity or not? A. Yes. 2. For connecting it firmly with metallic parts—say by screws or any other means—what will be the safest method to avoid its partial inflammation. A. We know of no way of doing this, as it will ignite if sufficiently heated.

(22) F. G. C. asks how to take the taint out of a galvanized iron can which has held kerosene. I want to use it for hot water. A. Rinse the can several times with benzine, allow it to dry out, then rinse it with alcohol.

(23) O. B. asks: 1. With a bichromate of potash battery of six one gallon cells, how can I produce an electric shock, and of what power? A. Use an induction coil. With a very large one you can destroy life. 2. Is there any electric motor and battery capable of producing one-half horse power; if so, what name? A. The Siemens or Gramme dynamo electric machine will produce any amount of power with sufficient battery, but we cannot advise the use of galvanic batteries as producers of power on a large scale. 3. Which is the best book on electricity for beginners? A. Begin with Ganot's "Physics."

(24) J. L. M. asks for a process for galvanizing iron. A. The process for galvanizing iron is as follows: Clean all scale, rust, and dirt or oil from the surfaces—if oily, by boiling in caustic soda—and then remove scale and rust by a bath of hydrochloric acid and water. If necessary, a little scrubbing with a metallic brush, and then thoroughly rinse in hot water and dry quickly. Then immerse in a bath of melted zinc; at the same time sprinkle a little powered sal ammoniac upon the surface of the melted zinc to clear it. Judgment is required as to length of time for the immersion, and temperature of the melted zinc—very small work is immersed but a few seconds.

(25) H. E. H.—Small wire can be welded without difficulty by heating in a muffled olowpipe with a groove in the bottom of the muffle, so as to retain a little borax. Butt the ends together with a gentle force while at a welding heat, at the same time upsetting a little, so that when you hammer or swage down you will not lose any stock by burning. We think that this will succeed better than scarfing.

(26) W. W. S. asks: 1. What is the cause of steam boiler explosions, or your theory of the cause, or the acknowledged scientific theory, if any? A. There are many causes. Each case must be closely investigated to determine the cause. 2. Did not the United States Government, several years ago, make an appropriation and appoint a committee of scientific gentlemen to inquire into this matter? If so, and I think they did, what were their conclusions or report? I do not recollect of ever hearing, but think I recollect of such an appropriation, etc. Did this committee recommend a preventive, or discover the cause? A. The operations of the commission were terminated in the midst of the work and no report was made, and they made no recommendation.

(27) J. T. B. writes: 1. We have a set of boilers that have been in use more or less for eleven years; they are clean and don't leak, and are apparently in good shape. How long should a set be run with good care, and how long before the plates in the fire box become crystallized and brittle and dangerous? A. Some boilers are run for twenty years (if well constructed). Their life depends upon the water used and care which they have had. You should have them carefully examined by a competent engineer. 2. Please tell me the difference between a high pressure boiler and a low pressure boiler, and the difference between a high pressure steam engine and a low pressure steam engine. A. A high pressure boiler is constructed of a strength to carry high steam and a low pressure for low steam—say below 40 or 50 pounds. A high pressure engine, as ordinarily understood, is one exhausting into the atmosphere and a low pressure one exhausting into a condenser. 3. In setting a boiler, what should be the distance or height between the grates and the boiler to give the best results? A. For coal, 30 to 36 inches; for wood, 3½ to 4½ feet.

(28) C. S. asks: If the inside of a copper vessel and a very narrow copper "goose neck" pipe can be enameled by an acid (sulphuric carbonic) and alkali (soda) proof enamel, and in what way? A. Try the following: Cullet, 11 pounds; boracic acid, 7 pounds; bicarb. soda, ¼ pound; phosphate of lime, 3½ pounds; oxide of antimony, ¼ pound; finely powdered, mixed with water, and applied with a brush; finally fused on on when dry. Or the treatment detailed on page 3953, SUPPLEMENT 248, may be used, as it is acid proof also.

(29) L. H. T. asks: Is it possible that a shaft, 1¼ inch or 1½ inch diameter, or the steel arbors of a wood working planer cylinder, may be sprung or otherwise injured by pouring hot Babbitt metal on and around them in running the boxes in which they are to revolve? At about what heat should Babbitt metal be poured? A. It is a common practice in renewing or re-Babbitting boxes to use the journals for forming the moulds. The shaft will not spring perceptibly. If you paint the journal with a mixture of whiting and water and let it dry, the metal will run better. Pour with as little heat as will allow a full casting without cold sheets. Babbitt metal melts at about 600°.

(30) C. R. writes: 1. I have a desk on which, before I could varnish it, I spilt a large spot of ink. I would like to know how I can take it off without planing it or sandpapering. A. Use a solution of chloride of lime in vinegar. 2. Can I melt glass in a muffle furnace so it can be worked? A. Some soft American or German glasses may be fused in a muffle furnace.

(31) C. A. W. writes: The engine of my small tug boat, 5½ diameter by 9½ stroke, runs 3 to 1 of the paddle wheels. Could not friction wheels be used to connect in lieu of cogwheels, which cause great noise and vibration, and what sort and proportion? Paddle wheels 6·8 feet in diameter. A. Friction wheels would, no doubt, run without noise, but would take a little more power than gearing, because it requires some pressure upon their peripheries to maintain the required friction. The best grooved wheels, we think, are the multiple shallow grooves. If leather would not be out of place, we would suggest a broad thin leather belt, slightly rubbed with beeswax, and held close to the pulleys with a light tightening pulley. Two belts could be made to work together.

(32) W. E. F. asks: How much power can I get from an engine, 2 inch bore and 4 inch stroke, and what size boiler will I want to supply it with steam? A. You can obtain 1½ horse power by running, say 450 revolutions per minute. Boiler should have 38 to 46 feet heating surface.

(33) C. D. writes: We are using live steam in a kiln drier. The drier is placed 85 feet from a 10 x 20 engine, and we would like to know if we could use exhaust steam from the engine without cramping same by connecting exhaust pipe to both ends of the "header" inlet, which is a pipe 4 inches diameter, 11 feet long; and by opening both ends of the corresponding pipe for escape steam, this pipe being same length and size as above header; the two connected together by forty lengths of L-shaped pipes, 1 inch diameter, each being 22 feet long. Also would like to know what size pipe would be sufficient to connect engine with drier. A. You can exhaust through your drying coil without any difficulty. Connect the exhaust of the engine to the nearest end of the coil header with pipe of the proper size for the engine, so as not to materially effect the working of engine—say, for your engine, 2½ or 3 inch pitch. Also continue the same size pipe from the opposite end of the other header to wherever you wish to discharge the exhaust. Have a small drip (three-quarter inch) from the lowest part of header, so as to easily get rid of the water of condensation. You will not need double connections. You will get quite as much heat as from live steam by the difference between 212° and the temperature due to the pressure now used.

(34) J. H. R. asks: What is the difference in the durability and strength of malleable and common cast iron; also the difference in price of same; also how malleable iron is made? A. The difference in durability between malleable and cast iron depends entirely upon the manner of its use. For mere abrasion the cast iron is fully as durable as malleable; but for light pieces where there is much strain, as in harness trimmings and the like, malleable iron is preferable. The price of cast iron castings in New York is from 3 cents to 6 cents per pound, according to lightness. Some very light work costs as much as malleable. Malleable castings cost from 8 cents to 20 cents per pound, according to size and difficulty of moulding. Malleable iron is made by decarbonizing cast iron partly in a cupola by using low iron and reducing by burning out the carbon, and finally finishing the process after casting by annealing the castings inclosed in pulverized hematite iron ore or iron scales from a blacksmith's anvil.

(35) C. M. C. writes: 1. In the factory where I work they use the exhaust steam to warm the rooms, and would like to run the drip back to the water tank under the boiler and use the water in the boiler again. Will it cause the water to foam in the boiler? The engineer says it will. I cannot see how any oil can get into the boiler, as the tank is about four feet deep, and the water is pumped from the bottom and the oil would float on the surface of water. Please inform me through your paper what effect the oil would have on the water in the boiler if any should get in it, and how it can be used again. A. It will not foam to produce any injurious effect. Oil is sometimes introduced to stop foaming. By all means return the water to the boiler as a measure of economy. 2. Also, can you tell me of any way to treat glue so it will be elastic like gelatine copy pads, and be waterproof? A. Use glycerine, melting them together with a little water.

(36) J. P. asks if mountain or brook trout have scales. A. Very small scales.

(37) A. J. P. asks: Can water be drawn through a pipe 2 inches in diameter by a steam pump situated 3,500 feet from the reservoir, and about 20 feet above its level? A. Yes, if the pipe is tight, but the supply of water will, of course, be much less than if the pipe was but a few feet in length.

(38) L. J. asks: 1. How may I manufacture gas economically for blowpipe use? A. Gas cannot be manufactured economically on a small scale, and hydrogen is not safe. Use a Fletcher petroleum furnace jet or its equivalent with naphtha. 2. What is chlorinated lime, and how is it manufactured? A. Chloride of lime is manufactured by passing chlorine gas evolved from a mixture of hydrochloric acid and black oxide of manganese over lime held in trays as long as the latter will absorb it. 3. What is the centrifugal force of a 2-inch lead ball revolving around a 32-inch circle 60 times per minute? A. The centrifugal force of a 2-inch lead ball revolving in a 32-inch circle 60 times per minute is 2·83 pounds.

(39) J. H. S. wants information as to making and applying a wash for outhouses, fences, etc., to take the place of lime whitewash, but of some dark color—brown or stone color. A. Use melted pitch, or a mixture of lamp black, Venetian red, or similar pigment in spirits of turpentine, thickened with crude turpentine.

(40) W. W. W. writes: Can I get any more heat from steam at 50 or 60 pounds pressure (for heating houses or factories) than at 5 or 10 pounds pressure? If so, what is the difference? A. You can get more heat at the high pressure by nearly the difference in temperatures of the steam at the two pressures. Temperature at 5 pounds pressure, 228°; at 10 pounds, 241°; at 50 pounds, 301°; at 60 pounds, 311°.

(41) J. B. asks for a good receipt for a preparation to keep water out of a coat. I am a fireman, and my coat is made of canvas; it is oiled and coated with some sort of black mixture, but whenever I go to a big fire the water goes through it. A. Try the following treatment: Soap, 2 ounces; glue, 4 ounces; water, 1 gallon. Dissolve the glue and soap in the water by heating. The cloth or garment is boiled in this for a quarter of an hour and then rinsed out and allowed to nearly dry; then it is allowed to lie in the following solution for six hours: Alum, 13 ounces; salt, 15 ounces; water, 1 gallon. After which it is wrung out, washed with water, and allowed to dry slowly, when it is ready for use. 2. Give a mixture to rub on boots that will keep out water and keep them soft. A. Use pure neats-foot oil.

(42) J. W. asks for a simple and easy plan of procuring sample of water from bottom of a well 1,300 feet deep, 4½ inches in diameter. A. You may get a fair sample of water from a deep well by using the sand bucket, if you can make a leather valve on the upper end, and also make the bottom valve tight with a leather lining Or, if you wish to make one, take a piece of iron pipe—say 2 inches—one or two feet long, screw a coupling upon one end, make a hard wood plug to screw into the coupling with a hole in it three-quarters of an inch diameter, and a soft leather clapper, loaded with a piece of iron or lead nailed upon the inside the same as a common pump bucket. At the other end of the pipe make a bale of one-quarter or three-eighths iron, and arrange a leather valve upon a block of iron, so as to fit tight upon the end of the pipe and have the bale as a guide. Let the bale have an eye for fastening a line, and also be heavy enough to carry down the line if you have a great depth of water to pass through. The bucket in descending will allow the water to pass through freely, but when you pull up the valves, close and confine the water. The bucket must not be allowed to have any motion backward during the whole ascent while in the water, or you will lose the charge and take a new one at the point of change.

(43) F. J. C. asks for information about the reversing gear on Maxim's steam launch Flirt. I would like to apply it to an engine of mine, about 2½ horse power, as I think it cheaper and as good as the regular reversing gear. A. The eccentric is fitted on a sleeve which works longitudinally on the shaft on a feather parallel with the shaft. On the outside diameter of this sleeve is a spiral feather fitting in a spiral groove in the eye of the eccentric. As the sleeve is moved back and forth, the eccentric is revolved to the extent necessary for the proper lead when working ahead or back.

(44) J. S. asks: 1. What is the area of a safety valve 4 inches in diameter, and how many square inches does it contain? A. 12·50 square inches. 2. A lever 28 inches long, the ball weighing 50 pounds—how many inches back on the lever must the ball be put so as to blow off at 50 pounds of steam? A. You do not give the distance from the fulcrum to the valve.

(45) S. C. writes: 1. I am running a steam pump; the size of steam cylinder, 8 inches bore; water cylinder, 2½ inches bore; 10 inches stroke; discharge pipe, 1¼ inches; suction pipe, 2½ inches. Could I draw water from a well 75 feet deep, providing my plunger, water valves, and pipe were all tight, having foot valve on suction pipe, if I were to first fill my suction pipe and pump full of water, having pressure of steam to move piston? A. No; you cannot "draw" water more than 29 or 30 feet if everything is perfectly tight. The pressure of the atmosphere limits the height. 2. What is the greatest number of feet that water can be lifted by suction with an ordinary steam pump? A. You would not be safe to attempt more than about 28 feet.

(46) F. S. asks: 1. In calculating the horse power of compound engines, how is the pressure in the large or low pressure cylinder obtained? A. The pressure is generally obtained from the indicator card. 2. What are the duties and pay of oilers on steam vessels? A. About $40 per month; sometimes less.

(47) T. D. M. asks: 1. What action would electricity have on a fur-bearing animal killed by it? A. None. 2. I would like to know about sulphurous acid gas in reference to the same purpose. A. Sulphurous acid gas would not injure the fur.

(48) J. A. asks: Where can I obtain the latest and best information on the reduction of silver ores? A. Obtain Percy's "Metallurgy of Gold and Silver" from the booksellers who advertise in our columns.

(49) C. E. B. writes: 1. You refer in issue of Nov. 18, 1882, page 329, of SCIENTIFIC AMERICAN, to ether spray as a cure for neuralgia in the face. Is it safe for an inexperienced person to apply? A. No. 2. How is it applied? A. By means of an atomizer.

(50) H. C. A. asks for a receipt for removing lard oil stains from linen table covers. A. Lard oil is soluble in 36 parts hot alcohol. White goods may be washed with soap or alkaline lyes.

(51) C. W. asks for a receipt for making the cement for putting gum soles on shoes. A. (1) Dissolve 10 parts of caoutchouc, in small pieces, in 280 parts of chloroform by maceration, melt 10 parts more of finely cut caoutchouc with 4 parts of resin; add 1 part turpentine, and dissolve the whole in 40 parts of oil of turpentine. Then mix the solutions. For use dip a piece of linen in the cement and apply it to the article, which should also receive a layer of the cement before and after the application of the linen. (2) A cement is made by dissolving india-rubber in carbon disulphide, chloroform, or benzine. Apply as above.

(52) W. H. R. asks how to wash or erase ink from paper, ledger books, etc? A. Writing may be erased by washing it with a solution of chloride of lime and acetic acid. In the SCIENTIFIC AMERICAN for November, 1881, pyrophosphate of soda is recommended. It is best to first apply tallow to the ink spot, then wash in a solution of pyrophosphate until both tallow and ink have disappeared. Solution of potassium oxalate is sometimes used.

(53) F. R. H. asks for a process for treating barytes with oil of vitriol and steam to purify it. A. Barytes may be prepared artificially for use as a pigment by adding dilute sulphuric acid to a solution of barium chloride, when a white precipitate is formed, this is washed and dried. Also, it may be prepared by heating the native mineral, grinding it to powder, and washing it, first in dilute sulphuric acid in order to remove any traces of iron, and afterward in water; the white powder is then thoroughly dried. Such is the process at Matlock Bath, Derbyshire, England.

(54) P. H. L. asks: 1. If a phosphorus lamp of any degree of light can be made by pouring boiling hot sweet oil into a bottle with a small piece of phosphorus in it, and then hermetically sealing. If so, how can I boil the oil? A. To make a phosphorus lamp or bottle dissolve 24 grains of phosphorus in an ounce of olive or cotton seed oil. The two should be mixed in a thin vial (flask), which should then be placed in hot water. When the phosphorus melts, cork the vial and shake vigorously until nearly cold. Upon being uncorked, it emits considerable light. This is a difficult and dangerous manipulation. 2. Give process for erasing or absorbing writing ink after it has become dried on the paper. And if it can be made in a solid form to use as a rubber eraser is used for leadpencil writing. A. For this purpose a solution of oxalic acid may be used, into which the paper is dipped and then allowed to dry quickly. While the paper should be saturated with this solution, its pores should not be clogged, and in using it, it should be applied to the spot to be removed with gentle pressure. Remember oxalic acid is poisonous.

(55) E. N. H. asks: What is the composition of Seidlitz powders, and in what proportions? A. The blue powder contains 1 drachm bicarbonate soda and 2 drachms Rochelle salts intimately mixed. The white powder is one-half drachm tartaric acid.

(56) E. S. asks how to electroplate articles that are non-conductors of electricity, such as leaves, fishes, insects, etc.? A. The leaf is carefully dried, and laid upon a smooth piece of milled lead, which is placed between two steel plates and passed between rollers; these press the leaf into the lead, and produce a complete mould. Copies from this may be taken with gutta-percha or electrotype, Roseleur describes the copying of nettle and other leaves so perfect that all the hairs on their surface were to be seen. One of the sides of a fresh leaf was covered by means of a brush with a thin paste of plaster of Paris, and after the drying of the first coat other layers were applied, until a resisting block had been obtained with the leaf uppermost. The free side was then covered with several coats, always with a brush or pencil of gutta-percha dissolved in carbon bisulphide, and lastly with melted gutta-percha. The mould was removed from the leaf, metallized, and immersed in the galvanoplastic bath. To cast reptiles, embed the subject in a mould made of four parts of plaster of Paris, one of unburnt lime powder, and one of Flanders' brick dust. Dry the mould carefully in an oven, then make it red hot, and burn the subject out of it, taking care to free the mould from the ashes. Fusible metal may be cast in this mould, or a wax model may be taken of the object, pouring the wax in just before setting. The whole is now placed in water, the lime causes the mould to dissolve or break up, and the figure modeled within it may be taken and covered with copper and the wax afterward melted out. Flowers, insects, lizards, or other small animals may be typed in this manner.

(57) G. M. asks for a method of crystallizing tin plate. A. Heat the plate until the tin begins to melt, and dip it into a solution of 1 part of bichromate of potassa in 3 parts of water, 2 parts of muriatic acid, and 1 part of nitric acid. After rinsing well, muriatic acid is poured over the tin plate, and then a solution of 10 parts hyposulphite of soda in 120 parts of water. The crystalline flowers produced thereby display a great variety of colors according to the time of contact. Rinse well with water, then with alcohol, and lastly lacquer.

(58) E. H. B.: The following is a good fireproof cement: 1. Iron filings, 140 parts; hydraulic lime, 20; quartz sand, 25; sal ammoniac, 3. These are formed into a paste with vinegar, and then applied. The cement is left to dry slowly before heating. 2. Iron filings, 180 parts; lime, 45; common salt, 8. These are worked into a paste with strong vinegar. The cement must be perfectly dry before being heated. By heating it becomes stone hard.

(59) J. C. asks If there is any process known by which we can dissolve india-rubber or gutta-percha? A. Use bisulphide of carbon: be careful not to use it near a light or fire.

(60) D. H. V. asks for the best method of cleaning bronze statuary or other bronze ornaments, in the fine lines of which dust has collected? In the ordinary process of dusting I have not been able to remove the dust so collected, and which causes such ornaments to assume a gray, dingy appearance. A. Use weak soapsuds or aqua ammonia.

(61) O. N. N. asks how to soften tin that has been hardened by being heated too often, so that it will not injure its plating properties? A. Melt it again and add a little antimony.

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

M. M.—The sample you sent is composed of iron pyrites (sulphide of iron) in clay, and has no value, containing no gold or silver.

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Rare Chance.—To rent, brick building, 38x80, located on one of the leading railroads. New England city, 20,000 inhabitants, twenty-five manufactories, no practical machine jobber in city; offers facilities for establishment of first-class business to right man. For particulars address Box 923, Meriden, Conn.

What would poetry or prose be without a pen, and what is a pen worth without the name of Esterbrook stamped on it? Don't forget to ask your stationer for them.

Wanted to purchase, a Patent of Merit. Chas. Babson, Jr., dealer in patents, 24 Congress St., Boston, Mass.

Contracts taken to Manuf. small goods in sheet or cast brass, sheet steel, or iron. Estimates given on receipt of model. H. C. Goodrich, 66 to 72 Ogden Place, Chicago.

25" Lathes of the best design. G. A. Ohl & Co., East Newark, N. J.

Pure Grain Nickel, Rolled and Cast Anodes, Pure Nickel Salts. Greene, Tweed & Co., 118 Chambers St., New York.

Mfr's desiring a first-class specialty in hardware, on royalty, address W., Drawer 23, Goshen, Ind.

Physicians acquainted with Dr. Elmore's Rheumatine Goutaline pronounce it the *only real* remedy for rheumatic disorders ever discovered, and the best remedy for dyspepsia, kidney and liver disorders. Hundreds of city references. Sent anywhere by express. $2.25 & $1.50 per bottle. Elmore, Adams & Co., 105 William St., N. Y.

Drop Forgings. Billings & Spencer Co. See adv., p. 413.

For Pat. Safety Elevators, Hoisting Engines. Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 414.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423. Pottsville, Pa. See p. 412.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 414.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J.

4 to 40 H. P. Steam Engines. See adv. p. 412.

"How to Keep Boilers Clean." Book sent *free* by James F. Hotchkiss, 84 John St., New York.

Scientific Books. See page 396. Catalogues free. E. & F. N. Spon, 44 Murray Street, N. Y.

Engines, 10 to 50 horse power, complete, with governor, $250 to $550. Satisfaction guaranteed. More than seven hundred in use. For circular address Heald & Morris (Drawer 127), Baldwinsville, N. Y.

Brass Finishers' Turret Lathes, 13½ x 4, $165. Lodge, Barker & Co., 189 Pearl St., Cincinnati, O.

Wanted.—Patented articles or machinery to make and introduce. Gaynor & Fitzgerald, New Haven, Conn.

To stop leaks in Boiler Tubes use Quinn's Patent Ferrules. Address S. M. Co., So. Newmarket, N. H.

Latest Improved Diamond Drills. Send for circular to M. C. Bullock Mfg. Co., 80 to 86 Market St., Chicago, Ill.

Water purified for all purposes, from household supplies to those of largest cities, by the improved filters manufactured by the Newark Filtering Co., 177 Commerce St., Newark, N. J.

Assays and Analyses of ores and all commercial products. Advice given and investigations made in all branches of chemical industry. Send for circular. N. Y. Assay Laboratory, 40 Broadway, New York.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Steam Pumping Machinery of every description.

Combination Roll and Rubber Co., 68 Warren street, N. Y. Wringer Rolls and Moulded Goods Specialties.

First Class Engine Lathes, 20 inch swing, 8 foot bed, now ready. F. C. & A. E. Rowland, New Haven, Conn.

Improved Skinner Portable Engines. Erie, Pa.

Ice Making Machines and Machines for Cooling Breweries, etc. Pictet Artificial Ice Co. (Limited), 142 Greenwich Street. P. O. Box 3083, New York city.

Lace Cutters. A useful little tool for cutting lace leather without waste. Greene, Tweed & Co., New York.

Steel Stamps and Pattern Letters. The best made. J. F. W. Dorman, 21 German St., Baltimore. Catalogue free.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works. Drinker St., Philadelphia, Pa.

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

Cope & Maxwell M'f'g Co.'s Pump adv., page 12.

Curtis Regulator, Float, and Expansion Trap. See p. 12.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Diamond Saws. J. Dickinson, 64 Nassau St., N. Y.

50,000 Emerson's Hand Book of Saws. New Edition. Free. Address Emerson, Smith & Co., Beaver Falls, Pa.

Eagle Anvils, 10 cents per pound. Fully warranted.

Gould & Eberhardt's Machinists' Tools. See adv., p. 12.

For Heavy Punches, etc., see illustrated advertisement of Hilles & Jones, on page 12.

Barrel, Key, Hogshead, Stave Mach'y. See adv. p. 12.

Magic Lanterns and Stereopticons of all kinds and prices. Views illustrating every subject for public exhibitions, Sunday schools, colleges, and home entertainment. 116 page illustrated catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., New York.

Fine Taps and Dies in Cases for Jewelers, Dentists, Amateurs. The Pratt & Whitney Co., Hartford, Conn.

Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 14.

For best low price Planer and Matcher, and latest improved Sash, Door, and Blind Machinery, Send for catalogue to Rowley & Hermance, Williamsport, Pa.

The Sweetland Chuck. See illus. adv., p. 14.

The Porter-Allen High Speed Steam Engine. Southwork Foundry & Mach. Co., 430 Washington Ave., Phil. Pa.

Knives for Woodworking Machinery, Bookbinders, and Paper Mills. Taylor, Stiles & Co., Riegelsville, N. J.

Advertisements.

Inside Page, each insertion - - - 75 cents a line.
Back Page, each insertion - - - $1.00 a line.
(About eight words to a line.)

Engravings may head advertisements at the same rate per line, by measurement, as the letter press. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.