Notes and Queries

[We herewith present a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

1.—Will some one please inform me how small birds are stuffed, and what is used?—A. A. O.

2.—Why do steam boiler plates crystallize over the fire, while feeding the furnace in front has a tendency to harden the iron?—B.F. M., of Ohio.

3.—How can I remove stains of blood or oil from the feathers of stuffed birds?—W. R. F.

4.—What properties are essential or indispensable in a soil or clay for making good brick?—H. C.

5.—Will some one give me directions to make a telescope for my rifle? The distance between the center of dovetail on front end and the rear peep sight is 29¼ inches.—C. E. R.

6.—If a tube of 36 inches hight from its base, and an inch in diameter and graduated in a hundred parts, stands at zero in still water, how high will the water rise in the tube if placed in a stream of water running at the rate of 12 miles an hour?—S.

7.—What articles are used and what is the proportion of each, in the composition of the white powder used for stamping with perforated patterns for braiding and embroidery? What is the paper or parchment used for making perforated patterns? What kind of machine is used for perforating?—J. M.

8.—I recently made a Leyden jar, by coating a two quart candy jar in the usual manner. I could not charge it; and when I insulated it and charged it through the knob, electric sparks could be drawn from the outer coating. I tried another jar of the same kind, with a similar result. Is it possible that the electricity could pass through the glass, and is some glass permeable by electricity? I have other jars which work well.—N. E.F.

9.—Upon what part of the face of a 4 feet mill stone, weighing 1,500 lbs. and running at a velocity of 180 revolutions per minute, will the least amount of power grind a given amount of grain in an hour, and what is the proportioned amount of resistance to the power at 12 inches, 18 inches, and 24 inches respectively from the center?—G. B. R.

10.—Will some one tell me if there is anything which will remove fly specks and other soils from gilt picture frames without also removing the gold? Is there any way of cleaning the light bronze gas fixtures without injuring the bronze? Can white window shades be done up with the same gloss and stiffness as when new?—F. E. V. E.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at $1·50 a line, under the head of "Business and Personal."

ALL references to back numbers must be by volume and page.

C. T. W., of N. Y., will find good recipes for preventing rust on and browning gun barrels on pages 154 and 266 of our volume XXVI.

J. R. S., of Mass., will find elaborate directions, with an illustration, for constructing cone pulleys, on page 100 of our volume XXV.

A Subscriber will find directions for building an ice house on page 130 of our volume XXV.

Will you or any one inform me if there is any method by which magnetism can be permanently retained in a piece of steel: or, in other words, is there any such thing as permanent magnetism; and at the same time mention, if it can be done, where I could get steel so magnetized?—J. P. Answer: Any magnetized piece of steel will retain its magnetism permanently. Any philosophical instrument maker will do the work for you. You can do the work yourself by rubbing the piece of steel with one of the poles of a common horseshoe magnet.

F. O. B., of Ill., says: I would like to enquire whether air compressed into a vessel and allowed to cool to the temperature of the surrounding air loses any of its pressure in cooling. Also, if allowed to escape when cooled, into another vessel, it will lower in temperature to correspond to a reduction in temperature. Answer: Yes. Compressed warm air is reduced in pressure by cooling. Within certain limits of temperature and pressure, air expands 1-491 of its volume for every degree of Fahr., of increased temperature and contracts accordingly by cooling. Contraction of volume of course reduces the pressure. Air under compression, when allowed to escape, is by its expansion reduced in temperature.

W. P. H. sends a diagram of a method of spacing a horizontal line into equal divisions, thinking that it is a new and quick method. By reference to Euclid, he will find that the method is not new.

J. H. S.—The mineral you send is calcite or carbonate of lime, and similar to coarse granular marble.

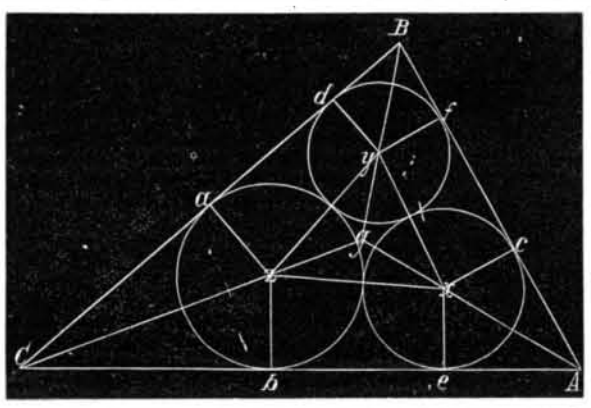
F. D. H. asks: How can I prepare bladders to be used as gas bags, rendering them soft and pliable? Answer: Try a little glycerin.

D. G. N., of Ark., will find the best method to run a 12 horse power engine to saw logs to be as follows: Belt direct from a six foot balance wheel to the saw pulley, which should be of 18 inches diameter; govern the steam by a butterfly valve by hand, shutting off steam just as the saw gets out the log; drill a ⅛ inch hole in the valve, which will just keep the engine moving, feed ½ to 1 inch at each revolution of the saw, and let it run as fast as the engine will carry it. I once sawed 5,000 feet per day, for 40 working days in succession, in this manner. But he must have a good foundation, as the engine will run 250 revolutions at times, with a 4 foot saw. We burned the saw dust as fast as made, but we had a 30 horse power boiler to an 8 inch cylinder engine, using steam at 80 lbs. We also did well with an 8 inch cylinder portable, with two boilers.—C. E. G. of Conn.

What is the reason that the old fashioned long stroke engines are all laid by, in places where they use stationary engines?—H. R. H. Answer: The reason why the high speed engines are preferred is because they develope more power from the same quantity of fuel, than the old fashioned engines. The theory is that the piston and rod, cross head and other reciprocating parts, if they have a high speed, act upon the principle of the fly wheel, absorbing the force of the steam at the commencement, and giving it at the end of the stroke. The practical effect is to do away with the unequal steam pressure experienced in ordinary engines, securing in lieu thereof a uniform rotative pressure on the crank. The strain on each dead center is avoided in the high speed engine, and a uniform smoothness of running is attained. In a competitive trial in England not long ago, of two engines with cylinders of the same size, using the same weight of steam per horse power per hour, the high speed engine developed 43 per cent more horse power than its low speeded competitor.

At what angle should a drill, to go the quickest speed through cast iron, be made? Will the same angle be the best for drilling wrought iron and steel?—C. E. G. Answer: for cast iron the cutting edge of the drill, should be on an angle of twenty to twenty-five degrees; for wrought iron the drill should be sharper. The cutting angle to be used is varied with the quality of the metal.

GEOMETRICAL PROBLEM.—To J. S. E., query 7, page 298.—



Let A, B, C, be any triangle, the sides of which being known, the angles may be found in the usual manner. From g, the center of gravity, draw lines bisecting the angles. Let x, y, z, be the centers of the circles. From x, y, and z, let fall upon the sides AB, BC, CA, the perpendiculars, xc, yf, yd, za, zb, xe. Join xy, yx, zx. Then,

AB equals Ac plus cf plus fB. (1.)
BC equals Bd plus da plus aC. (2.)
CA equals Cb plus be plus eA. (3.)

$$Ac = cx \tan.\frac{A}{2},\ cf = \left((yx)^2-(cx-fy)^2\right)^{\frac{1}{2}},\ fB = yf \tan.\frac{B}{2}.$$

Substituting these values in equation 1, we have an equation in which the side A B is given in terms of the perpendiculars cx, yf. In like manner from equations 2 and 3 will result equations giving the values of BC and and CA in terms of dy, az and zb, xe. From these the value of Ax, By and Czare easily obtained. J. S. E. can solve the problem thus indicated, taking care to use the table of natural tangents, etc., at his leisure.—H.F., of Ind.

M. S. of Va.—The mineral you send is asbestos. We believe the market is rather overstocked with the article at present.

What is the best way to rid a cistern of worms? The water is used for cooking purposes, and the worms are a source of great annoyance.—A READER. Answer: Tell us how your cistern is supplied and located, and what sort of worms you are troubled with.

Will you please inform me if there is an apparatus for producing light from electricity to take the place of gas?—G, E. B. Answer: Yes. The electric light is extensively used in England for lighthouses; but in this country it is not employed very much. The lecture rooms of some of the colleges have them. The electric light is expensive as compared with gas.

Has there ever been laid in this country a roadway pavement of the Scrimshaw or Abbott's concrete patent (or any other coal tar pavement) which has proved a success?—R. E. M. Answer. Yes. Such roads, properly made, are excellent. You will see examples of them in New York and Brooklyn. They are used quite extensively in the latter city,

Can your correspondent E. H., or some one else, tell me how to make good cider? I especially want directions for treatment after the cider leaves the press, and for preserving it by bottling or other means.—J. W. B. Answer: By placing a little of Professor Horsford's neutral sulphite of lime in the barrel, you can at once arrest fermentation at any point you wish, and keep your cider sweet for any desired length of time.

Please give me the figures for finding the capacity of a boiler which is 15 feet long, 4 feet diameter, and contains 30 four inch flues, and also the number of gallons of its capacity. Also the name and composition of the enclosed specimen of rock (rather poor) which was sent to me from some part of Baltimore county, Maryland.—I. P. H. Answer: The contents of the boiler, space occupied by flues deducted, will be about 975 gallons. To compute the volume of a cylinder multiply the area of base by the length. To compute the area of a circle multiply half the circumference by half the diameter. The mineral you send is asbestos.

What is carboline gas? In what manner is it produced, and how is it used?—A. S. Answer. We do not know of any such gas.

C. C. A., of Cleveland, asks: What galvanic battery is the best for all general use? Answer: The kind used at the telegraph office in your city.

W. R. H., of Ill., says:—We are preparing to build a church house in our vicinity forty-four feet long. What should be its width and hight to render it easy and agreeable both to the speaker and hearer? Answer: The width should be 30 feet and the hight 20 feet to the eaves and 20 feet more to the ridge. Lath and plaster on the under side of the rafters, making your ceiling the same pitch as your roof without any arch to the ceiling; then break it up by showing the principal trusses (three in number) extending across the roof. It is best to make these simply to consist of the two rafters and a short hammer beam at bottom on each side, and, in the absence of buttresses, connect these by a 1¼ inch iron tie rod. At the center of each tie rod, bring a rod down from the ridge to support the chandeliers, with an ornament at the intersection of the two.

Fig. 1.

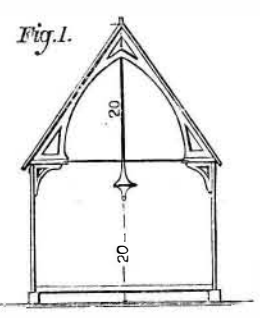
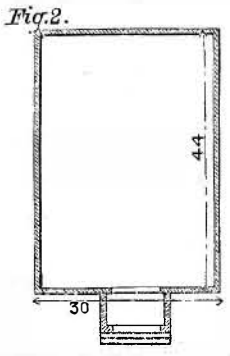


Fig. 2.



How can I cheaply obscure the window glass, to make it appear like ground glass?—L. Answer: Use a ball of putty and dab the glass.

W. P. says:—I send you a specimen of mineral; will you please say what it is, and its value? Answer: The incrustation on the stone is iron pyrites, of no value unless found in large quantities.

Can I coat a small part of a tin roof, that is leaky, with any thing to keep out the water for a few months, and if so, what?—L. Answer: Cover the cracks with rags dipped in melted asphaltum.

I want to make a marine aquarium. Can I compound a sea water that will do?—L. Answer: Probably not. But you can try. Ordinary sea water contains eight or nine different salts besides chloride of sonium. For quantities, consult any good chemistry.

Will you or some of your many readers inform me the origin and nature of the smoke of Indian summer? Also, is there a paper devoted exclusively to poetry; if so, where is it published?—W. S. H. In the fall of the year the burning of leaves, brush wood, and grasses loads the air, in some localities, with smoke, which in calm weather remains suspended in the atmosphere for some time. The ordinary blue haze, seen in the distance, is supposed to be due in part to the presence of minute particles of matter floating in the air, and in part to watery vapor suspended in the air.—We believe there is no paper published that is wholly devoted to poetry. But such a publication might be made a success, especially if it were wholly produced in verse. Such a paper would be in journalism somewhat like the opera in theatrical representation.

G. P. says:—Will you please inform me what is the fastest running time (well authenticated) ever made on any railroad in this country or in Europe? Answer: One of the fastest railway train records in this country is that of the special relief train, carrying men and steamers, which ran from Worcester, Mass., to Boston, November 10, 1872, during the recent conflagration. Distance 44 miles; time of run 45 minutes, being at the rate of over 63¾ seconds per mile, or over 56¼ miles per hour. It is probable that portions of the distance were made at a considerable faster rate of speed than the above, and other portions at less speed. A velocity of sixty miles an hour is often obtained on first class railways on straight portions of the track.

A. D. B. says:—The reservoir at the top of my house receives the water from Wenham Pond. My plumber declares that it would not be safe to apply a ball cock to the supply pipe, as he fears that the pipe would not stand the pressure. Does it not have to bear just as great a pressure with the arrangement the plumber has put in, namely, a cock in the lower story, which is opened by hand, and closed when a telltale pipe shows that the reservoir is full? Answer: The pressure in water pipes varies with the hight of the supply. If your house reservoir, supplied by cock, as stated, is 34 feet above the ground, the greatest pressure in your water pipes, at the surface of the ground, will not exceed 15 lbs. to the square inch. If Wenham Pond is 340 feet above your ground, then the pipe leading through your house up to the ball and cock at the reservoir would have to resist a pressure of nearly 150 lbs. to the square inch. So great a pressure in a dwelling house is not desirable, as the pipes, unless made of unusual strength, are likely to leak and do mischief. It is to avoid risk of leakage under high pressure, and consequent damage, that your plumber has put in the cock down stairs.

H. A. H. G., of S. C., says:—I enclose you a specimen of something, I don't know what; it is found tolerably plentiful a few miles from this place. You will do me a favor by answering what you think it is. Answer: The mineral is black tourmaline, of no use in the arts.

To F. A. S., query 17, page 314.—Get the regular transfer pictures, then cover the picture with a slight coating of varnish; let it stand 10 or 15 minutes, put your picture on the glass or wood. rubbing it gently so that the air is all pressed out, let it "set" a few minutes; then sponge it off nicely with water, taking care to let your paper get thoroughly wet, then raise the paper gently; when dry, varnish with finishing varnish.—A. A. O., of Iowa.

In answer to your correspondent from Tennessee, mentioned in your editorial on page 295, I will say that there are moments when a quantity of water is instantly converted into steam. If much steam escapes, the disturbance in the boiler mixes the water and steam, so that the water becomes instantly evaporated. This stirs up the mud in the boiler, as is frequently seen on trying the gage cocks. I believe this is the cause of many explosions.—F. B. C., of N. Y.

W. E. F., query 2, page 298, will find the following mixture to be the best lasting and cheapest wash paint for the preservation of shingles: Take two pecks of the best unslaked lime; slake it with boiling water, keeping it covered during the process. Strain the liquid through a fine sieve, and add to it one peck of salt dissolved in warm water, three pounds rice flour, boiled to a thin paste, stirred in boiling hot, one half pound powdered whiting, and one pound glue, well soaked and dissolved in a water bath. Add five gallons of hot water to the whole mixture and let it stand a few days; heat and apply it while hot.—F. S. B., of Me.

P., query 11, page 249, should use pulverized alum and saltpeter, in about equal parts, as a substitute for arsenic. By experience I find oakum superior to cotton or hemp in stuffing, as the tar it contains tends much to the preservation of the skin.—W. R. F., of Mass.

To J. W. S., query 13, page 314.—Silk is generally used, and is, I believe, the best material.—F. S. B., of Me.

J. F. S., query 29, page 314, can make litmus paper by taking 1 oz. litmus, 5 ozs. alcohol, 5 ozs. water. Put them in a ten ounce bottle, and shake them occasionally during five or six days, when a deep blue tincture will be obtained. Pour off the clear fluid into another bottle. To prepare the paper, pour a little in a plate, pass blotting paper through it in sheets, and hang it up to dry. This is for the acid test. For alkalies, take some litmus paper, pass it through weak vinegar, hang it up and let it dry. This is a very delicate test. Another test paper can be made by taking 1 oz. powdered turmeric wood, 5 oz. alcohol, 5 oz. water; prepared as the litmus paper.—W. M. F., of N. J.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

LEATHER CUTTING TOOL.—John Sweezy, Elizabethville, Pa.—This invention has for its object to furnish an improved tool for cutting strips of leather for fly nets and for other uses, which will cut four, more or less, strips at a time, and will cut them equally true from a side of leather or other irregular piece as from straight pieces, and whether the leather be the thinnest morocco or leather three sixteenths of an inch thick; and it consists in the arrangement of the adjustable gage plate, and in the combination of a spring guard with the knife block and cup block formed on the respective handles of the instrument.

FEED WATER HEATER.—Nathaniel Jones, Buffalo, N. Y.—This invention relates to the class of feed water heaters consisting, in general terms, of a series of pans or troughs arranged with a series of heat radiators within a case, so that the water in flowing downward falls from the first series of troughs on to the radiators next below them, and from the radiators on to the troughs in the next series, thus alternating till the final receptacle is reached. The invention has for its object to furnish a heater in which the water pans and steam and water guides are arranged to secure the speediest utilization of a given amount of heat with the least complicated and expensive construction of the apparatus.

FOLDING BEDSTEAD.—H. Harrison Hill, Pontiac, Ill.—The invention relates to bedsteads that fold together by having the rails hinged to the head and foot and the slats pivoted to the rails; and it consists in vertical cleats on the inside ends of rails to strengthen rails and give sufficient thickness for one leaf of hinge.

LAMP CHIMNEY PROTECTOR.—Edward Stern and Sigmund Blau, New York city.—This invention consists in a lamp chimney protector, consisting of two bars pivoted together at one end and provided with hooks at the other, so as to be adapted to use in chimneys of varying size.

ORE SEPARATOR.—Johann Friedrich Utsch, of Iserlohn, Germany.—This invention relates to a new self-acting jig machine, in which separate chambers, having separate discharge openings at varying hights, are arranged for the reception of the several kinds of ore, salts, or other material which are to be separated from one another by virtue of their varying specific gravity. By having the said chambers so united as to permit a free flow of the ore from one to another, the process of separation is greatly facilitated, and the separation carried on with greater certainty than in the jig machines now in use.