

Burnett's Cocoaine dresses the hair perfectly, without greasing, drying, or stiffening it.

Notes & Queries.

- 1.—PURIFICATION OF ZINC.—How can old zinc be made pure, or nearly so?—E. M. D.
- 2.—APPLICATION OF GUTTA PERCHA.—How is the gutta percha, which surrounds the helices in most telegraph instruments, put on?—E. M. D.
- 3.—GALVANOMETER.—How can I construct a cheap and effective galvanometer for galvanic electricity?—E. M. D.
- 4.—CLEANING BRONZE.—Will some of your readers give me a receipt for cleaning bronze chandeliers, etc?—T. E. L.
- 5.—SCENE PAINTING.—What kind of paint, that will not rub off, is the best to use for painting scenery?—Q. R.
- 6.—CEMENT FOR CAST IRON.—How can I make a cement or stopping cracks in cast iron pots, to make them water tight?—C. C.
- 7.—MEASURING ALTITUDE BY BOILING WATER.—Is there any way to tell the elevation above the sea, by the boiling point of water, with the aid of a thermometer?—F. A. C.
- 8.—GALVANIZING SMALL IRON CASTINGS.—I want to know the cheapest and simplest way of effecting this.—J. E.
- 9.—BREAKING UP OLD IRON.—I would like to know the best method, to be operated by one man, of breaking up old car wheels.—W. L.
- 10.—SPEED OF SHAFT.—How many revolutions per minute is it safe to run a shaft containing two cast iron arms, 20 inches long, and 4 inches square? As the work is to be done by the speed, it is a question as to how fast it is safe to run it.—W.
- 11.—POLISHING WOOD.—Will some one of your correspondents inform me how to construct a polishing wheel to polish boards of both hard and soft lumber?—W. M. H.
- 12.—STEAM ENGINE CONSTRUCTION.—If two engines are set quartering, so that they both work on one crank, will one eccentric do to work both valves, and do it as well as one eccentric to each valve?—M. H. A.
- 13.—VOLTAIC PILE.—Will some correspondent please inform me how to make a cheap voltaic pile?—T. F. G.
- 14.—GINGER BEER.—Will some one give me a receipt to make ginger beer, that will keep good for a month, and also, the best mode of fermenting, filling bottles, corking, tying, etc?—F. L. C.
- 15.—PRESSURE IN STEAM BOILER.—Which make the greater pressure on a steam boiler, steam of one hundred pounds to the square inch, or hydrostatic pressure of one hundred pounds to the square inch? Which strains the boiler most?—D. R. R.
- 16.—BORING CONICAL CYLINDER.—How can I bore out a hole in a cylinder 40 inches long, tapering truly from end to end, 12 inches in diameter at one end, and diminishing one eighth of an inch in the 40 inches? I am to do the job with ordinary tools of a machine shop, on a lathe with a boring bar 10 feet long.—J. F. W.
- 17.—VARIATION OF THE COMPASS.—Will some one please inform me, through the SCIENTIFIC AMERICAN, what the variation of the compass is, this year, at Portsmouth, N. H., and whether, and how much a year it is increasing or decreasing?—F. A. C.
- 18.—RINGING GOBLET.—Will some reader please inform me what is the cause of a goblet ringing when the wet finger ends are rubbed on the upper edge of the glass?—W. H. R.
- 19.—DIVIDING A CIRCLE BY RADII.—Is there any method, other than the tedious one by repeated trials, of dividing a circle into a given number of equal parts, when the number is a large prime number, say 61 or 73?—R. C. W.
- 20.—HARDENING IRON BY ROLLING.—Can thin—say one sixteenth inch—iron be cold rolled as hard and elastic as if hammer hardened? And if so, what kind of rolls should be used? Would a roll of large diameter, and a flat, movable bed do?—W. S. H.
- 21.—HYDRAULIC CEMENT.—Will some one kindly furnish, through your columns, a formula for manufacturing hydraulic cement, and a description of the stone used for that purpose?—J. A. T.
- 22.—METALS UNDER STEAM PRESSURE.—Which of the metals, iron, steel, brass, copper, or any other, excepting gold, that will resist the action of steam, will expand most when immersed in steam, say at 100 pounds per inch?—J. A. T.
- 23.—GASOLINE.—Will some of your readers please answer the following questions? What are the chemical constituents of gas evaporated from gasoline? Is it explosive when mixed with common air, and, if so, in what proportion? What is the cost per 1000 feet, not counting interest etc., on machinery? An early answer will oblige.—J. A. G.
- 24.—SAND IN DRIVE WELL.—I have a four inch drive pipe well, 75 feet deep. There is a rock bottom at a depth of 81 feet. When opened, an abundance of water was freely pumped; but having no use for it he pump stood a week or so, at the end of which time pumping was resumed, but little water came. The cause was found to be no less than ten feet of solid sand in the bottom of the pipe. Will some of your readers tell me how to get the sand out?—W. L.

Answers to Correspondents.

SPECIAL NOTE.—This column is designed for the general interest and instructions 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 100 a line, under the head of "Business and Personal."

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

- S., of Tenn.—The largest steam hammer in the world is, we believe, the 100 ton hammer at Krupp's steel works in Prussia.
- FRICITION PULLEY.—Will a friction pulley with six inches face have as much friction power as one twelve inches face with the same pressure? Answer: If similarly constructed, yes.
- RUBBER PACKING TO PREVENT FRICTION.—The device described by J. W. S. is neither new nor patentable.
- CEMENT FOR SHEET IRON AND RUBBER PACKING.—Let J. M., query 8, January 20, 1872, try a white lead paint on the iron. Leather or rubber can be glued on to an iron surface thus prepared.—D. B., of N. Y.
- VOLUME OF HYDROGEN.—To W. W., query 1, February 3, 1872: One ounce of hydrogen measures 22,371 cubic inches.—D. B., of N. Y.
- BENDING GAS PIPE.—This may be done by filling the pipe with molten resin. When the resin hardens, bend the pipe, and it will retain its round form. Remove the resin by heating.—W. H. R., of N. J.

WATERPROOFING COTTON CLOTH.—H. W. U., query 3, January 20, 1872, is evidently not a steady reader of your journal. Many recipes for this purpose have been given, and two new ones appear on page 105, current volume.—D. B., of N. Y.

A. D. N., of O.—Increasing the diameter of cylindrical boilers increases the strain resulting from steam pressure upon them, directly as the increase of diameters.

M. H. B., of Mass.—Your queries cannot be answered properly in any space we can give you in this column. You ought to obtain a good work on the steam engine, and read it for the information you seek.

SAW MILL GEARING.—To T. B., query 13, January 20, 1872: The weight of the saw has nothing to do with the question. You have to counterbalance the lower end of the pitman only. Therefore lay the pitman in a horizontal position and weigh the end which connects on the face plate, including the wrist pin; and you have the weight to counterbalance.—P. B.

FACING OIL STONES.—Your correspondents, who have written on this subject, have not yet described the best way of doing it. I go to a foundry and take any flat casting from which the scale has not been removed; by rubbing the stone on it, as on a board with emery, I can true an oil stone in one fourth the time needed for any other method, and I have tried them all.—J. E.

PRESERVING NATURAL FLOWERS.—R. A. L., query 1, February 10, 1872, should dip the flowers in melted paraffin, withdrawing them quickly. The liquid should be only just hot enough to maintain its fluidity, and the flowers should be dipped one at a time, held by the stalks and moved about for an instant to get rid of air bubbles. Fresh cut flowers, free from moisture, make excellent specimens in this way.—D. B., of N. Y.

COPPER DIP.—S. D. R., query 2, February 10, 1872, is informed that sulphate of copper is soluble in four times its weight of water at 60°, and that this proportion furnishes the strongest pickle. A coating of the required thickness may be produced by dipping the articles several times.—D. B., of N. Y.

R. M. C., of Mass., says: "I would like to inquire, through your paper, if there is any way to bleach ivory, and if so, how it is done?" Answer: Ivory is bleached by exposure to sunlight. For piano makers and others, it is prepared by first sawing it into thin sheets or plates. These are placed on suitable frames, under glass, and exposed to light for several months. The frames are of peculiar construction and patented. They are so arranged as to shift, thus reversing the exposure of the ivory, so that both sides may be duly acted upon by the light.

C. G., of N. J.—It is probable that the draft of your chimney is insufficient. The gases you detect, by smell, as escaping therefrom are certainly deleterious. It may be also that you use a damper between the fire chamber and chimney to regulate combustion. This would be wrong, and sure to result in the forcing of gases out into the room. The damping should be done at the throat of the stove, never in the uptake. If the stove is not made so that this can be done, it is not fit for use.

COLORING BAND FOR HOUSE'S TELEGRAPH.—Reply to R. I. H., query 6, page 90. The coloring band of the House printing telegraph is a common narrow silk ribbon, saturated with a mixture of lamp black, ivory black, sweet oil, and turpentine. The ink sold for hand stamps answers the purpose very well. Electro-chemical telegraphic paper may be prepared in several ways. Bain used a solution of yellow prussiate of potash in water, to which was added two parts nitric acid and two parts ammonia. With an iron style, this gives a dark blue mark on the passage of the electric current. Another formula consists of one part iodide of potassium, 20 parts starch paste, and 40 parts water. This gives a brown mark which, however, is not permanent, fading out in a few hours.—F. L. P., of N. Y.

STEAM ENGINE FOR SAW MILL.—I would say to NEMO, query No. 16, of January 20th, that it is very doubtful if he can ever obtain "satisfactory results" in running a circular saw mill with a ten horse power thrasher engine. He might increase the size of his mandril pulley, and run his engine faster, but even then he would lack in steam making capacity. He had better not attempt it at all, but procure a portable muley mill. They are made especially for engines of that class; can be run with one half the expense, and are said to do nearly or quite as much as a stationary muley.—A. D. N., of O.

SAFETY GUNPOWDER.—Would it not be an infinite saving, to property holders in cities and to insurance companies, if a plan could be invented to make gunpowder perfectly safe from explosion, so that the merchant's house and stock and the surrounding neighborhood and human life would be perfectly protected?—INVENTOR. Answer: Any plan for making gunpowder in explosive, while in stock, will meet with general approval.

AIR PRESSURE AND SUCTION.—P. D. asks how to prove that the pressure of the air, and not suction, raises the water in a pump. Let him take a straight lead pipe forty or more feet long, fill it with water, and plug both ends tight. Then, holding it perpendicularly, let him immerse the lower end in a pail of water and remove that plug. After all the water that will has drained from the pipe, let him replace the plug; and, on examination, he will find water enough remaining in the pipe to fill it to about thirty-two feet above the water in the pail. Then ask any unbeliever to explain why the water did not all run out. After he has done it satisfactorily on the suction theory, then ask him to explain why it would all run out if the upper plug were removed?—M., of Mass.

COMPOUND GEAR FOR SCREW CUTTING.—Some time ago R. H. S. asked for a simple rule for cutting threads by compound gearing. Since that time I have anxiously waited, and still wait, for such a rule. Many of your correspondents don't seem to know what compound gearing is, and give rules for simple gearing, and such rules as would be of very little use to a practical machinist. Imagine a machinist being ordered to cut a three eighth set screw two inches long for an engine ready to go out, and attempting to find his gear by the rule given by C. F., of N. Y., while, in reality, he need only multiply the number of threads in the leading screw and the number of threads to be cut by the same number. For instance, the screw is 6, and he wants to cut 8. Multiply by 3, which gives 18 and 24, or by 3½=21 and 28, or by 4, which gives 24 and 32; any of these pairs will cut the required thread. By this method, you can see that in a few seconds many sets can be found to cut the required thread without the use of pencil or chalk. Even if he wants to cut 8½ threads, or any bastard thread, the rule holds good, and is what I call a practical rule for single gears.—J. P. M. C.

SAW FILING.—In query 7, Jan. 27, C. M. B. wants to know how to file a cut off hand saw. I find by the practical use of said tool (which any one who pretends to file a saw should not be without) that the saw should be filed as follows: Put the saw into the clamp with the handle to the left hand always; run a file lightly across the teeth, as this will keep it straight, and give the filer a chance to see clearly the points of each tooth, which is necessary to a good job. Take the file and commence at the point of the saw, holding it (the file) at an angle of about 30° by lowering the right hand, and about 15° towards the handle of the saw. The file is to be so held as to file the front side of the tooth that is set from him and the back side of the one that is set towards him; and the point of the tooth should be but a trifle forward of the middle of the base. A saw to do nice work should have the least possible set in it, and must be a good tooth in every respect. I have had over twenty years practical experience in the use of the saw, and have filed many saws in shops where I have worked; and I do not recollect ever having a fault found with one that was filed in this way. It is my experience that this is the only right way. When he has filed one side, he will see that he must reverse the saw in the clamp to file the other side. In filing in this way, the front edge of the tooth will be the thinnest.—A. D. W., of Mass.

Practical Hints to Inventors.

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How Can I Obtain a Patent?

As the closing inquiry in nearly every letter, describing some invention which comes to this office. A positive answer can only be had by presenting a complete application for a patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning. If the parties consulted are honorable men, the inventor may safely confide his ideas to them; they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

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Construct a neat model, not over a foot in any dimension—smaller if possible—and send by express, prepaid, addressed to MUNN & Co., 37 Park Row New York, together with a description of its operation and merits. On receipt thereof, they will examine the invention carefully, and advise you as to its patentability, free of charge. Or, if you have not time, or the means at hand, to construct a model, make as good a pen and ink sketch of the improvement as possible, and send by mail. An answer as to the prospect of a patent will be received, usually, by return of mail. It is sometimes best to have a search made at the Patent Office; such a measure often saves the cost of an application for a patent.

Preliminary Examination.

In order to have such search, make out a written description of the invention, in your own words, and a pencil, or pen and ink, sketch. Send these with the fee of \$5, by mail, addressed to MUNN & Co., 37 Park Row, and in due time you will receive an acknowledgment thereof, followed by a written report in regard to the patentability of your improvement. This special search is made with great care, among the models and patents at Washington, to ascertain whether the improvement presented is patentable.

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To Make an Application for a Patent.

The applicant for a patent should furnish a model of his invention, if susceptible of one, although sometimes it may be dispensed with; or, if the invention be a chemical production, he must furnish samples of the ingredients of which his composition consists. These should be securely packed, the inventor's name marked on them, and sent by express, prepaid. Small models, from a distance, can often be sent cheaper by mail. The safest way to remit money is by a draft, or postal order, on New York, payable to the order of MUNN & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents.

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