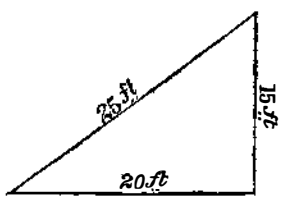
(36) J. D. reminds us of an old and good method of drawing a perpendicular to a straight line for the purpose of squaring foundations, etc. From the corner of the foundation take two lines respectively 15 and 20 feet, and connect them by a line of 25 feet; the angle included between the two shorter lines will be a right angle. The numbers 3, 4, 5, or, as in the present case, their multiples 15, 20, 25, are taken to measure respectively the perpendicular, base, and slant side of the triangle. It is obvious that any scale may be used so long as the ratio of 3, 4, 5, is observed.



(37) J. H. asks what kind of iron to use in making cast iron armatures. A. Soft gray iron.

(38) F. H. C. asks: How can I etch cheaply on glass to imitate ground figures or transparent figures on a ground background? A. For this purpose the sand blast is now generally used; the glass is covered with a film of wax or varnish, through which, with suitable needles or gravers, is etched the design; a fine sharp silicious sand impelled by a current of air is then directed from a suitable jet over the prepared surface, and the etching is accomplished in a few minutes. Glass is etched also by hydrofluoric acid; the plate may be prepared as for the sand blast, and placed face downwards over a shallow leaden tray, containing powdered fluorspar moistened with strong oil of vitriol and gently warmed; the gaseous hydrofluoric acid given off rapidly etches the portions of the glass not protected by the wax or varnish. Hydrofluoric acid should be used with great care.

(39) L. H. writes: I have seen it asserted that the parasites that infest the Asiatic tiger's paw are an exact miniature image of itself. Is this so? A No

(40) J. G B. asks if there is any way of melting brass in a common sand crucible for castings of a pound or so in weight for a small engine. A. You may melt small quantities of brass in any common stove having a good draught, using a coal fire. You may use borax as a flux.

(41) F. & Co. ask: 1. In making a telephone as described in Figs. 4 and 5, SUPPLEMENT 142, must the diaphragm be entirely free, or can it be punched and the screws which secure the flange pass through it? A. The diaphragm should not be punched. 2. In new form of telephone in No 20, current volume, must there be a battery in the circuit, or is the telephone sufficient to work it? A. A battery is required.

(42) J. M. B. asks: What will prevent the hair from falling out? A. Keep the pores of the skin open by frequent bathing and change of underclothing. Bathe the head with clean soft water, and stimulate the scalp with a moderately stiff brush morning and evening. The head should be occasionally cleansed with a weak solution of glycerin soap in dilute spirit of wine, with care to remove all traces of soap from the hair. Use no pomades or oils of any kind.

(43) B. H. P. asks (1) how to make malleable iron, such as used in wrenches. A. Malleable iron castings are made from mottled iron. They are cleaned by tumbling and then packed in iron boxes with alternating layers of rolling mill scale. The boxes are carefully luted and packed in an annealing furnace, where they are kept at a white heat for a week or more, and then allowed to cool gradually. 2. How is steel or iron made to adhere to the face of the jaws of the wrench? A. By welding.

(44) J. G. E. asks: What is the highest column of water that can be raised from a well by means of a siphon pump with 60 lbs. steam, likewise a 1 inch column of water with 60 lbs. steam? A. Lift, from 26 to 27 feet.

(45) W. H. W. asks: 1. Is there any solution excepting rubber that will make cloth thoroughly waterproof, or at least withstand the attack of water for an hour or so? It should be applied by dipping the cloth in the solution. A. Linseed oil boiled with a little wax and litharge is useful for some purposes. Cloth prepared with paraffin, balata gum, the gum of the asclet pias or milkweed, naphtha solution of the dried pulp of the bamboo berry, anhydrous aluminum soaps (see pp. 149 and 159, "Science Record," 1874), are also employed. 2. Is there any chemical that could be combined with the solution, imparting some property to the same for which rats or mice would have an antipathy so as to prevent their attacks? A. A trace of phenol will generally suffice.

(46) J. L. asks: Is the balata gum softened by animal oils or fat? A. Yes.

(47) P. L. W. asks. What distance would a 100 lb. weight have to fall to run a sewing machine for 5 hours? A. For an ordinary family sewing machine, requiring about one thirtieth of a horse power, the weight would have to fall about 3,300 feet in the 5 hours.

(48) W. G. R. asks: 1. What is the valve yoke of a steam engine? A. We presume you refer to the rectangular yoke that receives the back of the valve in the class of engines having balanced valves. 2. What should be the diameter of the bore of an engine of 1 horse power with 100 lbs. pressure, also the length of stroke? A. Diameter, 2¾ inches; stroke, 4½ inches. 3. How are the back gears of a lathe made so as to be thrown out of gear when it is wished to use the lathe at a high speed? A. Ordinarily by a cam and lever, or tight and loose joint. 4. Would $\frac{1}{32}$ of an inch thickness of sheet steel be strong enough for the boiler of a small model locomotive? How much pressure would it stand to the inch? A. If the diameter does not exceed 3 inches, you can carry a pressure of from 50 to 60 lbs. per square inch.

(49) J. W. W. asks: Which will stand the most pressure, a piece of round iron 1 inch long and 1 inch in diameter, or a piece of gas pipe the same dimensions, both being set upon end? A. The round iron.

(50) W. M. B. writes: 1. I have one eighth inch basswood, cherry, butternut and walnut. Which do you advise for the sounding board of a microphone and Hughes telephone? A. Either will do, but pineor spruce is better. 2. Would a glazed earthen jar do for the outside of battery described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 149? A. Yes. 3. Could I make insulated wire myself? If so, how? A. Wire may be insulated by giving it a coat of shellac varnish and allowing it to become dry and nearly hard before winding.

(51) W. H. S. asks how to satin finish tubing like sample sent. A. The specimen has been electro-plated with silver in the usual manner, and the electric current then reversed for a few moments, thus redissolving a portion of the plate, the remainder presenting the peculiar satin like luster.

(52) S. W. C. asks: Has carbon for telephone purposes ever been made by subjecting the black deposited by a flame to a heavy pressure? A. Yes. Edison's carbons are made in this manner.

(53) "Hardware" asks: 1. Where is best to take hot air in a room, at register near ceiling or in floor? A. At or near the floor. 2. Where is best place to have ventilation, near floor or near ceiling? A. If connected with a flue having a good draught it should be near the floor.

(54) R. W. J. asks: What causes the cracking noise in the pipes of a steam heating apparatus, when a fire has been started to warm up the building? Is it the water in the pipes made by condensed steam, or is it the expansion of the pipes from being heated? A. The noise is due to both causes in some degree, but principally to the water, which produces violent blows.

(55) C. N. A. asks how to temper steel tools for working on stone or similar work. There is some preparation which is put in water which accomplishes the purpose when the steel is heated and plunged in. A. Heat the tools to a cherry red, and plunge in clean, moderately cool water. A little common salt is sometimes added to the water.

(56) G. B. asks: 1. Is the height to which water is raised by a hydraulic ram measured from the ram itself or from the spring from which the supply comes? A. From the ram. 2. Can a hydraulic ram be constructed to discharge 1,000 gallons of water per minute? A. Yes.

(57) L. D. writes that benzine will answer much better to exterminate roaches, moths, etc, than anything else. It will not hurt furniture in the least, will evaporate, and can be easily applied.

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

M. B. W.—No. 1 is a silicious clay—it might be useful in the manufacture of some grades of pottery, etc. No. 2 is a ferruginous shale—contains about 80 per cent of silica and 10 per cent of alumina, besides lime, magnesia, iron oxide, and water.—W. S.—It is fibrous talc—talc of good quality is in considerable demand for paper making and other purposes.—W. G. H.—The sand contains no precious metal—the glittering particles are mica.—S. F.—The specimen you send consists of a mass of the long hairs which have been attached to the seeds of the "milkweed" (*asclepias*), or, as it is sometimes called, from the silky nature of these appendages, "silkweed." We believe that this material is put to no other economic use at present than that of a filling for cushions and pillows. The beauty of this silk like down long ago attracted attention, and many unsuccessful attempts have been made to put it to some practical use in the arts; but, as you have probably noticed, the hairs are both brittle and weak, and an examination with a lens will show that it wants the roughness and angularity necessary to fit it for being spun like other fibers. It has, however, been mixed with cotton and woven into fabrics having a silky luster and capable of taking brilliant dyes, but the manufacture has never been prosecuted. The plants, though widely distributed over the United States, and quite common, are nevertheless not abundant enough in a wild state to afford much of a supply, and we believe no experiments have been made in cultivating them.

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

COMMUNICATIONS RECEIVED.

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

Manufacture of Porous Cups for Tyndall Grove Battery. By W. H. S.
Cylinder Condensation. By F. F. H.
Sawdust. By W. H. M.
Keely Motor. By G. R. S.
Firing. By A. P. A.
Steam Launches. By G. F. S.

HINTS TO CORRESPONDENTS.

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.

Many of our correspondents make inquiries which cannot properly be answered in these columns. Such inquiries, if signed by initials only, are liable to be cast into the waste basket.

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.

English Patents Issued to Americans.

From November 8 to November 12, inclusive.

Electric light.—T. A. Edison, Menlo Park, N. J.
Feed water apparatus.—S. J. Hayes *et al.*, ——.
Pipe, manufacture of.—W. Radde, N. Y. city.
Potato digger.—L. A. Aspinwall, Albany, N. Y.
Refrigerator.—J. A. Whitney, N. Y. city.
Screw cutting machinery.—C. D. Rogers, Providence, R.I.
Sewing machine.—Wilson Sewing Machine Company, Chicago, Ill.
Wire machinery.—C. D. Rogers, Providence, R. I.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

October 15, 1878,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired, and remit to Munn & Co., 37 Park Row, New York city.

Animal trap, B. H. Noeltiug 209,068
Axle box, car, J. N. Smith 208,993
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