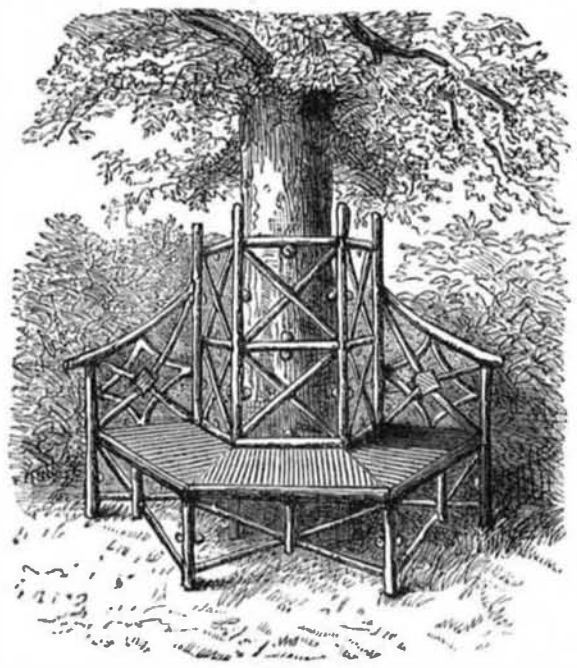


FIG. 13.

HOW TO MAKE RUSTIC WORK.

For materials you need stout branches, two, three or even four inches through, for all the principal parts of the structure you make. For the covering of seats, table tops, etc., branches about an inch in diameter are needed. To prepare these latter for use, cut them into lengths of about eight inches, and, with a hatchet or sharp knife, split them longitudinally in halves. If the wood has been freshly cut from the tree it will work easily; if not, soak it well in water over night. Trim up the pieces with a sharp knife, taking care to remove all the sharp knots where the shoots have grown out from the branches.

FIG. 1.

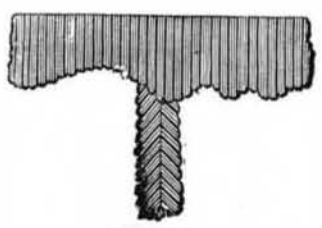


FIG. 2.

A good method of rustic work for beginners is to take an old chair, or table, or settee frame, and cover it with bark, or with these split branches. Before driving brads or nails through the bark or branches, bore a hole with an awl, so that the work will not split. The pattern may be varied to suit your taste. Fig. 2, which is the representation of a pillar table, will give a hint in this direction.

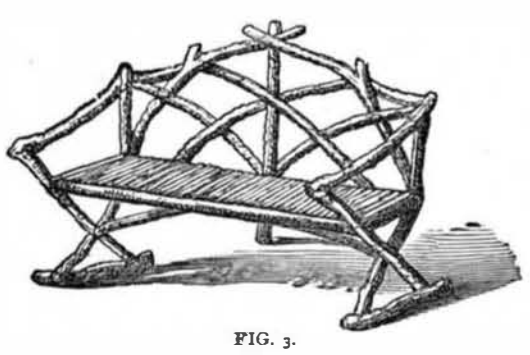


FIG. 3.

For real rustic work, Figs. 1, 3, 5, 9, and 13 will give hints for the general form of some chairs and settees. Figs. 6, 7, 11, and 71 show the principles for constructing the frames. Fig. 11 shows a simple way of making the legs for a seat without a back. When back and arms are desired, this simple structure may be modified by continuing one leg up as far as may be necessary to form the corner post for the back, and the other a somewhat less distance, to support the arm. Fig. 3, by little study, will make this plain. Where the legs cross they should be "halved" together, as at A, Fig. 6. The seat frame should meet the legs, as at B, Fig. 6. To form the seat, use five branches, same size as the supports, of the length required. Cut them as shown at C, Fig. 6. Fasten the outer rails first, nailing them securely, and then fit in the center ones. The whole structure should be well braced.

FIG. 4.

Fig. 7 shows another method of constructing a frame, by the use of mortices and tenons. As shown at B, Fig. 12, the shoulder of the tenon must be cut to fit the curve of the part that has received the mortice.

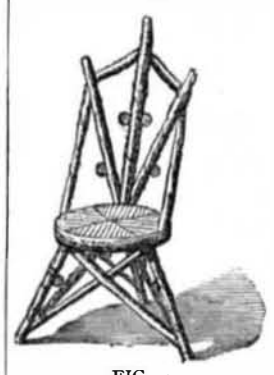


FIG. 5.

Fig. 10 is the ground plan for the settee in Fig. 13, showing the position of the legs. Fig. 8 shows a method of interlacing split branches, to form the back of a settee. The ends must be well secured to the rails.

Fig. 4 is a table, the support of which is made from the stump of a small tree with the roots attached, the latter forming the feet. The top may be made of rough boards, covered with small small split branches, and it may be braced by curved or straight pieces to the supporting column.

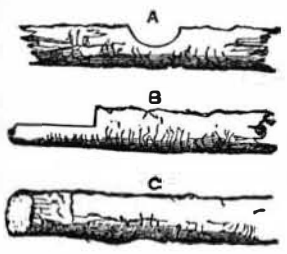


FIG. 6.

Pieces of roots, or grotesque growths of clusters of branches, as shown in the illustrations at the bottom of this page, may be used as ornaments on various parts of rustic work with good effect. When you use smooth-barked wood, a coat or two of varnish will improve its appearance. Do not apply the varnish till the wood is thoroughly dry.

Wood Staining.

The practice of staining woods is much less common in America and England than on the Continent, where workmen, familiar with the different washes, produce the most delicate tones of color and shade. Wood is often stained to imitate darker and more expensive varieties, but more legitimately to improve the natural appearance by heightening and bringing out the original markings, or by giving a definite color without covering the surface and hiding the nature of the material by coats of paint. The best woods for staining are those of close, even texture, as pear and cherry, birch, beech, and maple, though softer and coarser kinds may be treated with good effect. It should be dried, and if an even tint is desired, its surface planed and sandpapered. All the stains should, if possible, be applied hot, as they thus penetrate more deeply into the pores. If the wood is to be varnished, and not subjected to much handling, almost any of the brilliant mordants used in wool and cotton dyeing may be employed in an alcoholic solution; but when thus colored it has an unnatural appearance, and is best used in small surfaces only, for inlaying, etc. The ebonized wood, of late years so much in vogue, is in many respects the most unsatisfactory of the stains, as the natural character and markings are completely blotted out, and it shows the least scratching or rubbing.

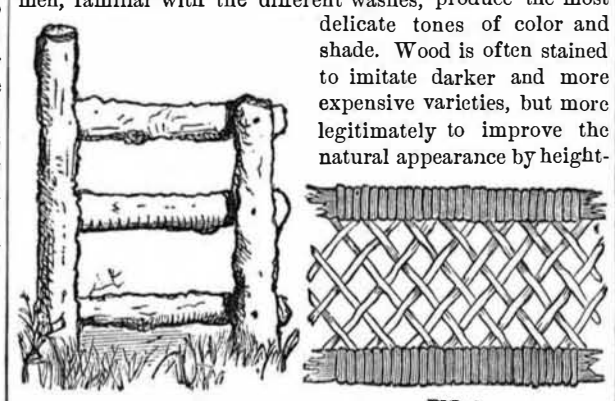


FIG. 7.

FIG. 8.

The common ebony stain is obtained by preparing two baths; the first, applied warm, consists of a logwood decoction, to every quart of which 1 drachm of alum is added; the second is a solution of iron filings in vinegar. After the wood has dried from the first, the second is applied as often as is required.

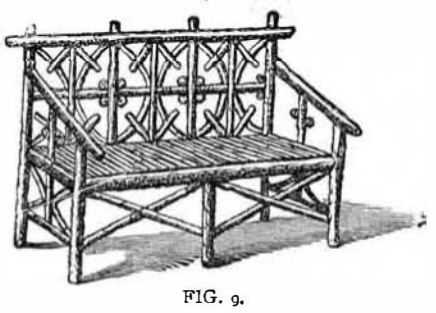


FIG. 9.

For the first named bath, some substitute 16 weight parts of gallnut, 4 of logwood dust, and 2 of verdigris, boiled in a sufficient quantity of water. The writer has seen a peculiar method of blackening walnut in use in Nuremberg. On one of the Pegnitz islands there is a large grinding mill, turned by that classic stream, where iron tools are sharpened and polished. The wood is buried for a week or more in the slime formed by the wheels; when dug out it is jet black, and so permeated by silica as to be in effect petrified. Another way to ebonize flat surfaces of soft wood is to rub very fine charcoal dust into the pores with oil. This works well with the European linden and our own white wood. A brown mahogany-like stain is best used on elm and walnut. Take a pint decoction of 2 oz. logwood, in which ½ oz. of chloride of barium has been dissolved. This gives also, when diluted with soft water, a good oak stain to ash and chestnut. But the most beautiful and lasting of the browns is a concentrated solution of permanganate of potash (mineral chameleon). This is decomposed by the woody fiber, and forms hydrated oxide of manganese which is permanently fixed by the alkali.

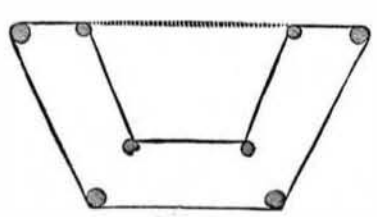


FIG. 10.

A simpler brown wash is ½ oz. of alcanna root, 1 oz. aloes, 1 oz. dragon's blood, digested in 1 lb. alcohol. This is applied after the wood has been washed with aqua regia, but is, like all the alcoholic washes, not very durable. Aqua regia (nitro-muriatic acid), when diluted in three parts of water, is in itself a much used, though rather destructive, yellow. For a red stain, a decoction of ¼ lb. of logwood and ½ oz. of potash in 1 lb. of water is used as the bath, being fixed by a wash of alum water. For scarlet, use 1 oz. cochineal, 6 oz. powdered argol, 4 oz. cream of tartar in 12 oz. of chloride of tin (scarlet spirits). For rose color, iodide of potassium 1 part, water 12 parts, as a first bath; as second, chloride of mercury (corrosive sublimate) 1 part, water 40 parts. Indigo solutions give blue washes, and 1 part of verdigris to 4 parts of water the best green. Soft wood floors are well stained with ½ lb. turmeric, ¼ lb. logwood, 22 lbs. soapboiler's lye, ¼ lb. potash, to which, after it has been boiled down to about 14 lbs. weight, 1½ lbs. wax and 3 oz. of annotto are added. This is largely used in Germany as a substitute for paint, and keeps the floor in good condition for a year or more. As a curiosity, the bleaching of mahogany to the appearance of

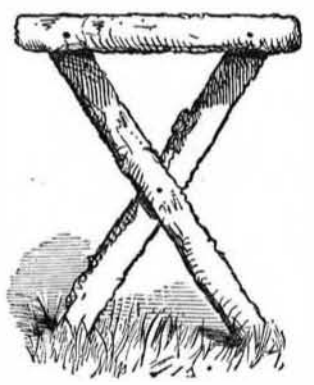


FIG. 11.

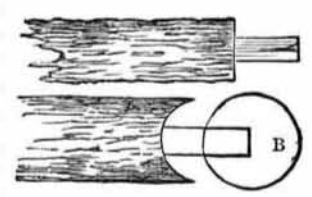
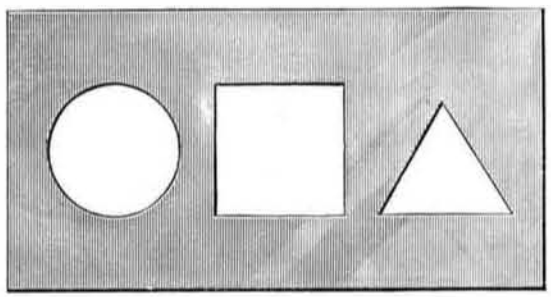


FIG. 12.

chestnut may be mentioned. This was once done to make a dining room table match the other furniture of a room in which it was placed, and was effected by alcohol saturated with sulphurous acid gas. A solution of 4 oz. of sandarac, 1 oz. gum mastic, and 4 oz. shellac, in 1 lb. of alcohol, to which 2 oz. oil of turpentine is added, can be recommended as a varnish over stained woods. Boiled linseed oil should be rubbed into the pores before it is applied.—*Joseph T. Clarke, in American Architect.*

A GEOMETRICAL PUZZLE.

Three apertures, exact size in illustration—a triangle, square and circle—are cut through a piece of cardboard or wood. The problem is to cut from another bit of wood a

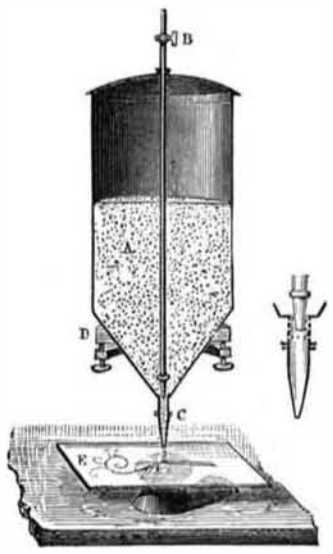


single piece, of such form that it will, in passing through each aperture, exactly fill the same. A correspondent furnishes the above problem, which, though old, may be new to a considerable number of our readers.

ENGRAVING ON GLASS.

The process here described consists in corroding glass by violently projecting sand upon its surface by means of a current of air or steam. It is very probable that it will be found of service in a great variety of ways, and may eventually come to replace, at least in part, engraving by means of a revolving wheel, or even the well-known hydrofluoric acid method.

The apparatus used is very simple, and is shown in the accompanying cut, for which we are indebted to *La Nature*. Our French cotemporary, however, omits to mention the fact that this invention is the discovery of Mr. Benjamin C. Tilghman, of Philadelphia, Pa. Well dried sand, contained in the cylindrical vessel, A, is allowed to flow in a continuous manner through the tube, C, whose length and inclination can be altered at will, so as to regulate the fall of the sand. The tube conveying the current of air or steam terminates just above this spout, in a nozzle containing a series of fine holes. The sand, urged on by the jet, is thrown violently against the glass plate, E, or other body placed within its range, and thus exerts a corroding action. By varying the quantity of the sand, the volume and velocity of the current, as well as the diameter of the jet, more or less rapid effects are produced.



Bodies much harder than glass have been submitted to the action of sand thus thrown forcibly against their surface, and have been as rapidly worn away. In a series of experiments recently conducted in this city, a hole 3 centimeters in diameter was drilled through a block of corundum in twenty-five minutes, a pressure of 136 kilogrammes being used. With a pressure of 45 kilogrammes, a hole 3 centimeters in diameter and 8 millimeters in depth was formed in a steel file in three minutes. The weight of a diamond was sensibly diminished in a minute, and a topaz utterly destroyed.

In engraving on glass very little pressure is needed, the current from the bellows of an enameller's lamp being quite sufficient. In this way the divisions on graduated tubes, the labels on bottles, etc., can easily be engraved in laboratories with but little trouble.

The portions of the glass which are to remain clear are covered with paper, or with an elastic varnish, these substances being sufficiently exempt from the corroding action of the sand.

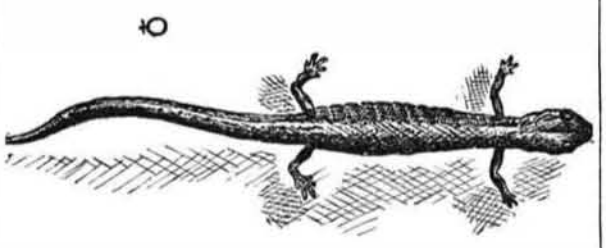
Belladonna in Asthma.

The Melbourne (Australia) *Medical Record* states that smoke from the leaves of the belladonna possesses much more power in cutting short an attack of asthma than that from stramonium; a long pipe being the best means of smoking them, the smoke to be drawn deep into the chest. Or if, when the attack is at its height, the patient has not the power of doing this, the leaves may be placed in a saucer containing lighted charcoal or wood ashes, which should be put on a chair in front of the patient, this chair, as well as his own, being covered with a large sheet, so as to confine the fumes, before the leaves are put on the hot charcoal. From two and a half to five grains of the leaves are sufficient when smoked, and from five to twenty grains when burned.

THE ASH-COLORED SALAMANDER.

BY C. FEW SEISS.

This salamander was first described by Green in "The Journal of the Academy of Natural Sciences," Philadelphia



(vol. I, page 356), under the name of *Salamandra cinerea*. He in the same journal (same vol. and page) re-described it as the *s. erythronota*. Dr. Holbrook corrected this error, but lately Professor Cope has them once more divided into two sub-species, viz: *plethodon cinereus*, sub-species *cinereus*, and *plethodon cinereus*, sub-species *erythronotus*. I cannot now consider them sub-species or even varieties.

On March 24, 1877, my brother and myself captured, near Philadelphia, sixteen or eighteen of these salamanders. They were found beneath large flat stones where the soil was light and loamy, on the bank of a brook, about six feet from the surface of the water. With but few exceptions, one red-

backed (*erythronotus*), and one ash-colored (*cinereus*), were found together under the same stone. We have found in the same locality both red and ash-colored, from one inch to three and a half inches in length. We have specimens with a bright red longitudinal doreal band strongly defined, others with an obsolete dull reddish-brown band, and others completely grayish-brown above. On dissection, I have found ova in the red-backed animal, but thus far not in the ash-colored. So far as my observations have gone, I am of the opinion the ash-colored is the male, and the red the female, of the *plethodon cinereus* (Green).

This is one of our most inert salamanders, and it rarely, I think, quits its retreat in the day-time, unless during or after a rain. It is not an aquatic species, but is only found near the water during the breeding season, when it seeks to deposit spawn. With the exception of the *desmognothus fusca*, it is the most common salamander in the vicinity of Philadelphia.

In captivity its habits have been uninteresting, as it is continually hiding beneath the stones of the vivarium. I rather think small earth-worms are its common food when in its native haunts. I was surprised at the length of time some of them lived after having been dropped alive into a jar of alcohol. Many salamanders die almost immediately after an alcoholic immersion, giving only two or three convulsive jerks of the head; but many of these crawled about the bottom of the jar among their dead relations for nearly five minutes before expiring. You cannot censure me with cruelty to animals, for their life's finale must have been one of oblivious intoxication.

Photography in Disease.

We have in photography an excellent means of determining the condition of the blood. According to its quality, the blood deposits more or less impure material in all the cellular tissues. Such deposits occur also in the sebaceous glands of the skin, which secrete a natural fat and deposit it in the mucus layer between the true skin and epidermis. Although the color of the mucus layer is visible through the epidermis, its finer shades are not seen in this manner, yet they appear in the photographic negative with such sharpness that the slightest impurities are here apparent as dark specks.

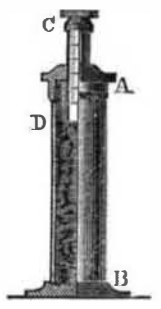
This phenomena is due to what may be called the photography of the invisible—that is, to that remarkable property of light by virtue of which the chemical action of color rays falling upon the plate varies with the rapidity of their transmission to it. It is interesting to observe the accuracy with which the condition of the skin is thus shown, varying as the shade upon the plate does, from the utmost delicacy and purity to a peculiar sieve-like character—that is, appearing as if punctured with innumerable little holes; these in the worst cases being irregularly united, so as to present a more or less ragged and unsightly appearance. After a person has taken fat, beer, tobacco, and other like injurious substances into the system, even for a little time, the negative exhibits this punctured appearance; while in the case of those whose manner of life is wholly corrupt, these defects are often magnified into such blotches as are seen upon the face itself in skin diseases.—*From Schlickeysen's "Fruit and Bread," translated by Dr. Holbrook.*

THE ALEUROMETER—GLUTEN TESTER.

This instrument has for its object the economic testing of the value of flour, so far as it relates to the quality and *elasticity* of gluten, one of its most important constituents. It is a very common remark that a particular description of wheat is far richer in gluten than another, but it by no means follows that *quantity* represents quality, when used for the purpose of making bread. For example, wheat adapted for the manufacture of maccaroni is unquestionably rich in gluten, but the grain specially sought after for this purpose is that which contains gluten distinguished for its *ductility*, rather than its elasticity, and it may be doubtful whether any judicious blending of this kind of wheat with other sorts would produce a first quality of flour.

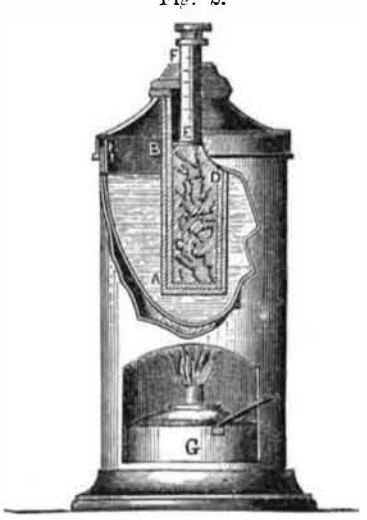
The ordinary methods of testing the quality of gluten are hardly conclusive. The rough and ready way of wetting a sample of flour and working it by the fingers, and other methods well known to buyers, doubtless, are excellent, but not altogether reliable. The aleurometer is designed to measure the *elasticity* of the gluten. The apparatus, Fig. 1, shown partly in section, with gluten expanded in the tube, consists of a brass tube, D, slightly over an inch in diameter and about five inches long. To its lower end a movable cap, B, is fitted; the top of the tube consists of an adjustable cap, A. Through the latter runs a graduated stem, C, to which is attached a *piston* that accurately fits the inside of the tube. The whole length of the tube represents 50 divisions. The stem of the piston is marked to a scale of 25 to 50, the piston itself being only capable of descending half way down the tube. This simple contrivance constitutes the aleurometer proper, and is designed for the use of bakers in their ovens.

Fig. 1.



Special additions have been made to the instrument, in order to meet the requirements of merchants and extensive dealers in flour. For this purpose a small stove is provided (see Fig. 2) and a copper bath, A, filled with oil. The bath is covered by a cap, and to the latter is soldered a tube, B, which extends nearly to the bottom of the oil bath. On the lamp being lighted a thermometer is placed in the hollow tube and allowed to remain until 150° C. (318° Fah.) is reached. From the flour required to be tested 30 grammes (about an ounce) are taken, and made into a paste by the addition of 15 grammes of water. After kneading it the mass is carefully washed by a stream of water, which carries off the starch, leaving the crude gluten — which should be compressed so as to strain off the water —which will then contain about 0·66 of water. A sample of the crude gluten is then weighed, about 7 grammes (¼ ounce), and is rolled in starch or fecula forming a roll of gluten. The inside of the gluten tube, D, is greased; the roll of gluten is then inserted, and the tube closed up.

Fig. 2.



The gluten tube, or aleurometer, is placed into the hollow tube, B, and heated to 150° C. (318° Fah.). The lamp is allowed to burn ten minutes, and then extinguished. The gluten should remain undisturbed for about ten minutes longer, during which time, under the influence of the water, which is converted into vapor or steam, it expands and forces the piston upwards. The graduated scale, F, on the stem, E, marks the degree of *elasticity* of the gluten, C. The roll of gluten is then removed, and should the expansion not have forced the piston upwards the flour is considered too weak and unfit for bread making. The gluten of the best flour has never indicated more than 50 per cent.

Good flour furnishes a gluten which augments to four or five times its original bulk; but bad flour gives a gluten which does not swell, becomes viscous and nearly fluid, adhering to the sides of the tube and giving off occasionally a disagreeable odor, whilst that of good flour merely suggests the smell of hot bread.—*The Miller.*

THE Metropolitan Railway (the longest underground line) carried at the rate of 154,137 passengers daily during the first half of 1877, the average receipt from each being about 4⅓ cents. The net earnings were sufficient to justify a dividend of 2¼ per cent for the half year. The traffic was greater than for any corresponding period in previous years. It was sufficient to fill 2,770 large American cars every day.

Bricks perforated with three holes, that the mortar may get a good hold, are being used in the construction of some buildings in Minneapolis, Minn.