WOOD CARVING.

To one having an idea of form and proportion, wood carving is not very difficult, even though a practical knowledge of drawing and modeling be wanting. Creditable specimens of carving have been produced by means of the pocket knife alone, by persons having dextrous hands and good eyes; but it takes a good workman to produce a fine job with poor tools, or none at all, therefore the average wood carver will be obliged to rely somewhat upon tools and appliances. In fact, the more complete the set of tools and the more perfect the accessories, the more readily can the work be done and the more satisfactory the result.

The principal tools are gouges, chisels, parting tools, curved and straight, a heavy mallet, a light mallet, a solid bench, and some clamps. As to materials: For the beginner soft woods are best, such as pine, whitewood, or cedar. After a little experience, pear, black

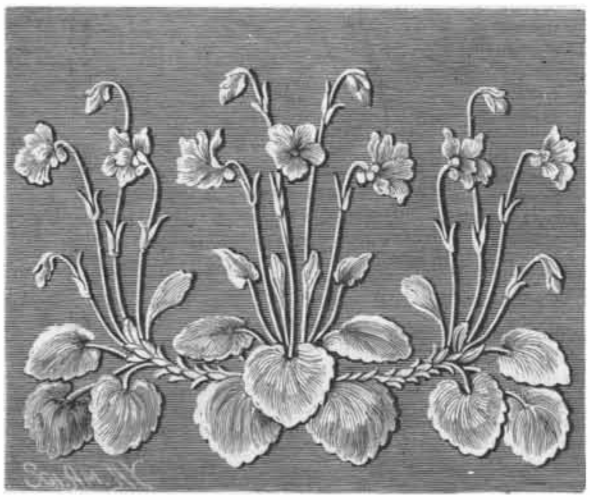


Fig. 3.—VIOLET PANEL.

walnut, and oak may be tried. Nine-tenths of the difficulty in carving is in working one's self up to the point of setting out in the work. The chances are that in the beginning the tyro will not succeed in producing the exact forms desired; but progress will be made with every successive trial.

It is, indeed, difficult to give any explicit directions for carving. We might almost say, here are the materials, the tools, and the design, the whole of carving is to take these tools and cut this design from this piece of material, using your own judgment, at the same time "making haste slowly."

The tools required are shown in Fig. 1, 1 being a firmer, 2 a straight gouge, 3 a curved gouge, 4 a bent chisel, 5 a front-bent gouge, 6 a back-bent gouge, 7 a parting tool, 8 a curved parting tool, and 9 a macaroni tool. These tools can be purchased either separately or in sets. There are other forms and many different sizes. It is well to begin with a half dozen medium sized tools, and then learn by experience what further tools are required. A flat and curved chisel and a flat and curved gouge, each one-half inch wide, a narrow deep gouge, and a parting tool are sufficient for the first effort.

The design is marked upon the wood to be carved, and the outline is shaped by means of a scroll saw, if

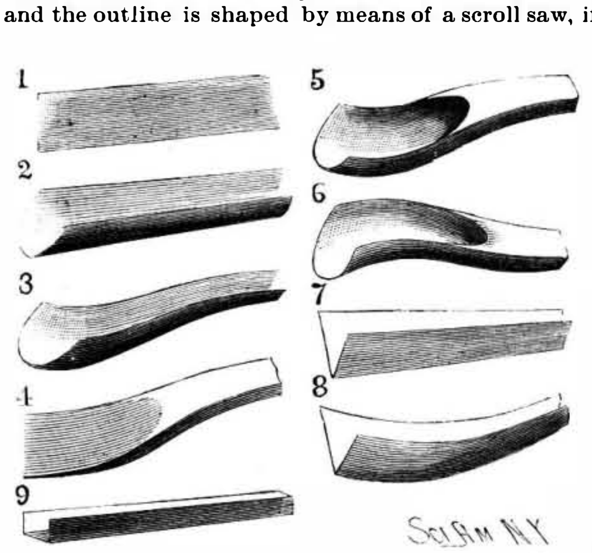


Fig. 1.—CARVING TOOLS.

Fig. 2.—EDGE VIEW OF TOOLS.

the design is to be in high relief, and the most prominent part is isolated from the rest by cutting down its sides with the straight gouges and chisels. Then the lower portions are roughed out, and so on until each part of the block is reduced to the requisite thickness. In this part of the work a mallet is required to drive the gouges and chisels into the wood and remove superfluous portions.

In the later operations of paring the work to give it the final shape no mallet will be required, the tools being pushed forward by the pressure of the hand. During this operation of paring, great care is required to avoid cutting too deeply, or raising slivers that run into the wood and spoil the work. Where the carving is done on a flat surface in low relief, gouges having little curvature are required.

The tools should be kept as sharp as possible, to secure smooth work and to economize labor. Carving tools are usually sharpened from both sides by means of suitable oilstone slips and by leather strops charged with crocus.

The wood while being carved is held in place on the bench by means of screw clamps, or by pointed screws passing upward through the bench into the back of the work.

In Fig. 3 is shown a panel of violets, which may be copied after some experience is gained. It is easier, however, to copy other carvings than to produce the work from engravings.*

Simple subjects should be chosen, and no work should be passed until it has been made as perfect as the tools, materials, and ability of the carver will permit. A final finish imparted with fine sandpaper is admissible; but neither sandpaper nor putty should be depended upon as material aids in this kind of work.

*The reader is referred to "Wood Carving," by Fred Miller, and "Manual of Wood Carving," by W. Bemrose.

American Flax.

The tariff discussion has brought out some interesting facts with regard to flax production in the United States. More than a million acres in our Northwestern States are annually planted with the flax plant, but very little linen cloth, and that of the coarsest quality, is made here. A few mills are engaged in the manufacture of twine and thread from the fiber, but the flax is chiefly grown for the seed, of which some thirteen million bushels are produced each year. The crop is raised on new ground, the seed being thinly sown, and, without cultivation, bearing a heavy yield of seed. When this is ripe the plants are cut by horse reapers, the seed thrashed out by a machine, and the straw burned on the ground. The fact that flax is not grown here for its fiber is laid by some to the account of our climate as being too dry and hot for its best development, but by others to the great cost of cultivating the plant with such an end in view. In Europe each farmer devotes but a small plot to flax, prepares the soil as carefully as for a garden bed, sows the seed very thickly, and keeps the crop nicely weeded. The plants, coming up closely, grow tall and branchless, developing the fiber at the expense of the seed, and they are pulled up by the roots before the seed ripens. After this the fiber must be extracted on the farm by laborious hand processes, as it costs too much to send the flax in bulk to the market. It will be easily seen that, even were our climate propitious, American farmers would be slow to engage in such a time and labor absorbing industry.—*Garden and Forest.*

Ingenious Expedient in Hydraulic Engineering.

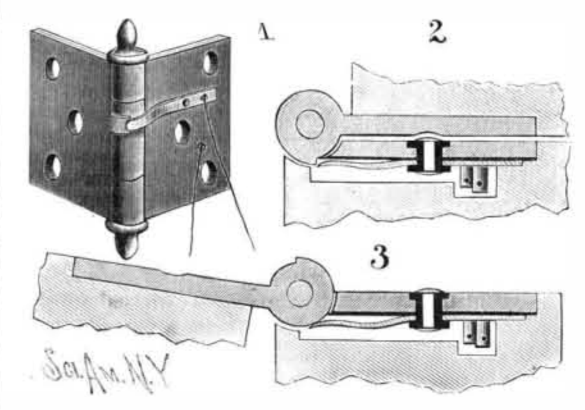
F. S. Pecke, a civil engineer at Watertown, N. Y., lately accomplished in a very simple, cheap, and expeditious way what is usually a difficult and expensive operation—the laying of a long line of pipe in deep water. He had occasion to lay nearly 1,000 feet of suction pipe at Rouse's Point. The water was needed for manufacturing purposes, and as it was found that water near the shore was more or less roily and impure, it was necessary to have the inlet a considerable distance out into the lake. He purchased for the purpose a steel pressure pipe of 8 inches diameter, manufactured by the Spiral Weld Tube Company, at East Orange, N. J., and used for couplings cast iron flanges, weighing, with bolts and gaskets, about 65 pounds to the pair. Plugging the end of the first length, he pushed it out on the surface of Lake Champlain and connected the second length, pushing this out in turn until the whole line was coupled. It then presented the unusual spectacle of a line of 8 inch pressure pipe, nearly 1,000 feet long, floating with a displacement of only 3½ inches of its diameter. When the requisite length had been connected, the line was towed to position, the plug at the end removed, and the pipe sank easily in 16½ feet of water without breaking a joint or receiving any injury. No buoys or floats were used in the operation, and no apparatus of any kind. The pipe is now in use as the suction of a steam pump, and gives perfect satisfaction. Work of this kind usually involves the use of expensive and troublesome flexible joints, and Mr. Pecke's ingenious expedient is worthy of record.—*American Gas Light Journal.*

Production of Heat in Living Bodies.

Heats of combustion of the principal nitrogen compounds contained in living bodies, and their role in the production of animal heat, by MM. Berthelot and Andre.—The data and results are given for sixteen nitrogenous bodies. The average heat of combustion is 9,400 cal. for fatty bodies, 5,700 cal. for albuminoids, and 4,200 cal. for carbohydrates, taking one gramme of each substance. The conclusion is drawn that a weakening of the organism, with diminution of power of consumption of the food digested, shows itself first by general deposition of the most difficultly eliminated substances, fatty matters, then by failure to get rid of nitrogenous bodies, and finally by incapacity to consume the carbohydrates.—*Academy of Sciences, Paris.*

HINGE CONNECTION FOR ELECTRIC BURGLAR ALARMS.

The invention herewith illustrated provides means whereby the local battery circuit used to ring an alarm will be instantly closed when a door to be guided by the alarm is moved on its hinges. It has been patented by Mr. William M. Bleakley, of Verplanck, N. Y. Fig. 1 is a side view of a door hinge having such a circuit making and breaking device, Figs. 2 and 3 being sectional views. On one leaf of the hinge is applied any suitable insulating material, such as cardboard protected by varnish from moisture, and upon the insulating material a leaf spring forming a good conductor is so secured as to project toward and be adapted to engage the hub of the leaf. To insulate the spring from the leaf, the fastening is made by means of a rivet enveloped with insulating material, as shown in Figs. 2 and 3. The hub has a slight projection, formed by an annular flattened rib cut away for a short distance near the leaf, producing a recess which prevents contact with the spring when the hinge is folded, as shown in Fig. 2. Between the insulated rivet and the inner end of the spring is a binding post connecting the battery wire with the spring, another binding post on the hinge leaf connecting the other terminal of a battery circuit thereto. With this arrangement, when the door is closed, and the hinge is in the position shown in Fig. 2, the circuit remains open; but on the door being party or fully opened, the circuit is instantly closed and the electrical connection sounds an alarm. The device can also be readily arranged to sound the alarm when the circuit is opened, instead of when it is closed, by



BLEAKLEY'S HINGE FOR ELECTRIC BURGLAR ALARMS.

reversing the position of the enlargement on the hub, so that when the door is closed the spring will bear on the hub and produce a normally closed circuit that will be broken when the door is opened.

Indian Copper.

Dr. Charles C. Abbott, the Curator of the Archæological Museum of the University of Pennsylvania, recently read a paper on "Implements from the Workshop of a Prehistoric Coppersmith." Dr. Abbott in his prefatory remarks referred to the two views now prominent with reference to the peopling of America. The one that the Indian is indigenous and native to this country, the other that from successive migrations from other continents a people arose that finally became the now readily recognized American Indian. "There is much to be said," he continued, "in favor of the former view, and yet I cannot myself summarily dismiss the arguments in favor of trans-oceanic migration." He then proceeded to discuss the use of copper among the Indians.

It is mentioned in the earliest references to Indians by European visitors to America. Captain John Smith, in his history of Virginia, speaks of the Indian women of the Southern Atlantic coast having pendants of copper, and again that "the Mangoaks have plenty of it, and beautify their houses with great plates thereof." Captain Smith found the Virginia Indian covetous of copper, and refers to a common personal ornament, consisting of "a broad piece of copper," and also to the custom of throwing pieces of copper in the river, when passing by their burial places. The records of the visitors and settlers in New England in the 17th century contain frequent references to copper, and Champlain records of an Indian whom he met in the valley of the St. Lawrence, that "he drew from his bag a piece of copper the length of a foot, which he gave me; the same was very handsome and very pure; giving me to understand that he had a quantity of it where he had taken this, which was on the border of a river near a great lake." These many references to copper give no hint of its use for any other than ornamental purposes, and yet, besides a few scattered beads, the few objects that have been procured from graves and village sites along our Northern Atlantic coast are either spear heads, arrow points, or celts.