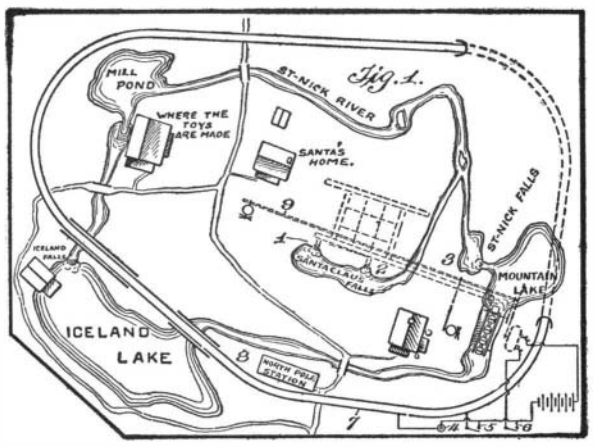
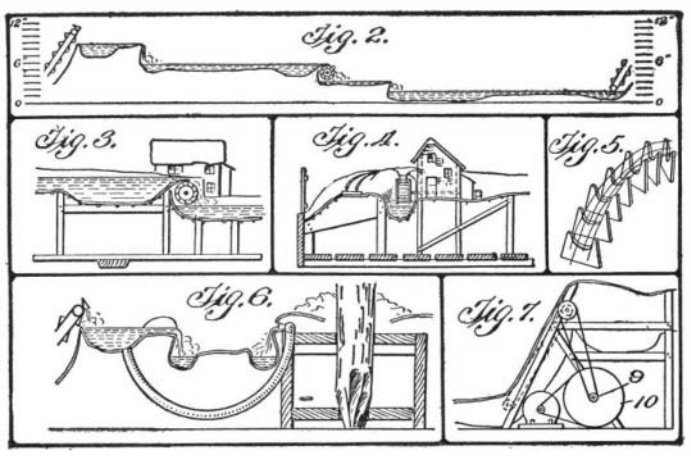
A CHRISTMAS TREE GARDEN.

BY L. GESSFORD HANDY.

A "garden" under the Christmas tree offers an excellent opportunity to add much to the interest of the children's holiday. In the accompanying illustrations I have shown how an interesting and instructive



PLAN VIEW OF THE GARDEN.



SOME SPECIAL FEATURES OF THE GARDEN.

garden may be made at small expense. The formation of rivers, lakes, falls, etc., is here prettily demonstrated.

A base 8 feet long by 6 feet wide (these measurements may of course be modified) supports the garden. This base is made of board ½ inch thick and with cross cleats to stiffen it. The boards are 3 inches wide and spaced ½ inch apart, to allow water that may leak from the garden to pass through to an oil or rubber cloth spread on the floor. The socket for the tree is quite substantial. It is built up, as shown in Figs. 1 and 6, of 1-inch boards, and screwed firmly to the base. The opening for the tree is 3½ inches across, and wedges are used when necessary.

The stream is supplied by water from the falls 1, 2, and 3, and flows around back of the tree to the mill pond, over the wheel, under the long bridge, and over the falls into the lake. It passes thence under the short bridge to a "bucket elevator." The water is here raised to the "mountain lake," to again supply the falls 1, 2, and 3. The "lift" could more properly be hidden from view, but is really interesting to look upon.

In Fig. 2 is illustrated a profile of the stream, falls, etc., showing the various levels to be observed. Fig. 1 is a plan view of the garden, showing the relative positions of the various devices and necessary wiring for operating them.

All curves in the railroad system are on a 20-inch radius. The engine and cars used are home made, and tracks are 1¼-inch gage. (These may be bought in the market if desired, but the store trains are usually larger.) The inside track is connected with one side of the motor and with one side of the battery. The opposite side of battery connects with push button 4 and switches 5 and 6. Button 4 connects with an insulated section 7, 3 feet long, set into the outside track. Switch 5 connects with the main outside track, and switch 6 with the remaining side of motor. The train always stands at station 8 until button 4 is pressed, when it makes a circuit of the garden, and stops at station 8 until the button is again pressed. This feature is not only interesting, but saves the battery. The switch 5 controls the railroad system, and switch 6 the water system and windmills. A small motor costing $1.50 is arranged as shown in Figs. 1 and 7. The shaft 9, carrying wheel 10, is ⅛ inch diameter and 4 feet long. It is designed to operate the windmills in the manner shown in Fig. 1. Waxed thread is used for belts. The lift is made of an endless brass-wire sprocket chain passing over 1-inch wheels at top and bottom. Small buckets of painted tin are soldered to each sixth link. The wheel centers are 10 inches apart.

Fig. 6 illustrates clearly how the water is fed underground from the mountain lake to the falls 1 and 2. A 30-inch length of ¾-inch copper tube is used here. Figs. 3 and 4 illustrate the manner of mounting the mill wheel.

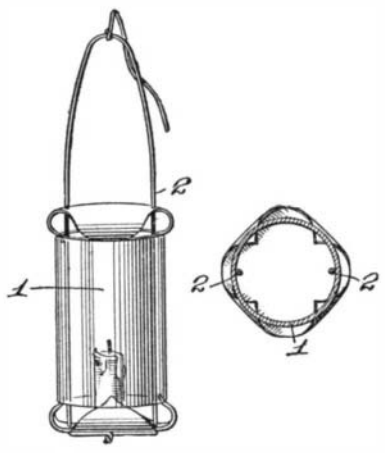
Old cigar boxes and similar light material are employed to form the frame of the waterways, hills, etc. For the streams, these are cut as in Fig. 5; for other parts, they are cut and arranged as required. Short lengths of copper wire are bent to necessary shapes, and fastened in place with small staples. For large areas rust-proof wire netting is bent and tacked to the frame. Irregular pieces of tough paper, dipped into oil paint, are laid on the network of wires to a thickness of several layers. The beds of the streams and lakes are covered with five layers. When the paint is thoroughly dry, the waterways are spread with several coats of good shellac.

For a summer garden, paint the "ground" a flat grass green, and cover judiciously with artificial moss and trees. For a "winter" scene paint the ground a flat white, and cover with raw cotton and snow-laden trees. Sprinkle with artificial snow. A quantity of gravel in the streams, a sailboat or two on the lake, ducks, horses, etc., and even people placed around the garden, give life to the scene.

PROTECTION FOR CHRISTMAS TREE CANDLES.

BY G. H. RUTHERFORD.

It is a foolishly dangerous practice to risk the consequences of fire from the unprotected lights commonly seen on Christmas trees. In the accompanying illustrations I have shown how a very simple and ornamental protector may be made at home. The cylinder 1 is preferably of glass, but a wire netting may be used with entire satisfaction. The top and base are each made from a piece of tin cut 1⅞ inch square. They are identical, and are punched with two holes to receive the wire 2. The corners are bent inward just far enough to enter the ends of the tube. To light, slide the tube along the wire until the wick can be reached. The tube should be 3 inches long by 1½ in diameter.



PROTECTION FOR CHRISTMAS TREE CANDLES.

Some Home-made Christmas Presents.

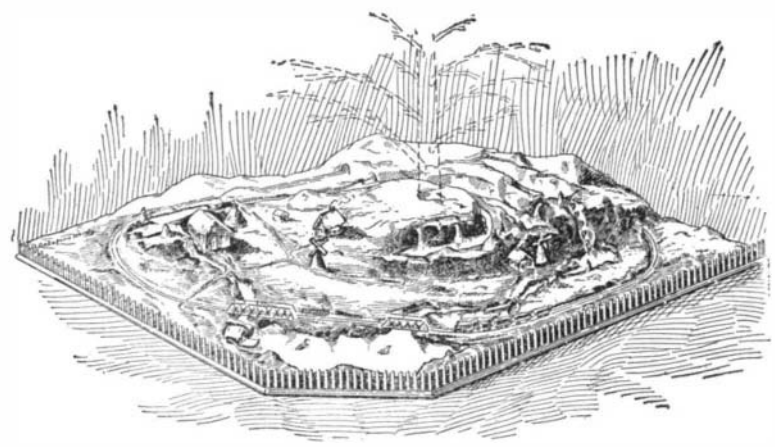
FLEXIBLE MIRRORS.

BY LEONARD F. GREENE.

Mirrors which can be bent into any desirable shape, or can be cut to conform to any pattern, can be made by the following process: Coat stout paper or tissue with three or four coats of white of egg, allowing each coat to dry before applying the next, and then apply several layers of transparent varnish to the thickness of mirror glass. Smooth a sheet of tinfoil, and apply to it several coats of waterproof varnish. When dry, glue the varnished side of the foil to paper, tissue, or whatever substance is to form the permanent support of the mirror. Spread mercury on the other side of the tinfoil, forming an amalgam. On this lay the varnished surface of the first paper, applying first a transparent glue, very thin.

Subject the whole to a strong pressure, as in a letter press, letting it stand for at least twelve hours. The upper paper is now removed by moistening with water until the white of egg is dissolved. The result of the operation will be an actual mirror, the beauty of which will of course largely depend upon the clearness and transparency of the varnish used. The mirror may be made in such a form as to fit the place it is to occupy. But this is not absolutely necessary, since the finished mirrors can be bent into any desired shape.

Beautiful effects can be produced by using colored mirrors, which are obtained in the same manner by substituting a varnish of the desired color over the white of egg.



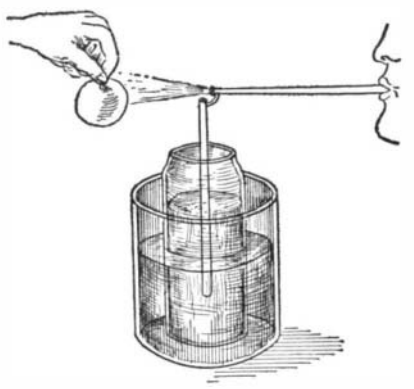
A REAL LIVE WINTER SCENE UNDER THE TREE.

COPPER-PLATING FLOWERS AND OTHER PERISHABLE ARTICLES.

BY W. J. C.

The following process of preserving objects as souvenirs in a state where they will not only retain their original shape, but have their appearance greatly added to, while comparatively simple, depends for its success on the thoroughness with which the different operations are performed.

The requirements consist of any common form of

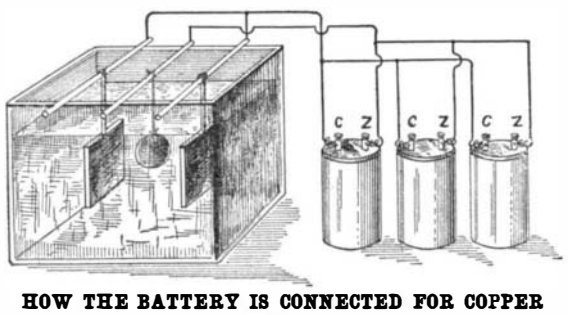


COATING THE OBJECT WITH WAX.

battery—three Daniell or two Bunsen cells connected for intensity, will be found sufficient—a large stoneware or glass pot large enough to hold the object, and two rods to fit across the top. The stoneware pot is now filled with the usual copper sulphate solution used in plating, namely, 4 pounds sulphate of copper, 1 pound sulphuric acid, 18 to 20 pounds water. The solution should be filtered. The object to be preserved is suspended in the solution, and attached to the zinc wire of the battery. To the other wire a piece of copper is hung. So far the process is that of copper plating. In order to obtain an even deposit of copper, however, on the objects, they must be prepared beforehand, and this is where the skill is required. The list of objects that can be thus coppered is large, and each will in a measure require different treatment.

If, however, I describe the handling of two or three different kinds, the necessary requirements will be made plain to anyone accustomed to copper plating.

One popular souvenir is "baby's first shoe" when it has arrived at the cast-off state. The shoe is taken and washed thoroughly to remove all grease, such as polish. It is then coated evenly with graphite, which is well rubbed into the leather inside (as far as possible) and out. The laces tied in a bow left half way up the shoe add to the appearance when finished. When this is covered with copper it presents a very solid appearance, and can be left dull or polished in places. The exact appearance of the shoe is retained.



HOW THE BATTERY IS CONNECTED FOR COPPER PLATING.

A piece of lace makes a very pretty object when covered with copper, as it has the appearance of being woven in copper thread. The lace must be well covered in graphite, the best method being to pin the lace on a board and rub the graphite well into the fabric with soft linen. In suspending it in the copper solution, it must be spread out and held in position by means of small shot tied to it by means of thread, to keep it vertical. If a very delicate piece of copper lace is silvered afterward, the effect is very fine.

The most beautiful object is perhaps a flower covered with copper, and this requires special treatment.

Let us take a simple flower as a sample. A daisy is covered by means of an atomizer with a thin coating of paraffine wax, care being taken that all parts are covered. On cooling, the wax-coated flower is dusted over with graphite, and when thoroughly covered is treated as other objects described above. A half-

opened rose is more difficult to spray with wax, but when cool the petals can be moved to any desired position. A rosebud is comparatively simple, requiring only to be dipped. Leaves and other objects of a similar shape need not be waxed if the graphite will adhere without. Copper-coated flowers are now being used as hat pins, and make very artistic Christmas presents.

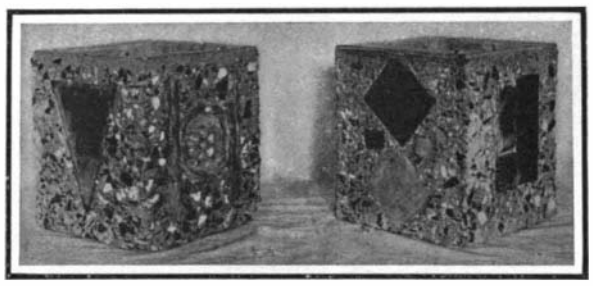
The best form of atomizer to use is one composed of two tubes at right angles to each other, the vertical one being inserted in the hot wax, which can be kept in a water bath. By blowing in the horizontal tube, a fine spray of wax will cover the flower.

In order to obtain an even coating on the object, a good method is to have two copper wires from the carbon, and hang a piece of copper on each side. If this is not done, the object must be turned at intervals.

ORNAMENTAL CONCRETE FLOWER POTS AND HOW TO MAKE THEM.

BY RALPH C. DAVISON.

The majority of people know something of concrete and of its advantages for a building material, especially where strength and fire-resisting qualities are a



THESE ORNAMENTAL FLOWER POTS MAKE EXCELLENT CHRISTMAS PRESENTS.

factor. Few however know of the wonderful ornamental possibilities which can be obtained with it by a little ingenuity in the selection of the proper aggregates and the imbedding of tile arranged in varying designs.

A most interesting example of this work, the conception of Mr. Albert Moyer, is displayed in the permanent exhibition hall of the Concrete Association of America, New York. Here are to be seen a number of highly decorative flower pots. These look as though they were difficult to produce, but they are simple to make when one knows how.

Concrete is a mixture of cement, sand, and stone; to this is added the proper amount of water and the whole is then worked into a pasty mass. Thus the concrete mixture being of a plastic nature, can be molded or cast into any desired form.

Therefore the first thing to do is to prepare a mold in which the pots are to be cast. A detailed drawing for a pot 9 inches square by 10 inches high is shown in the accompanying illustrations. Use wood not less than ½ inch thick, ¾ inch or 1 inch would be better. The outside form, Fig. 1, should be made first. This is nothing but a wooden box with the top left off and the bottom nailed on from below. Use as few and as small nails as possible. Three on each side will be plenty, as indicated in the illustration. The core, which is shown in Fig. 2, is the most difficult part to make. It is in the form of a tapered box, and must be made of sections as indicated, so that it can readily be removed after the concrete has set or hardened. After completing the mold, the concrete mixture should be made up. This should consist of 1 part Portland cement, 1 part good clean sand, and 4 parts of an equal mixture of marble chips and trap rock varying in size from ½ inch to ¾ inch. If marble is not available, very effective results can be obtained by using broken brick with the trap rock. Mix the sand and cement together thoroughly while dry, wet down the marble and trap rock by dipping it in a pail or sprinkling with water, and then add it gradually to the sand and cement, thoroughly mixing the whole, and at the same time adding enough water to make it the consistency of a good heavy cream.

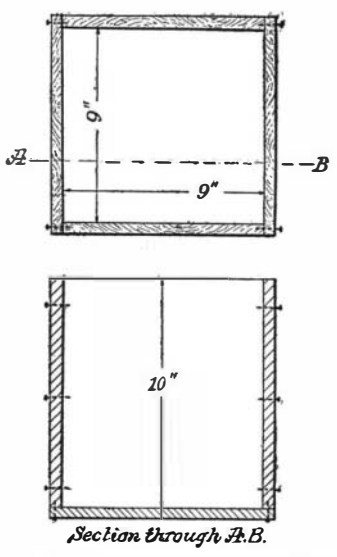


Fig. 1.—THE OUTSIDE FORM OF THE FLOWER POT MOLD.

The next operation after mixing is the pouring or placing of the plastic concrete into the mold. This is done as follows: First fill the mold solid up to a level with the bottom of the core, pack the cement down well, and then place the core box in position, as indicated in Fig. 3. Be sure that it rests solid on the concrete which is already placed, and that it is centered in the box. This is important, for if the core is not exactly in the center, the sides of the pot will not be of equal thickness. A good way to center and secure the core in position is to nail a strip of wood to it, and in turn nail the ends of this strip to the top of the outside form, as shown in Fig. 3. This will also keep the core down in place. After the core has been placed, and secured as above, fill the rest of the mold with the plastic concrete, packing it or ramming it down well with the blunt end of a stick. When the concrete mixture reaches the top of the mold, smooth it off nicely, and set the mold and its contents on a level place to let the concrete set or harden. In twenty-four hours from the time of pouring (do not let it be longer than this, for if so the concrete will be too hard for treatment) the concrete will be sufficiently hard to remove the molds. This should be done carefully, in order not to break the corners, as the concrete is yet more or less soft. First remove the bottom and then the sides of the outer mold. These should come off easily, unless there have been too many or too long nails used. As yet do not attempt to take out the core, as the concrete is not hardened, and the core will help to hold it up. After removing the outer forms, the surface of the concrete will appear comparatively smooth and uninteresting. The next operation is to wet the concrete surface down lightly by dashing water on it, and then to gently scrub it with a stiff brush, such as an ordinary house scrubbing brush. This operation will remove all of the surface cement and will expose the aggregates, that is the pieces of trap rock and marble which were used in the mixture, thus producing a surface similar in some respects to a black and white mosaic. If it is found that in some places the surface cement will not

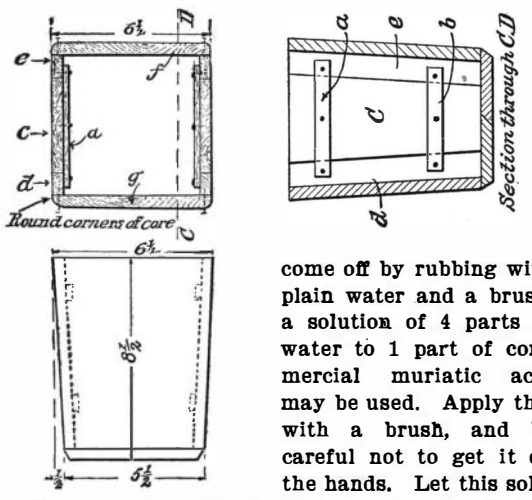


Fig. 2.—DETAILS OF THE CORE BOX.

come off by rubbing with plain water and a brush, a solution of 4 parts of water to 1 part of commercial muriatic acid may be used. Apply this with a brush, and be careful not to get it on the hands. Let this solution remain on the surface for 15 minutes, and then scrub again with clean water and rinse thoroughly. This will leave a good, bright, clean surface, each stone sticking out boldly and free from all surface cement.

After the surface has been treated thus, the pot should be put away for two or three days to dry out and harden. The core can then be removed. This should be done as follows:

First remove the small strips *a b*, which have been nailed from the inside, as indicated in Fig. 2. On removing these the V-shaped section *c* will be released from the sections *d e* and can be forced toward the center of the pot and drawn out. After these V-shaped pieces have been removed, the sides *f* will be free and can be collapsed toward the center, and in turn can be removed. The bottom, which is made in two pieces, as shown, will then release itself freely. Before pouring the concrete mixture it is well to grease all parts of the mold, which come in contact with the plastic concrete, with a heavy oil or vaseline. This will prevent sticking, and will allow the mold to be released readily from the concrete after it has set up or hardened.

Many will probably ask why it is necessary to have a collapsible core. Why will not a plain, solid box do? The reason for this is that in pouring your wet concrete mixture, more or less moisture is absorbed by the wood mold, thus causing it to swell. If the core were made solid, it would be next to impossible to remove it without cutting it to pieces.

Therefore, in order to prevent any undue strain on the fresh concrete by hammering or cutting on a solid core in order to remove it, and also in order to be able to save the core, so that it can be used over and over again for other casts, it is always better to make a collapsible core, as shown in Fig. 2.

So far the method of procuring a mosaic effect has only been explained. But by exerting a little artistic taste, by the incorporation of colored tiles in pleasing designs, one can produce some very interesting and really striking results.

There are various means which can be employed for inserting the tiles in the outer surface of the pots. One is to place in the outer mold a negative mold. This is done by cutting out a piece of wood the exact shape but a trifle larger than the tile which is to be inserted, and nailing it in the desired position to the inside of the outer mold. On drawing the outer mold this will leave a cavity in the outer surface of the pot, into which the tile can be cemented. In cementing the tile in place, the surface of the pot as well as the tile itself should be well soaked with water. Use a mortar composed of 1 part cement to 1 part fine sand. Another method for placing the tiles is to bore small holes through the outer forms, and secure the tiles to the inside of the outer forms by tying with string, as indicated in the illustration; care being taken to see that the ornate side of the tile is placed next to the wood. Then pour in the plastic concrete as you would proceed to do in an unornamented pot. Before removing the outer forms in this case, however, the strings which hold the tile in place should be cut. This is

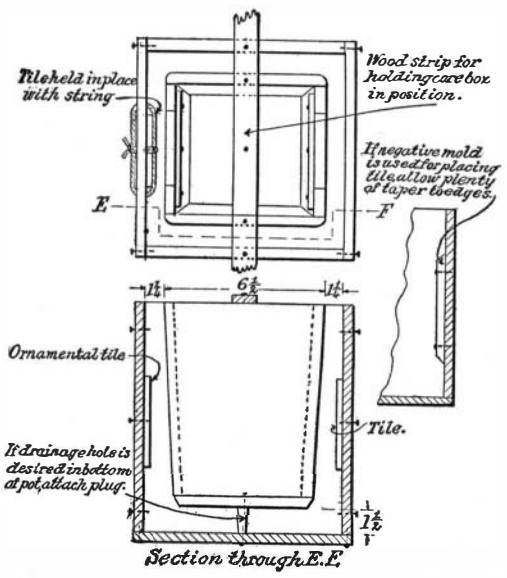


Fig. 3.—THE MOLD ASSEMBLED FOR THE PLACING OF THE CONCRETE.

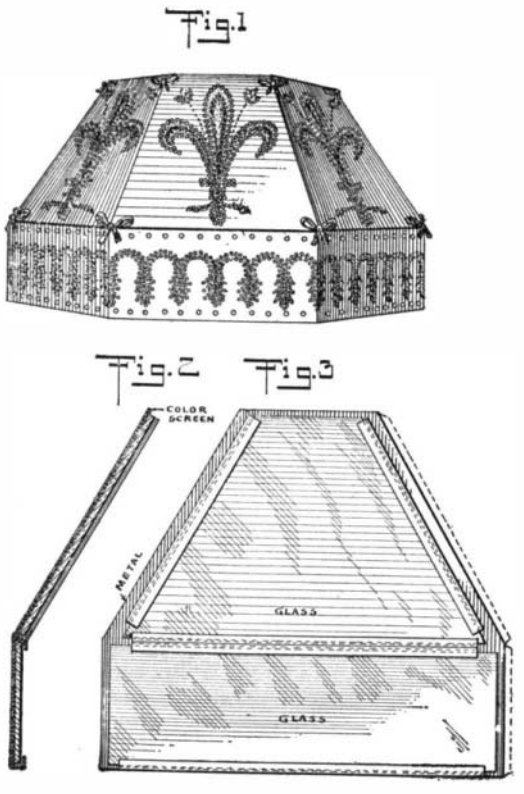
perhaps an easier method of placing the tile than that of making a negative mold. But in some cases it is hard to get the plastic concrete to flow completely around the tile. If in removing the forms, however, it is found that there are some places where the concrete has not run up to the tile, these holes or "voids," as they are called, can be filled in or pointed up by cementing small pieces of stone in them. Anyone making a vase or pot after the above directions will be amply repaid for his trouble; for the work is interesting, and is suggestive of an unlimited number of designs and combinations, each of which will contain more or less individuality.

HOME-MADE METAL LAMP SHADE.

BY B. A. JOHNS.

The accompanying sketches show a simple and yet effective way to make a metal lamp shade. When the desired size, shape, and general style of the shade is selected, a diagram is made, from which the blanks or sections are made. The blanks are cut out from some thin metal, such as copper, brass, or black iron, with a small strip on one side, as indicated in dotted lines in Fig. 3. This flap is to be turned in and soldered to the adjoining blank.

Now trace the desired design on the blank, which may be a conventional flower or anything that ap-



HOME-MADE METAL LAMP SHADE.