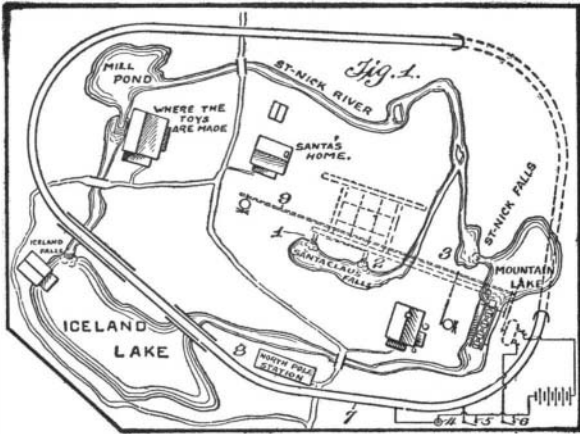


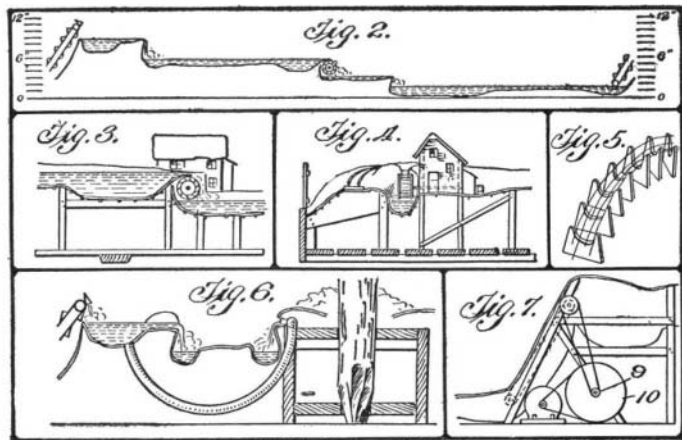
A CHRISTMAS TREE GARDEN.

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.

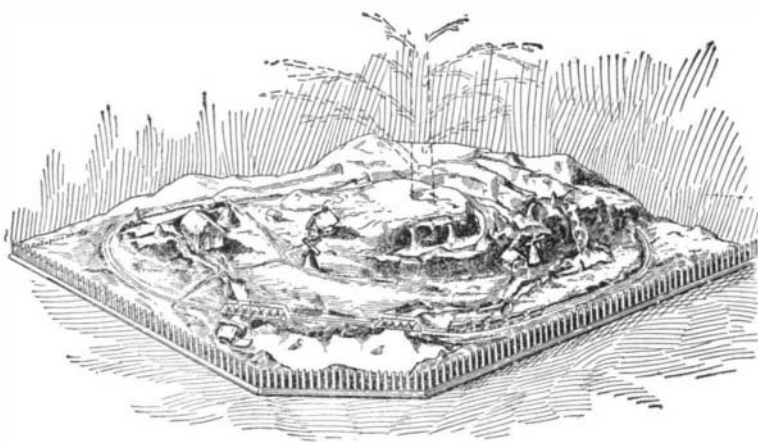
garden may be made at small expense. The formation of rivers, lakes, falls, etc., is here prettily demonstrated.

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 1/2 inch thick and with cross cleats to stiffen it. The boards are 3 inches wide and spaced 1/2 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 3 1/2 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 1 1/4-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



A REAL LIVE WINTER SCENE UNDER THE TREE.

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 1/8 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 3/4-inch copper tube is used here. Figs. 3 and 4 illustrate the manner of mounting the mill wheel.

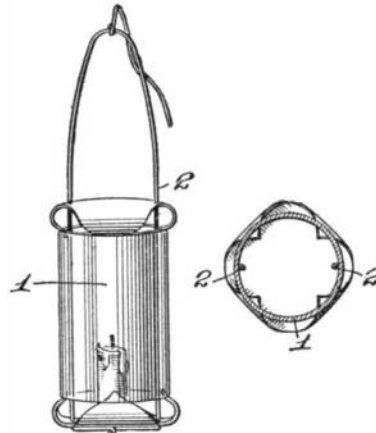
Old cigar boxes and similar light material are employed to form the frame of the waterways, hills, etc. For the streams, these are cut as in Fig. 5; for other parts, they are cut and arranged as required. Short lengths of copper wire are bent to necessary shapes, and fastened in place with small staples. 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 sail-boat 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



PROTECTION FOR CHRISTMAS TREE CANDLES.

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 1 1/8 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 1 1/2 in diameter.

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.

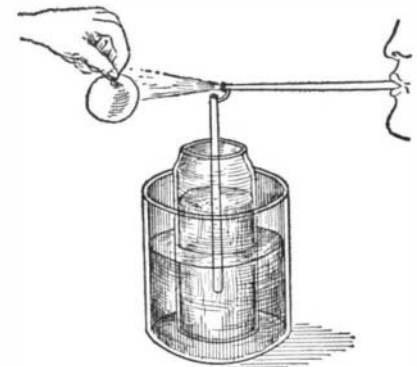
Beautiful effects can be produced by using colored mirrors, which are obtained in the same manner by substituting a varnish of the desired color over the white of egg.

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

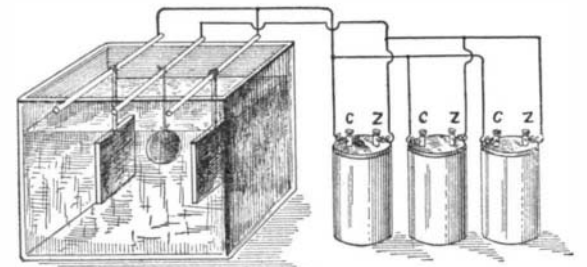


COATING THE OBJECT WITH WAX.

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 pos-



HOW THE BATTERY IS CONNECTED FOR COPPER PLATING.

sible) 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.

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-