1960

4-H Handicraft Guide Metal Craft

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4-H HANDICRAFT GUIDE

Metal Craft

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Metal Tooling and Embossing

Metalcraft is an art that dates back many centuries, yet always proves to be very fascinating and practical. Metals most commonly tooled are aluminum, copper, and brass. The tooling of thin sheets of these materials is a craft that may be done by a first grader or a skilled craftsman.

Annealed (softened) metals are best for hand tooling. The desirable thickness varies from 40 gauge to 34 gauge; 36 gauge is most commonly used. The metals are rolled into coils, and are sold by the lineal foot. They can be cut to the desirable size by household shears. The coils range from 12 to 24 inches wide.

PROJECT SUGGESTIONS

Pictures, boxes, trays, screens, book ends, wastepaper baskets, and many other articles can be beautifully fashioned with amazing ease and simplicity.

MATERIALS NEEDED

Hard lead pencil, meat skewer, ball point pencil, a 'liner' or tracing tool, or pointed end of orange stick for tracing and outlining design.

Plastic tape, masking tape, or rubber cement to hold pattern in place.

Large, thick soft magazine, thick newspaper, or felt pad for base in stretching metal. (Embossing and modeling steps.)

Large, thick hard magazine, piece of plate glass, or marble slab to use for base in background work.

Ruler for drawing straight lines.

Two or more orange sticks with a "v" shaped end, a tip of a spoon, and ½ of a snap clothes pin that has been sanded or modeling tools for modeling and background steps.

Emery paper for sharpening wooden tools.

Double 0 or 000 steel wool.

Pair of old shears for cutting metal.

Liver of sulphur for oxidizing metal.

Dull ground paint.

Floor wax, amyl lacquer, clear plastic spray for finishing to prevent tarnishing.

Glue and sawdust or glue and cotton, soft clay.

By **Henrietta Gohring** and **Ivan Sundal,** State 4-H Club Agents

DESIGN

The design should be in keeping with the purpose of the finished article, and in good proportion to the finished article. See the circular on design for further suggestions. Designs may be secured from craft catalogues, free hand, color books.

STEPS

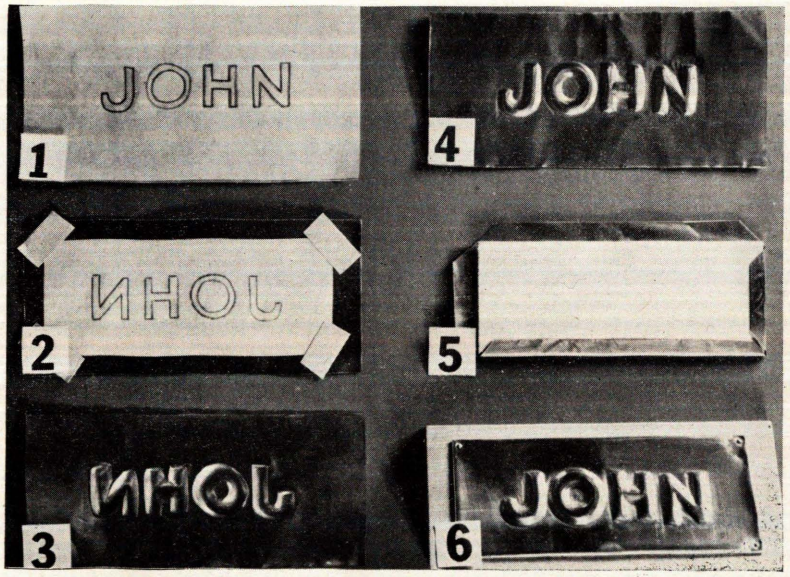
Trace Design

Select the design to be used for the project. Cut metal to proper size. Use a square to mark right angles for square or rectangular pieces. Cut with household shears. Allow for margins and mounting that may be required for the project.

Center design on metal. There is no right or wrong side to metal. Fasten design in place with plastic tape, masking tape, or rubber cement. Place design and metal on felt pad, newspaper, or magazine.

Trace design with meat skewer, ball point pencil,

Steps in metal modeling: 1. tracing name; 2. reversing name on copper piece, 3. tooling on reverse side; 4. finished copper piece; 5. adding cardboard backing; 6. completed name plafe.



or orange stick. Trace so design shows clearly on metal. Check to see if all the design is being traced.

Remove design. Go over lines on metal again. This is the right side of the project.

Emboss Design

Emboss by turning metal design face down on felt, newspaper, or magazine. Trace design about one-thirty-second inch inside line of original tracing. Make this inside tracing a little heavier than the first tracing. This begins the modeling process. Do not press hard enough to puncture through metal.

Model

Using small rounded orange stick, gradually depress the metal within the outline of the design on the wrong side. This creates a raised surface of varying depths depending on the amount of stretching done. Use an even pressure. Start to work on the highest areas first, followed by the lower areas. Check on right side to be sure the correct effect is obtained. Light steel wool strokes on the right side bring out high lights and help see the desired effect. You may work the metal out to about one fourth inch if done very gradually.

Retrace the original design on right side. Do not push too hard.

Flatten the Background

When all of design is raised to desired height, work metal carefully from design out to edge with flat spatulas to flatten background. Work on right side and on a hard surface as plate glass. Use light strokes. The hard surface must be free of any irregularities and clean. Working the metal in two directions will cause it to buckle.

Add Detail and Filler

Place the metal, designed surface down, on hard tooling surface. Fill the depressions in the back with soft clay to give body for adding finer tooled details.

Using a small modeling tool, slightly and sharply depress the areas and details of the design that are needed for its completion. This modeling creates the finer detail and definition of the design.

Remove the soft clay.

Finish Background

Background may be left plain, patterned, or antiqued.

Rubbing. Lay the metal on a piece of coarse material, like a window screen or sandpaper, and rub with a blunt tool. Be careful of slippage.

Tapping. Using a blunt piece of metal, such as a nail or ball point pencil without the refill, tap lightly on the metal background to obtain the desired design. Too sharp an instrument may pierce the metal.

Painting. If you desire to block out the background to bring out the design more vividly and to add depth, you may use "dull black ground paint." It comes in either dark green or black and is applied with a brush.

This is the last step and should be done after the design has been lacquered.

To antique. (darken depressed areas) Apply a solution of liver or sulfur (available at a drug store) and water with a wad of cotton to right side of metal. A piece of liver of sulfur the size of your thumb nail dissolved in one-half to three-fourths cup of warm water will antique two to three projects each 12 by 12 inches. Wipe off immediately. Then steel wool lightly but firmly until the high lights are as you desire. Include the background if you desire this to be a bright color.

This step is done after polishing with steel wool. Do not get finger prints on the metal.

Finishing

Using 00 to 000 steel wool, lightly polish the right side of metal. This brings out the high lights of the metal. To preserve this color brush design completely with clear lacquer, clear plastic spray, or floor wax. Brush out any air bubbles that may form.

Permanent Filler

To avoid the possibility of raised portions being pushed back in (especially for items that are handled in use), fill is recommended before mounting. A mixture of sawdust and glue or cotton and glue may be used. Be careful not to raise the filling higher than the background. This filling stays in place and does not crumble.

The project is now ready to mount or mold to the framework.

Mounting Tooled Projects

Metal is easily mounted on various types of hard and soft woods that are finished according to the type of project made. Cut the metal carefully to fit the shape of the wood, leaving a slight border of wood showing.

Another simple method of mounting is over a thin, flat piece of wood about one-half to three-fourths inch smaller than the metal. Heavy cardboard or wallboard may also be used. Center the wood on the back of the designed metal and draw around it with a pencil. Mark the corners for cutting by carrying out the pencil lines to the edge.

In bending metal to fit, lay a ruler up against the line and bend against a hard surface. Bend all four sides before inserting wood mount.

To cover a disc with metal, mark around the shape, cut the margin or edge to one-eighth to one-fourth inch intervals, bend, and fasten.

A picture may be framed as any other picture but without glass or mounted to the back of wood.

To mount to the back of wood, first finish one side of the frame. Then cut a heavy piece of cardboard the exact size of the frame; place in back of designed metal. The three pieces are fastened together with a braquette (quick change picture frame) on each corner.

Plan the size of the wooden frame by the size of the tooled metal picture. Allow one-half to three-quarter inch margins on the metal picture for fastening to the wooden frame plus enough margins on the wood for the picture to appear in balance.

Remember the bottom margin is the largest when matting pictures. For a vertical picture the side margins are narrowest; the top margin width is in between bottom and top widths. Horizontal pictures have the top margin the narrowest; side margins are wider than top but not as wide as the bottom margin. The general rule for margin widths is 5:7:11.

Cloth tabs with a hook may be glued to the back or eyelet screws secured to the frame and wire threaded through the eyes are methods for hanging.

Metal Etching

Etching is a method of applying a design on different types of metal, such as aluminum, copper, stainless steel, or pewter. The metal should be approximately 16 gauge. Lighter metal articles usually will not lay flat after the edges have been fluted.

Preparation

1. Clean metal with hot water and soap, steel wool, or carbon tetrachloride (do not use steel wool on mirror aluminum). Wipe surface dry. Avoid fingerprints because they may leave an invisible film.

2. Then trace the design onto the metal by means of a pencil and carbon paper. For a clearer outline go over the carbon line with a scriber, awl, or any sharp pointed instrument; then remove the carbon lines.

3. Place the metal on a clean piece of paper and avoid touching metal with your fiingers.

4. Paint the design on the part of the picture that you want left shiny with asphaltum varnish (acid resistant). A camel hair brush works very well. Be sure that there are no unpainted spots. Check the drying time on the asphaltum can.

5. Turn or shape the edges of the article (called fluting). There are several ways of shaping the edges of a flat metal surface. You may use an ordinary pair of pliers with the jaws well taped with adhesive tape. This prevents scratching of the metal surface. You may also buy or borrow a fluting tool. This tool does a better job for uniformity of the flutes.

A suggested way of making sure that you have equal spacing of the flutes on a round article.

a. Cut a piece of paper the size of the circle.
b. Fold paper in half. Fold it again; to have more flutes fold the paper accordingly.
c. Open paper, place on the metal, and tape it securely. You then have even spaced areas for each flute.
d. Flute each space directly across from each other at one time for more uniformity.
e. When fluting the article, be sure to work on a flat surface; this helps keep the article in its original shape.

6. Mix the etching solution according to directions on the product you use. Be sure that you have the proper equipment needed before starting. If you want a deeper etch you can apply a second application of the solution.

7. Rinse off etching solution under cold water until completely removed, then dry. Remove the asphaltum paint with clean turpentine, coal oil, benzene, or other similar solvent. Then using a clean rag saturated in the solvent clean thoroughly and wash with hot, soapy, water. Rinse and dry. Your article is finised.

8. Suggested ideas for metal etching—trays, coasters, pictures, book covers, planters, book ends, waste baskets, decorated boxes.

Metal Engraving

Metals to engrave include copper, brass, and aluminum. These metals should be approximately 16 gauge. The lighter weight pieces (20 gauge and up) are too light and when the edges are fluted the tray does not sit flat.

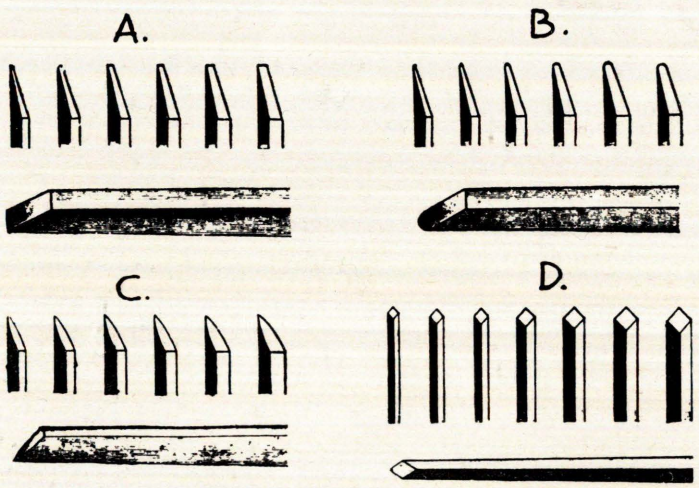
TOOLS

Engraving Knives

Gravers, as they are commonly called, are made in a variety of sizes and shapes. The most common shapes are flat, round point, point or onglette, and diamond-shaped. The flat and round point gravers are used to remove stock in considerable amounts, while the pointed and diamond shape are for making fine lines.

Pliers

Household pliers covered with tape, to flute the edges.



Engraving tools—the most common shapes are: A. flat; B. round point; C. point; and D. diamond shaped.

STEPS

1. Trace pattern on tracing paper or onion skin.

2. Secure paper pattern to the flat metal (centered correctly) with masking or plastic tape.

3. Trace pattern using a ball point pen. (Carbon paper can also be used.)

4. Select engraving knife to use. If there is small, detail work, a fine knife should be used.

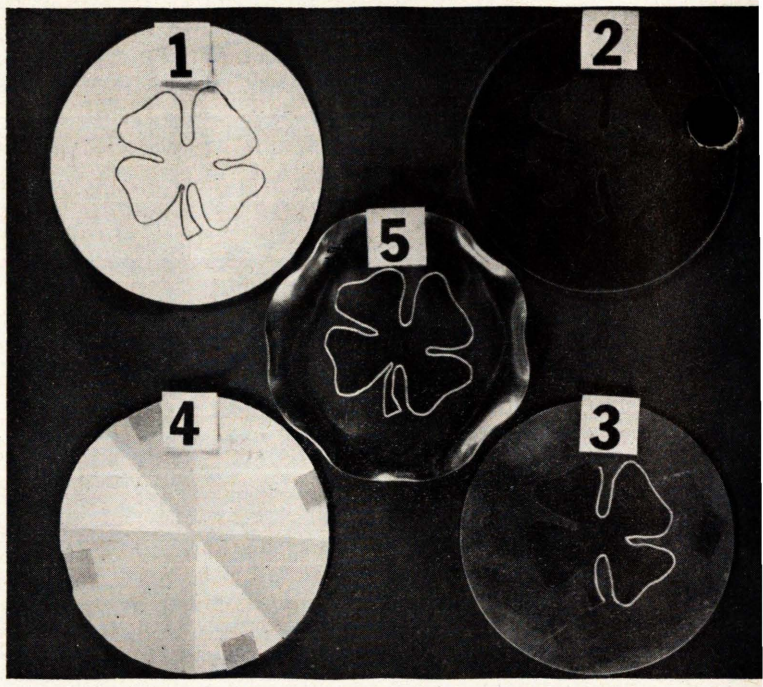
5. The tool is "walked" along following the lines. Movement should come from the wrist. The index finger should be placed just above the point and is used to guide the engraving knife.

6. After engraving is completed cut a piece of paper the size of the metal; fold. Keep folding in two until it is folded to approximately 2 inches. Open it and tape down to metal. (The fold lines are guides for bending or fluting.)

7. Set pliers in to the depth desired to turn up.

8. Have tray on table; with left hand holding metal flat, lift up with the right hand.

9. Turn tray around and do the same on the opposite side. Continue this working from one side to the other.



Five basic steps in metal engraving: 1. drawing pattern; 2. tracing pattern; 2. tracing pattern on metal; 3. engraving; 4. preparing to fllue edges; 5. finished tray.

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