



Power unit is simple box built from scrap to house small transformer and silicon rectifier. Cord at right plugs into wall outlet. Center cord (from rectifier) is positive, clips to work; one at left, to stencil pad.

Make an Electric

You use a common mimeo stencil, but the printing agent isn't ink—it's an electrochemical flow

By ROLAND LOEWEN

You can easily—and safely—put electrochemistry to work "branding" your name on tools, or decorating aluminum sheets. The stencil pad consists of a metal plate (copper, aluminum—even a scrap of tin can) covered with felt that's saturated with a solution of table salt (or with liquid Sani-Flush).

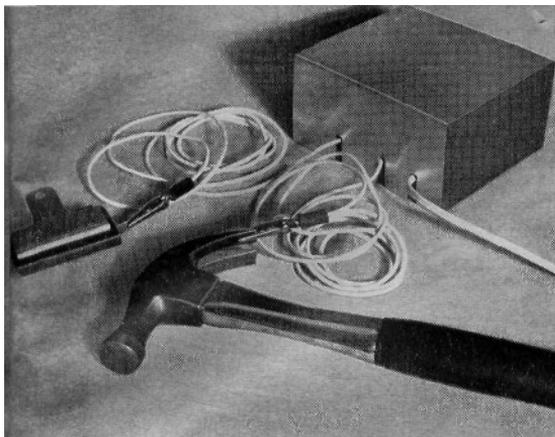
Over this pad you smooth a section of an ordinary mimeograph stencil (available at any office-supply store) which you have typed on a typewriter set for stencil cutting, or with a hand stylus—just as if you were preparing it for inking.

Clip the leads from a DC power source to the stencil pad and the workpiece and press the two together for 10 to 90 seconds. This power source can be your auto battery, a battery charger, or an electroplating unit. Or, to use house current, you

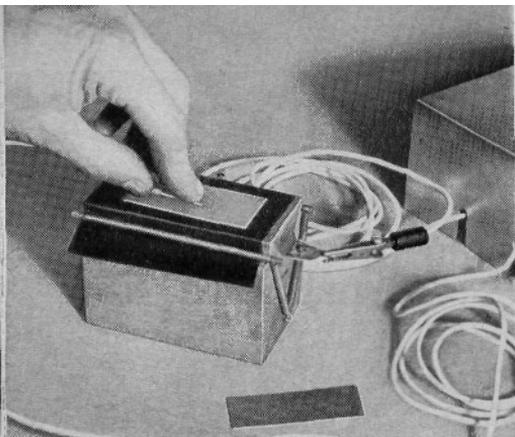
can easily assemble a unit costing under six dollars from a small transformer, a silicon rectifier, a few feet of insulated wire, a male plug, and two alligator clips. The power needed is at only six to 12 volts low amperage. I use a filament transformer from Allied Radio (their stock number 54C1420) that's rated 110-120 volts primary, and 12.6 volts at two amps secondary. I get about 12 volts, which speeds up etching jobs.

I made two types of stencil pads—a one-liner to hand-hold against tools and a block against which metal plates can be pressed. Both are sketched at right. For the one-liner, glue the metal plate to the slightly rounded edge of the wood strip with epoxy cement, letting it extend at one end and bending it up as shown for attaching an alligator clip. Fasten a strip of felt over the metal, gluing it lightly.

To use, soak the felt in the salt solution, then dab with a cloth to remove excess. Center stencil over felt so the lettering is backwards as you look at it. Tuck ends under a big paper clamp. The larger rig has two spring-loaded bars for this purpose; they seat in rabbets. Be sure your stencil is large enough to cover the felt or you'll leak current at the ends.

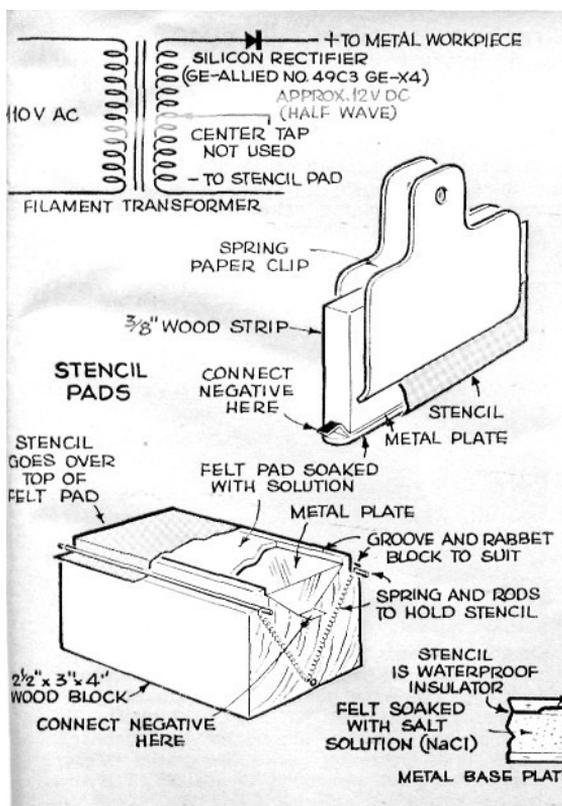


One-line stencil pad (left) is secured by spring clamp, as shown in sketch below. It's fine for applying name to hammer (above, with clip applied) or to steel punch and chromed tape case (far left, facing page).



Block-type stencil pad offers etching area about 2½" by 4"—ideal for address plates shown above. You induce electrochemical flow by holding positive clip in contact with back of plate centered on stencil.

Stencil to Etch Metal



How electrochemical etching works

Metal plate of stencil pad becomes cathode, charged with negative electricity (electrons). Above this (in cross sections below) is felt pad soaked in salt solution (sodium chloride: NaCl) plus a waxy stencil. Where latter is pierced, chlorine ions flow through to carry electrons to anode. Iron workpiece reacts with chlorine to form iron chloride (FeCl_2), which dissolves, leaving mark. Other metals react similarly.

