

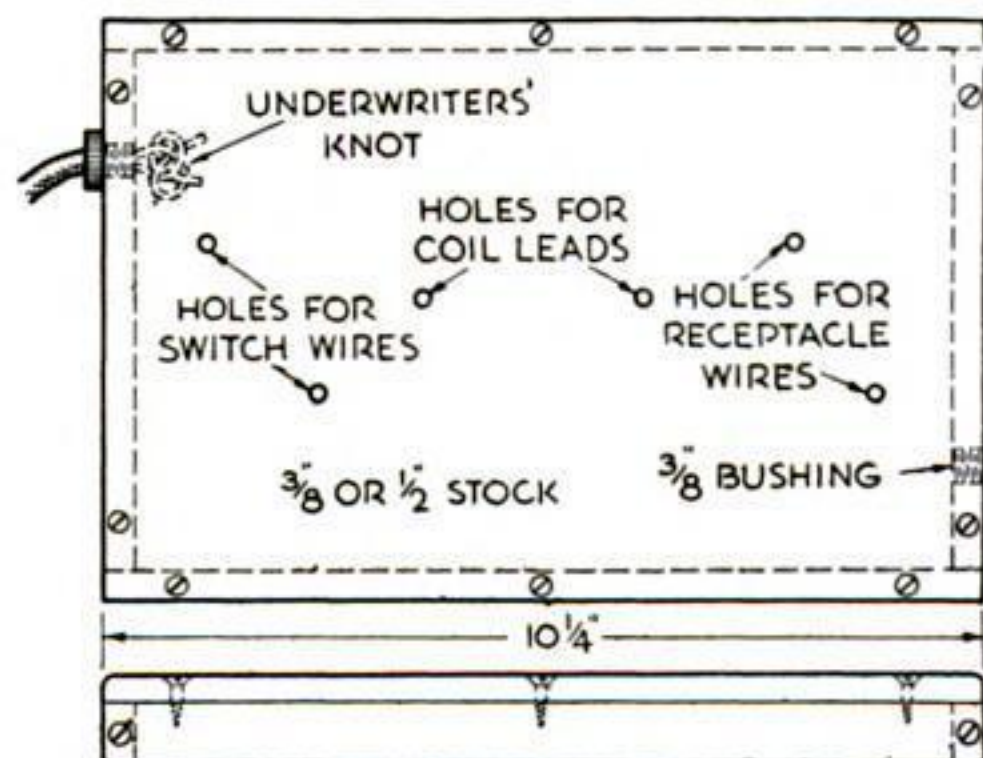
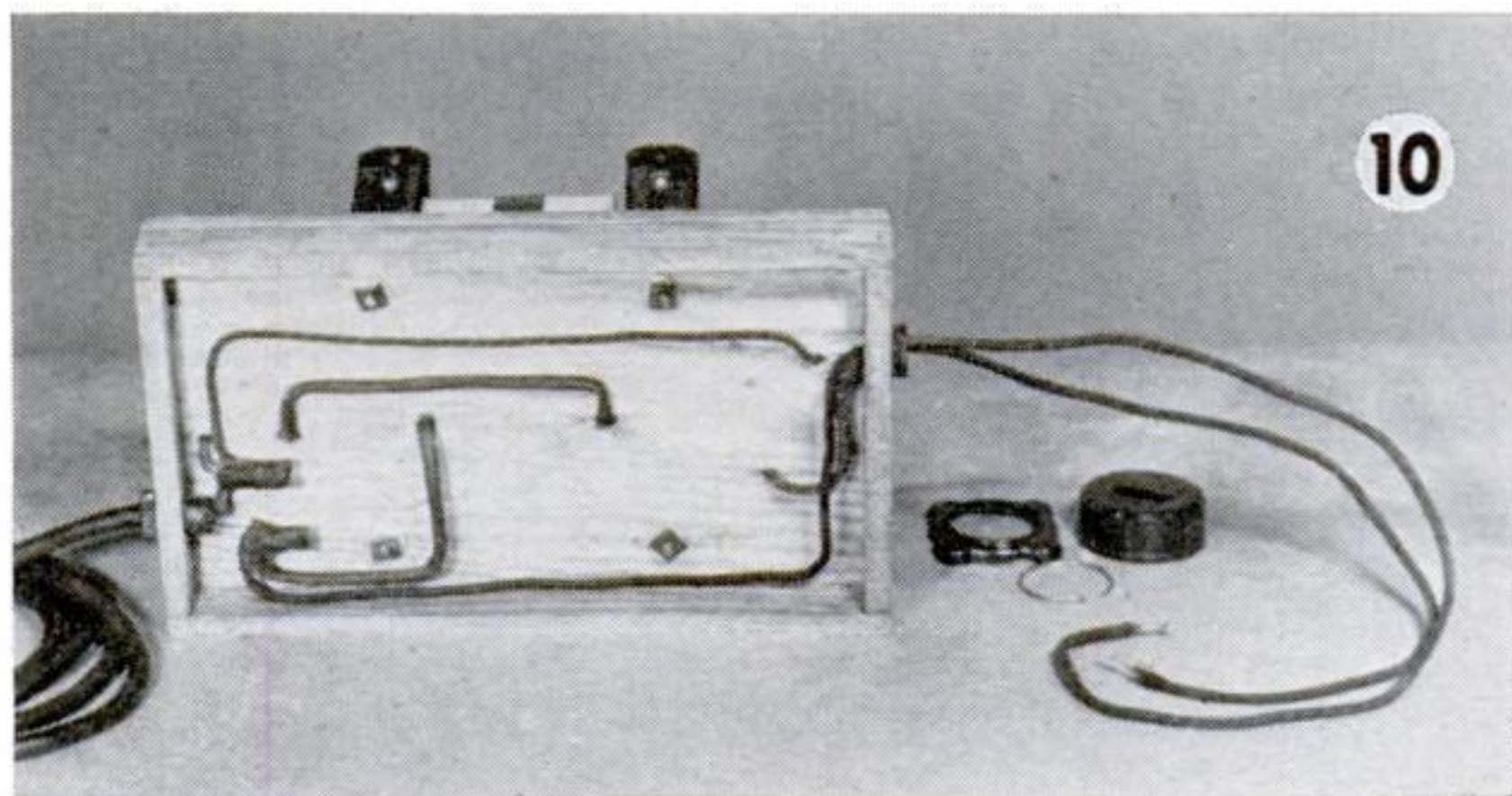
## **How to Complete and Use Our Adjustable GROWLER for Testing Armatures**

By **HAROLD P. STRAND**

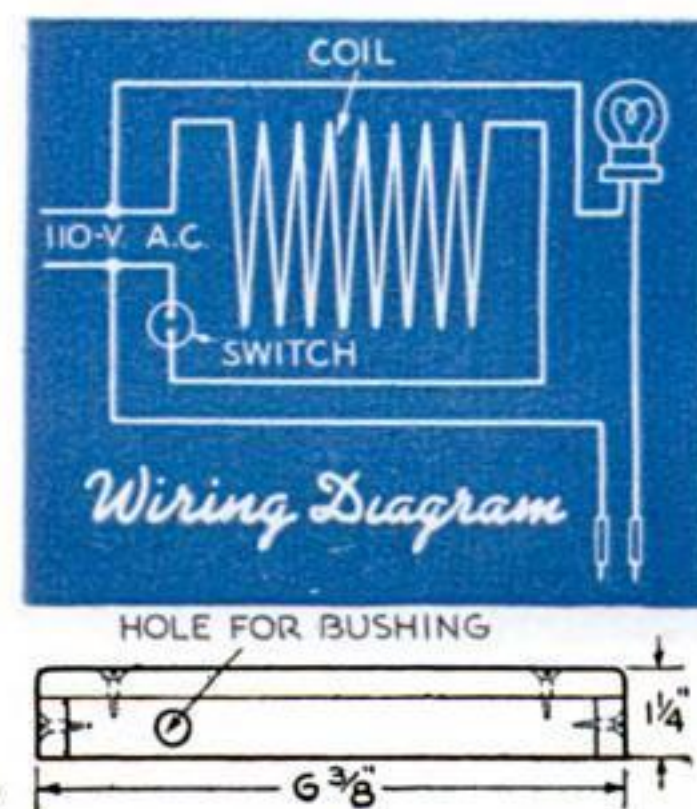
TO SIMPLIFY the work of fitting the pole pieces to the core of the growler, the construction of which was described in the first part of this article (P.S.M., Dec. '41, p. 193), the finished parts may be mounted upon the baseboard. This is preferably a shallow box made of  $\frac{3}{8}$ " or  $\frac{1}{2}$ " thick oak or other hardwood. Dimensions are given in the drawings, and Fig. 9 shows the arrangement of the three units on the baseboard.

Both the receptacle and the toggle switch are of the surface type, and may be composition or porcelain. The test leads and the line cord enter through hard-rubber bushings. Four short  $\frac{3}{16}$ " bolts secure the growler to the base.

Figure 10 shows the base wiring. The taps for the series lamp



*Baseboard Details*



are soldered and taped. Use No. 18 flexible insulated wire for all connections, as well as for the two test leads. Slip rubber tubing over the winding leads where these pass through the base.

The baseboard and core brackets are finished with two coats of black enamel, but the core is best left unpainted. Insulating varnish is applied over the coil. Allow 24 hours for drying.

Eliminate any burrs in the slots by using a fine-cut file as in Fig. 11, which shows one pole assembled. Great care must be taken to construct the joints so that they work freely. Start by fitting four short round-end laminations into the first slot of the core leg. Push the brass hinge pin through just far enough to hold these while the next group is inserted (Fig. 12). Select pieces to fit each individual slot as closely as possible. If four laminations are too tight, the slot may perhaps be filed slightly, or three laminations used instead. The thickness of the completed joint, when it is drawn tightly together by means of the wing nut, should be equal to that of the core leg, and it should be possible to move the pole pieces when the wing nut is loosened.

The upper ends of the pole pieces are locked together by fitting two small iron washers into each slot and passing a 3/16" by 4" stove bolt through the parts. File the washers individually, if necessary, to maintain correct spacing. Figure 13 illustrates this part of the assembly.

The ends of the pole pieces should be filed smooth and flat across as shown in Fig. 14. This completes the growler (Fig. 15).

Suitable test prods should be soldered to the leads connected with the series lamp. An easy way to make the prods from ordinary No. 10 rubber-covered solid copper wire is shown in one of the drawings. Leave one lead somewhat longer than the other so that the prod tips will be less likely to touch each other accidentally.

To test an armature, place it on the growler as in Fig. 16, adjusting the pole pieces to suit, and only then turn on the switch. A loud hum, from which the device derives its name, may now be heard. Hold a hack-saw blade at the top of the armature, and slowly turn the latter through at least one complete revolution, keeping the test blade at the top. If the winding is intact, no magnetic attraction will be felt. Avoid testing on the side of the armature, as the growler poles may attract the blade there.

Should there be a short-circuited coil, it will cause the blade to be attracted to the armature when that coil is directly beneath. Mark the spot and continue rotating the armature. If attraction is evident at more than one point, either more than one coil

