

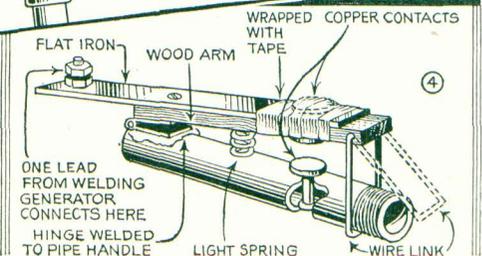
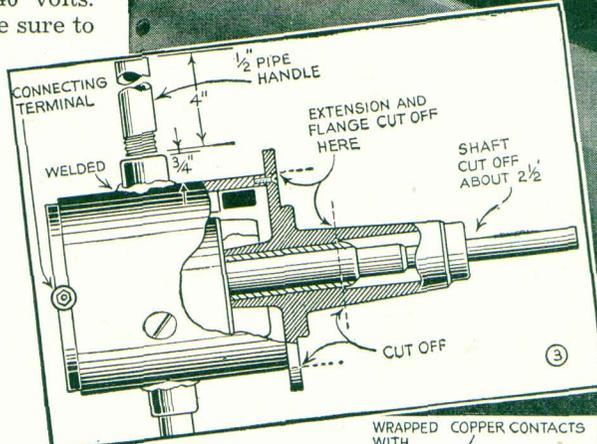
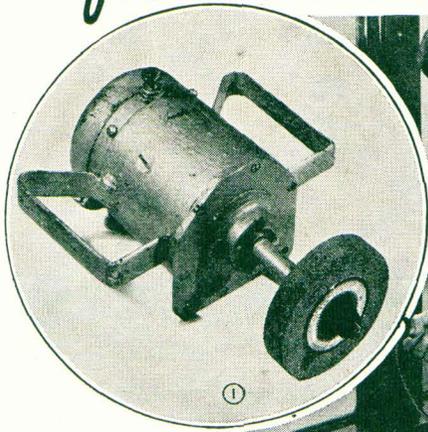
WELDER'S DRILL and GRINDER

from old auto starter

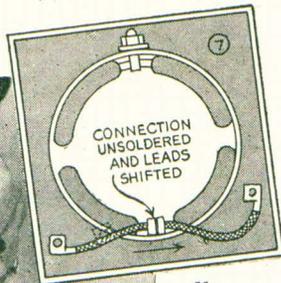
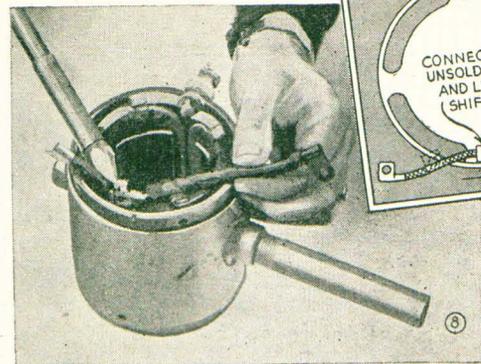
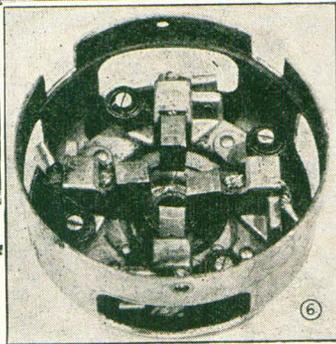
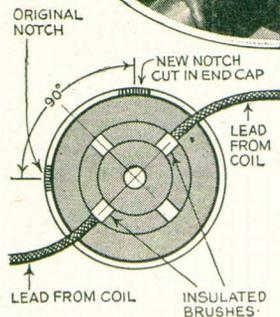
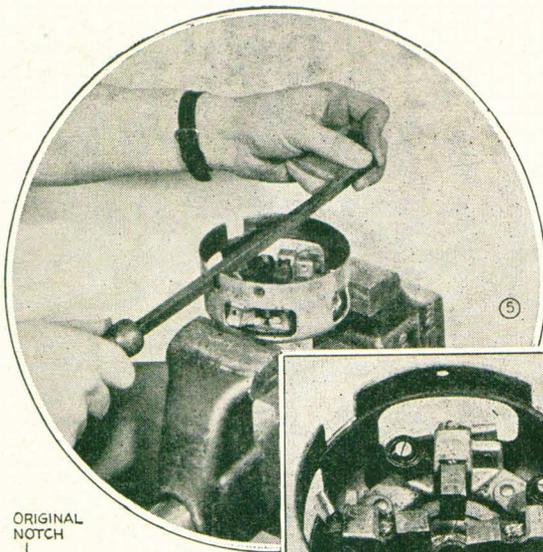
By F. Gage

OPERATING on current produced by a welding generator, this grinder and drill, Figs. 1 and 2, will be helpful to owners of motor-driven electric welding outfits who take them to farm fields and other places where electric current is unavailable. The only expenditure is the cost of a drill chuck, a grinding wheel and a couple of old auto starters. The drill and grinder shown here were made from model-T Ford starting motors, which are rugged and do not burn out easily. They can be operated safely on any d.c. welding generator having an open voltage range from 0 to 40 volts. When using the drill or grinder, be sure to run the generator at idling speed of the motor that drives it so that voltage delivered will be low. A little experimenting will enable you to determine at what speed the generator is producing the voltage most suitable to operate the tools.

After obtaining the starting motor, take it apart and clean it thoroughly, washing the parts with gasoline if necessary. Then inspect the bearings, and replace them if they are worn. If desired, you can substitute ball bearings for the bronze ones already in the motor. Also, check the brushes and replace them if they are worn down. If the commutator is worn, turn it down in a lathe, and undercut the mica, or else replace the armature with one on which the commutator is in good condition. Now, before reassembling the motor, cut off the end plate and armature shaft as indicated in Fig. 3. Be sure that the armature shaft is straight and true. Then thread the end of the shaft to take a drill chuck. As these motors rotate in the opposite direction of a drill, they must be reversed. This is done as in Figs. 5 to 8



inclusive. The end cover is given one quarter turn to the left as you face the closed end of the cover. In this way, the cover is turned so that the screw holes are moved to line up with the next holes in the housing. This makes it necessary to cut a



brackets to which they were connected, and then resolder them. In examining the brush brackets, you will notice that two of them are insulated with fiber strips from the copper ring on which they are mounted. The leads are connected to these brackets. Before replacing the cover, drill a small hole in the end so that the bearing can be lubricated frequently. A little felt placed inside the cap in front of the hole will help distribute oil to the bearing. This completes changes in the motor.

Next, comes a pair of handles. These are pipe nipples, which are screwed into sockets arc welded to opposite sides of the motor housing. The original sockets were made by sawing a pipe coupling in half. Be very careful in doing this welding job to see that the motor housing is not heated enough to damage the insulation of the coil wires inside. One of the handles is fitted with a switch made as in Fig. 4, using heavy copper contacts. This gives instant control of the drill as the switch really becomes part of the handle and must be gripped to keep it closed. If the motor is to be used as a grinder, the treatment is the same except that the armature shaft is threaded for nuts to clamp on a grinding wheel, and the handles are shaped from flat iron to provide grips suitable for manipulating a grinder.

Notches Cut in Eye of Lathe Dog Adapt It for Square Stock

new notch in the cover to straddle the terminal that projects from the housing. You can do this easily with a file or hacksaw. After the cover has been shifted, you will find that one of the coil lead wires is too short to connect to its brush bracket. You can lengthen it with a short piece of wire, of course, but a neater and better way to do the job is to unsolder the leads where they are connected to the field coils, and shift them as shown in Figs. 7 and 8, until both will reach the two insulated brush

Sometimes it is handier to drive square stock in a metal-turning lathe by using a dog instead of a chuck. Any dog suited for round work can be made to hold square stock by filing two small notches in the position shown. In most small dogs, several sizes of squares can be held in one pair of notches.

