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
ackets to which they were connect-
ed, and then resolder them. In ex-
aming 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 brack-
ets. 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 com-
pletes changes in the motor.

Next, comes a pair of han-
dles. These are pipe nipples,
which are screwed into sock-
ets are welded to opposite
ides of the motor housing.
The original sockets were
made by sawing a pipe cou-
pling 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 con-
tacts. This gives instant con-
trol of the drill as the switch
really becomes part of the han-
dle 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
to a grinding wheel, and the han-
dles 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

Sometimes it is
drawer 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.