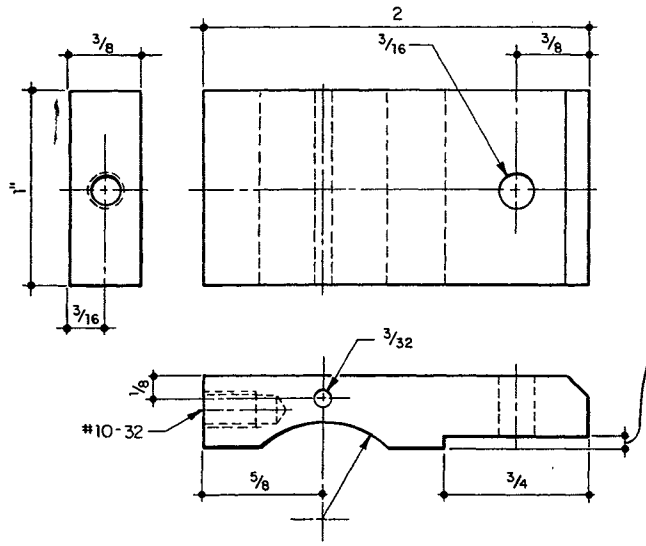
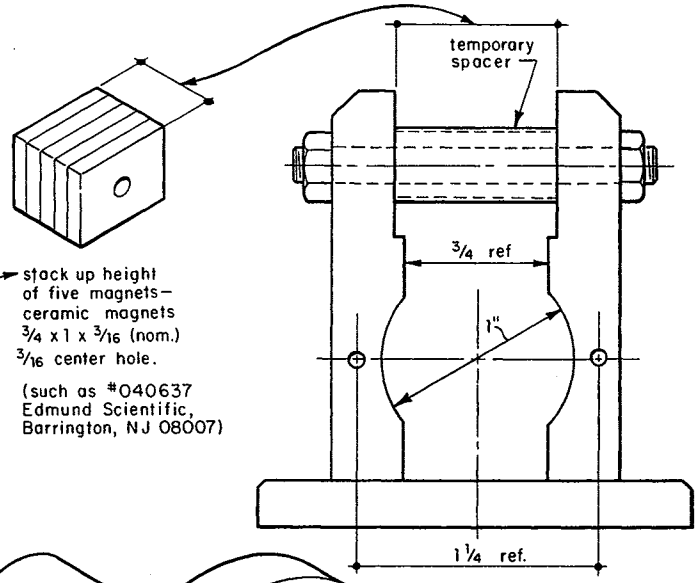
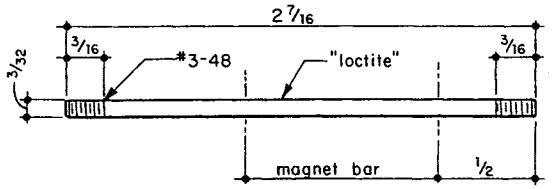


stock up height of five magnets– ceramic magnets 3/4 x 1 x 3/16 (nom.) 3/16 center hole.

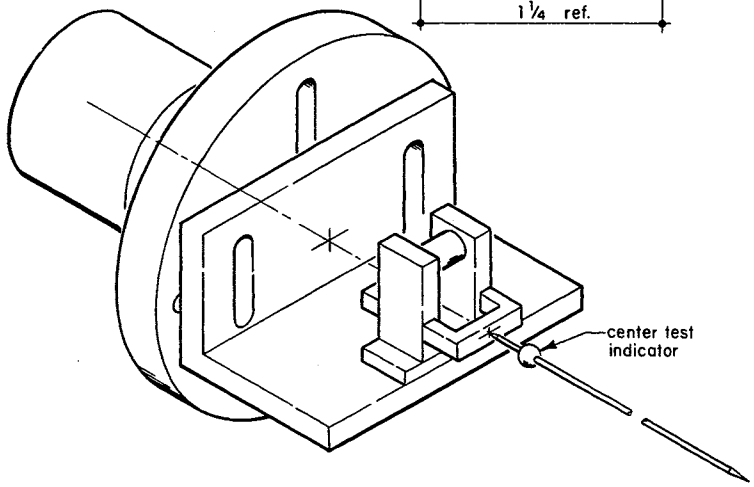
(such as #040637 Edmund Scientific, Barrington, NJ 08007)

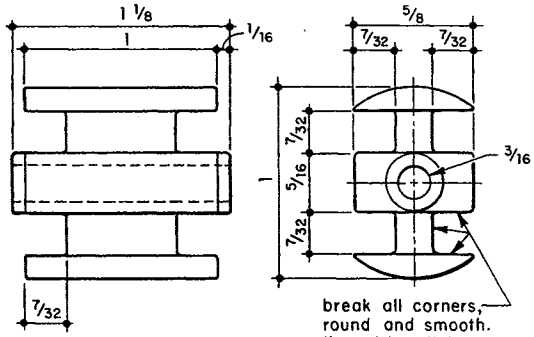


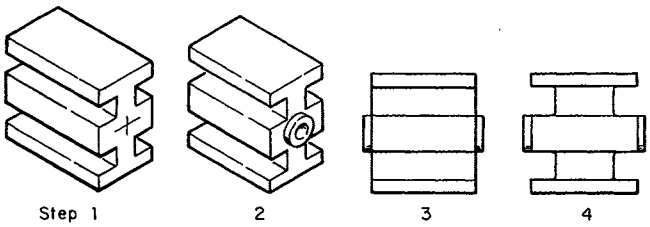
MAGNET BAR
Mild Steel, 2 required



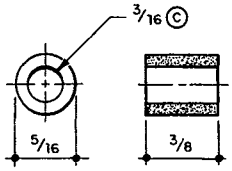
BEARING TIEBOLT
Steel, 2 required



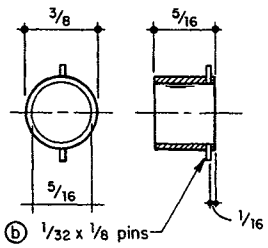




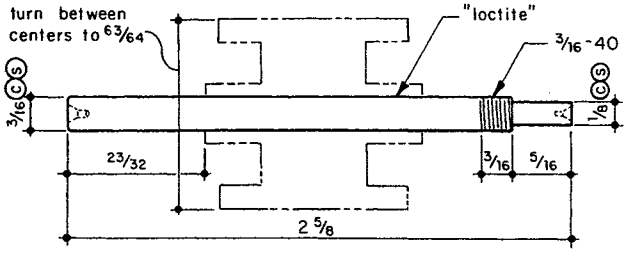
ARMATURE
Steel, 1 required



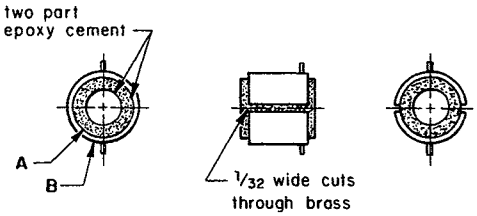
A
Canvas Laminated Bakelite, 1 required



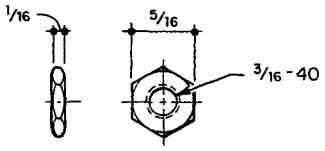
B
Brass, 1 required



ARMATURE SHAFT
Steel, 1 required



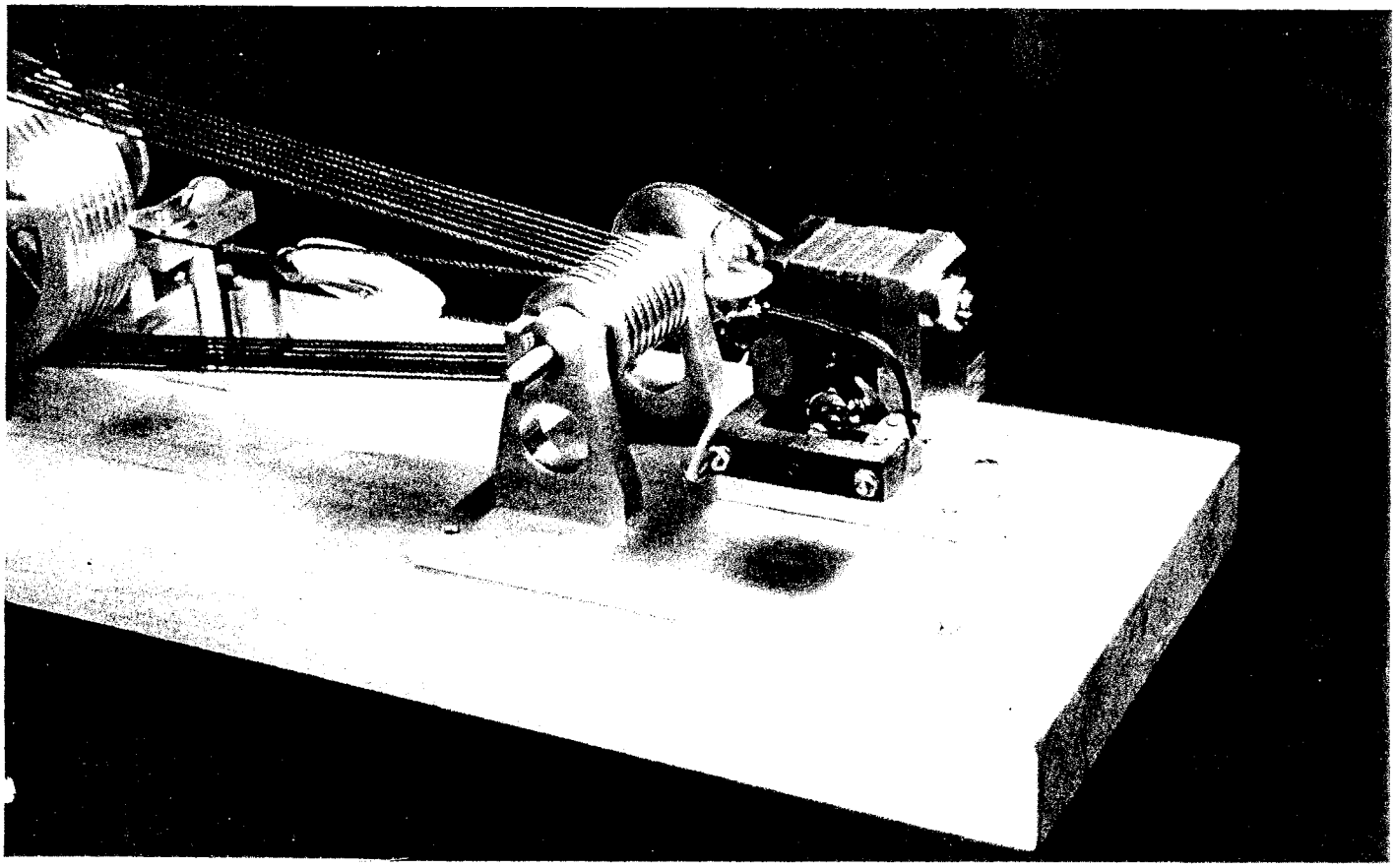
COMUTATOR



NUT
Brass, 1 required

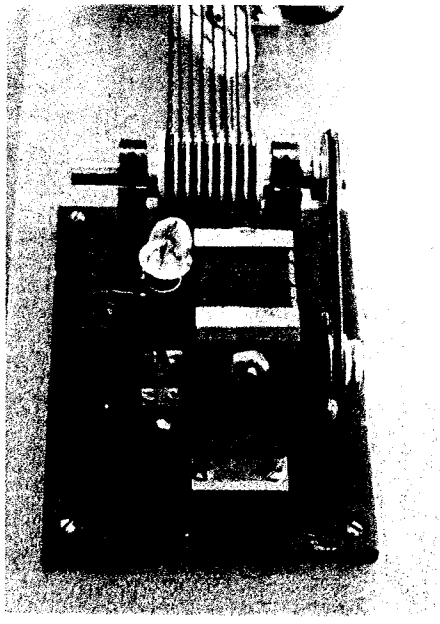
CHAPTER

40 Generator



There have been suggestions sent in to run plans for a model generator that can be driven by the model engines that have been built. Since none of the readers with electrical experience have submitted such an item, the generator shown was designed by a person with only a practical knowledge along this line. With the help of those better acquainted with the subject, clippings, and old textbooks, a generator was made that works. We're always looking for suggestions to improve this design, though it will light a flashlight bulb to a surprising degree just as it is.

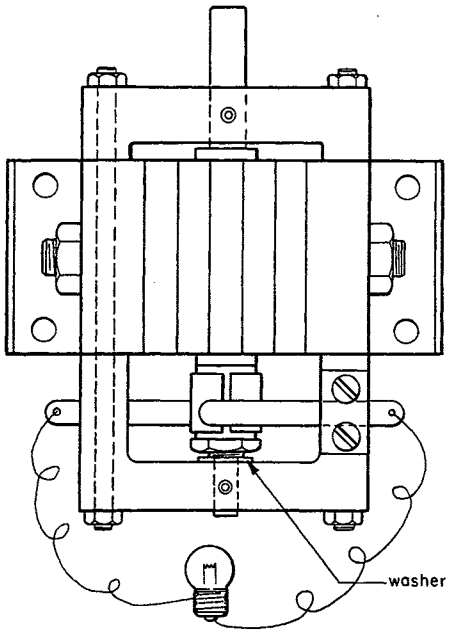
The old textbook says permanent magnets make a "magneto" and the wound-field type is a "dynamo," but both are called generators. This is the permanent-magnet type made

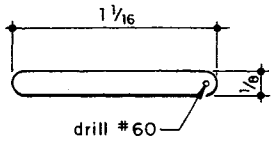


with ceramic magnets purchased from a popular scientific supply house.

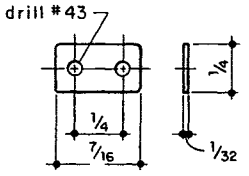
None of the material is difficult to acquire. Boring for the Armature and Shaft Bearings and Winding are the most difficult operations, but not beyond the average shop.

Measure the stack of magnets and put the magnets aside out of the reach of steel and iron chips around the bench. Make all the parts for the **MAIN FRAME**. Those are the Base, Magnet Bars less the 1/2" radius scallop, Bearings less the Shaft holes, Spacer and Tiebolts. Assemble the Bearing Tiebolts in the Magnet Bars with Loctite, with the proper amount projecting on each side. Lay out the Shaft center on the Outboard Bearing. Mount on the angle plate and center as shown. Make the 1/8" Shaft

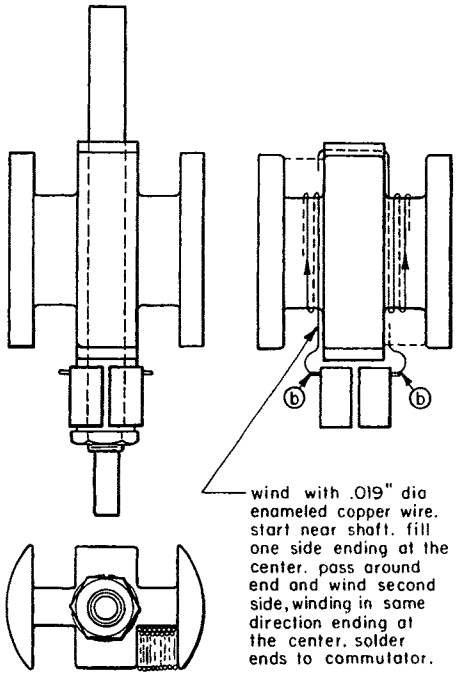


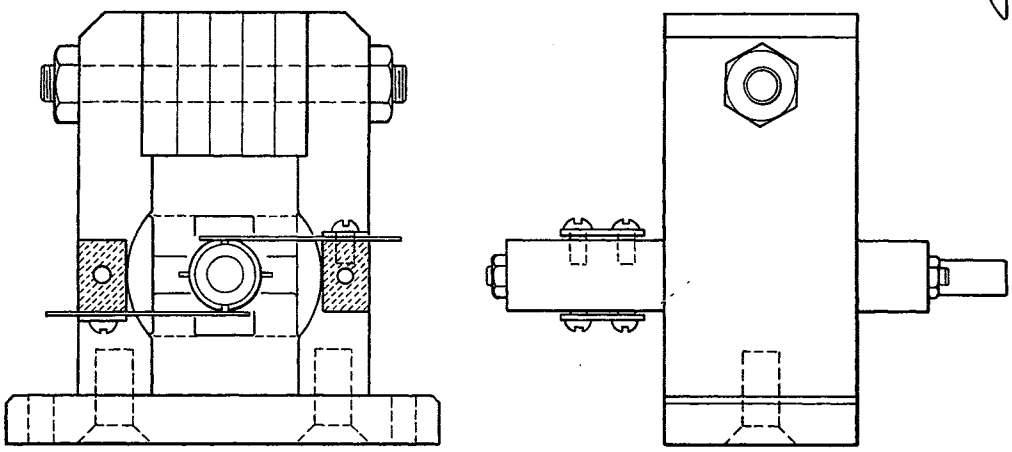


BRUSH
Spring Bronze,
2 required

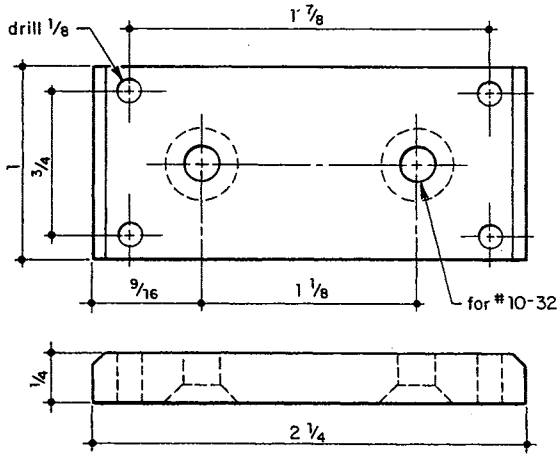


BRUSH CLAMP

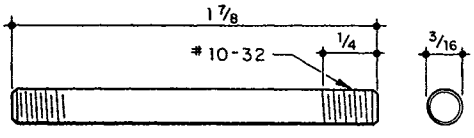




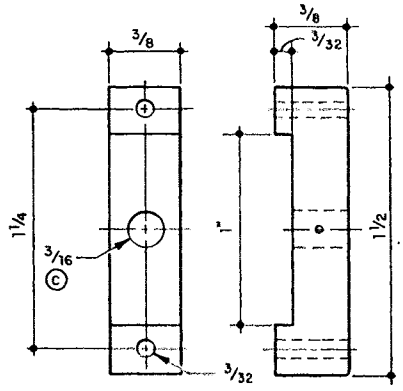
GENERATOR



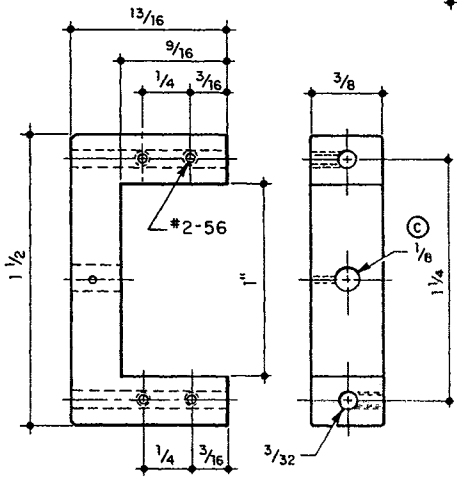
BASE
Aluminum, 1 required



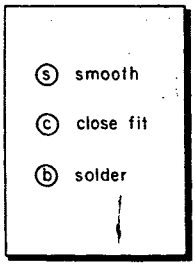
MAGNET TIEBOLT

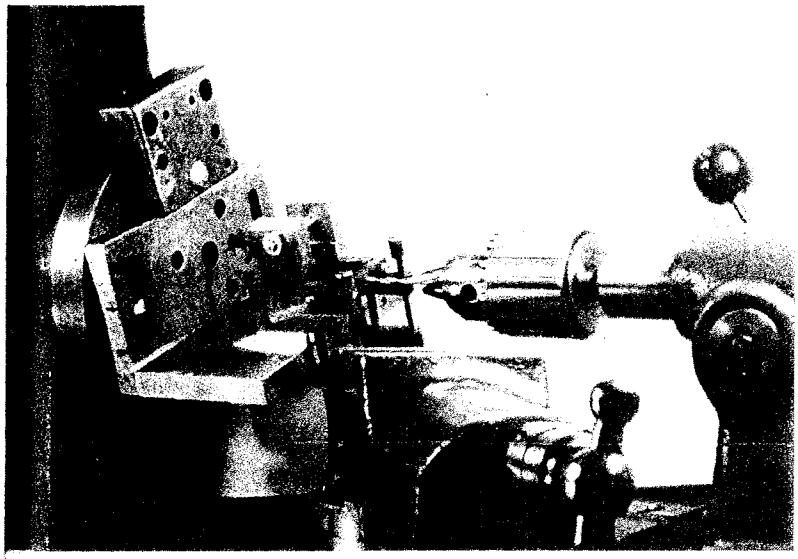


INBOARD BEARING
Canvas Laminated Bakelite

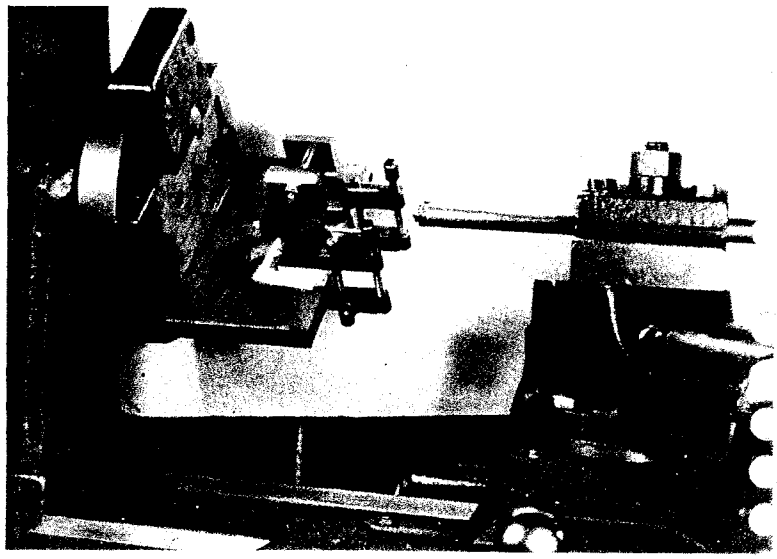


OUTBOARD BEARING
Canvas Laminated Bakelite





Boring the Bearing in the Generator Frame.



Boring 1" clearance for the Armature in the Generator Frame.

bore. Remove Outboard Bearing and reach through, making the 3/16" Shaft bore in the Inboard Bearing. Set up a boring bar and turn the 1" diameter across the Magnet Bars. The ideal condition is to have the Armature clear the Magnet Bars by only a few thousandths. That is a bit fussy so the Armature is turned to 63/64" making it about .008" clearance. This works OK though it is close enough to cause considerable trouble with fine steel chips, attracted by the magnetized parts and wedging between the Armature and the Magnet Bars. Wipe everything clean before final assembly with the Magnets. This was learned the hard way.

The **ARMATURE** starts as a 5/8" x 1" x 1-1/8" block. Lay out all the outlines and mill the four 7/32" x 7/32" grooves as in **Step 1**. Center in the 4-jaw and turn the 1/16" x 5/16" hub and bore 3/16" as in **Step 2**. Reverse in chuck and turn the other end as in **Step 3**. Make milling setup and do **Step 4**. The **ARMATURE SHAFT** is made between centers and set in Armature with Loctite.

The **COMMUTATOR** is an insulating body with a brass Sleeve cemented to the outside. Two 1/32" Pins are soldered to the Sleeve before cementing. These provide an easier soldering operation when attaching to the Winding Wire. It is less apt to overheat the "Epoxy" cement. Make the 1/32" cuts, just barely cutting through the brass. If a section should loosen, a thin coat of cement and a spring clothes pin can anchor it back in place. True-up the Commutator in the lathe for smooth contact with the brushes.

The **MAGNET WIRE** is the coated type rather than the old cotton-covered. Care must be taken that no sharp edges cut through the varnish, thus the rounded corners and cellulose tape insulation. Wind as shown, trying for the same amount of turns on each side to keep the Armature balanced. Remember to wind the second side in the same direction as the first. A washer 1/8" I.D. may be necessary on the Commutator end at assembly. The **BRUSHES** are already insulated away from the other metal since the Bearings are non-conducting "Bakelite." The material for the Brushes can often be found in car distributors and abandoned electronic assemblies. Bend the Brushes so they ride the Commutator a bit firmly. Make sure the 2-56 screws holding the Brushes do not touch the Tiebolts.

Unfamiliarity with such electrical equipment made this a cut-and-try dead-reckoning project, so no calculations or data can be supplied such as proper proportions, wire diameter, number of turns, stress, output, etc. The only thing is the flashlight bulb "LIT UP"!

This generator made a good unit to drive with the Twin-Cylinder Rope Drive. It makes a great conversation piece.

The completed Generator