

Wobbler

A wobbler is usually the first type of engine made by the beginner. The wobbler takes care of the valving without any additional tiny parts. The Frame, Foot and Flywheel are aluminum on the model shown and described here.

Start by making the **FRAME** from an accurate 1/4" x 1" x 2-1/4" piece of metal. Lay out and machine the **FOOT**, **Pivot** and **Crank** holes.

Make a jig and **LOCATING PIN** as shown. Run a close-fitting pin through the pivot hole and jig. Drill the 1/16" port opening while holding the side X of the jig against the 3/16" Locating Pin. Turn the jig over to drill the other port. Note — the lower hole goes all the way through. The upper hole is 3/16" deep. Transfer the upper hole centerline around to the end and drill and tap the 5-40 steam connection. Now is the time to check smoothness and flatness where the Cylinder rubs against the Frame. Make the bearing and set with "Loctite". Drill a small oil hole.

The **CYLINDER** is the next part to make. On an accurate and square brass block 1/2" x 5/8" x 1-1/8", lay out and center punch the centers for the 3/8" bore and 1/8" pivot. Chuck in the 4-jaw and center with a center test indicator. Turn and bore and ream 3/8". Before reaming, make an undercut at the bottom for reamer runout. This is done to avoid a shoulder that the Piston would strike. Chuck the Cylinder in the 4-jaw, using a protector over the bore end, centering on the pivot with a center test indicator. Check for squareness in the jaws. Face and undercut as shown and drill for the 1/8" pivot pin.

Make a brass **PIVOT PIN** 11/16" long and thread the end 5-40. In the 3/8" Cylinder bore, insert a close-fitting aluminum pin. Solder the Pivot Pin into the Cylinder using only a tiny bit of low-temperature silver solder. The solder will not stick to the aluminum Pin. Heat is applied to the Cylinder with a propane torch.

Make the **PISTON** of brass as shown. For the **ROD**, chuck a 1/4" brass rod in the 3-jaw with about 2"

projecting. Drill a center hole with a tiny 3/64" center drill and bring the tail center up to support while turning the 1/8" diameter. Turn this long enough to cut away the center hole later. Thread 5-40 using a tailstock die holder. Use parting cuts to bring to final dimensions. Hold the 1/8" diameter in a V-slot in the milling vise and mill to 1/8" thickness. Drill and ream for the **CRANK PIN**. Place the drill jig over the **Pivot Pin**. Run a close-fitting 3/32" pin through the jig and the Crank Pin hole after inserting the Piston in the Cylinder. Drill the 1/16" port in the Cylinder.

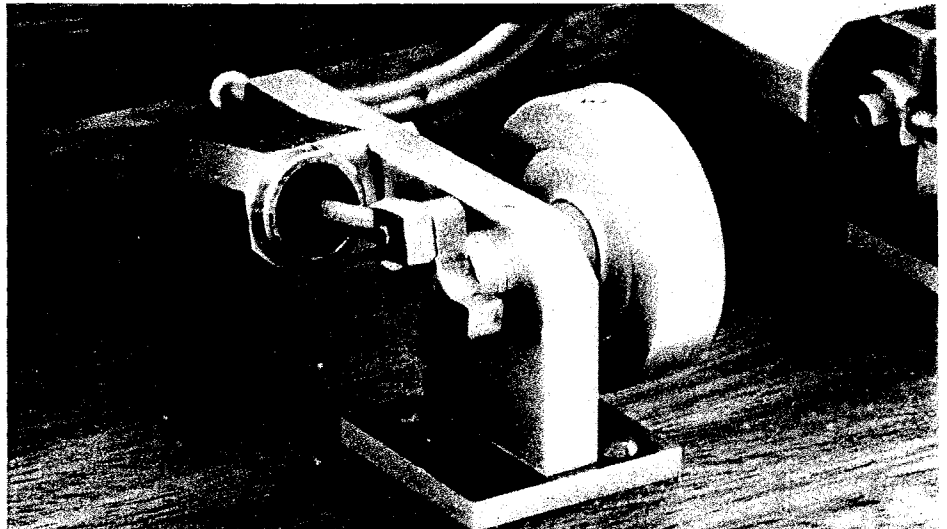
The **CRANKSHAFT**, **FOOT** and **STEAM CONNECTION** don't re-

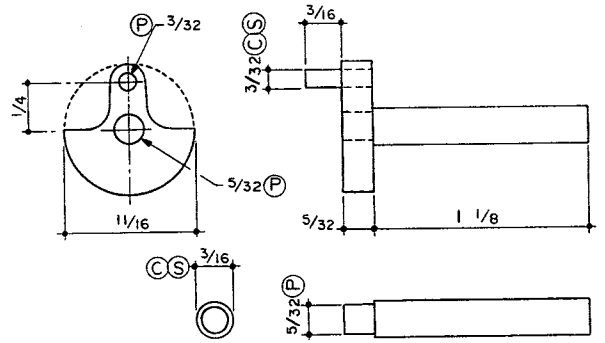
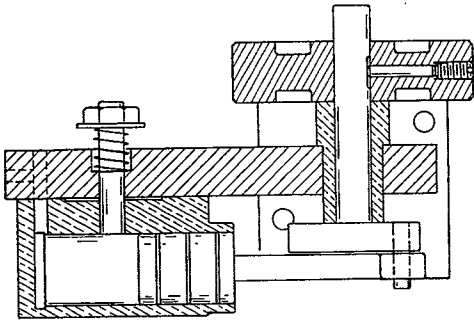
quire much explanation. The Crank-Shaft is steel. The shoulder on the Shaft helps square up the Crank Disk at assembly. The "steam" connection is made to take 3/16" plastic aquarium tubing on compressed air.

SPRING proportions shown are those of a spring found in the odds-and-ends department.

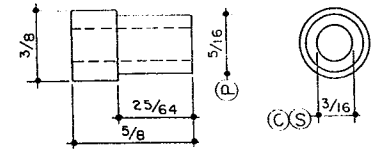
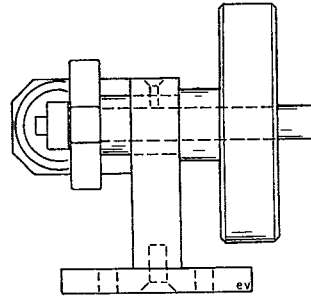
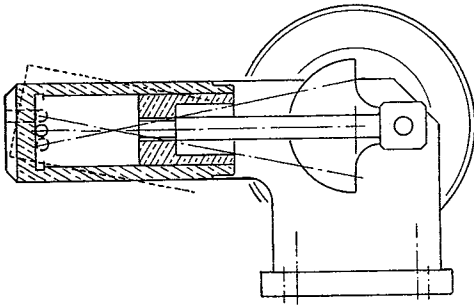
The **FLYWHEEL** is 1-1/4" diameter x 5/16" wide with a set screw. In this case, a set screw is near the surface and a free-fitting pin in the tap drill hole applies the pressure to the Shaft.

It's all done, now so you can assemble, lubricate and give a test run on 5 to 10 pounds of air.



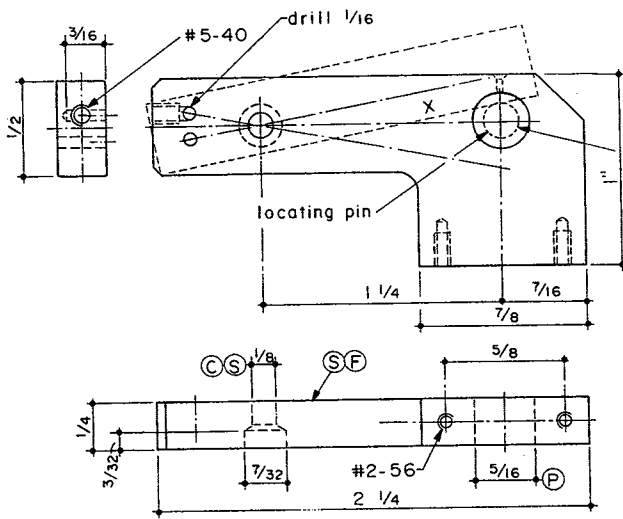


CRANKSHAFT
Steel



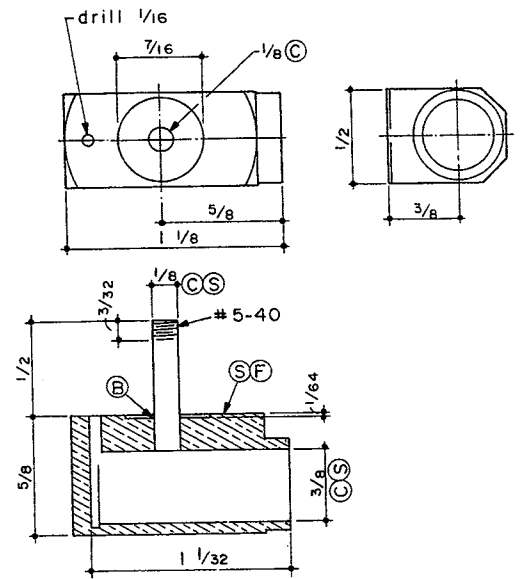
BEARING
Brass

WOBLER

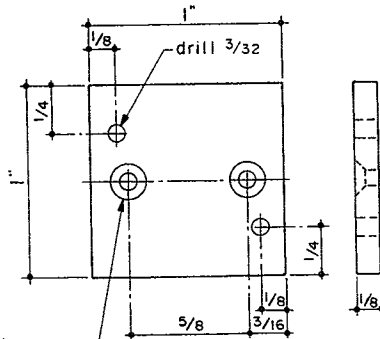
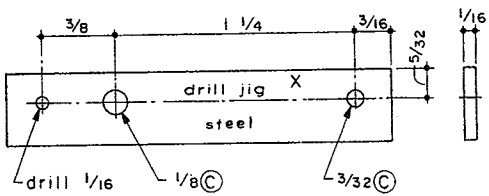


FRAME
Aluminum

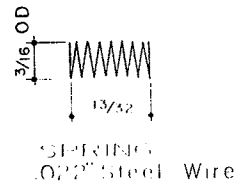
LOCATING
PIN
Steel



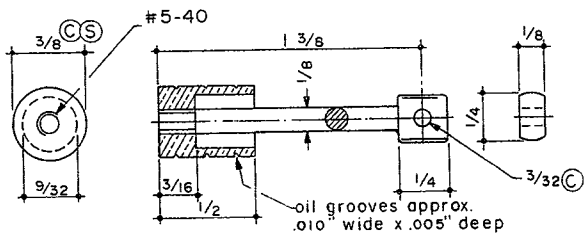
CYLINDER
Brass



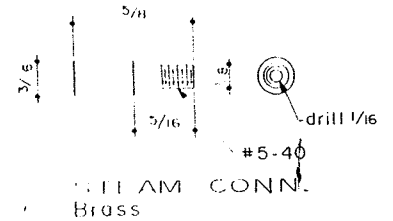
for #2-56
FOOT
Aluminum



SPRING
0.022" Steel Wire



PISTON AND ROD
Brass



STEAM CONN.
Brass