

8

Scotty

This is a simple Scotch Yoke Drive engine. It is another way of rotating a Shaft without rocking the Cylinder or using a Connecting Rod.

Make the **FRAME** complete as shown except do not plug the 1/16" hole. The **FOOT** needs no comment.

Make the **BEARING** of brass or bronze. Drill and counterdrill for the steam connection. Solder a 3/4" piece of 3/16" copper tubing into the Bearing as shown. Set the Bearing in the Frame with Loctite. Drill the 1/16" hole through the Bearing after curing and plug the hole in the Frame. Use a short bit of 1/16" wire filed to a slight taper to enter about 1/16" and set with Loctite. Cure and dress flush.

For the **CYLINDER**, lay out all the holes on a clean square block 5/8" x 1 1/16" x 1". The model shown has an aluminum Cylinder. Center it in the 4-jaw, using a center test indicator, to make the 3/8" bore. On the last cut

before reaming, run the boring bar to the bottom and make an undercut for reamer runout. Do not leave a shoulder that the Piston might strike. Drill and tap the four bolt holes and drill the 1/16" port hole.

The **PISTON** and **ROD** need no comment. A brass Piston is used with a steel Rod. The Outboard Bearing is brass and, at assembly, is tightened in place when the Piston and Rod are free and easy moving.

Make the **YOKE** of steel. Square up a piece 5/16" x 7/16" x 3/4" and set up for milling the 3/16" slot. Lay out, drill and ream the 1/8" hole for the Rod. Lay out and center punch for the 2-56 setscrew. Chuck in the 4-jaw and turn to shape and drill and tap 2-56. The two small notches remove a condition where the exhaust is closed off for a moment each time the Yoke crosses the center.

Make the 1/8" x 3/16" x 1/4" **SLID-**

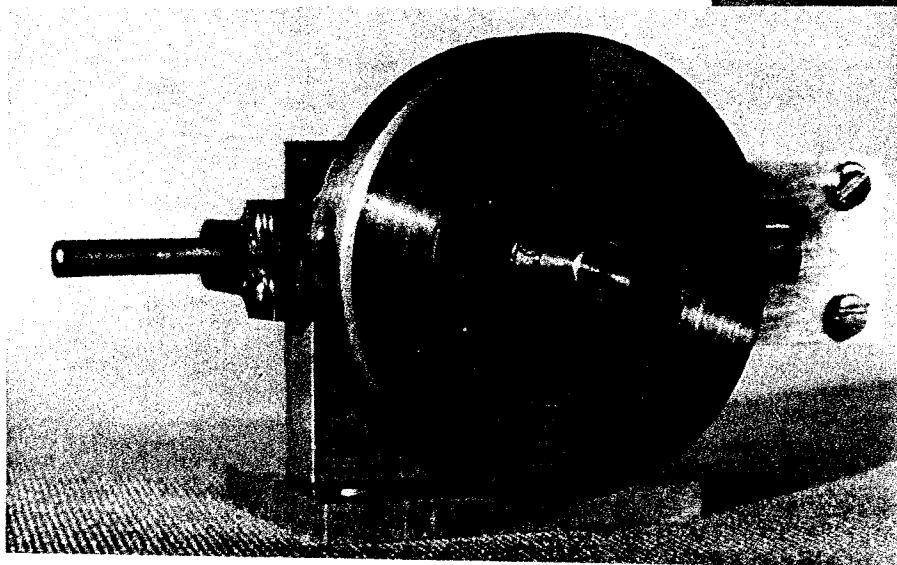
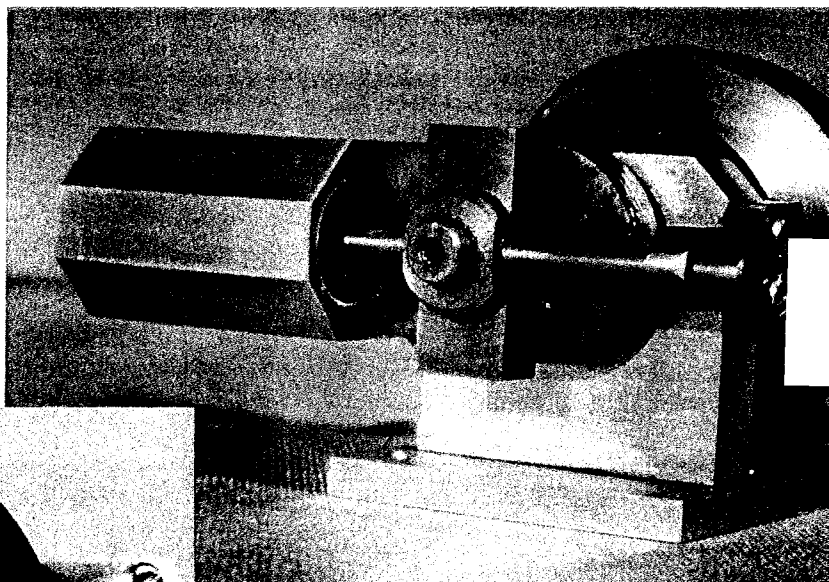
ING BLOCK of brass or "oilite".

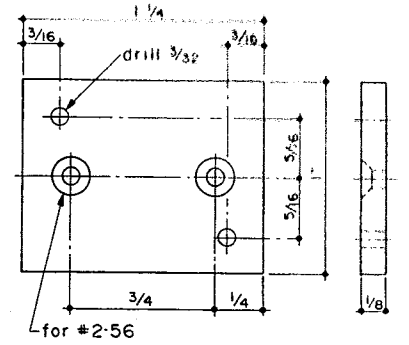
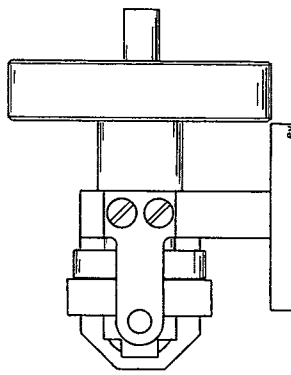
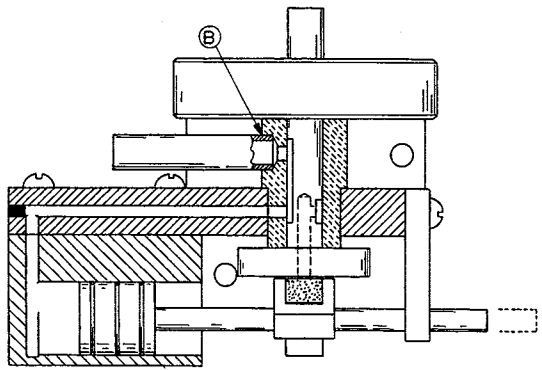
The **FLYWHEEL** is steel, 1-3/8" diameter x 5/16" wide, fitted with a setscrew. The setscrew pressure is transmitted to the Shaft by a loose pin in the tapdrill hole.

There is a bit of vibration in this engine since there is no counterbalance of any sort, so a solid mounting is called for. The Yoke should be close but free at the Crank Disk to reduce any rocking of the Yoke.

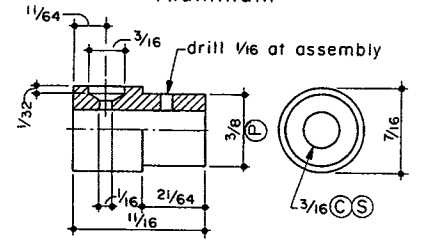
Make the **CRANKSHAFT** of steel. The important thing here is the accurate location and depth of the Valve flats 180° apart and the throw of the Crank set midway between the flats. In the assembled view, the Piston is at mid-stroke and taking full steam. Attach the Disk to the Shaft with Loctite.

When assembled and turning free, lubricate and give it a trial run on 5 to 10 pounds of air.

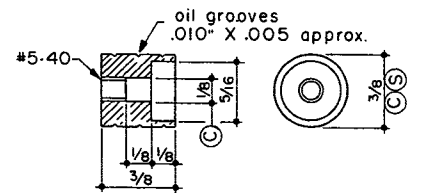




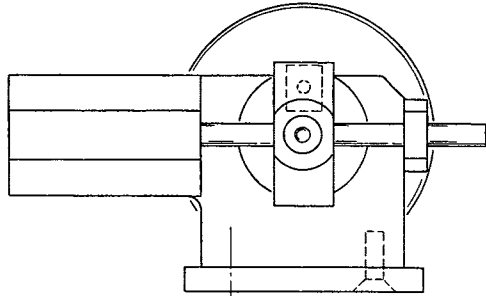
FOOT
Aluminum



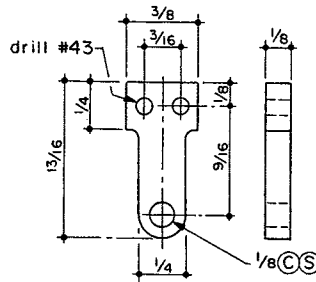
BEARING
Brass



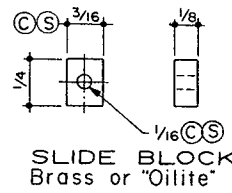
PISTON AND ROD
Brass



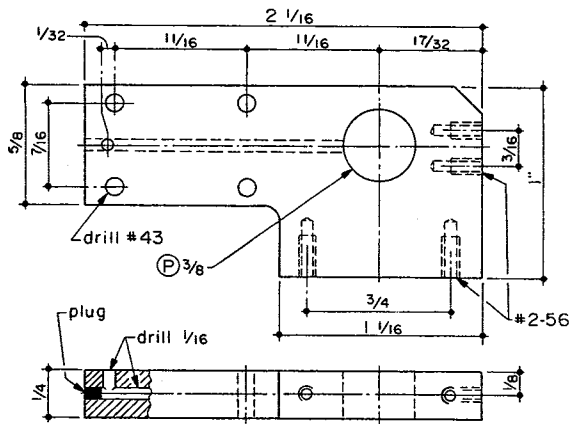
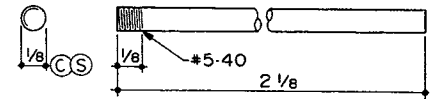
SCOTTY



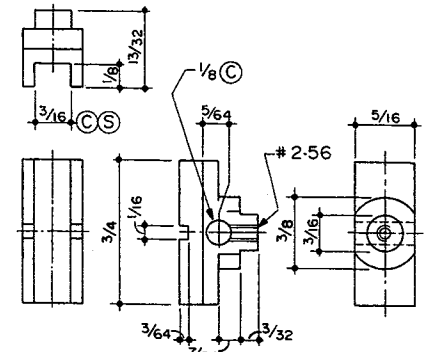
BRACKET
Brass



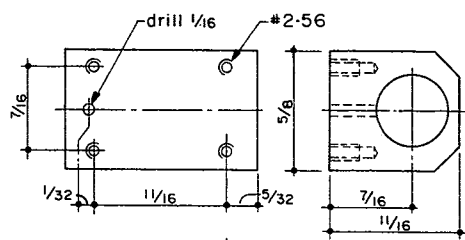
SLIDE BLOCK
Brass or "Oilite"



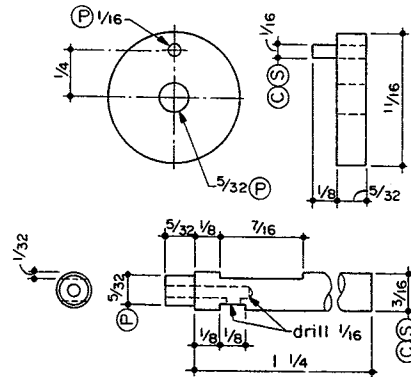
FRAME
Aluminum



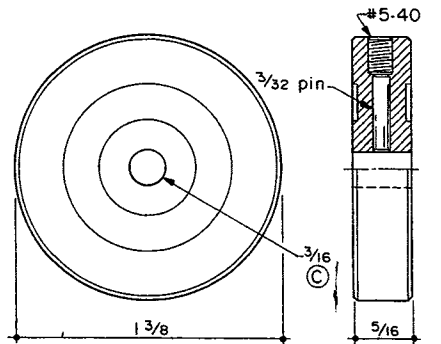
YOKE
Steel



CYLINDER
Hard Aluminum



CRANKSHAFT
Steel



FLYWHEEL
Any Metal