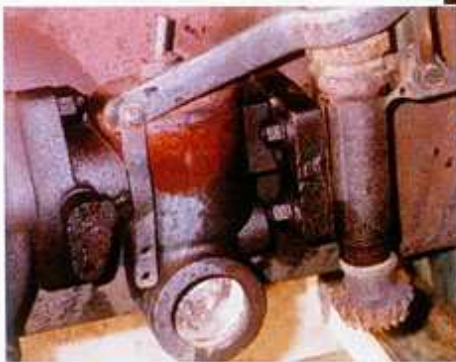


Left: Trial fitting cylinder sleeve (with piston).

Above: Cylinder sleeve, cylinder jacket and piston assembled to bed plate.

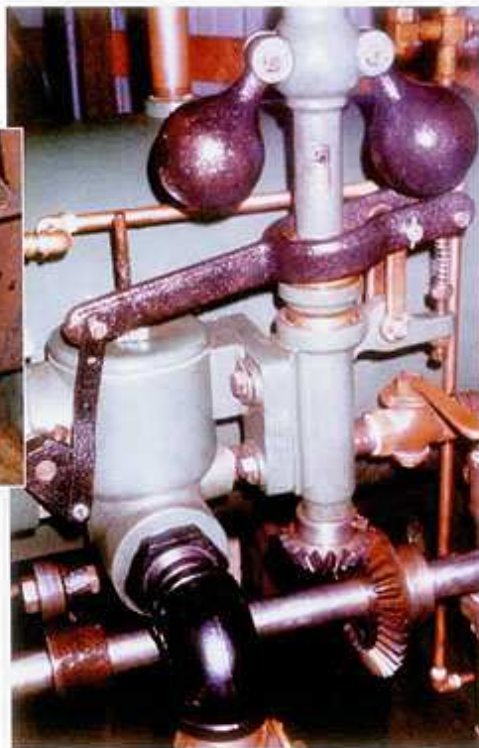
rial to machine, so as an experiment I made the new head flat. I did this to increase the combustion chamber size, which also lowered the compression.

Now it was time to start assembling the cylinder. I had already bolted the sleeve on with some temporary "T" bolts. The water jacket and the combustion chamber each have two cast ears to bolt them together and hold them in position while assembling the six tie rods. The head and cover plate were the last two pieces that had to go together, and I cut gaskets for every interface. With everything lined up – checked and double-checked – I started tightening up the tie rods. Before I put the final torque on the tie rods, I loosened the bolts holding the water jacket and combustion chamber together so they would not fight against the tie rods.



Above: Mixer and governor before disassembly.

Right: The restored mixer and governor highlight the work that went into this engine's restoration. Note the new governor gears.



### Mixer

With this done, I cut gaskets and put the valve chests on. Next up was the mixer, which needed a little work before I could bolt it up. I re-cut the seat for the gas valve (it holds the gas back until it sees a vacuum from the engine) and made a new shaft for the butterfly valve. I reamed out the shaft holes in the mixer housing and installed new bronze bushings. With that work done the mixer was like new.

With the mixer installed, I could install the governor assembly and line things up to pour the babbitt for the governor and the sideshaft. This required a lot of measuring, as the governor, sideshaft and crankshaft have to line up and have the correct relationship with each other so nothing binds up. After checking the setup a couple times, I poured the sideshaft bearings.

The next step was attaching the connecting rod to the crankshaft, and with those parts assembled it really started looking like an engine again. For the first time since I'd bought the Swan, the piston and crosshead moved together when the flywheels were rotated. What a great feeling! I noticed in setting up the engine that it got tougher to set the bearings as I progressed – it's tough to feel the drag on things like the crankshaft and crosshead when the mass of parts starts coming together. Yet, everything seemed to be working well as the flywheels rotated: The governor balls actually went around – what a site!

I still had to fabricate the exhaust cam lobe, which was