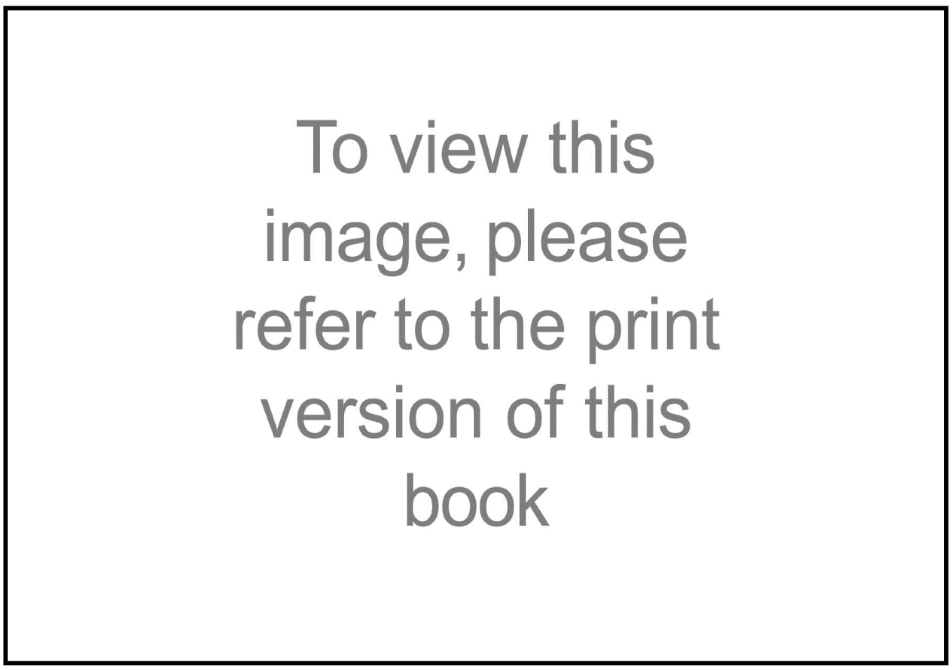

Fig. 4-3. *Lycoming four-cylinder horizontally opposed engine.* (Photo by author, courtesy of Frasca Air Service)

Let's call our big, old, fat drop of fuel Fred. So, Fred flows into the carburetor, where he is mixed with air in just the right proportion to support combustion. If the mixture is too rich (excessive fuel for the amount of air) or too lean (insufficient fuel for the amount of air), the engine won't run. The carburetor sets the maximum rich and maximum lean limits. Within those limits the pilot can control the airflow into the carburetor with the throttle and the fuel flow with the mixture control. In fact, with the aircraft engine, we shut it down by pulling the mixture control all the way back to cut off the fuel supply. Starved of fuel, the engine simply stops running.

As the air flows through the venturi throat of the carburetor, it creates a lower pressure, causing the fuel to be drawn in with it. If the pilot wants the engine to run faster, the throttle is advanced, causing more air to go through the carburetor, which in turns brings in more fuel.

From the carburetor, Fred and his air molecule friends travel via an intake manifold to the engine. There are four doors in the manifold called intake valves—one per cylinder. The doors open and close at separate, timed intervals. Timing is governed by when their respective cylinder is ready to receive a charge of fuel/air mixture. Fred and company happen to arrive just as the piston, which moves up and down inside cylinder #1, has begun its downward movement on the intake stroke. The intake valve opens and as the piston travels downward, it creates a partial pressure within the cylinder drawing the fuel/air mixture. As the piston reaches the bottom of its stroke, called bottom dead center (BDC), the intake valve closes and the piston begins it compression stroke.