The other oil line connects the unloaded side of the piston to a quart can that serves as an oil reservoir. The entire system was filled with a mixture of half kerosene and half #10 oil.

Towing Procedure

The tow car is accelerated as fast as possible to about 20 mph in low gear. The gears are quickly changed to second and the gas pedal floored until the glider leaves the ground. This speed is usually about 55 mph indicated airspeed on the tow car air speed indicator. The air speed indicator can be seen to the left of the pressure gauge in Figure 2. After the glider is about 50 feet off the ground, the car is quickly shifted to high gear. The 55 mph airspeed is held by the tow car driver until the glider reaches approximately 100 feet of altitude. The first part of the climb is held to a "not too steep" attitude for safety reasons in the event of a wire break. At approximately 100 feet of altitude, the pilot slowly pulls the stick all the way back. This loads up the wire and tends to slow down the tow car. From this point on, the tow car driver maintains a speed so that the pressure gauge indicates a pressure of 400-425 pounds for two people in the Pratt-Read, and 300-325 pounds for the 1-19. As long as the stick is held all the way back, the glider will reach the maximum altitude possible with the given length of wire. This usually occurs before the tow car reaches the end of the 5000 foot runway.

On training flights, we do not climb as rapidly as possible as it may lead to confusion on the student's part. If the tow car driver tried to maintain 350 pounds force in the tow wire, he would overspeed since the stick was not all the way back. Consequently, the tow car driver must be informed of all training flights. During these tows, the airspeed indicator is used as a reference. Usually an indicated airspeed of 52 to 55 mph is sufficient to give a nice rate of climb without overspeeding.

So far, 192 tows have been made using the tensiometer. The only maintenance costs have been for a quart of oil to replace that oil lost through a leaky connection. We use approximately 1300 feet of .071" torsion straightened music wire for our tow wire. A four foot piece of .036" is attached to the glider end to act as a safety link. A two foot diameter parachute is attached to the glider end of the .071" wire which brings down the 17 pounds of wire at a slow rate. The tow wire is purchased from the Johnson Steel and Wire Co., Worcester, Mass., for $38.00 per 500 feet. Being torsion straightened, the wire does not coil, but lays straight on the runway.

We consistently get 850 to 950 feet of altitude in the Pratt-Read with some flights reaching 1000 feet. With the 1-19 we consistently get 900 to 1000 feet with some flights reaching 1100 feet.

To date, we have approximately 1700 auto tows, about 1400 of them being dual flights in the Pratt-Read. Anyone having auto towing facilities available will find that the costs of gliding are greatly reduced compared to air towing. We have found that auto towing the Pratt-Read is just as easy and safe as the 1-19 or any of the other light ships. The use of the tensiometer takes a lot of the guess work out of auto towing and allows maximum time on tow. The system is simple, foolproof and a worthwhile investment.

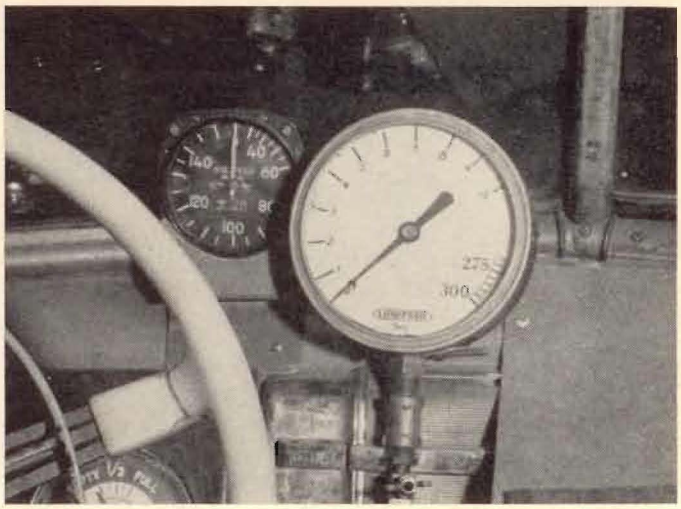

Fig. 2 — Instrument panel of the tow car showing the pressure gauge and airspeed indicator. The clip board to the right of the pressure gauge is used to hold the towing record.

UNUSUAL GLIDERS

(Continued from Page 7)

make it retractable so that there is a minimum of aerodynamic penalty associated with the power plant installation. There still is, however, the weight penalty imposed by carrying an inoperative engine along for the ride when soaring. In spite of this handicap, however, the "Hummingbird" is one of the world's most efficient two-place sailplanes, and has auxiliary power besides!

The inventors and gadgeteers are still at it, however, and we may yet see a universally-acceptable powered sailplane that can be set up and launched by one man. There is still one problem of a different nature to overcome, though, and that is how to integrate powered and non-powered sailplanes into the same competitions. Some special rules are going to have to be drawn up. Those who are against letting ships with auxiliary power compete with standard types argue that the former have a competitive advantage in that the pilot will take longer chances over rough terrain, knowing that he can use his power to get out of a tight spot.

So we have two problems on our hands—first, to get a good powered glider design, and second, to work out rules whereby the two types can get along together at the contest site.