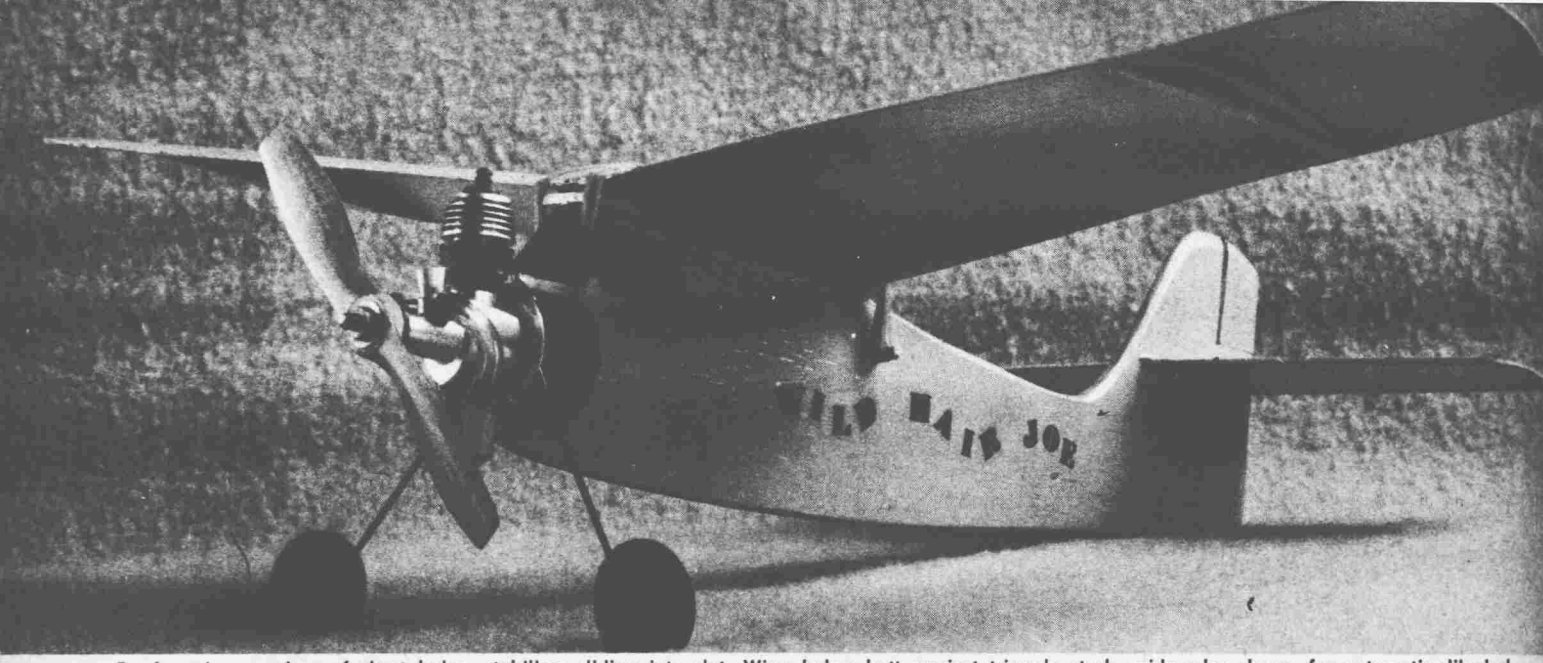


Fuselage is one piece of sheet balsa, stabilizer sliding into slot. Wing halves butt against triangle stock, wide edge down, for automatic dihedral.

Wild Hair JOE

By KEN WILLARD

An evening's time and work will repay you one hundredfold in fun unlimited. Make this wee .02 to .039 free flight from full size plans, opposite.

▸ Are you tired of technical tripe? Fed up with frightful free flights? Would you like to go out to your workshop, toss some balsa together, and in a couple of hours have a little job ready to fly that will have your friends asking for the plans so they can join the fun? Then Wild Hair Joe is just the model for you.

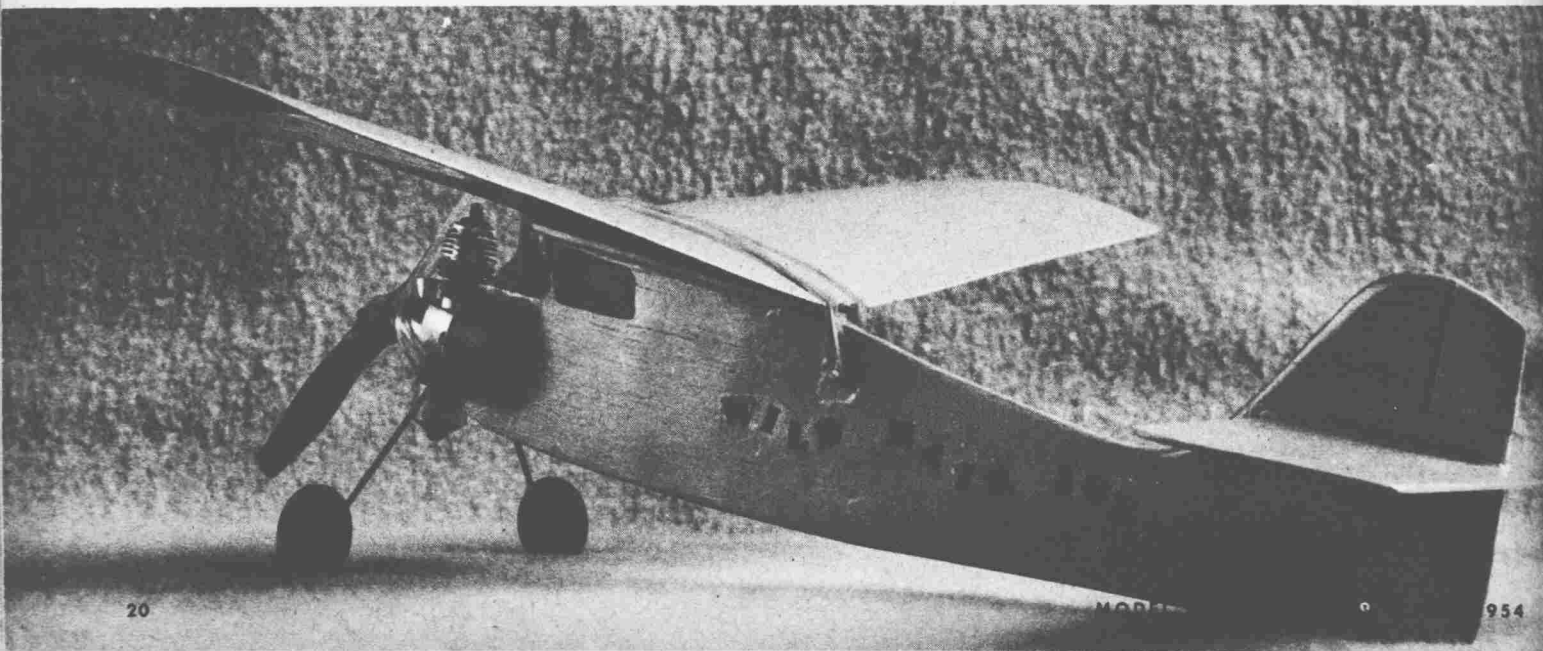
Mind you, it's a small job (the plans are full size) and you'll have to go easy on the tab settings, because with all the power it has for its size, especially with an .035 or .039, a little too much tab in either direction will spin it in; but, if you have a good straight piece of balsa for the fuselage, you probably won't need any tab at all. Properly adjusted, Wild Hair Joe goes spiraling up in a left turn, and really makes time. In fact, that's where the name comes from; the first time I flew the model, a friend of mine remarked, "That little Joe curls up there like a wild hair!"

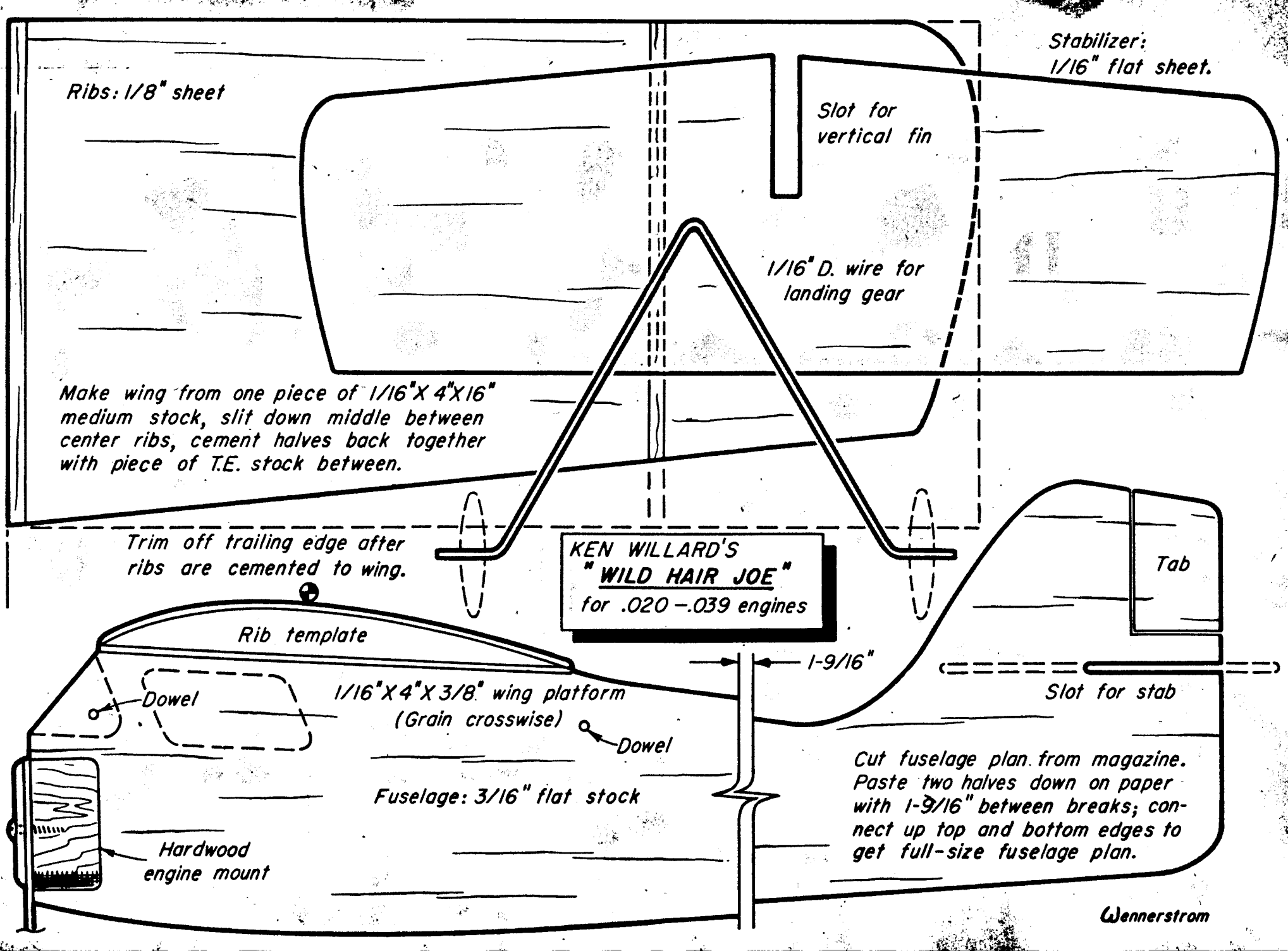
Construction is so simple that you can build it in one evening. The profile fuselage is cut from one piece of balsa, with a slot cut in the fin where the stab fits. The wing platform cemented on the top of the body automatically establishes the proper angle between the stab and the wing, and the only thing you want to watch pretty closely is that the hardwood disc for the engine mount doesn't give any side thrust when it is cemented in place.

Make the wing from one piece of 1/16 x 4 x 16 on a flat surface, without tapering the trailing edge until after all four ribs are cemented in place; then, when you cut away the trailing edge from the center ribs out to the tips, you automatically provide washout, which improves the flying characteristics. The dihedral is also automatic; slit the wing apart between the two ribs at the center and insert a piece of trailing edge stock between the ribs, with the thick edge on the bottom. Then cement the two halves back together; this gives just the right dihedral. Trim off the top of the trailing edge stock to conform with the wing.

The landing gear is bent from (*Continued on page* 46)

When the sheet balsa is tapered after construction, it provides automatic washout for extra stability. Adjustments by tab only but do go easy!




Stabilizer:
1/16" flat sheet.
Ribs: 1/8" sheet
Slot for
vertical fin
1/16" D. wire for
landing gear
Make wing from one piece of 1/16"X 4"X16"
medium stock, slit down middle between
center ribs, cement halves back together
with piece of T.E. stock between.
Trim off trailing edge after
ribs are cemented to wing.
KEN WILLARD'S
"WILD HAIR JOE"
for .020 –.039 engines
Tab
Rib template
1-9/16"
Slot for stab
Dowel
1/16"X 4"X 3/8" wing platform
(Grain crosswise)
Dowel
Fuselage: 3/16" flat stock
Cut fuselage plan from magazine.
Paste two halves down on paper
with 1-9/16" between breaks; con-
nect up top and bottom edges to
get full-size fuselage plan.
Hardwood
engine mount
Wennerstrom

?

READERS

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   - (c) Snipe.....
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5. I am.....years old.
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Wild Hair Joe

(*Continued from page 20*)

1/16 in. spring wire, and to mount it, slide it between the engine mount and the engine backplate so that when you tighten the engine in place it holds the landing gear also.

Two short lengths of dowel stuck through the fuselage serve to anchor the rubberbands which hold the wing on. To keep the wing from wobbling on the wing platform, sand the bottom of the two center ribs where they are joined by the piece of trailing edge stock until the wing sits solidly on the wing platform.

Color the model to suit your own taste; imitate cabin windows with black dope.

You will probably have to add some weight to the tail to make the model balance. The approximate balance point is shown on the plans.

Flying Wild Hair Joe takes very little skill. Find some tall grass and glide the model first. You'll have to give it a pretty fast launch to check the glide, because the glide is fast. Correct any tendency to turn in the glide with the tab, and you're ready for the first power flight. Start up the engine, run it a little rich, and launch the model straight ahead. If it spins in to the right or to the left, give it some opposite tab and try again (you had better take a few props with you—that's about all you can break). After you get a steady climb, turn to the left under power, you can give it full power and watch it curl up skyward until the power goes off, then a fast glide back down. Incidentally, the nature of the glide depends on how the prop stops, because the model is so small that variations in the prop position will vary the drag and the glide path. If the prop stops in the usual horizontal position, the glide is very satisfactory. Use 5-2 props with the Infant .020, and 5-3 with .035's and .039's.

That's all there is to it, fellows. Take Wild Hair Joe along with you for fun and laughs, especially when you're taking some other job out to test. Then, if the other job doesn't work and needs repairs, you can relax with Wild Hair Joe in the meantime. Have fun! END

Tuning The Free Flight Engine

(*Continued from page 23*)

engine which is designed for maximum efficiency at that speed. The peaking speed is therefore the logical one to use.

Since bhp is the equivalent of 33,000 lb. raised one foot in one minute, it is obvious that more of it will move more weight in a similar time, and since we are concerned with moving a weight of air, then the more bhp we can get, the better. Therefore, purely from the engine standpoint, the high revolutions, with correspondingly high bhp, is what we want.

Phenomenal crankshaft bhp, however, is quite useless unless it can be transformed into equally large quantities of thrust, and the real answer regarding engine suitability rests ultimately with the prop. Is a small prop as efficient as a large one at the business of shoveling air?

The quantitative answer to that is best left to experts on the subject, but broadly speaking, the larger prop is best. However, a modern .29 peaking at 12,000 rpm can produce something like .4 bhp, whereas a .29 peaking at 15,000 turns out around .6 bhp, which is 50 per cent more, and a difference of one inch in prop diameter will normally accommodate the faster engine. Obviously, the 1-in. reduction does not reduce prop efficiency by one-third, so even putting it at a 10 per cent drop, the faster engine will still be way ahead on thrust production. To our thinking, this definitely points to using a racing engine for free flight, and the more urge that can be squeezed out of it by tuning, the better. Those interested are therefore recommended to follow the same tuning procedure as described for speed controlline engines in MAN (Apr. '54, p. 22).

A footnote to all this is that the faster you rev, the greater your problems with gyroscopic forces, but then John Bull with his big wind shovels is having just as much fun neutralizing torque. However, the conclusive evidence in favor of high revs was the solid victory of the K & B .15 equipped American team at the International Power Championships last August in England. In the opinion of Peter Chinn, who was fortunate enough to see it at first hand, our team was getting at least 15 per cent more power behind the prop than most other contestants.

Let us now put aside the exhausting business of competition flying and turn to the most pleasurable occupation of all: sport flying. In our opinion there is nothing like a Sunday afternoon which ends with all your models intact in the trunk of the car, pleasant memories of stable realistic flights behind you, all your workaday worries forgotten, fresh air in your lungs, and a good supper ahead of you. That is living.

We will therefore drop the nerve-wracking implications of "tuning" and call it "adapting for sport flying" and assume that the greatest satisfaction comes from scalish models that perform like the real thing and behave, in matters of stability and reaction to trim adjustment, like gentlemen.

Such models offer endless possibilities for the engine gadgeteer, and by making and fitting a simple one-way valve to the crankcase, the resulting pressure supply can be made to operate all kinds of "hydraulic" apparatus such as retractable gear, flaps, sequence control of elevators, rudder and engine, parachutes, banners, etc., with complete reliability. In fact, radio control is nothing but worry in comparison, because as long as the engine runs, the airplane is under control. When the engine stops, control is lost, but gravity takes over In other words, a flyaway is unlikely, and relays, tubes and batteries are simply expensive worries for the other fellow.

The basic requirement is a well-made moderate output engine with good compression and wearing qualities, such as the two-speed Cameron .19. Leakproof main bearings, well fitted lapped piston, and small-sized air intake are good indications of startability and consistently reliable performance. An expensive racing engine is completely wasted in a sport job, and is troublesome to operate, so cost is not an indication of suitability.

A glance at Fig. 1 will show the two alternative methods of arranging a pressure take-off from the crankcase, and of the two, the rotary valve type is easiest to make and most reliable.

The timing of the rotary valve take-off is not critical and for most engines a position at 90° to the intake is satisfactory. The important point is that the intake port must be closed before the take-off port opens, and also that the take-off port is closed before the piston uncovers the bypass port, otherwise engine efficiency will be affected. The take-off bore need not exceed 1/16 in. diameter.

Fig. 2 shows the principle of the control actuator. A tube conveys crankcase pressure to a standard needle valve assembly feeding the actuator cylinder, and is used to regulate the rate of delivery, and therefore determines the time required to complete a stroke of the actuator piston. The needle settings are very sensitive and critical, and a first class, well fitted unit must be used, with fiber washers under both spraybar flange and nut. A type with a positive shut-off, such as the Cameron assembly, is very satisfactory, but it is most important that leakage past the needle shank be eliminated, and an application of thick grease inside the friction thimble will assure this.

As the mixture enters the cylinder, pressure builds up until it overcomes the return spring. The piston then moves, and by coupling this