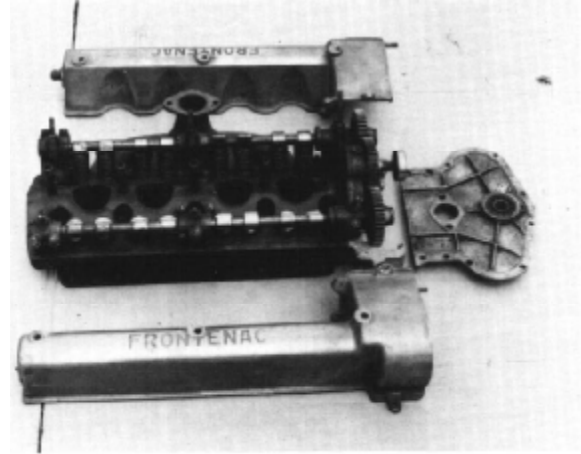


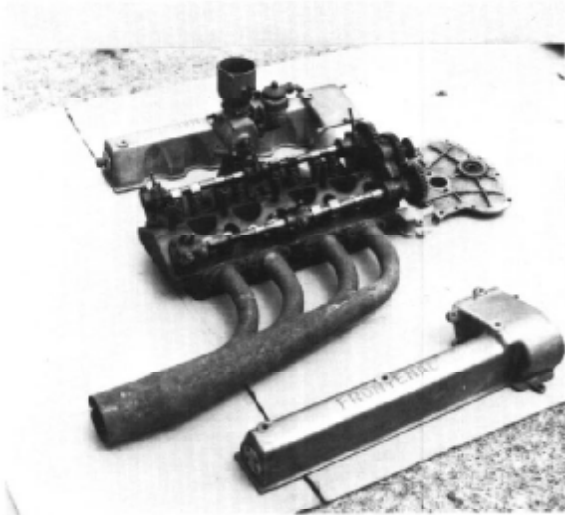
THE D. O. FRONTY

It is doubtful that there is any other head which has the "prestige" of the dual overhead cam Frontenac. This was the head for most of the Model T Ford-based racing cars in the Twenties and early Thirties. Unlike the later Gallivans, the Fronty used four valves per cylinder, operated by two chain-driven camshafts.

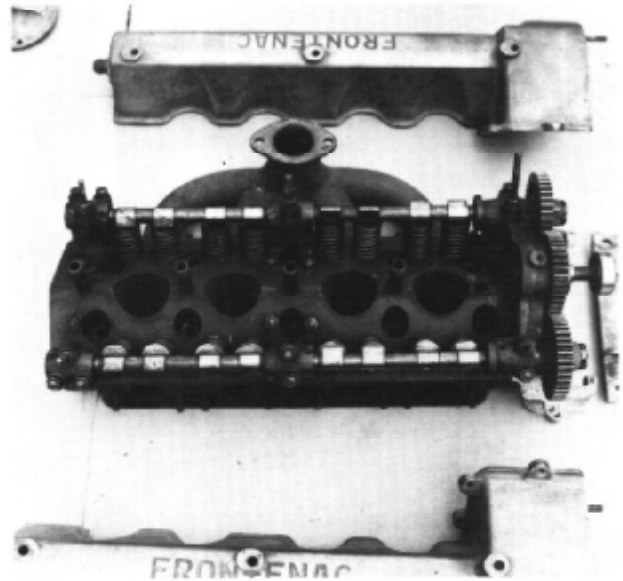
Most of the D.O. Fronties were as the one shown here; exhaust valves on one side, intakes on the other. A major problem with this arrangement was that the heat on one side of the head, and the relative cool on the intake side created severe stresses in the casting, and attendant cracking of the head. Near the end of the production, a "stagger-valve" head was produced in which each side had four intake and four exhaust valves and accompanying dual manifolding. Very few of these heads were produced; some sources saying only seven!



D.O. Fronty head with cam covers removed, exhaust side. Notice the four valves per cylinder; cam followers on top of the valve stems.



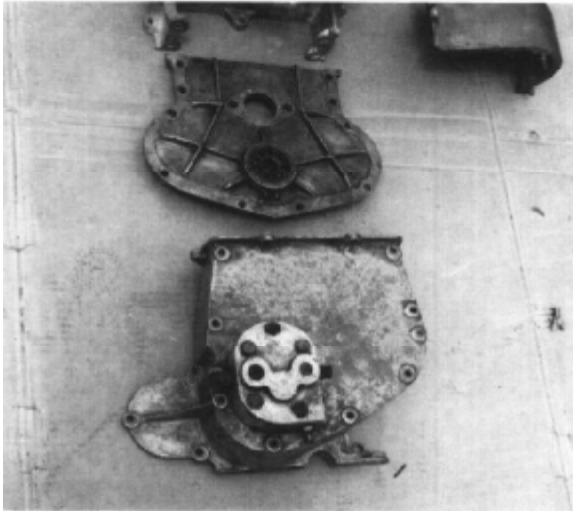
The factory carburetor is a 1-7/8 barrel-valve Winfield Model OD. This one is serial number 38.



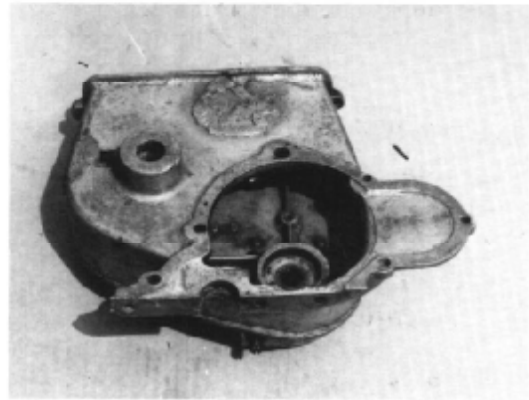
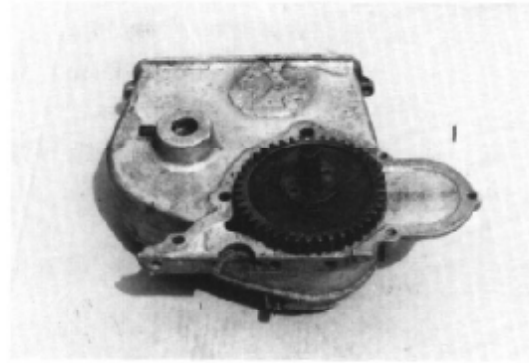
A closer look at the D.O. head. Notice the pipes in the center of the head between the spark plugs. These were added to try to control the overheating problems of the D.O.'s. They are not factory and were added by racers to direct water to the top of the cylinder head and ease the hot spots there.



A complete factory D.O. Fronty with cam covers removed. The manifolds and carburetor are factory parts and very rare.



Lower chaincase and upper front cover from the D.O. Frontenac.



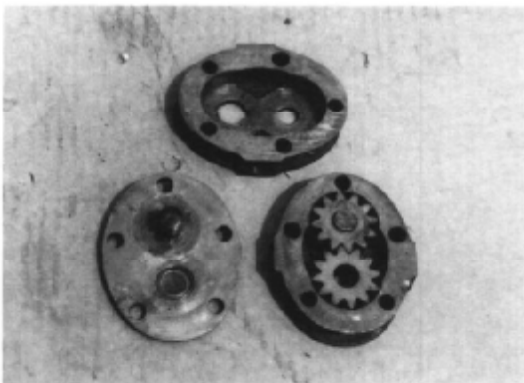
The back of the D.O. Fronty lower chain case showing the gasket surface to mate to the T block (starter type only), and the billet steel timing gear. The welding is not factory and is probably due to a chain breaking and jamming, breaking the case.



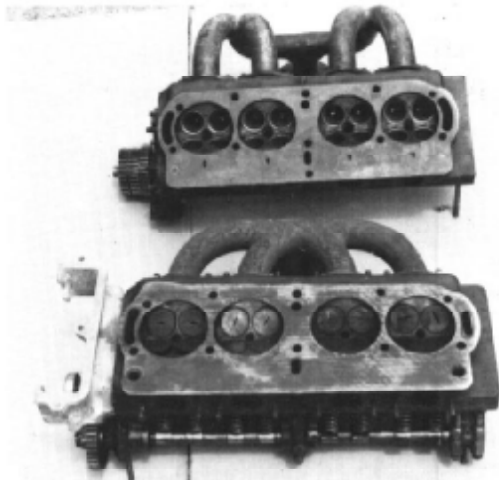
Fronty lower chaincase with the cover removed, showing the chain drive (silent chain) with idler and tension sprocket and the drive sprocket. There were two types of chain drive, the silent chain and the triple-roller chain. The silent chain is the earlier.



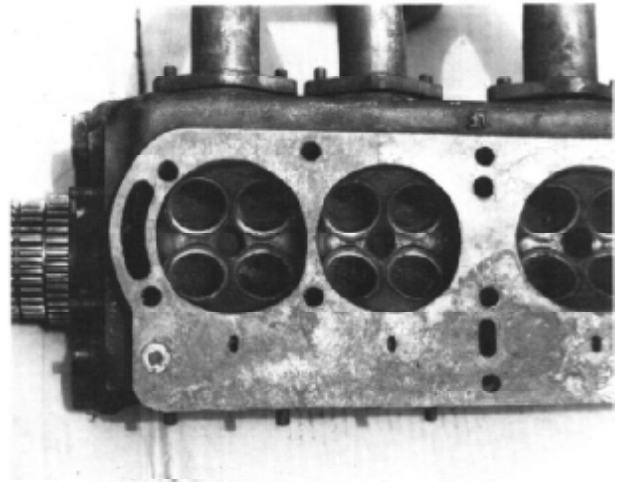
The cam stub shaft with the steel timing gear and the lower sprocket for the triple-roller timing chain. The slot in the front end of the shaft drives the oil pump.



Bronx Fronty oil pump. This is a two-stage; one part is for the engine pressure, the other to scavenge the oil from the sump in a dry-sump oiling system.

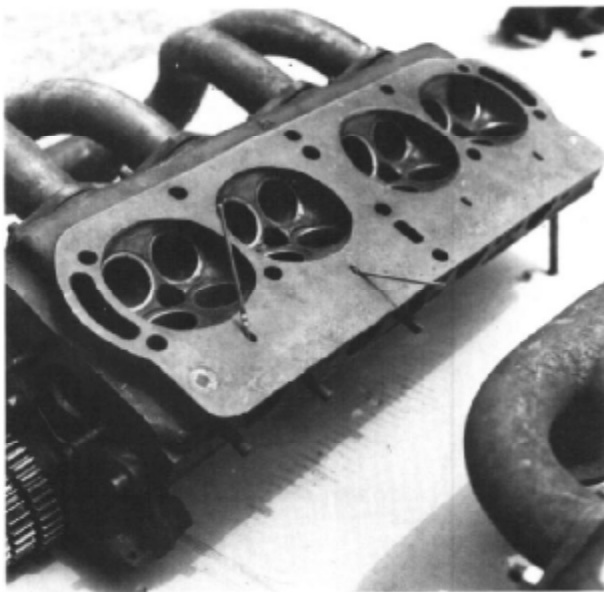


Two D.O. Frontenac heads side by side. Note the unshrouded spark plug hole on the top head, shrouded one on the bottom. Also note the extra bolt hole in the bottom center of the top head, none on the bottom head. All D.O. Fronties were different as to the fit of the parts; nothing, or nearly nothing, interchanged from one head to the next. No jigs were used during the machining so holes were located as much as 1/2 different from one to the next head, making life hell to try and build one from miscellaneous parts found here and there.



Ballot-type cam follower cups. These work like pistons with the cam rubbing on the top and the valve stem taking the place of the connecting rod. This system takes all side thrust away from the valve-stem guide.

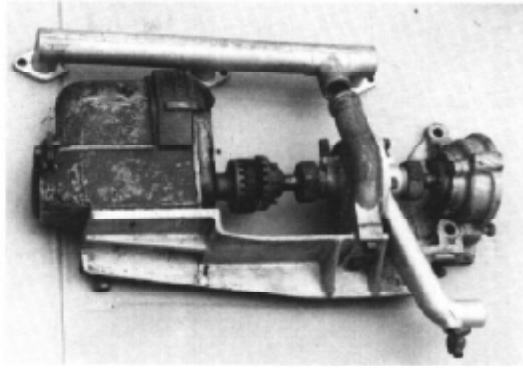
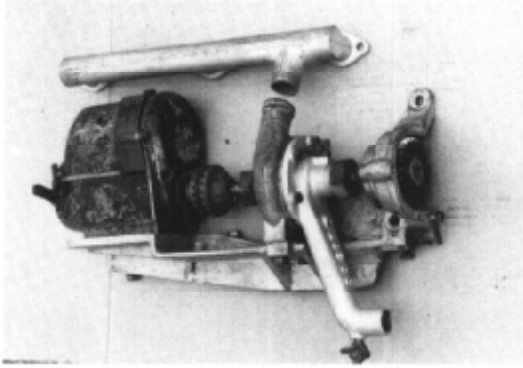
This system was used on the Fronty SOC heads but not on the DO. The cups shown are for illustration only, are not Frontenac parts.



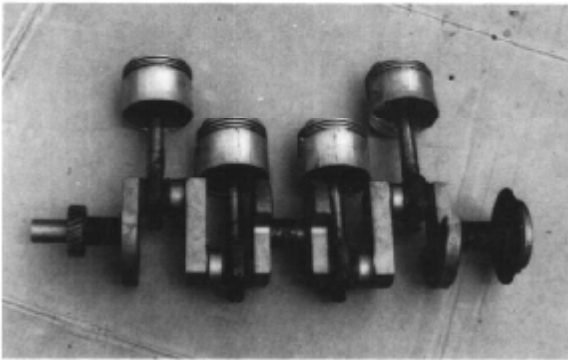
A D.O. head with drilled water passages between the exhaust valve seats. Most D.O.'s, when they overheat, crack between the exhaust valves. These water holes were an attempt by an early mechanic to prevent this from happening, a very rare modification. The photo shows ball-point-pen fillers in the water holes to show the directions of the drilled passages. The intake manifold is the late factory type.



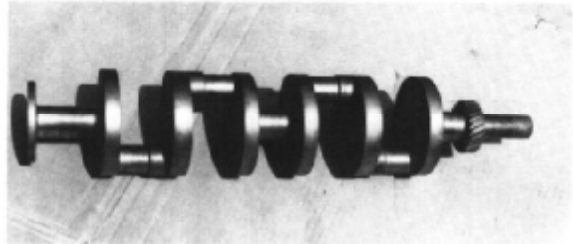
One 1-5/8 D.O. Fronty valve with the combination cam follower and spring retainer. This screws on the threads at the top of the valve stem and the cam clearance is adjusted by screwing the cam follower up or down the valve stem. This was a weak system as the cam thrust is transmitted directly to the valve guides, which wear quickly. Also, at high r.p.m. the retaining threads soon loosen up, aided by valve spring pressure, and the valve then drops into the cylinder - with painful wounding of the owner's pocketbook. This is the stock Fronty system, developed by Hispano-Suiza and used by Alfa Romeo, Stutz and many others in the Twenties, Thirties and Forties.



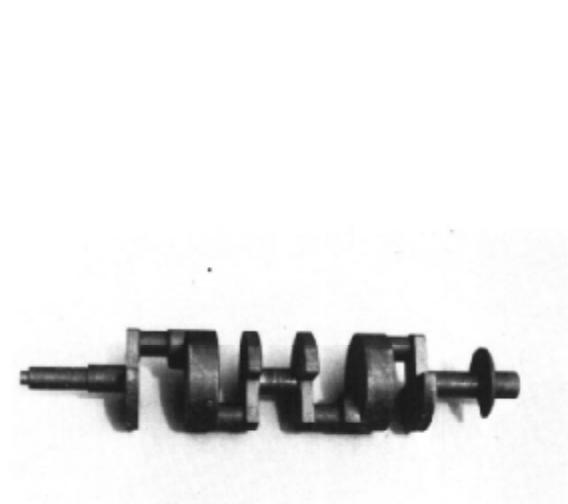
Factory Fronty side-drive water pump and magneto bracket, with factory Scintilla AG-4 magneto. These were also sold by other racing equipment houses under their own names.



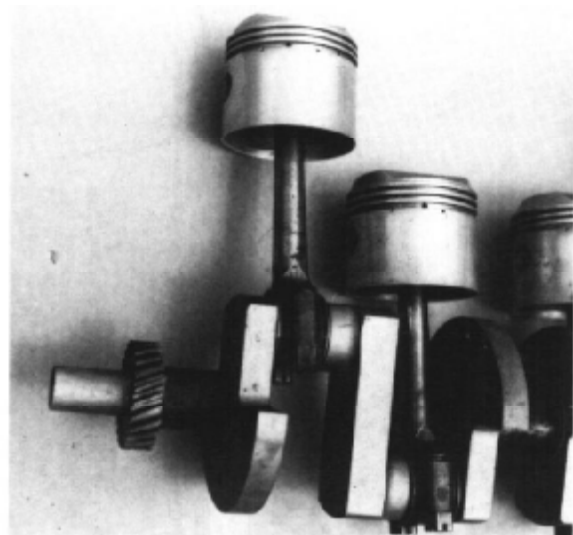
D.O. Fronty crank and rod assembly (with 1-5/8 bearings). Note the oil slinger machined on the flywheel flange. This crank is for the Model A Ford transmission conversion.



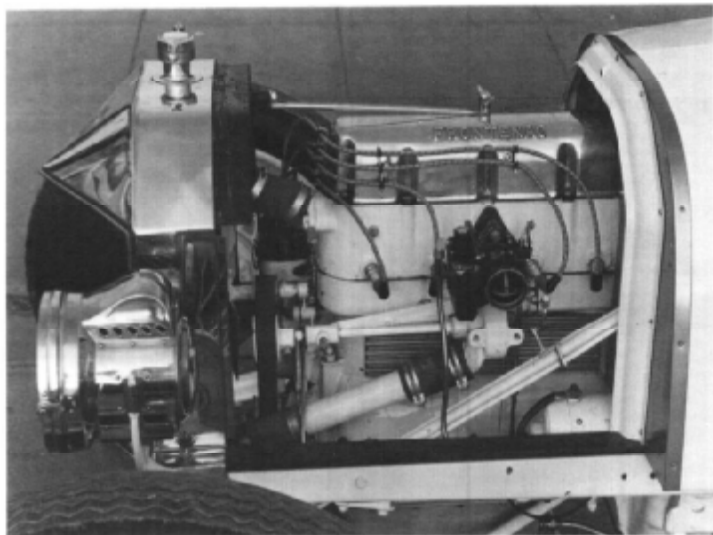
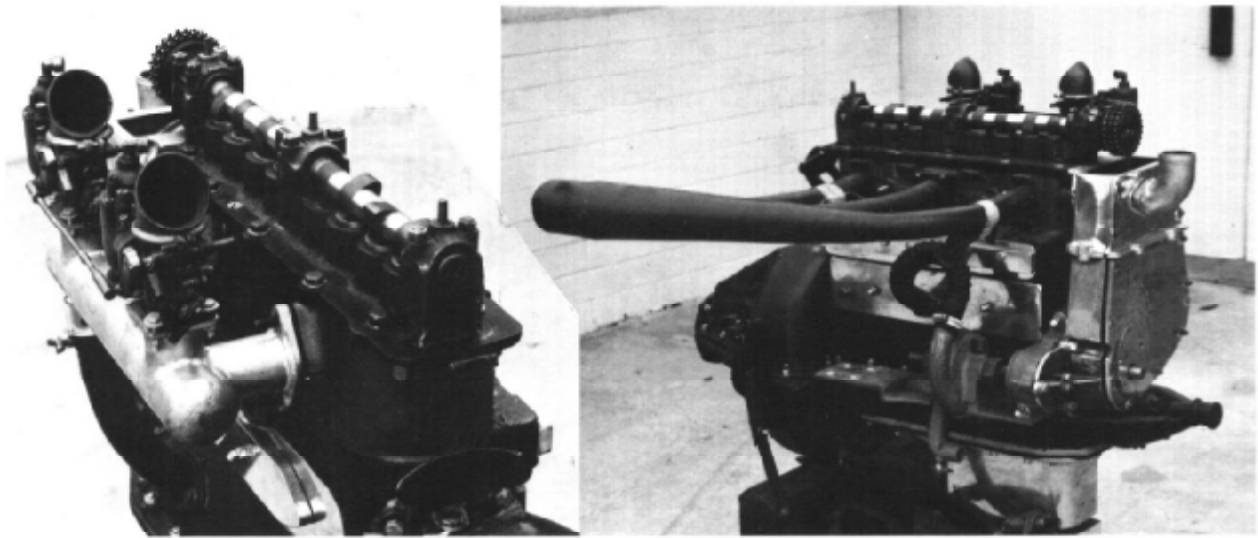
The early full-circle type Fronty billet crank. 1-3/8 or 1-1/2 bearings were available; this one has 1-1/2.



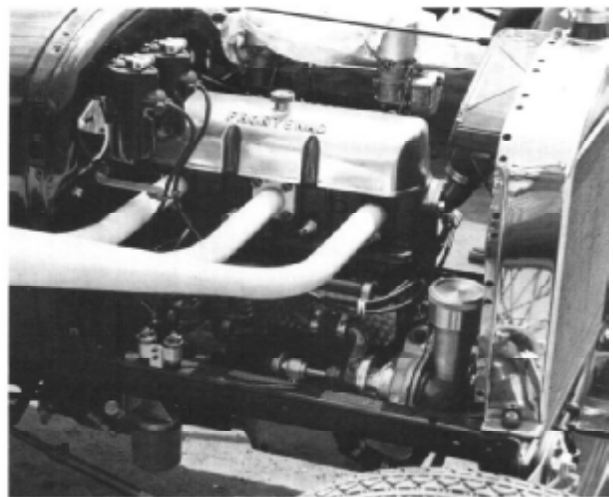
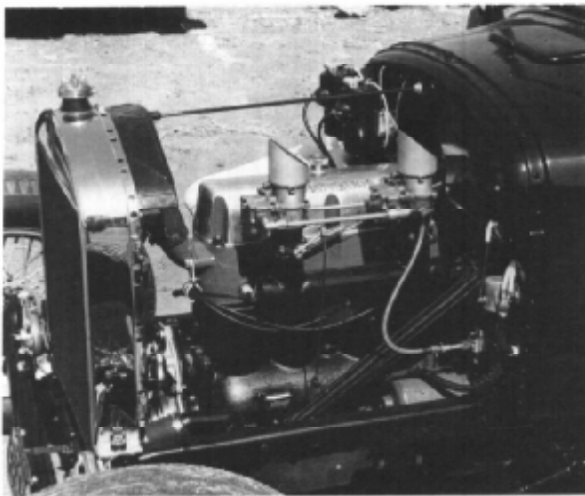
An unfinished Frontenac billet crank. This is the transitional crank between the full circle type and the square web type shown above. Bearings are 1-1/2.



Fronty billet counterbalanced crankshaft with tubular connecting rods and J.E. pop-up racing pistons (1/8 overbore) for a D.O. Fronty installed. The rod bolts are 1/2 in diameter! This is all original equipment. The bearings are 1-5/8. This set-up cost \$490 in 1929, as much as a new Model A Ford!



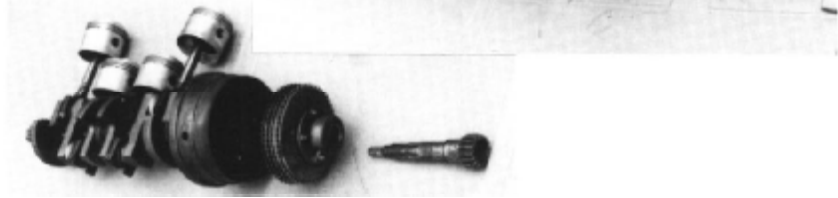
Left: The Frontenac Model T, S and R heads were similar except for the size of the combustion chamber. All had one intake port (the manifold was integral with the head casting). Below: The later Model SR had two intake ports, provision for two spark plugs per cylinder, and an even higher compression ratio than the Model R.



CRANKSHAFTS FOR RACING FORDS

With the advent of speed equipment for the Model T Ford, it didn't take long for the need of a stronger crankshaft to become apparent. A list of all the available replacements for the stock T crank would be endless but a few are shown here.

You will note that a few of these cranks appeared after the Model T Ford had "gone to rest" but since the Model T engine continued in racing until the Forties, we feel they are a true part of the car's history.



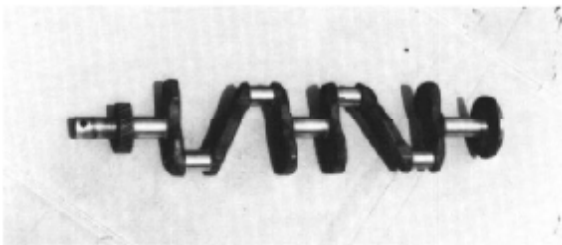
Frontenac billet crankshaft assembly with a chopped-down Model A Ford multiple disk flywheel installed, with the clutch and input shaft for the "A" transmission displayed beside it. This was a common set-up after 1928. It did away with the drag from the bands of a stock Model T transmission.



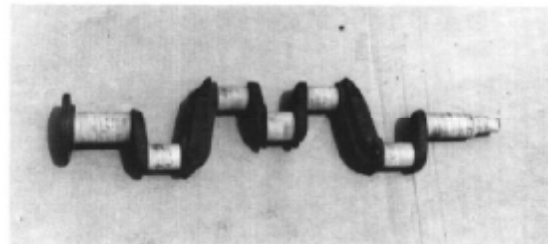
Suremike counterbalanced crankshaft. This is the rare "heavy" type crank, the strongest made by *Suremike*. It was available with 1-1/4 or 1-3/8 journals and with or without drilled holes for pressurized oil.



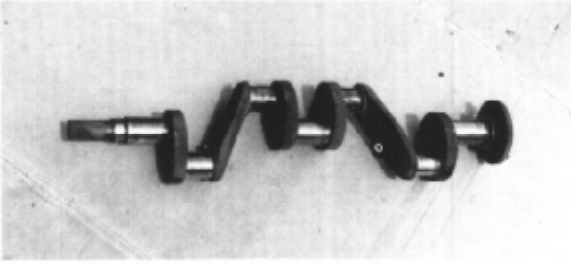
Wills-St. Clair V-8 crank. These were modified and used in Model T racing engines. This crank is unmodified, has a 4 stroke.



"Intermediate" type *Suremike* crank. This is the middle-size crankshaft so far as strength is concerned. It was available in stock bearing size only.



Stock Chevrolet four-cylinder crankshaft. Used in T engines by racers and hop-up artists. Not as good as an "A" crank for strength; also has a 4 stroke, compared with the A's 4-1/4.



1928 early Model A Ford crankshaft, "diamond web" style. This is the best "A" crank to use as it is lighter and stronger than the later "A" shafts. It is also much more difficult to find! It gets its name from the shape of the web between the crank throws (1 & 2 and 3 & 4) which have a diamond-like shape.



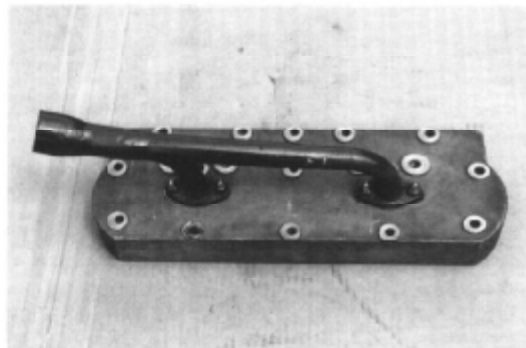
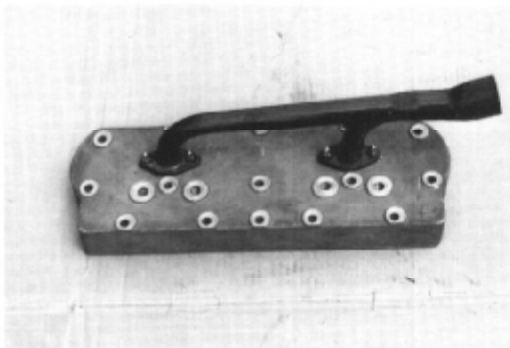
The stock Model B Ford crankshaft. These were used in racing T engines during the Thirties.



Model C Ford crankshaft. The best of all the stock Ford cranks. A bit difficult to modify to fit a T block unless it is to be an overhead cam conversion, but it can be put in if you work at it. The main problem is that the counterweights hit the camshaft in the T block.



A Miles-Bilt dual exhaust manifold for a Model T Ford. Directs exhaust from cylinders 1 & 4 and 2 & 3 into their own pipes. Cast iron.



Winfield flathead cylinder head, aluminum casting. The water manifold is homemade. Ed Winfield once turned 132 mph on the Culver City board track (California) with a head like this one on his T Ford-based dirt track car. An outstanding performer, it would out-run all but the fastest overhead valve engines.