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FUEL PUMP AND DISTRIBUTOR DRIVE

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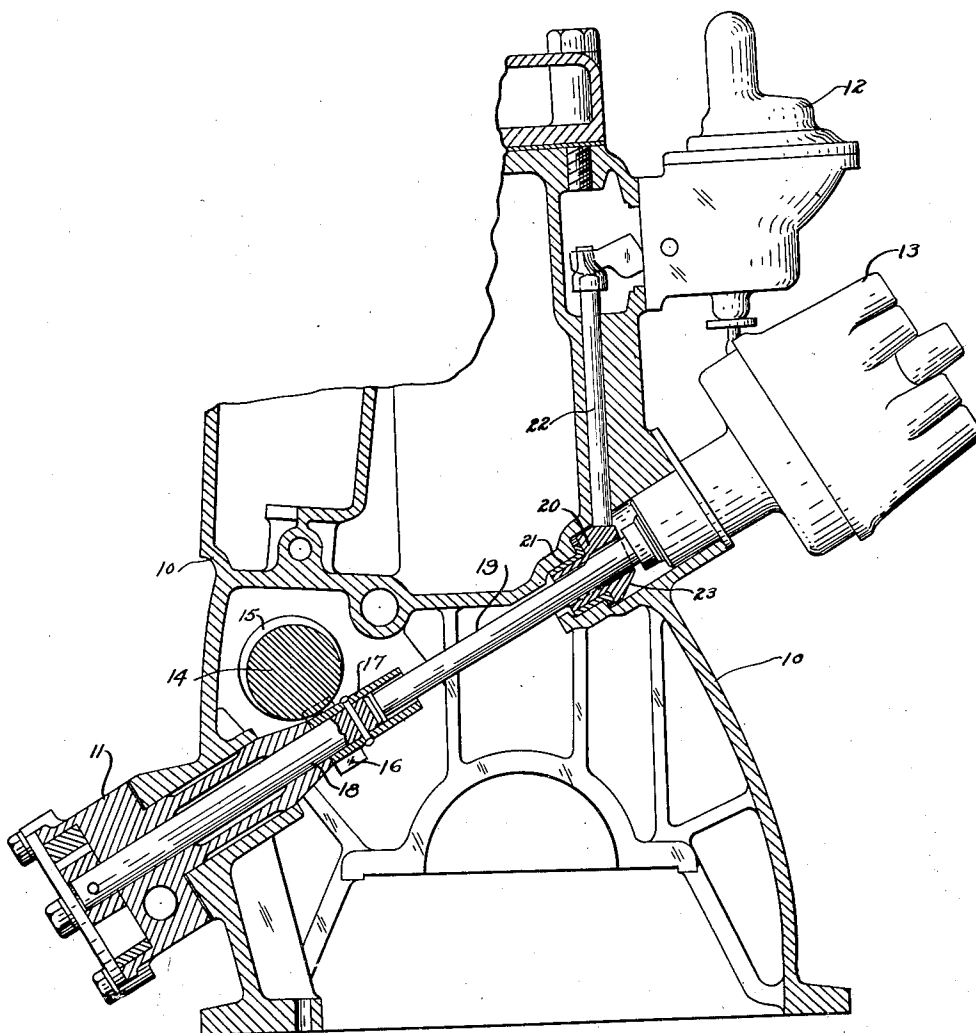


Fig. 1

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FUEL PUMP AND DISTRIBUTOR DRIVE

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1 Claim. (Cl. 123—195)

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This invention is concerned with the construction of internal combustion engines and more particularly with a driving system for actuating three vital engine auxiliaries, viz., the oil pump, distributor and fuel pump.

An object of this invention is accordingly to provide a simple, reliable and inexpensive apparatus for driving these three auxiliaries. Since the failure of any one of these three auxiliaries results inevitably in prompt engine failure, the necessity for a simple and reliable drive therefor is readily apparent. The fact that such a simple and reliable drive is also inexpensive to manufacture increases its attractiveness from a commercial viewpoint.

A further object of this invention is to provide an engine structure in which the fuel pump and distributor are mounted in an accessible location. This is desirable since both of these units require occasional adjustment and repair.

A further object of this invention is to provide an engine structure in which the fuel pump is so located that it is protected from heat emanating from the exhaust manifold and the crankcase.

With these and other objects in view, the invention consists in the arrangement, construction and combination of the various parts of the improved structure as described in the specification, claimed in the claim and illustrated in the figure of drawing which shows a view partially in section of an automotive engine. This section is taken perpendicular to the crankshaft and for purposes of clarity the crankcase and crankshaft have been eliminated.

In the drawing the engine block casting is generally indicated at 10. The oil pump is indicated at 11, the fuel pump at 12 and the distributor at 13. The motion for driving all of these auxiliaries is obtained from cam shaft 14. Gear 15 is cut into cam shaft 14 and drives gear 16 which is part of sleeve 17 which is in turn secured to shaft 18. Shaft 18 terminates at its lower end in the inner gear of gear pump 11. This pump is preferably of the gerotor type comprising a rotating inner and outer gear, the inner gear having a fewer number of teeth than the outer gear, and serving to drive the outer gear.

Shaft 19 is upset on both ends. The lower end of shaft 19 is splined to fit into a corresponding

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set of splines in sleeve 17. Fuel pump 12 is driven by push rod 22 which rides on the face 23 of eccentric 20. Eccentric 20 revolves in and is supported by bushing 21. The lower portion of the bore of eccentric 20 is splined to accommodate a corresponding spline on shaft 19. The spline driving eccentric 20 and the spline driving shaft 19 are identical. The upper end of shaft 19 drives distributor 13 and is journaled therein. By this structure shaft 19 and distributor 13 can be removed axially as a unit without disturbing the fuel pump or oil pump drives. The splining on the lower end of shaft 19 will readily pass through the splining of eccentric 20.

15 In ordinary automotive practice the fuel tank is located at the rear of the car and the fuel pump on the side of the engine adjacent the cam shaft since the cam shaft usually drives the fuel pump. To avoid vapor lock in the gasoline line leading 20 from the fuel tank to the fuel pump it is necessary to locate this line on the side of the car opposite the heated exhaust line. Since, however, the cam shaft and hence the fuel pump in most engine designs are on the same side of the engine 25 as the exhaust system, it has been necessary to carry the fuel line the length of the vehicle along the longitudinal frame member opposite the exhaust system, then across the car on the front transverse frame member and then to the fuel 30 pump. Only in this way could the gas line be adequately protected from the heat of the exhaust system. The fuel pump was located at the front of the engine to take advantage of the cooling effect of the fan.

35 By the structure of this application it is possible to locate the fuel pump on the side of the engine remote from the heated exhaust system and to extend the fuel line in a forward direction only to a position opposite the carburetor. This 40 makes possible a saving of approximately three feet of fuel line per car and locates the fuel pump in a readily accessible position.

What is claimed is:

45 In an internal-combustion engine, a gear mounted on the camshaft and driving a second gear carried upon an oil pump shaft mounted at a substantial angle to the vertical, an oil pump adjacent said camshaft and driven by the oil pump shaft, a distributor disposed coaxially with 50 the oil pump shaft and mounted on the opposite

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side of the engine, a shaft having upset and splined ends connecting the oil pump gear with the distributor, a fuel pump mounted adjacent the distributor and driven by a reciprocating push rod, an eccentric mounted upon and driven by the splined ends of the shaft adjacent the distributor, and a bushing supporting said eccentric, said eccentric being arranged to actuate the fuel pump rod, and said splined shaft and distributor being removable as a unit by sliding the splined shaft axially through the eccentric.

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