This invention relates to fuel injection pumps and has particular reference to the provision of a new and improved fuel injection pump having means for increasing fuel delivery by the pump as the fuel temperature increases. An object of the invention is to provide a fuel injection pump having temperature compensating means for controlling the fuel delivery according to pump and/or fuel temperature.

Another object is to provide a new and improved device for the fuel pump hereinafter which is relatively simple and economical in construction, yet efficient in operation.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings, wherein the invention has been shown applied to a distributor-type pump for the purposes of illustration only.

Referring to the drawings:

FIG. 1 is a longitudinal sectional view of a distributor-type fuel injection pump embodying the invention;

FIG. 2 is an end view thereof, partially in section;

FIG. 3 is a fragmentary view thereof;

FIG. 4 is a sectional view taken on line 4—4, looking in the direction the arrows; and

FIG. 5 is a fragmentary view showing the temperature compensating means employed.

Referring more particularly to the drawings wherein similar reference characters designate corresponding parts throughout, the pump shown embodying the invention is of the distributor type wherein a single pumping element is employed together with a distributor for pumping and distributing fuel to a plurality of outlets and combustion chambers successively. While the invention has been shown embodied in such a distributor-type pump, for the purpose of illustration, it is understood that the invention could be applied to other forms of injection pumps, such as that shown in Patent No. 1,944,858 of January 23, 1934 to Baur, with equal effectiveness.

The form of the pump shown embodying the invention comprises shaft 22 and in which is positioned a hydraulic head 11 having a bore 12 containing the pumping and distributing member 13.

The hydraulic head 11 is also provided with the fuel inlet passages 14 for supplying fuel to the bore 12, and said bore 13 communicates with each of the outlets 15 by means of a fuel passage 16, whereby fuel pumped and distributed by the pumping and distributing member 13 will be supplied through the outlets 15 to each of the combustion chambers of an internal combustion engine successively.

In the housing 10 beneath the pumping and distributing member 13 is journaled the cam shaft 17 having the gear 19a for operative connection to the engine for driving the pump, and said cam shaft 17 is provided with the cam lobes 18 for urging the pump and distributing member 13 on its pumping stroke and the suction or return stroke of said pumping and distributing member 13 is effected by means of the springs 18 and 19.

The pumping and distributing member 13 is, therefore, reciprocated upon rotation of cam shaft 17 and is adapted to be rotated simultaneously with said reciprocation through the gear 20 which meshes with gear 21, which is keyed on shaft 22 and which is geared with gear 23 which, in turn, meshes with gear 24, which is keyed to pumping and distributing member 13.
I claim:

1. In a device of the character described, a pumping member, means for controlling the fuel quantity delivered from said pumping member, said means including a rod and thermally actuated means for varying the effective length of said rod, said means comprising a pair of separate rod portions and a thermally actuated member connecting said rod portions with the adjacent ends of said rod portions being in abutting relation at a temperature in the range of from about 70° F. to 80° F.

2. In a device of the character described, a pumping member, a governor, a control rod connected to said governor for controlling the quantity of fuel delivered by the pump, said rod comprising a pair of rod sections and thermally actuated means connecting said rod sections and adapted to be thermally actuated to vary the effective length of said rod and the adjacent ends of said rod sections in abutting relation at a temperature in the range of from about 70° F. to 80° F.

3. In a device of the character described, a pumping member, a governor, a control rod comprising a pair of rod sections connected to said governor for controlling the quantity of fuel delivered by the pump, thermally actuated means connecting the adjacent ends of said rod sections in abutting relation at a temperature in the range of from about 70° F. to 80° F., said thermally actuated means adapted to vary the effective length of said rod to vary fuel delivered by the pump when the temperature is above said range.

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