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LIQUID FUEL CONTROLLING MEANS

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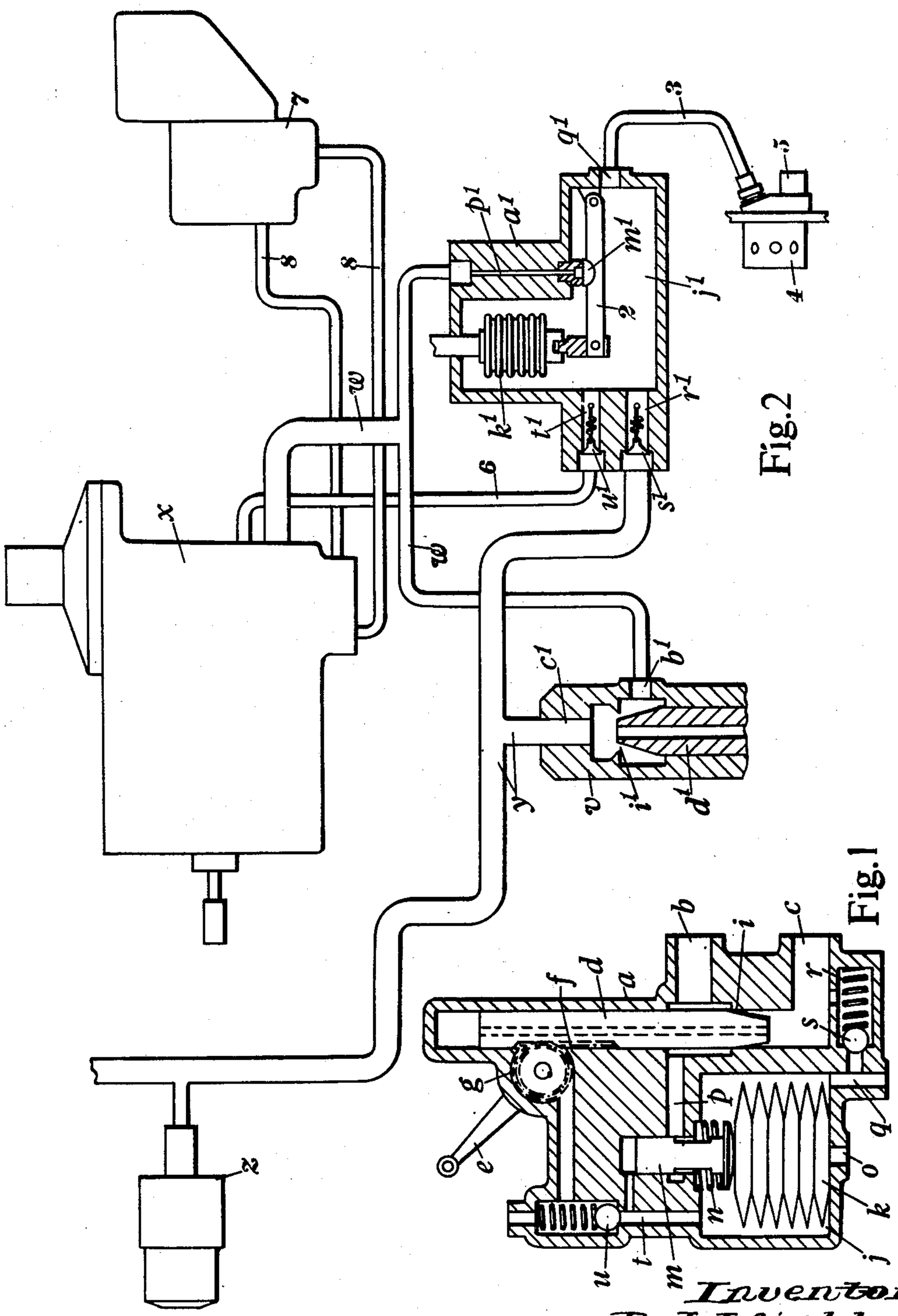

Fig. 2

Fig. 1

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LIQUID FUEL CONTROLLING MEANS

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This invention relates to means for controlling the supply of liquid fuel to the burner nozzles of a combustion chamber forming part of a prime mover, the latter being of the kind in which the combustion chamber is provided with a main burner and also with a pilot burner for effecting ignition of the main combustible mixture in the chamber. The use of a pilot burner avoids the necessity for arranging the required igniting device in the vicinity of the main burner, and thereby subjecting the device to undesirable heating effects. In cases where a pilot burner is not employed, it is known to make the igniting device retractible so that it can be moved away from the main burner after ignition has been effected, but this entails complication of the igniting device, and it is more usual to provide a pilot burner which enables the igniting device to be arranged away from the main burner, and which can project a flame for effecting ignition of the main combustible mixture. In order to attain satisfactory atomisation at the pilot burner, it is desirable that fuel shall be supplied thereto at a substantially constant pressure. The object of the invention is to provide improved means for controlling the supply of fuel to the main and pilot burners, such that the supply to the pilot burner is effected at a substantially constant pressure.

In the accompanying sheet of explanatory drawings:

Figure 1 is a diagrammatic sectional side view of means constructed in accordance with the invention for controlling the supply of liquid fuel to a prime mover of the kind specified.

Figure 2 is a part sectional side view illustrating a modified form of the invention.

In carrying the invention into effect as shown in Figure 1, I employ a hollow body part *a* having an inlet *b* for connection to a fuel supply pump and an outlet *c* for connection to the main burner. Between the inlet *b* and outlet *c* there is arranged in the body part *a* a manually controllable valve *d* of any convenient form. Preferably and as shown the valve *d* is of the slidable-plunger type, and is operable by a lever *e* through the medium of a rack *f* and pinion *g*, the plunger having a conical end which co-operates with an annular seating *i* in the body part *a* to control the flow of liquid fuel from the inlet *b* to the outlet *c*. In the body part *a* is formed a cylindrical or other chamber *j* containing a deformable capsule *k* which supports a by-pass valve *m* in the form of a slidable plunger loaded by a spring *n*, the capsule being in communication with the atmosphere through an opening *o* in the chamber, or being wholly or partially evacuated. Instead of the capsule *k* a spring loaded piston or diaphragm may be provided in the chamber *j* for supporting the by-pass valve *m*. This valve controls communication between the chamber *j* and a passage *p* leading from the inlet *b*. From the chamber *j* fuel can pass to an outlet *q* for connection to the pilot burner. Also the chamber *j* communicates with the main fuel outlet *c* by way of a passage *r* extending between this outlet and the chamber outlet *q*, this passage being controlled by a spring loaded non-return valve *s*. Moreover, a relief passage *t* controlled by a spring loaded valve *u* is provided in communication with the chamber *j*.

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Starting of the prime mover is usually effected by an auxiliary motor. Assuming the manually operable valve *d* to be open the pump then supplies fuel past this valve to the main burner. At the same time fuel flows past the by-pass valve *m* and through the chamber *j* to the pilot burner. Should the pressure of the fuel supplied by the pump exceed some predetermined amount, the action of the pressure on the capsule *k* (or the piston or diaphragm) in the chamber *j* causes the same to move and allow the by-pass valve *m* to be moved by its spring *n* to close or restrict the fuel flow to the chamber and thus to the pilot burner. Consequently the supply of fuel to the pilot burner is effected at a substantially constant pressure. After ignition has been effected, the supply to the pilot burner is cut off by another valve (not shown), and the supply of fuel to the main burner is regulated as required by means of the manually operable valve *d* above described. When it is required to supply to the main burner only sufficient fuel to maintain combustion, as when the prime mover is idling, the manually operable valve *d* is closed. The required restricted supply to the main burner is then maintained by flow past the by-pass valve *m* and through the above mentioned passage *r* containing the non-return valve *s*.

In the modification shown in Figure 2, in which parts similar or analogous to those above described are indicated by the same reference characters suffixed by 1 the manually operable valve d^1 and its seating i^1 are contained in a housing *v* which is separate and may be arranged at any convenient distance from the body part a^1 containing the by-pass valve m^1 and the chamber j^1. The housing *v* is provided with an inlet b^1 for connection by piping *w* to the delivery side of a fuel supply pump *x*, and with an outlet c^1 for connection by piping *y* to the main burner

z. The by-pass valve m^1 comprises a closure member adapted to co-operate with an annular seating at the inner end of an inlet passage p^1 leading to the interior of the chamber j^1, the outer end of this passage being adapted for connection to the piping w communicating with the delivery side of the pump x. The closure member of the by-pass valve m^1 is formed on or secured to a lever 2 which at one end is pivoted to the body part a^1, and at the other end is connected to the capsule k^1 in the chamber j^1, this capsule being open to the atmosphere, or wholly or partially evacuated, as in the previously described example. The chamber j^1 is provided with an outlet q^1 for connection by a pipe 3 to the pilot burner 4, this pipe having associated with it any convenient valve 5 for interrupting the supply of liquid fuel to the pilot burner after the prime mover has been started. Also the chamber j^1 is provided with a passage r^1 for connection with the piping y leading to the main burner z, this passage being controlled by a non-return valve s^1. Moreover, the chamber j^1 is also provided with a pressure relief passage t^1 for connection by a pipe 6 to the inlet side of the pump x, this passage being controlled by a spring loaded valve u^1.

The pump x may be of the swash-plate or other suitable type, and may be controllable by barometric pressure through the medium of any convenient and known device 7 which is connected to the pump by pipes 8.

In operation the example shown in Figure 2 is essentially similar to that shown in Figure 1.

By this invention I am able to effect the required control of the supply of fuel to the main and pilot burners in a simple and satisfactory manner. The invention is not, however, limited to the examples described as subordinate details may be varied to suit different requirements.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. Means for controlling the supply of liquid fuel to a prime mover of the kind specified, comprising in combination an inlet passage for liquid fuel under pressure, a main outlet passage for liquid fuel from said inlet passage, a subsidiary outlet passage for liquid fuel from said inlet passage, a manually operable valve for controlling liquid fuel flow from said inlet passage to said main outlet passage, a bypass valve for controlling liquid fuel flow from said inlet passage to said subsidiary outlet passage, a non-return valve operable by liquid fuel pressure at the outlet side of said by-pass valve for admitting a restricted supply of liquid fuel from the outlet side of said by-pass valve to said main outlet passage, and means for actuating said by-pass valve in response to liquid fuel pressure at the outlet side of said by-pass valve.

2. Means as claimed in claim 1 and having a hollow body part containing the manually operable valve, the by-pass valve, the non-return valve, and the means for actuating said by-pass valve.

3. Means as claimed in claim 1 and having in combination a housing containing the manually operable valve and communicating with the inlet passage and main outlet passage, and a hollow body part containing the by-pass valve and its actuating means and communicating with the inlet passage and subsidiary outlet passage, the non-return valve being arranged between said main outlet passage and the interior of said hollow body part.

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