No. 695,232. Patented Mar. 11, 1902.

F. A. REYNOLDS.

FUEL FEED FOR BURNERS.

(Application filed Sept. 20, 1901.)

(No Model.)

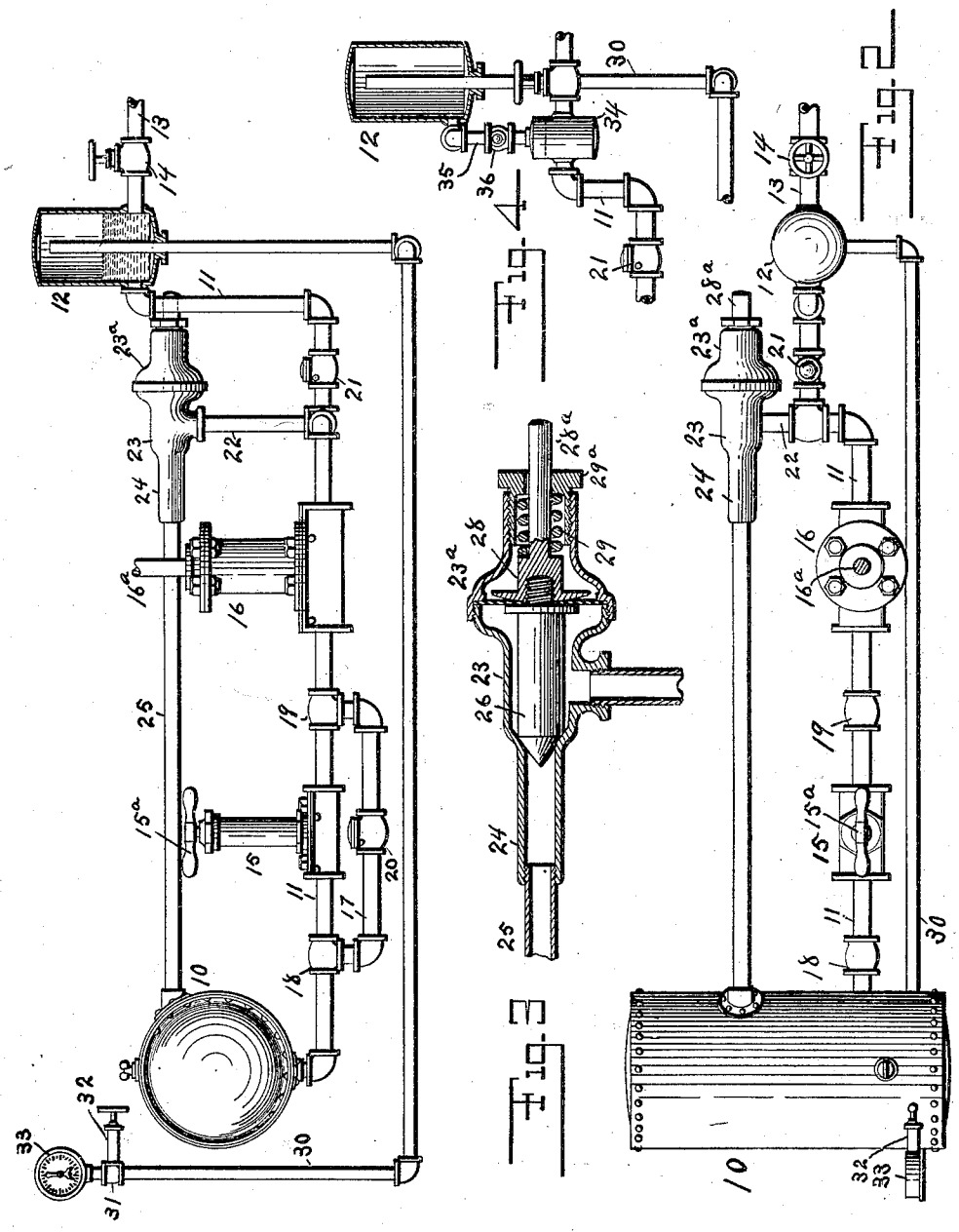


Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES:

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FUEL-FEED FOR BURNERS.

SPECIFICATION forming part of Letters Patent No. 695,232, dated March 11, 1902.

Application filed September 20, 1901. Serial No. 75,736. (No model.)

To all whom it may concern:

Be it known that I, FRANK ARTHUR REYNOLDS, of Lewiston, Androscoggin county, Maine, have invented certain new and useful Improvements in Fuel-Feeds for Burners, of which the following is a full, clear, and exact description.

My invention relates to improvements in devices for controlling and regulating the fuel-supply to burners, and especially to that class of burners which use a fluid or liquid fuel. Usually burners of this class, especially such as use kerosene or gasolene, have fuel supplied to the burner under pressure, and the pressure is applied in the main fuel-tank. It is well known that this practice is dangerous, as it is liable to result in flooding the burner and in forcing the fuel in such a way that an explosion of the entire fuel-supply may result.

The object of my invention is to produce a simple apparatus by means of which the fuel-supply in the main tank is used without any pressure whatever and the necessary burner-pressure supplied from a pressure chamber or tank, which chamber holds but relatively little fuel, so that there is but little fuel to explode in case of accident, and also to arrange the device so that an explosion is very unlikely.

Further objects of my invention are to make the apparatus as simple and compact as possible, to the end that it may be used to advantage in automobiles or motor-vehicles, and to provide means for automatically regulating the pressure on the fuel.

With these ends in view my invention consists of certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar numerals of reference refer to similar parts throughout the several views.

Figure 1 is a broken side elevation, partly in section, of my improved apparatus. Fig. 2 is a plan view thereof. Fig. 3 is an enlarged detail sectional view of the pressure-regulator, and Fig. 4 is a broken sectional elevation showing a slight modification of the device.

The main fuel-tank 10 may be of any usual construction, and in practice I have it provided with an easily-removable cover, as there is no pressure in the tank. From this tank leads a pipe 11 to a pressure-chamber 12, which is relatively small and contains a comparatively constant fuel-supply, which is maintained under an equable pressure, as hereinafter described. From this pressure-chamber a pipe 13 leads to the burner, this pipe being controlled by a suitable valve 14.

Located in the pipe 11 is a hand-pump 15, which may be of any usual kind and is worked by the ordinary handle 15^a, and between the hand-pump and the chamber 12 is a power-pump 16, which also may be of any approved kind and which is worked by its piston 16^a. This may be driven in any customary manner. The pipe 11 is also provided with a by-pass pipe 17, which connects with the pipe 11 through ordinary connections, as shown at 18 and 19. These connections are located on opposite sides of the hand-pump 15, so that the pump may be cut out, and in the by-pass pipe is a check-valve 20. Another check 21 is also located in the pipe 11 between the power-pump 16 and the pressure-chamber 12. It will be seen, therefore, that by working the hand-pump 15 to a very limited extent gasolene or other fuel may be drawn from the pipe 10 and forced into the chamber 12, the fuel at the same time priming the power-pump 16, and after this when the power-pump is started the hand-pump will not be used; but the fuel will pass through the by-pass pipe 17 and check 20 to the auxiliary chamber 12.

To provide for maintaining an even pressure in the pressure-chamber 12, an ordinary diaphragm-regulator (shown clearly in Fig. 3) is used. Nothing is claimed for this regulator in detail, but its construction will be generally described, so that the operation of the device may be perfectly understood.

A pipe 22 leads from the pipe 11 at a point between the power-pump 16 and the pressure-chamber 12. This pipe 22 delivers into the regulator-casing, which is made of two parts 23 and 23^a. One end of the casing is reduced, as shown at 24, and this reduced end connects with an overflow-pipe 25, which leads

back to the supply-tank 10. In the regulator-casing is a valve 26, which abuts with a transverse diaphragm 27 in the casing 23 23ª and is normally pressed so as to close the exit 24 of the casing. The diaphragm is backed by a piston 28, which is pressed against by a spring 29, this in turn being held by the nut 29ª, which fits over the shank 28ª on the piston 28, and by adjusting the nut the pressure of the spring 29 may be regulated. The pressure of the spring is adjusted so as to balance the desired pressure in the chamber 12, and so long as this pressure is not exceeded the valve 26 will remain closed; but if the pressure rises above the desired point the back pressure in the pipe 22 and against the diaphragm 27 will overbalance the pressure of the spring 29, thus opening the valve 26 and permitting the excess pressure to be relieved by causing the fuel to flow back through the pipes 22 and 25 to the tank 10.

To provide for initial pressure in the chamber 12, an air-pipe 30 is used, which extends well up into the chamber, and this has an ordinary air connection 31, to which a small hand-pump 32 may be connected or which can be connected with any suitable hose or air-pipe. The pipe 30 is also provided with a pressure-gage 33 to indicate the pressure in the chamber 12. When the apparatus is to be used for the first time, a quantity of air is pumped through the pipe 30 into the chamber 12—enough to make a pressure of, say, fifteen or twenty pounds—and then the gasolene or other fuel is pumped into the chamber, and as this fuel rises it increases the air-pressure to the necessary extent, and unless there is a leak the pressure once being adjusted will be maintained indefinitely.

To provide for still greater safety, the modification shown in Fig. 4 may be used. Here a supplemental fuel-tank 34, adapted to contain very little fuel, is arranged in the pipe 11 between the check 21 and the pressure-chamber 12, the supplemental chamber being connected to the pressure-chamber 12 by a pipe 35, which is provided with a check 36 to prevent any backflow from the chamber 34 to the pressure-chamber 12. In this case the feed-pipe 13 opens from the supplemental tank 34 instead of from the pressure-chamber 12.

It will be seen from the foregoing description that I provide a very simple system of piping and of regulation which entirely relieves the pressure in the main supply-tank and which yet provides a suitable burner-pressure.

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

1. An apparatus of the kind described, comprising a source of fuel-supply, a pressure-chamber, a fuel-pipe leading from the source of supply to the pressure-chamber, a hand-pump and power-pump located in the fuel-pipe, a by-pass pipe provided with a check and leading around the hand-pump, and a feed-pipe opening from the pressure-chamber.

2. An apparatus of the kind described, comprising a source of fuel-supply, a pressure-chamber having a suitable discharge, a fuel-pipe leading from the source of supply to the pressure-chamber, a hand-pump and power-pump located in the fuel-pipe, a by-pass pipe extending around the hand-pump, said by-pass pipe having a check, an overflow-pipe extending from the fuel-pipe back to the source of fuel-supply, the said pipe being connected with the fuel-pipe between the power-pump and the pressure-chamber, and a pressure-regulator located in the backflow-pipe and controlling the pressure in the said pipe, the fuel-pipe, and pressure-chamber.

3. An apparatus of the kind described, comprising a fuel-supply tank, a pressure-chamber, an air-pipe discharging into the pressure-chamber, a fuel-supply pipe leading from the fuel-tank to the pressure-chamber, a hand-pump and power-pump located in the fuel-pipe, a by-pass pipe connected with the fuel-pipe and extending around the hand-pump, said by-pass pipe having a check, a backflow-pipe leading from the fuel-pipe at a point between the power-pump and the pressure-chamber back to the supply-tank, and a pressure-regulator located in the backflow-pipe.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK ARTHUR REYNOLDS.

Witnesses:

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