W. H. WETZLER.

POWER PLANT.

APPLICATION FILED OCT. 24, 1914.

1,258,068. Patented Mar. 5, 1918.

Fig. 1

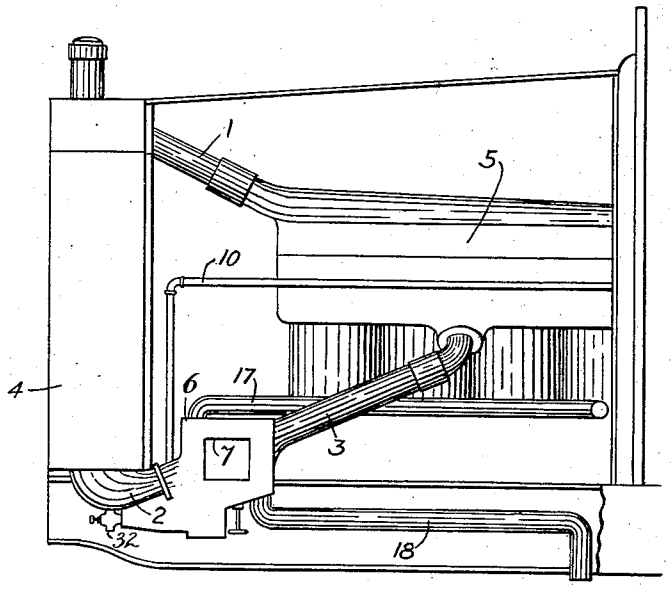
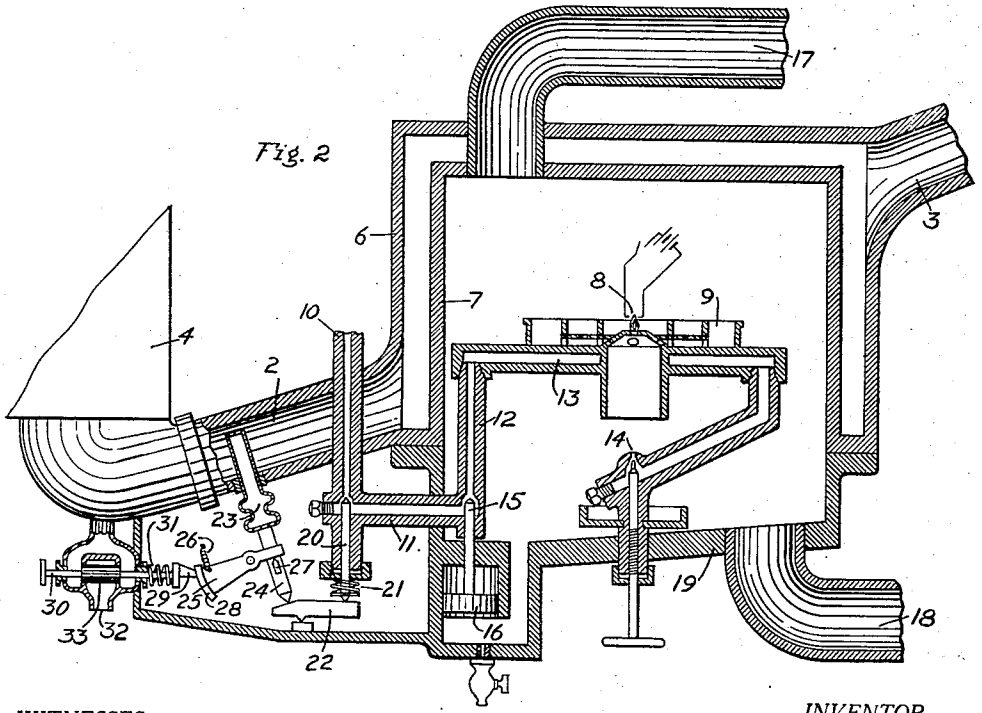


Fig. 2



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POWER PLANT.

1,258,068. Specification of Letters Patent. Patented Mar. 5, 1918.

Application filed October 24, 1914. Serial No. 868,385.

To all whom it may concern:

Be it known that I, WILLIAM H. WETZLER, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Power Plants, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to power plants which include internal combustion engines that employ circulating systems for engine cooling fluid.

My invention has for one of its objects the provision of automatically operating means for preventing the temperature of engine cooling fluid from descending below a predetermined minimum. A desirable lower limit for the temperature of the cooling fluid is 38° plus, Fahrenheit, though the apparatus of my invention may be adjusted to permit the temperature to reach a lower degree, especially if the cooling fluid is a non-freezing mixture. By means of my invention the temperature of the engine cylinders may be prevented from descending below a predetermined limit whereby the efficiency of the engine may not be seriously reduced in cold weather and whereby the engine may readily be started.

My invention has for another of its objects the provision of means for effecting the discharge of the cooling fluid from the circulating system traversed thereby when the temperature of the fluid is lowered below a predetermined limit as may occur, for example, in exceedingly cold weather if the aforesaid feature of my invention should become accidentally incapacitated.

I will explain my invention more fully by reference to the accompanying drawing showing the preferred embodiment thereof and in which Figure 1 is a side view illustrating the application of my invention to an automobile driving engine, a sufficient portion of the engine hood being removed to reveal the structure normally covered thereby, and Fig. 2 is an elevation, mainly in section, of a part of the equipment illustrated in Fig. 1 and on a larger scale of illustration.

Like parts are indicated by similar characters of reference in both figures.

While the invention has been shown as being applied to an automobile driving engine it is, of course, not to be limited to an engine adapted to this purpose.

The circulating system, apart from the apparatus of my invention that is associated therewith, is well known by those skilled in the art and will be readily understood by an inspection of Fig. 1 where there are illustrated pipe portions 1, 2 and 3 which are in serial relation with each other and with the radiator 4 and the jacket structure or casing 5 of the engine, and as these parts and the interrelation thereof are so well known a further detail description thereof will not be essential.

In practising my invention I enlarge the portion of the piping system that intervenes between the pipe portions 2 and 3 by introducing between these pipe portions a cubiclike chamber 6 whose bottom 7 generally follows the contour of the portion 6 and is spaced apart therefrom to afford a fluid containing space that is located above and around the bottom 7 and between and below the sides and top of the portion 6, as indicated clearly in Fig. 2. That is the portion 7 is so spaced apart from the portion 6 that cooling fluid will surround the portion 7 and be located above the same. The cooling fluid that occupies the cubiclike chamber 6 has a slower rate of circulation than may be said of the fluid in other portions of the circulating system and I therefore locate supplemental means for heating the fluid at this locality. This heating means may, for example, reside in a usual form of gasolene or gas burner that is provided with means for maintaining a pilot gas flame 8 adapted to ignite a larger flame when sufficient gas is supplied to the main burner portion 9. Gasolene is supplied to the burner through piping 10 that communicates with a suitable source of gasolene supply, not illustrated, and which is adapted for communication with the pipe sections 11 and 12 in order to convey the liquid gasolene to the heating chamber 13 where it is gasified and thereafter led to the valve structure 14 from which the gas is directed to the burner. The structure may include a safety valve 15 provided at its lower end with a valve actuating float 16 which may be arranged to close the valve 15 if gasolene should be admitted to the apparatus without being vaporized at the portion 13. The necessary air for supporting combustion of the flame is furnished by means of the pipes 17, 18 that

communicate at their inner ends with the space inclosed by the chamber portion 7 and the closure 19 and which are opened to the external air at their other ends. A valve 20 may be positioned nearly to close the bore of the pipe 10 then to permit the passage of just enough gasolene to maintain the pilot flame at 8. The valve 20 may be variably positioned from this nearly closed position to permit the gasolene to flow at that rate which is required to supply sufficient fuel for the burner to furnish the heat required and to prevent the cooling fluid from descending below the predetermined minimum. The opening action of the valve is directly due to the spring 21. The means that prevent and permit the operation of the spring 21 include an intermediately pivoted valve lever 22 whose position is influenced by a thermostat 23. A portion of this thermostat extends within the bore of the pipe 2 so as to be subject to the temperature of the cooling fluid in the circulating system. When the cooling fluid is at or near its predetermined lower temperature or the temperature at which heating is to occur the thermostat 23 will contract in its length whereupon the spring 21 will depress the lever 22 to the extent permitted by the thermostat stem 24 whereby the valve 20 will be correspondingly opened to furnish a corresponding flame at the burner to compensate for the reduction in the temperature of the cooling fluid. When the temperature of the cooling fluid has been sufficiently raised the thermostat will expand whereby the valve lever 22 is rocked in a counter-clockwise direction to force the valve 20 toward its closed position against the force of the spring 21.

If for any reason the burner should become inoperative I provide means for discharging the cooling fluid when the temperature thereof goes below the predetermined lower limit, a means which should be especially employed if the cooling fluid (such as water) is adapted to freeze. In practising this feature of my invention I employ a rocking lever 25 which is pulled upon by a spring 26 in a clockwise direction and which is pushed upon by the lug 27 carried by the thermostat stem 24 in a counter-clockwise direction. This lever 25 carries a shoe 28 that is concentric with the pivot of the lever and toward which the nose 29 of a valve stem 30 is pressed by a spring 31. The valve stem 30 carries a plunger valve 32 which normally closes the cooling fluid outlet 33, the shoe 28 being normally engaged, in its various positions, by the nose 29 during the normal range of expansion and contraction of the thermostat. If, for any reason, the heating flame should cease and the temperature of the cooling fluid should go below the lower limit the shoe 28 will be moved sufficiently in a counter-clockwise direction, owing to the consequent contraction of the thermostat, to enable the nose 29 to escape the same whereupon the spring 31 will operate to move the valve stem 30 to the right, this stem then carrying with it the valve 32 that is then positioned to uncover the outlet 33. When the valve 32 is thus removed from its normal position the cooling fluid will drain from the system so that it will not freeze and injure the equipment.

While I have herein shown and particularly described the preferred embodiment of my invention I do not wish to be limited to the precise details of construction shown as changes may readily be made without departing from the spirit of my invention but having thus described my invention I claim as new and desire to secure by Letters Patent the following:—

1. A power plant including an internal combustion engine; a liquid circulating system for cooling working parts of the engine; a fluid fuel consuming burner for heating the liquid in the circulating system; a valve for permitting and obstructing the flow of fluid fuel to the burner; and mechanism for positioning the valve, said mechanism including a thermostat subject to the temperature of the cooling liquid which operates to enable the valve to open upon decrease of temperature of the liquid and which enables closing movement of the valve upon increase of temperature of the liquid.

2. The combination of an internal combustion engine, a liquid circulating system for cooling the engine, a heating device for the liquid in the circulating system, and automatically operated means for progressively increasing the degree of heat produced by the heating device as the temperature of the liquid in the system decreases and for progressively increasing said degree of heat as the temperature of said liquid rises.

3. The combination of an internal combustion engine, a liquid circulating system for cooling the engine, a heating device for heating the liquid in the circulating system, and thermostatically controlled means for progressively increasing the degree of heat produced by said heating device as the temperature of the liquid decreases and for progressively decreasing said degree of heat as the temperature of the liquid in the system increases.

4. The combination of an internal combustion engine, a liquid circulating system for cooling the engine, a fluid fuel consuming heating device for heating the liquid in the circulating system, and automatically operated means for increasing the supply of fuel to said heating device as the temperature of the circulating liquid decreases

and for decreasing the supply of fuel as the temperature of the circulating liquid increases.

5. The combination of an internal combustion engine, a liquid circulating system for cooling the engine, a fluid fuel consuming heating device for heating the liquid in the circulating system, and thermostatically controlled means for increasing the supply of fuel to the heating device as the temperature of the circulating liquid decreases and for decreasing said supply of fuel as the temperature of the circulating liquid increases.

In witness whereof, I hereunto subscribe my name this 22nd day of October, A. D. 1914.

WILLIAM H. WETZLER.

Witnesses:
G. L. CRAGG,
ETTA L. WHITE.