F. I. HITCHCOCK.

VAPOR HEATER FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED MAY 8, 1913.

1,135,113.

Patented Apr. 13, 1915.

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Fig 1

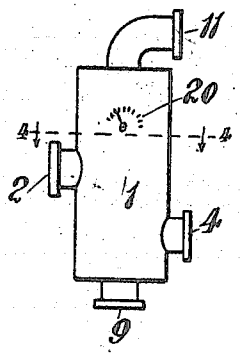

Fig. 2

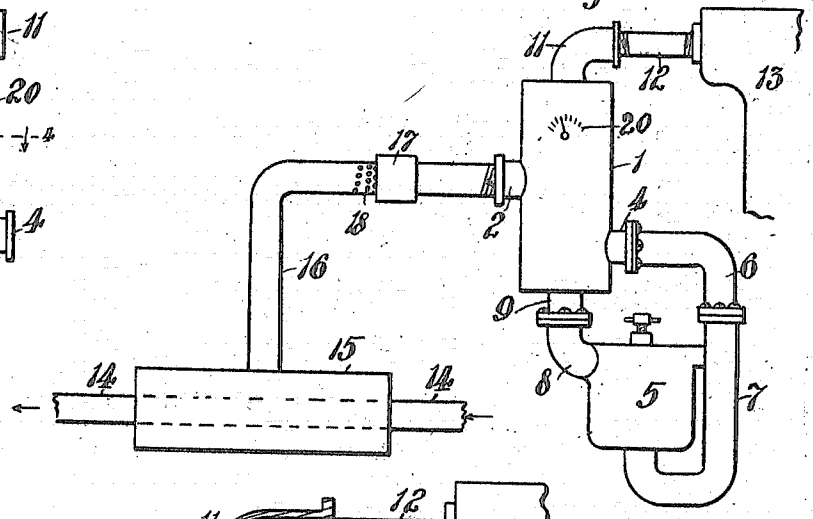

Fig. 3

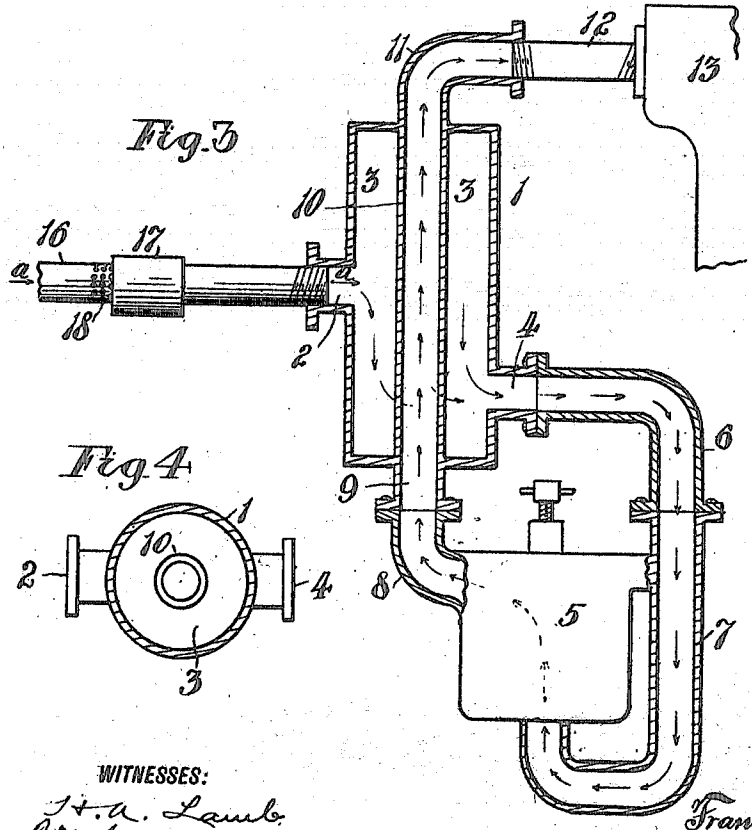

Fig 4

WITNESSES:

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VAPOR-HEATER FOR INTERNAL-COMBUSTION ENGINES.

1,135,113. Specification of Letters Patent. Patented Apr. 13, 1915.

Application filed May 8, 1913. Serial No. 766,352.

To all whom it may concern:

Be it known that I, FRANK I. HITCHCOCK, citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Vapor-Heaters for Internal-Combustion Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a device to be used in connection with internal combustion engines, adapted to use the heavier hydrocarbon distillates, like kerosene.

The object of my invention is to maintain a uniform temperature at all times of the ignitible vapor passing into the engine.

Referring to the drawings, in which the same figures and letters of reference indicate like parts throughout the several views, Figure 1 represents a detail view of the gas or vapor heater; Fig. 2 is a broken view of an engine and exhaust pipe, showing the vapor heater connected with the engine; and Fig. 3 is an enlarged central sectional view of the vapor heater and its connections with the carbureter, and broken view of the carbureter, engine and intake pipe from the exhaust pipe drum; and Fig. 4 is a cross sectional view of the heater on line 4—4, of Fig. 1.

The vapor heater 1 has the heat intake port 2 through which heat enters into the chamber 3, and the outlet port 4 through which heat passes to the carbureter 5, through elbows 6 and 7, and the elbow 8 connects the carbureter with the port 9 of the heater. The vertical pipe, or inclosed passage 10, elbow 11, and the body or casing 1 are shown integral as the most convenient construction to insure a gas tight structure. The short pipe or nipple 12, connects the heater with the engine 13.

The exhaust pipe 14 passes through the exhaust pipe drum 15, in the usual manner and the heated air in the drum is drawn up through the pipe 16, to the vapor heater 1 at a temperature regulated by the controller 17, adapted to slide on the pipe 16 and control the amount of cold air entering the holes 18 in the pipe, so as to regulate the temperature of the heated air entering the chamber 3 of the vapor heater 1.

It has been demonstrated from practice, with the use of heavier distillates, like kerosene, that the best results are obtained when the vapor enters the cylinder at a temperature of about 125 degrees. It is a well known fact that hot air, when leaving the carbureter, will fall in temperature below the point at which it entered, owing to the unavoidable drop in temperature of the vaporized distillates. It is, therefore, absolutely essential that the temperature of the hot air admitted to chamber 3, must be high enough to compensate for this loss of heat at the discharge end of the carbureter, so as to maintain a uniform and unvariable temperature of the vapor entering the engine cylinder. To illustrate this, let it be supposed that the temperature of the hot air entering chamber 3 is 175 degrees, and the fall of temperature at the discharge end of the carbureter is 50 degrees. It will thus be readily seen that the mean unvarying temperature in said chamber and in the pipes leading from thence to the carbureter, and also in pipe 10, will be 125 degrees, which as before mentioned, is about the proper working temperature for the vapors entering the cylinder. As the point at which the fall of temperature varies in different carbureters, the intake nozzle 2 may be located at any height best calculated to bring the hot air in direct contact with that part of the pipe 10 where the chill caused by the fall of temperature takes place. The thermostat 20, Fig. 1 will indicate the temperature in chamber 3, which temperature can be regulated and maintained by the controller 17 as before mentioned.

While I show the vapor heater detachably connected with the carbureter, it will be readily seen that they could be made integral with equally as good results, for the mode of connection or construction is merely a matter of economy or convenience.

Having thus described my invention, what I claim is:—

1. The combination with an engine and carbureter of an interposed vapor heater having a hot air chamber and a hot air inlet, a manually operated controller for regulating the temperature of the heated air entering said chamber, a hot air outlet from said chamber to the carbureter, and an inclosed passage in the chamber directly connecting the carbureter with the engine.

2. The combination with an engine and carbureter of an interposed vapor or gas

heater connecting the carbureter with the engine, said heater having a chamber and a hot air receiving port through which air enters the chamber at a higher temperature than required for the engine, a manually operated controller for regulating the temperature of the heated air entering said chamber, an outlet port leading from said chamber to the carbureter, an inclosed passage in the chamber having communication with the carbureter and engine, all combined and arranged so that a mean uniform temperature is maintained in said chamber and outlet connections between said carbureter and engine.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK I. HITCHCOCK.

Witnesses:
C. M. GADENIER,
JAMES FEELEY.