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L. M. WOOLSON

HYDROCARBON MOTOR

Filed Jan. 15, 1920

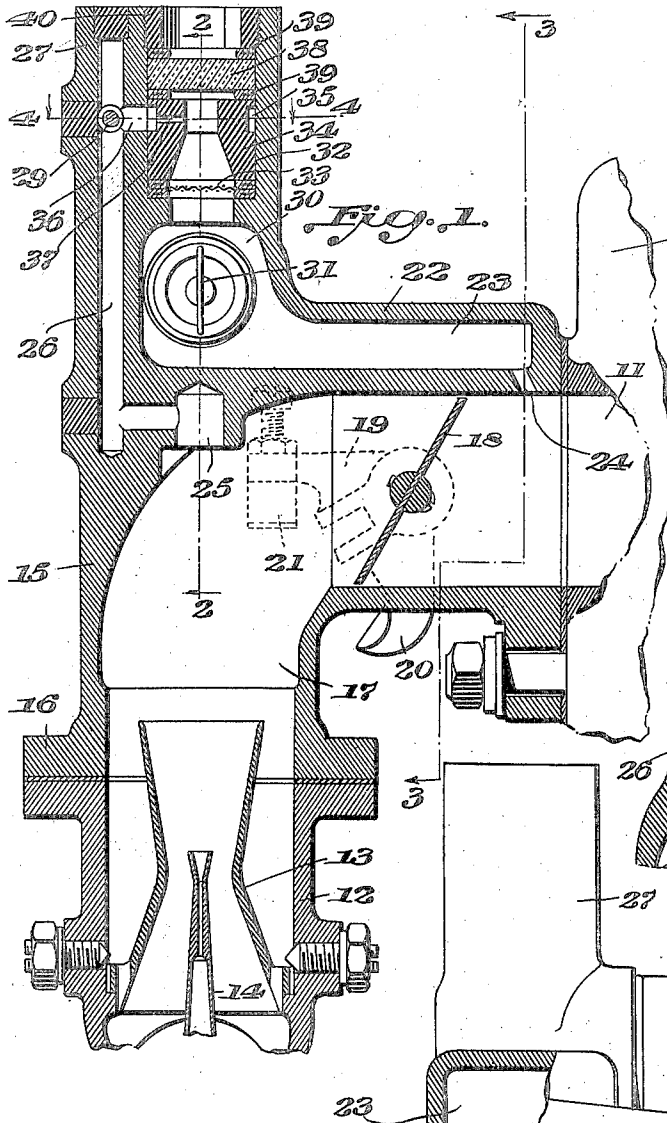


Fig. 1.

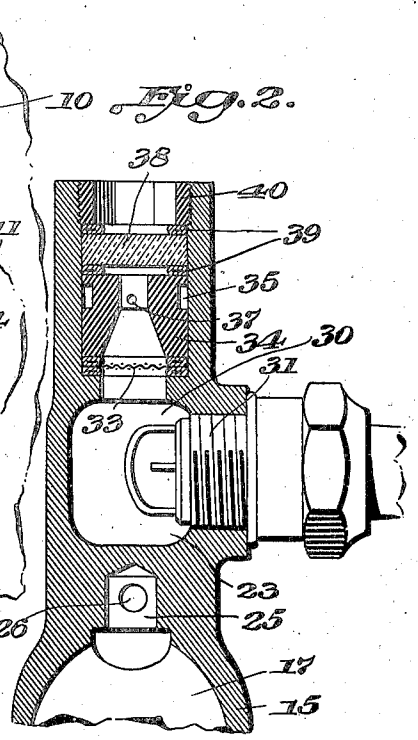


Fig. 2.

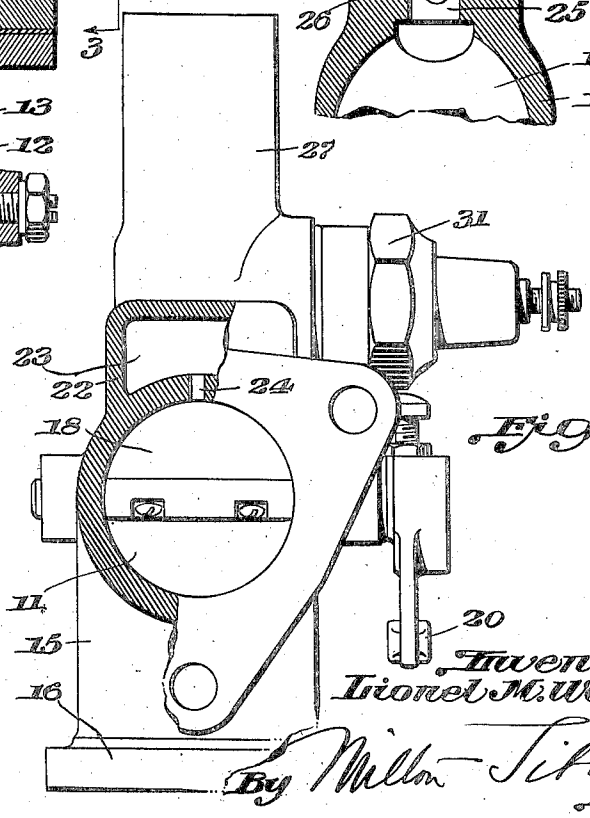


Fig. 3.

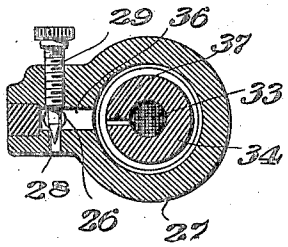


Fig. 4.

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UNITED STATES PATENT OFFICE.

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HYDROCARBON MOTOR.

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This invention relates to hydrocarbon motors, and particularly to mixture heating means therefor.

One of the objects of the invention is to provide a hydrocarbon motor with carbureting and mixture heating means of extremely simple and efficient form.

Another object of the invention is to provide a combustion heater as an integral part of the motor intake elbow.

Another object of the invention is to provide a combustion heater with a combination inlet and observation window.

Another object of the invention is to provide a combustion heater with mixture feeding means having an adjustable air inlet to insure a more nearly correct mixture for the heater.

Other objects and advantages of the invention will appear from the following description taken in connection with the drawings which form a part of this specification, and in which—

Figure 1 is a vertical section through a motor intake elbow and carburetor, embodying this invention;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is partly in elevation and partly in section on the line 3—3 of Figure 1; and

Figure 4 is a horizontal section on the line 4—4 of Figure 1.

Referring to the drawings, 10 indicates a portion of a motor cylinder block which may comprise one or more cylinders, and 11 is the intake passage in said block leading to the motor intake valves.

12 represents the upper portion of a carburetor which may be of any suitable form, the form shown, however, being of the well known Packard type in which a Venturi mixing tube 13 surrounds the gasoline nozzle 14, which nozzle is connected to the usual float chamber, not shown in the drawings. By the suction of the motor the air and gasoline supplied by the tube 13 and nozzle 14 respectively are mixed in the upper part of the tube 13 and pass upwardly therefrom in the form of a combustible mixture.

Between the carburetor and the motor is an intake elbow 15 which is usually a casting having a flange 16 secured to the upper end of the carburetor 12 and having a bent intake passage or conduit 17 for carrying the mixture from the carburetor 12 to the intake passage 11 of the motor. A throttle valve 18 is shown as arranged in the horizontal part of the passage 17 near its outlet end. The throttle valve is operated by suitable connections and arms 19 and 20 are adapted to abut against a stop 21 which determines its extreme positions. The throttle valve is shown in closed position for idling the motor, only a small amount of mixture being allowed to pass it.

The upper part of the casting or elbow 15 is formed with a jacket 22, the space inside of this jacket forming a combustion chamber 23 of a combustion heater. The combustion chamber has an outlet 24 into the intake conduit 17 beyond the throttle valve 18 so that the combustion chamber 23 is always subject to the suction of the motor. Of course this suction is unusually high when the throttle valve is closed, as shown in the drawing, because at that time the motor is idling and the carburetor is substantially shut off from the motor except through the combustion chamber 23 as will hereinafter appear.

The mixture withdrawing means for the combustion chamber 23 comprises an opening or port 25 which is arranged in the bend of the elbow immediately above the carburetor 12, and a passage 26 which leads upwardly through a portion of the casting 15 to the upper part of an enlargement or boss 27 shown as formed as an integral part of said casting. The opening 25 is so arranged in the bend of the passage 17 that it is adapted to receive a portion of the mixture on its way from the carburetor 12 to the motor cylinders, and in some cases it is found that while this mixture as a whole is just suitable for the motor, that part of it which is withdrawn for the combustion chamber is a little richer than is required for the best operation of the heater. In such cases an air inlet port 28 is provided near the upper end of the passage 26, as shown particularly in Figure 4, and a manually adjustable needle valve 29 is provided for regulating the size of or cutting off entirely this air inlet port 28.

The combustion chamber 23 may be of any suitable size or shape, but it is shown as jacketing the upper wall of the horizontal part of the elbow 15 and the chamber is slightly enlarged at one end as shown at 30 and a spark plug 31 is threaded into one side

of this part of the combustion chamber so that the mixture entering the chamber may be ignited in the usual way. It will be understood that the products of combustion or burnt gases from the combustion chamber 23 will be expelled through the outlet 24 where they will meet the mixture passing to the motor and heat it to a suitable temperature for firing in the motor cylinders. Also, some of the heat from the burning of the mixture will pass through the wall of the intake elbow and keep the elbow hot to thereby assist in vaporization. Likewise the passage 26 is kept hot so that the temperature of the mixture passing therethrough will be raised and thereby make it more readily ignited when it reaches the combustion chamber.

The boss or enlargement 27 above referred to is arranged directly above the spark plug 31 and is drilled out as shown at 32, the drilled out part being open at the upper end of the boss. A screen 33 is set into the boss immediately over the spark plug and an inlet plug 34 is set in on top of the screen so that it retains the latter in place. This inlet plug is hollow and it is formed with an exterior annular passage 35 which is in communication with a branch 36 of the passage 26, and the plug 34 is also formed with a somewhat offset inlet port or passage 37 leading from the passage 35 to its interior. This offset arrangement of the port 37 causes the gas to descend spirally through the plug 34 and to pass through the screen 33 in a well mixed form so that it is readily ignited by the spark plug 31 immediately below the screen.

A glass or other transparent window 38 is arranged directly above the plug 34 between suitable washers 39 and a hollow nut 40 is threaded into the upper end of the boss 27 and retains the screen, the plug 34, and the glass 38 in place.

This arrangement of the inlet plug 34 and glass window not only makes a cheaper and more readily assembled construction than heretofore, but it also places the glass in the coolest part of the combustion chamber without in any way interfering with the function of the window. Because of the entrance of the relatively cool gas just beneath the window 38 and the fact that the gas is not ignited until it passes through the screen 33, the upper part of the interior of the plug 34 is really cooler than any other part of the combustion chamber. At the same time the flame in the combustion chamber may be readily observed through the glass.

A specific embodiment of the invention has been described in detail and will be specifically claimed, but it will be understood that the invention is not limited to the exact details of construction shown, as it will be apparent that changes may be made without departing from the spirit or scope of the invention.

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

1. A combustion heater comprising a combustion chamber, a spark plug, a window for said chamber, and mixture inlet means for said chamber between the spark plug and the window.

2. A combustion heater comprising a combustion chamber, a window in the upper part thereof, a spark plug having its sparking point below the window, and mixture inlet means for said chamber between the window and the spark plug.

3. A combustion heater comprising a combustion chamber, a mixture inlet plug for said chamber, a glass window outside of said plug, and a hollow nut for retaining said window and plug in place.

4. A combustion heater comprising a combustion chamber, a mixture screen, a mixture inlet plug outside of said screen, a glass window outside of said plug, and common means for retaining said screen, plug and window in place.

5. A combustion heater comprising a combustion chamber, a hollow mixture plug having an exterior annular channel, and said plug having a somewhat offset inlet passage from said annular channel to its interior.

6. A combustion heater comprising a combustion chamber, a mixture plug having an unobstructed middle opening communicating directly with said chamber, said plug having a lateral inlet passage, and means for closing one end of said opening and for retaining said plug.

7. In a hydrocarbon motor, the combination with a motor cylinder, of a carburetor, and an elbow intake conduit between said carburetor and said cylinder, a combustion chamber having an outlet connection to said elbow beyond the throttle valve, mixture withdrawing means at the bend in said elbow and connected to supply mixture to said combustion chamber, and an air inlet in the connection between said means and said chamber.

8. In a hydrocarbon motor, the combination with a motor cylinder, of a carburetor, and an elbow intake conduit between said carburetor and said cylinder, a combustion chamber having an outlet connection to said elbow beyond the throttle valve, mixture withdrawing means at the bend in said elbow and connected to supply mixture to said combustion chamber, and air inlet means for thinning the mixture withdrawn for said combustion chamber.

9. In a hydrocarbon motor, the combination with a motor cylinder, of a carburetor,

and an elbow intake conduit between said carburetor and said cylinder, a combustion chamber having an outlet connection to said elbow beyond the throttle valve, mixture withdrawing means at the bend in said elbow and connected to supply mixture to said combustion chamber, and manually adjustable air inlet means for thinning the mixture withdrawn for said combustion chamber.

10. A hydrocarbon motor intake elbow comprising a casting having a bent intake passage therein, said casting also having a heater jacket formed along its upper wall and a mixture withdrawing passage leading from the bend in said intake passage to the upper part of said heater jacket.

11. A combustion heater comprising a chamber having an outlet for the burnt gases and having an inlet passage arranged in the integral wall of the chamber and extending alongside the hottest part of the chamber to thereby raise the temperature of the mixture passing to the chamber.

12. A combustion heater comprising a combustion chamber, a spark plug, a window for said chamber, and a mixture screen between the spark plug and the window.

13. A combustion heater comprising a combustion chamber, a spark plug, a window for said chamber, a mixture screen between the spark plug and the window, and mixture inlet means for said chamber between the window and the screen.

14. A combustion heater comprising a combustion chamber, a window for said chamber, and mixture inlet means arranged to direct the mixture away from said window during the operation of the heater.

15. A combustion heater comprising a combustion chamber, a spark plug, a window for said chamber, and mixture inlet means arranged to admit mixture adjacent said window and direct it away from said window and towards said spark plug.

In testimony whereof I affix my signature.

LIONEL M. WOOLSON.