Jan. 15, 1929. **1,699,215**

W. WHEELER

INTERNAL COMBUSTION ENGINE

Filed Dec. 15, 1924 3 Sheets-Sheet 1

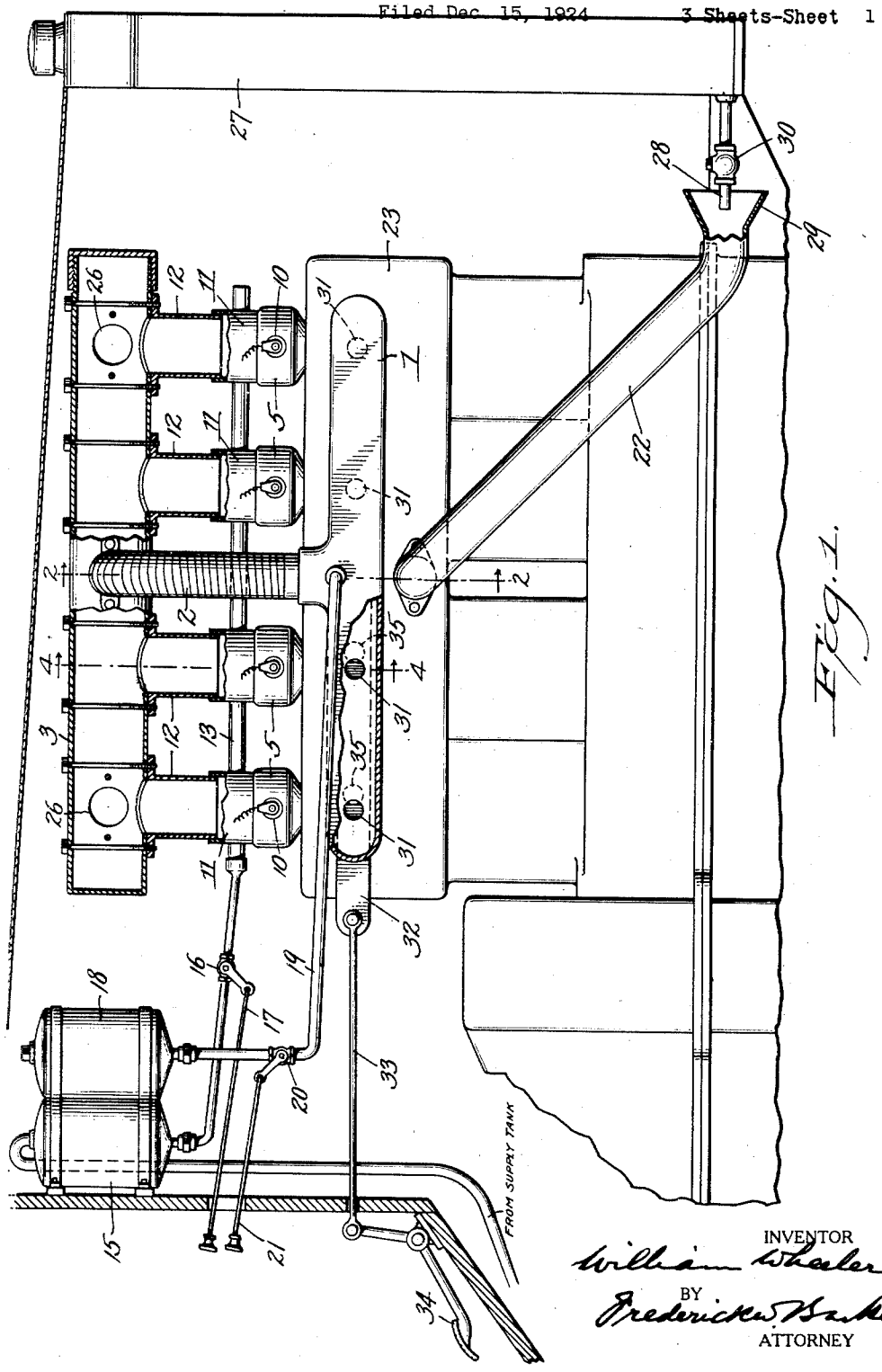


Fig. 1.

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Fig. 3.

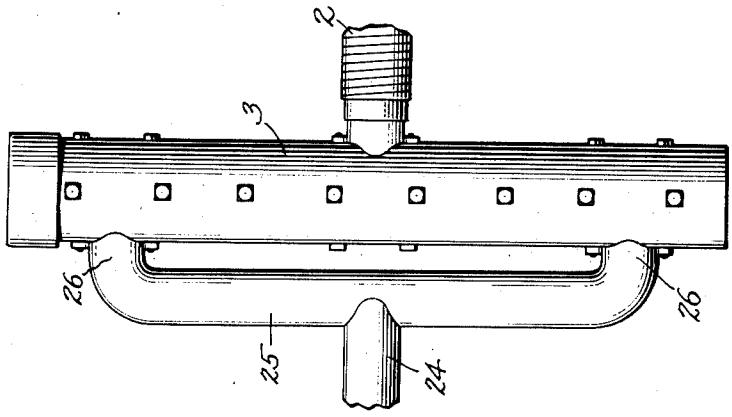
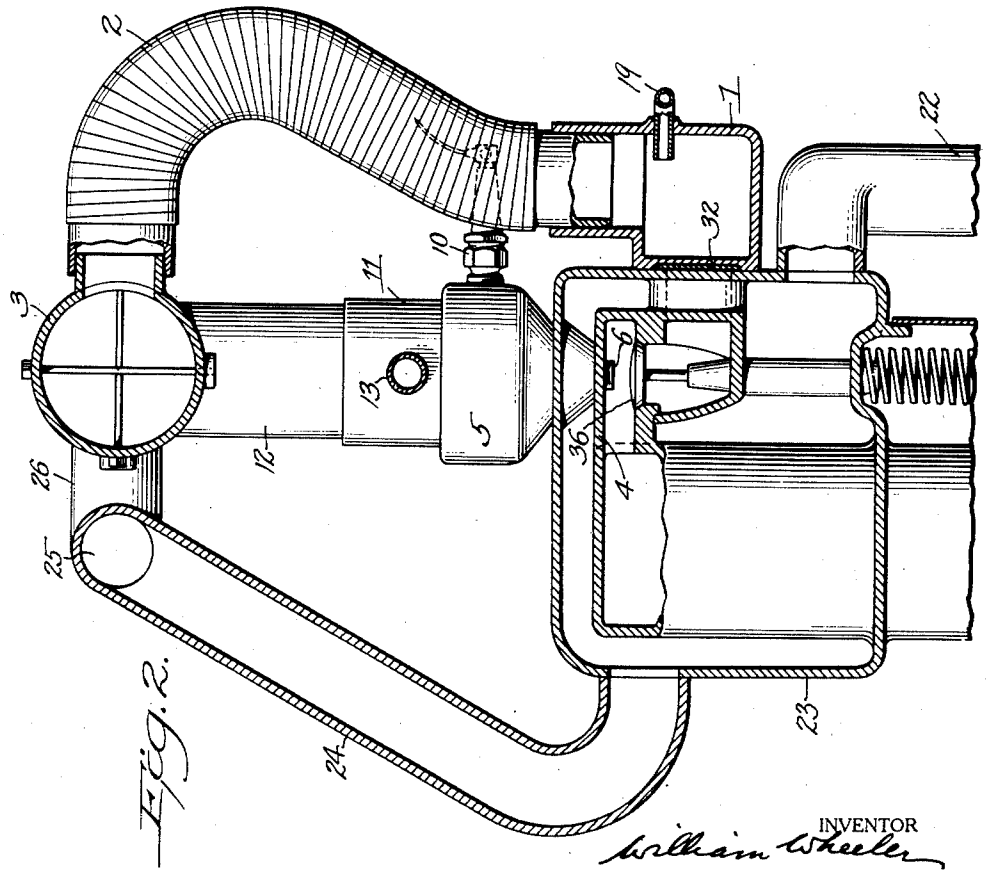


Fig. 2.



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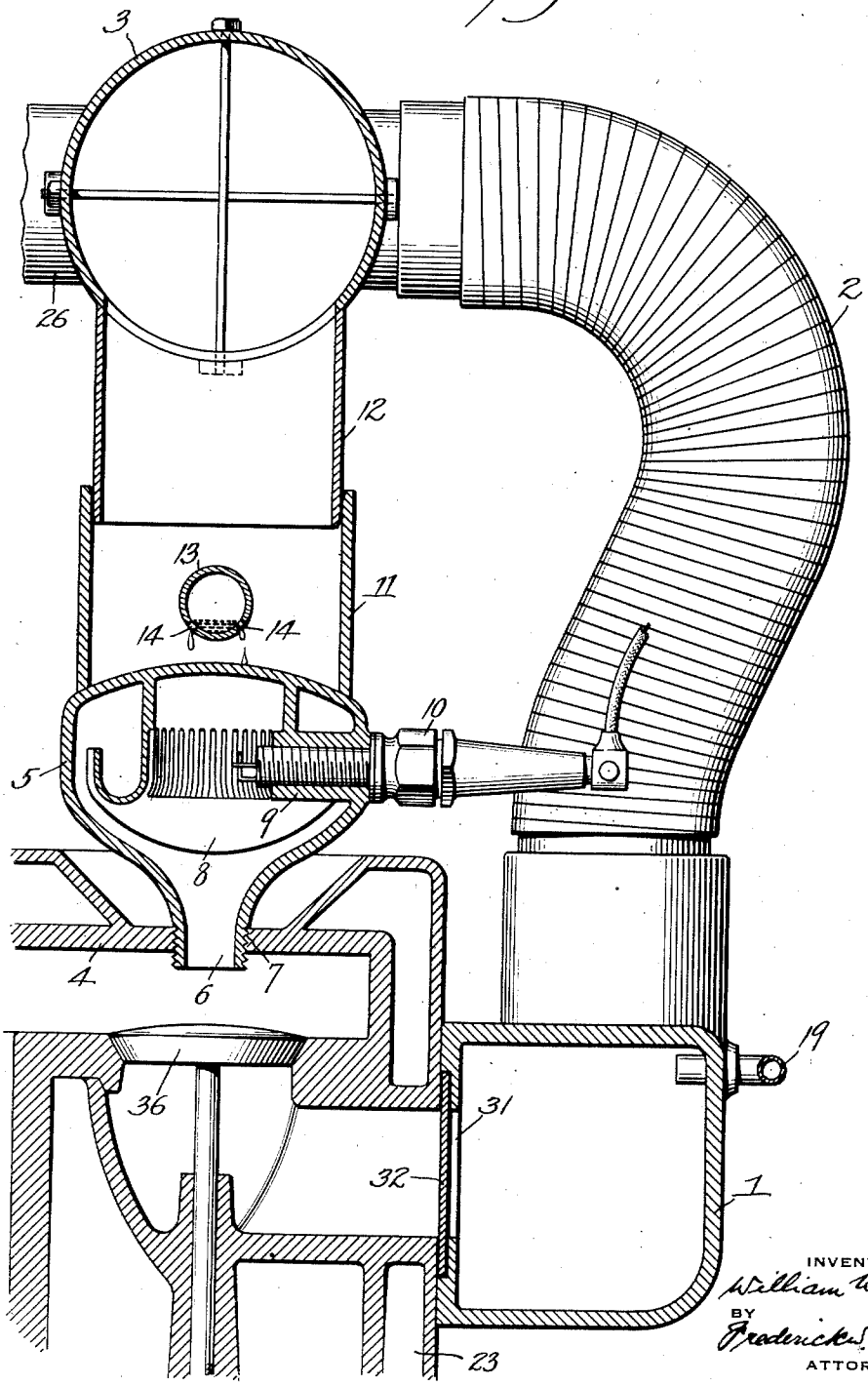
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3 Sheets-Sheet 3

Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM WHEELER, OF BROOKLYN, NEW YORK.

INTERNAL-COMBUSTION ENGINE.

Application filed December 15, 1924. Serial No. 755,813.

This invention relates to internal combustion engines, and my improvements are directed to means for gasifying the heavier hydrocarbons, such for example as furnace oil, by bringing such fuel into the vicinity of the maximum heat zones of the engine, to be gasified thereat, the gases then being conveyed to a mixing chamber where they mingle with a supply of air, and then the mixture is admitted to the intake manifold for aspiration into the cylinders.

The air supplied to the mixing chamber is first heated by being passed through a jacketed space about the cylinder heads, and carries with it a proportion of moisture which is generated into steam in such passage.

Some of the mixture becomes compressed in spark plug chambers which communicate as by hollow necks with the combustion chambers of the respective cylinders, these spark plug chambers forming the hottest zones of the engine, wherein is created the initial combustion of fuel mixture.

Other features and advantages of my invention will hereinafter appear.

In the drawings:

Figure 1 is a side elevation of an automobile engine to which my improvements are applied.

Fig. 2 is an enlarged sectional view on the line 2—2 of Fig. 1, showing a portion of a cylinder head to which is attached my improved fuel gasifying means, the air and gas mixing chamber also being shown, and means communicating therefrom to the intake manifold.

Fig. 3 is a top plan view of the mixing chamber, and

Fig. 4 is an enlarged sectional view on the line 4—4 of Fig. 1.

The four-cylinder engine here shown by way of example is provided with an intake manifold 1, which is in communication, by a pipe 2, with a cylindrical mixing chamber 3 that is disposed above the engine, extending lengthwise thereof.

The cylinder heads 4 are each shown as equipped with a spark plug chamber 5 in the form of a hollow bulb, and provided with a neck portion 6 by which it is screwed into the usual spark plug orifice 7. The bulbs 5, which each contain a series of heat radiating fins 8, also each have a horizontally disposed, internally threaded sleeve 9, for the reception of a spark plug 10, whose sparkling points are thus brought into the centre of the bulb. It will be appreciated that as the gaseous mixture is fired within the bulbs 5 the heat therein becomes very intense and has the effect of preventing the formation of carbonaceous deposits.

Exteriorly of the hot bulbs I provide chambers wherein liquid fuel may become gasified under the influence of the heat they supply. Thus I affix a short cylinder 11 on top of each bulb 5, the upper surface of the bulb forming the base of the gasifying chamber. These cylinders 11 are then fitted to other short cylinders 12 that depend from and communicate with a mixing chamber, here shown as a horizontal cylinder 3, which is closed at both ends.

A fuel pipe 13 extends through the cylinders 11, and within each cylinder is provided with one or more fuel exit openings 14, to permit liquid fuel to drop therefrom on to the top of bulb 5, thereby becoming gasified, and the gaseous fuel then ascending into the mixing chamber 3.

The pipe 13 leads from a vacuum tank or other receptacle 15, here shown as attached to the dash, but which may have any other location. Valve 16 and control means 17 are also indicated.

In addition, I provide a tank 18 containing gasolene or other priming fuel, and a pipe 19 leading therefrom to the intake manifold, a valve 20 and control means 21 being indicated in connection therewith. The use of the priming fluid is necessary in starting the engine from cold, because the heavier oil requires to be gasified by the engine heat before it will function as fuel.

The air supplied to the mixing chamber is first heated by bringing it in contact with the engine. In the present example I have shown the air pipe 22 as leading to the usual water jacket 23 (which contains no cooling water) and I have shown a pipe 24 as leading from the water jacket to a manifold 25 which supplies the mixing chamber at 26, 26. Under the aspiratory operation of the engine the pull from the mixing chamber is through pipe 2, the intake manifold 1, and thence into the cylinders.

In order that some moisture may pass with the air into the mixing chamber I have shown a water tank 27 as taking the place of the usual radiator, and a spout 28 extends therefrom toward a flared inlet 29 for pipe 22. Normally the spout 28 is held closed by a spring valve 30, but when the engine is

in operation the rush of air into inlet 29 will open the valve and draw a limited quantity of water into pipe 22. This water in passing through the engine jacket will be converted into steam and as such will aid in the production of a highly efficient gaseous mixture of fuel, air and steam. Furthermore, the air entering the jacket 23 will by heat exchange serve to cool the cylinders, while itself becoming raised in temperature, whereby it is better enabled to blend with the gaseous fuel in mixing chamber 3 for the formation of an efficient combustible mixture.

The intake ports 31 for the respective cylinders, to which fuel mixture is directed by the manifold 1, are here shown as controlled by a slide 32 that normally covers said ports. The slide 32, which is here shown is connected by a link 33 with an accelerator pedal 34, is provided with apertures 35 that may be caused to register with the ports 31 in greater or less degree according to the extend of the movement imparted to the slide by the accelerator action. In other words, the slide 32 is intended to function in the manner of a throttle to thereby control the quantity of fuel mixture admitted to the cylinders.

Compression holding means, as valves 36, may be employed, and the engine exhaust means may also be of usual character.

Variations within the spirit and scope of my invention are equally comprehended by the foregoing disclosure.

I claim:

1. The combination with an internal combustion engine of a spark plug chamber having means of communication with a cylinder of said engine, a fuel gasifying chamber, a relatively thin, heat conducting partition separating said chambers, said partition forming the top of the spark plug chamber and the bottom of the fuel gasifying chamber, means for supplying liquid fuel to said gasifying chamber, a mixing chamber, means of communication from said gasifying chamber to said mixing chamber, and means of communication between said mixing chamber and cylinder.

2. The combination with an internal combustion engine of a spark plug chamber having means of communication with a cylinder of said engine, a fuel gasifying chamber, a relatively thin, heat conducting partition separating said chambers, said partition forming the top of the spark plug chamber and the bottom of the fuel gasifying chamber, means for supplying liquid fuel to said gasifying chamber, a mixing chamber in communication with said gasifying chamber, means for communicating air to said mixing chamber, and means of communication between said mixing chamber and cylinder.

3. The combination with an internal combustion engine of a spark plug chamber having means of communication with a cylinder of said engine, a fuel gasifying chamber, a relatively thin, heat conducting partition separating said chambers, said partition forming the top of the spark plug chamber and the bottom of the fuel gasifying chamber, means for supplying liquid fuel to said gasifying chamber, a mixing chamber in communication with said gasifying chamber, means for communicating air and moisture to said mixing chamber, and means of communication between said mixing chamber and cylinder.

4. The combination with an internal combustion engine having a plurality of cylinders, of a spark plug chamber mounted on and in communication with each cylinder, a fuel gasifying chamber mounted on each spark plug chamber to derive heat therefrom, a liquid fuel pipe extended through said gasifying chambers and having means for delivering fuel in each gasifying chamber, a mixing chamber in communication with said gasifying chambers, means for supplying air to said mixing chamber, an intake manifold for said cylinders, and means of communication between said mixing chamber and manifold.

5. The combination with an internal combustion engine having a plurality of cylinders, of a spark plug chamber mounted on and in communication with each cylinder, a fuel gasifying chamber mounted on each spark plug chamber to derive heat therefrom, a liquid fuel pipe extended through said gasifying chambers and having means for delivering fuel in each gasifying chamber, a mixing chamber in communication with said gasifying chambers, means for supplying air and moisture to said mixing chamber, an intake manifold for said cylinders, and means of communication between said mixing chamber and manifold.

6. The combination with an internal combustion engine having a plurality of cylinders of a spark plug chamber mounted on and in communication with each cylinder, a fuel gasifying chamber mounted on each spark plug chamber to derive heat therefrom, a liquid fuel pipe extended through said gasifying chambers and having means for delivering fuel in each gasifying chamber, a mixing chamber in communication with said gasifying chambers, means for supplying air to said mixing chamber, means for passing the supplied air in enclosed contact with the cylinder walls for heat exchange therewith, an intake manifold for said cylinders, and means of communication between said mixing chamber and manifold.

7. The combination with an internal combustion engine having a plurality of cylinders of a spark plug chamber mounted on and in communication with each cylinder, a fuel gasifying chamber mounted on each

spark plug chamber to derive heat therefrom, a liquid fuel pipe extended through said gasifying chambers and having means for delivering fuel in each gasifying chamber, a mixing chamber in communication with said gasifying chambers, means for supplying air and moisture to said mixing chamber, means for passing the supplied air and moisture in enclosed contact with the cylinder walls for heat exchange therewith, an intake manifold for said cylinders, and means of communication between said mixing chamber and manifold.

8. The combination with an internal combustion engine having a plurality of cylinders, of a spark plug chamber mounted on and in communication with each cylinder, a fuel gasifying chamber mounted on each spark plug chamber to derive heat therefrom, a liquid fuel pipe extended through said gasifying chambers and having means for delivering fuel in each gasifying chamber, a mixing chamber in communication with said gasifying chambers, means for supplying air to said mixing chamber, an intake manifold for said cylinders, means of communication between said mixing chamber and manifold, and means located in the manifold for controlling the supply of mixture to the cylinders.

9. The combination with an internal combustion engine having a plurality of cylinders, of a spark plug chamber mounted on and in communication with each cylinder, a fuel gasifying chamber mounted on each spark plug chamber to derive heat therefrom, a liquid fuel pipe extended through said gasifying chambers and having means for delivering fuel in each gasifying chamber, a mixing chamber in communication with said gasifying chambers, means for supplying air and moisture to said mixing chamber, an intake manifold for said cylinders, means of communication between said mixing chamber and manifold, and means located in the manifold for controlling the supply of mixture to the cylinders.

Executed this 10th day of December, 1924.

WILLIAM WHEELER.