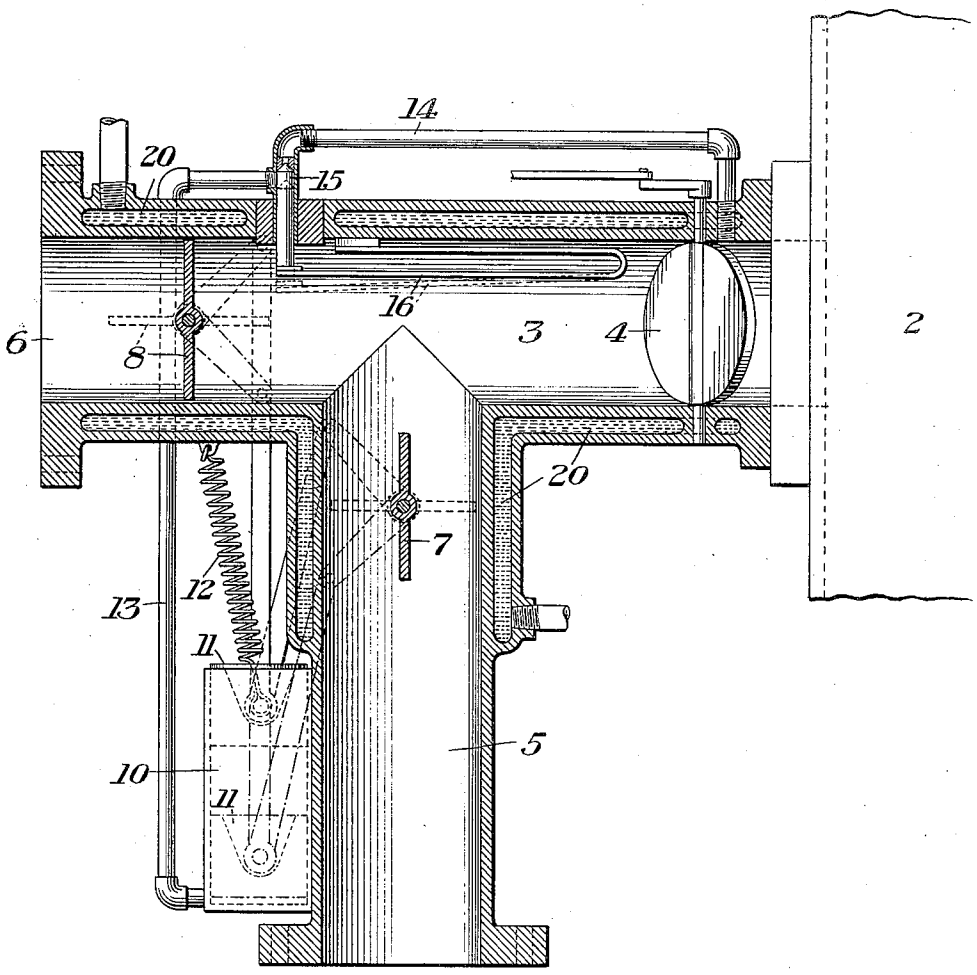
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AUTOMATIC CONTROL FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JUNE 9, 1917.

1,304,888. Patented May 27, 1919.



WITNESSES

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AUTOMATIC CONTROL FOR INTERNAL-COMBUSTION ENGINES.

1,304,888. Specification of Letters Patent. Patented May 27, 1919.

Application filed June 9, 1917. Serial No. 173,826.

To all whom it may concern:

Be it known that I, CHRISTIAN H. KENNEWEG, a citizen of the United States, residing at Millvale, Allegheny county, Pennsylvania, have invented a new and useful Improvement in Automatic Controls for Internal-Combustion Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, which illustrates diagrammatically in cross-section the preferred embodiment of the invention.

The present invention relates to internal combustion engines, and more particularly to an automatic control whereby the engine is adapted to run on gasolene and kerosene.

Referring to the illustrated embodiment of the invention, the engine, the end of which is indicated by reference numeral 2, is provided with a passage or manifold 3 for the carbureted air or explosive mixture. This passage is provided with the usual throttle control valve 4. The passage 3 has two branches 5 and 6, which are connected with gasolene and kerosene carbureters, respectively. These carbureters are not shown, as the particular construction of carbureter forms no part of the present invention. In the gasolene mixture passage 5 is a valve 7, and in the kerosene mixture passage 6 is a similar valve 8. These valves are automatically controlled by a vacuum-actuated thermostat control. The valves are turned by a vacuum-operated motor comprising a cylinder 10 and piston 11. The piston 11 is connected through suitable links and arms to the valves 7 and 8. A spring 12 tends to raise the piston 11 against the suction of the vacuum in the cylinder. The bottom of the cylinder 10 is connected through a vacuum connection 13 and 14 to the passage at a point between the throttle valve and the engine. This vacuum connection is controlled by a thermostatically operated valve 15. The valve illustrated in the drawing is a needle valve, opened and closed by the thermostatic strip 16. The thermostatic strip 16 is made of a bent strip of two dissimilar materials having different coefficients of expansion, as readily understood by anyone skilled in this art. The passage 3 and its branches are preferably surrounded by a water jacket 20 supplied with the heated water from the water jacket of the engine.

The operation of the device is as follows:—When the engine first starts it is cold, and should be supplied a gasolene mixture. When the parts are cold the thermostatic strip 16 closes the valve 15, so that there is no suction exerted on the piston 11 and the parts are in the position shown in full lines in the drawing. As the engine runs and becomes heated, the gasolene supply is gradually reduced and the kerosene substituted as the fuel. When the engine is sufficiently heated to operate on kerosene the thermostatic strip 16 opens the valve 15, opening the vacuum connection 13, 14. The suction operates on the piston 11, drawing it down against the resistance of the spring 12, closing the valve 7 and opening the valve 8, thus changing from gasolene to kerosene. The position of the parts when running on kerosene is indicated by dotted lines. The valve 7 is preferably made so as not to entirely cut off the branch 5, so that a small amount of gasolene vapor is always fed to the engine. The position of the valves 7 and 8 is not only controlled by the thermostat, but also by the suction of the engine. The vacuum connection is made at a point between the throttle valve 4 and the engine, so that there is a suction whether the valve 4 is open or nearly closed. The air supplied to the carbureters is preferably drawn from around the exhaust, and thereby heated, as is usual with automobile engines, so that as the engine becomes heated up the air going into the intake manifold is heated.

As soon as the engine is stopped the vacuum is broken and the valve 7 opened and valve 8 closed. Therefore when the engine is first started, whether the engine is hot or cold it will be initially supplied with gasolene vapor to get it up to running speed before the kerosene supply is switched on.

It will be seen from the foregoing description that when the engine is cold or when the engine is first started it is supplied with gasolene and thereafter when the engine is brought up to speed and is heated, the gasolene supply is practically cut off and kerosene substituted as a fuel.

While gasolene and kerosene are preferably used as the two liquid fuels, other fuels may be employed, the object being to start the engine with a readily vaporizable fuel, and after the engine has become heated, to supply the engine with a less readily vaporizable fuel.

It is to be understood that the drawing is intended to be diagrammatic, particularly in its illustration of the means for actuating the valves 7 and 8. The present invention is not limited to the details of construction shown diagrammatically, but may be embodied in other structures within the scope of the following claims.

I claim:

1. The combination with an internal combustion engine, of a carbureted-air passage having two branches adapted to be connected with carbureters supplied with a readily vaporizable fuel and a less readily vaporizable fuel, respectively, a valve in each branch, and means including a thermostat in the passage and a vacuum connection to said passage for simultaneously operating the valves, substantially as described.

2. The combination with an internal combustion engine, of a carbureted-air passage having two branches adapted to be connected with carbureters supplied with a readily vaporizable fuel and a less readily vaporizable fuel, respectively, a valve in each branch, a throttle valve near the engine end of said passage, and vacuum operated means for the valves in the branch passages including a vacuum connection to the passage beyond the throttle valve, a thermostat in the passage, a valve in the vacuum connection operated thereby, and a vacuum operated motor connected to the valves in the branch passages, substantially as described.

3. The combination with an internal combustion engine, of a carbureted-air passage having two branches adapted to be connected with carbureters supplied with a readily vaporizable fuel and a less readily vaporizable fuel, respectively, a valve in each branch, a vacuum operated motor for simultaneously operating to close one valve and open the other, and controlling means therefor including a thermostat, substantially as described.

In testimony whereof, I have hereunto set my hand.

CHRISTIAN H. KENNEWEG.