Jan. 2, 1923. 1,440,689

M. M. McCOY.

OIL COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINES.

FILED JULY 7, 1917.

Fig. 1

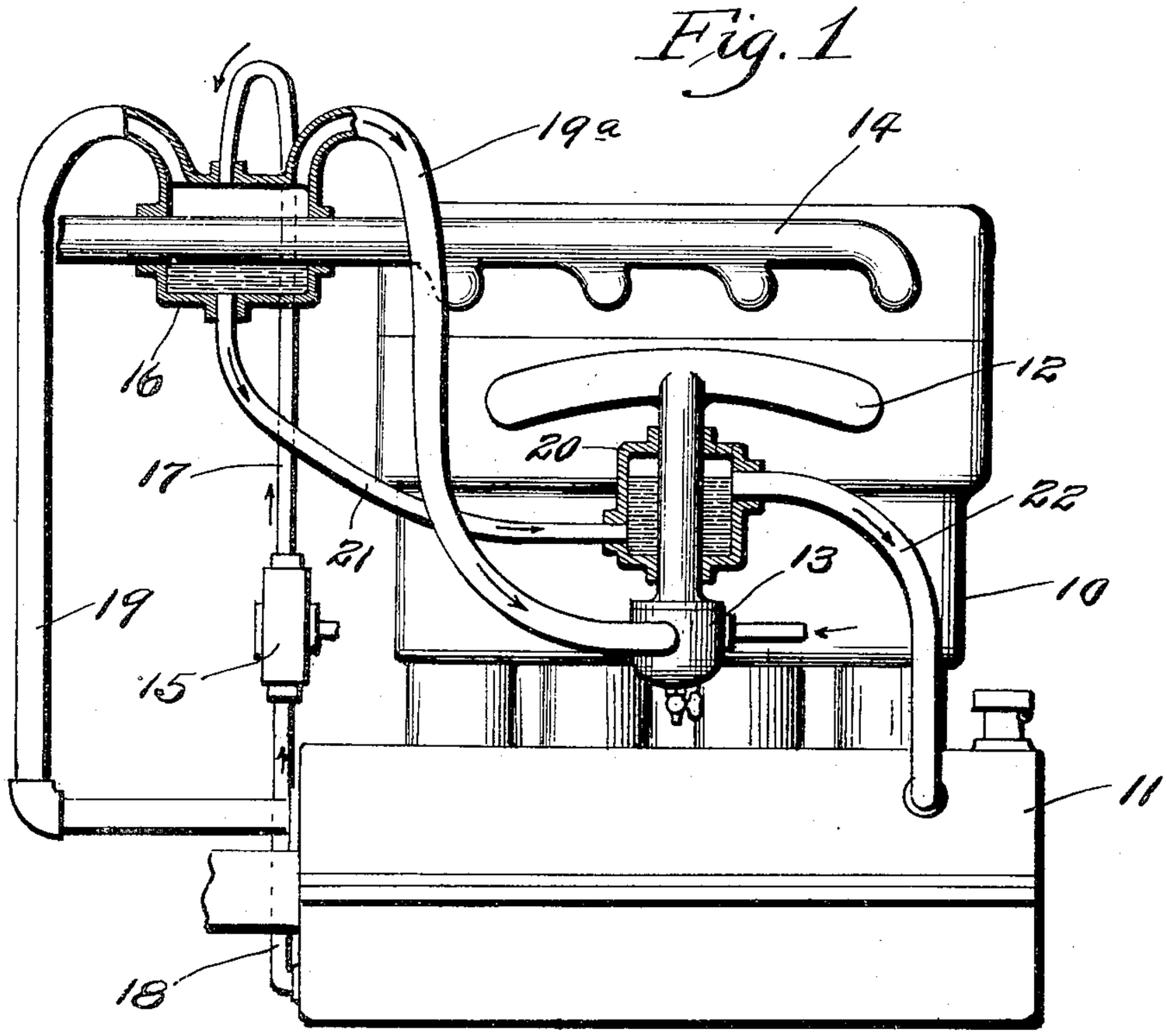
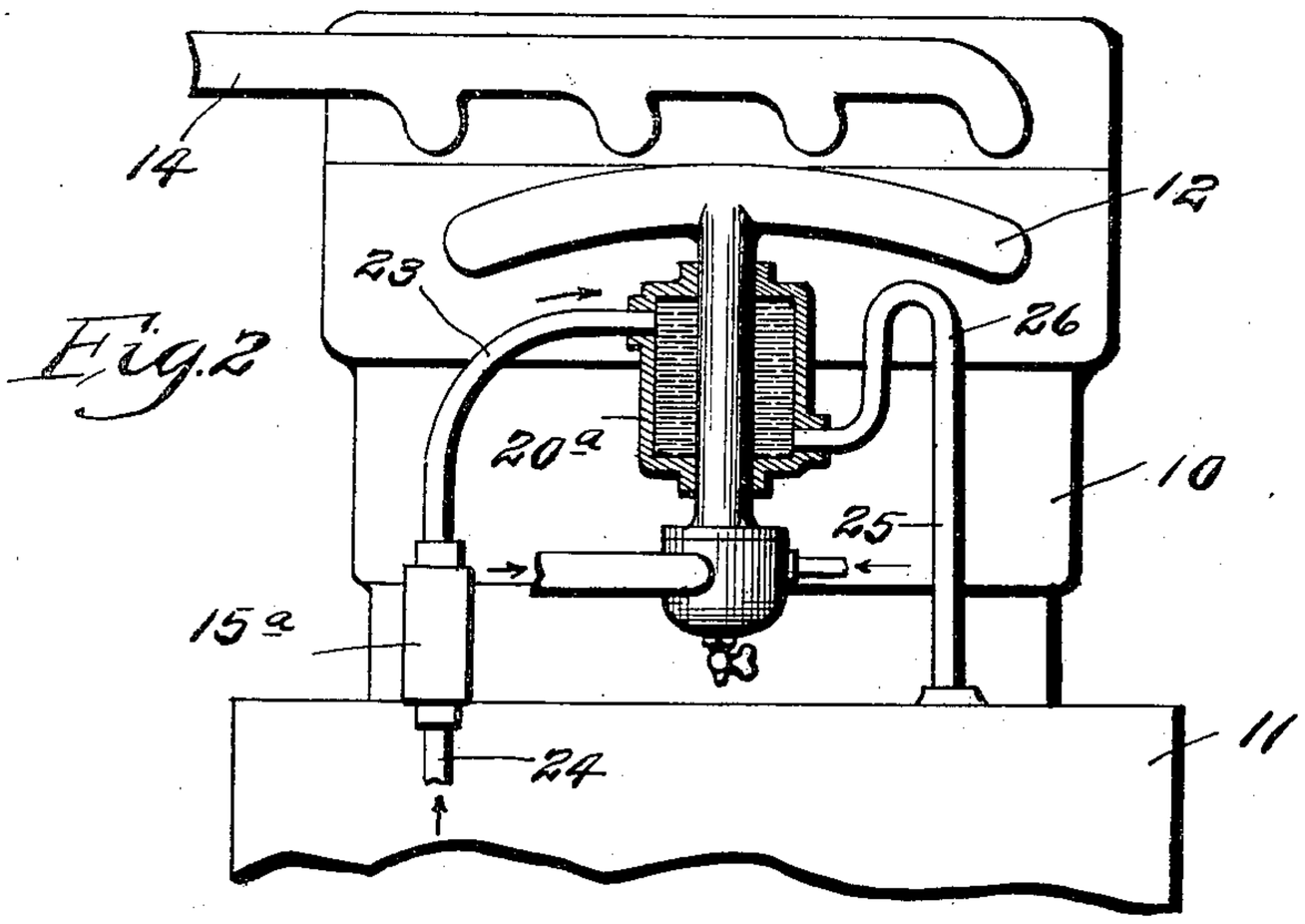


Fig. 2



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Patented Jan. 2, 1923. 1,440,689

UNITED STATES PATENT OFFICE.

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OIL-COOLING SYSTEM FOR INTERNAL-COMBUSTION ENGINES.

Application filed July 7, 1917. Serial No. 179,212.

To all whom it may concern:

Be it known that I, MARION M. McCOY, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Oil-Cooling Systems for Internal-Combustion Engines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates generally to internal combustion engines and more particularly to the oil cooling systems therefor, the principal object of my invention being to provide comparatively simple means which will be effective in materially lowering the temperature of the lubricating oil in the engine cylinders and crank case, and which provision will be of considerable assistance to the cooling fluid system which is generally used in connection with internal combustion engines in disseminating the heat produced during operation.

A further object of my invention is to provide simple means for heating the lubricating oil of the engine in order to produce hydrocarbon vapor, which latter is led to and through the carburetter of the engine, thus materially assisting and increasing the supply of combustible vapor produced by said carburetter and delivered therefrom by the intake manifold into the combustion chambers of the engine cylinders.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is an elevational view of an internal combustion engine and showing my improved oil cooling system applied thereto;

Figure 2 is an elevational view of an internal combustion engine and showing a modified form of the cooling system applied thereto.

Referring by numerals to the accompanying drawings and particularly Figure 1 which illustrates a practical embodiment of my invention, 10 designates the body of a multi-cylinder internal combustion engine, 11 the crank case thereof, 12 the intake manifold, 13 the carburetter, 14 the exhaust manifold, and 15 a lubricating oil pump, preferably of the rotary type.

Located upon the exhaust manifold at a point immediately adjacent to the engine is a jacket or housing 16 which performs the functions of a heating chamber for the lubricating oil, the latter being delivered into said chamber through a tubular connection 17 from the pump 15.

An oil circulating pipe 18 leads from the lower portion of the crank case 11 to pump 15. Leading from the upper portion of the crank case 11 to one end of the jacket or housing 16 is an air pipe 19, and leading from the other end of said jacket to the carburetter 13 is an air pipe 19^a.

Located on the intake manifold 12 immediately adjacent to the carburetter 13 is a jacket or housing 20 which serves as a lubricating oil heating chamber and leading from jacket or housing 16 to the lower portion of this heating chamber 20 is an oil conveying pipe 21. Leading from the upper portion of jacket 20 to the crank case 11 is a lubricating oil conveying pipe 22.

When this form of my inproved system is in operation, pump 15 draws lubricating oil upwardly from the crank case 11 through pipe 18, and this oil is delivered into the heating chamber within jacket 16 through pipe 17.

It will be understood that the exhaust gases passing out through manifold 14 heat the same and the jacket 16 to a comparatively high degree of temperature and consequently the oil entering the chamber within said jacket will be heated with the result that certain of the volatile constituents of the lubricating oil will be vaporized and in such form will be drawn through pipe 19 into carburetter 13 to mix with the vaporized hydrocarbon, and this mixture finally passes through the intake manifold into the

combustion chambers of the engine cylinders.

A certain amount of air will be mixed with the vapor thus generated within jacket 16, said air being drawn from the upper portion of crank case 11 through pipe 19.

The lubricating oil from the chamber within jacket 16 passes downward through pipe 21 and enters the lower portion of the chamber within jacket 20.

It will be understood that the intake manifold of an internal combustion engine and particularly that portion immediately adjacent to the carburetter is maintained at a comparatively low degree of temperature owing to the fact that the action of the carburetter or the mixing of liquid hydrocarbon and air tends to lower the temperature of said carburetter and adjacent parts, and as a result, the lubricating oil entering the chamber within jacket 20 will be very rapidly cooled, and in such condition will pass through the tubular connection 22 back to the crank case 11. In this form of my improved system, the mixture of air and gases from the chamber within jacket 16 is drawn into the carburetter by the suction produced therein and the lubricating oil flows by gravity from jacket 16 through tube 21 to jacket 20 and from the latter through tube 22 to the crank case.

In the modified construction illustrated in Figure 2, the means for heating the lubricating oil to volatilize certain of its elements is eliminated, and the apparatus comprises only such parts as are necessary for effecting a cooling of the lubricating oil. This apparatus includes a jacket 20^a located upon that portion of the intake manifold which is immediately adjacent to the carburetter and leading from the oil circulating pump 15^a to the upper portion of said jacket is an oil circulating pipe 23.

Leading from the lower portion of the crank case to the oil circulating pump is a tube 24 and leading from the lower portion of jacket 20^a to the crank case is an oil circulating tube 25, the same being provided with an inverted U-shaped portion 26, the top of which occupies the same horizontal plane with the top of the jacket 20^a.

In this form of apparatus, the lubricating oil is forced under pressure of the pump through the circulating pipes 24 and 23 to jacket 20^a wherein said oil is cooled and from said jacket, the oil is forced through tube 25 back to the crank case.

An oil cooling system of my improved construction is comparatively simple, is applicable for use in connection with practically all forms of internal combustion engines, and is effective in material increasing the efficiency of the engine to which it is applied by reason of the fact that certain volatile elements of the oil are taken off and utilized as combustible vapor for the operation of the engine, and further, by reason of the fact that the comparatively low temperature of the carburetter while in operation is utilized for cooling the oil, thus assisting the regular cooling system of the engine in maintaining the latter at a comparatively low temperature during operation.

It will be readily understood that minor changes in the size, form and construction of the various parts of my improved cooling system can be made and substituted for those herein shown and described, without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim:

1. The combination with an internal combustion engine provided with the usual intake manifold, of a container associated with said manifold so as to be effected by the comparatively low temperature thereof, and connections to said container whereby the lubricating oil utilized in the engine is delivered to and from said container.

2. The combination with an internal combustion engine provided with the usual intake manifold, of a container on said manifold, connections from said container to the lubricating oil chambers of the engine, and means for effecting a circulation of the oil through said tubular connections and chamber.

3. The combination with an internal combustion engine and its intake and exhaust manifolds, of a container associated with the exhaust manifold and adapted to be heated thereby, means for delivering the lubricating oil used in the engine to said container, a tubular connection from said container to the carburetter associated with the intake manifold, a container associated with the carburetter and intake manifold, means for delivering oil from the first mentioned container to the second mentioned container, and means for delivering oil from the second mentioned container to an oil chamber within the engine.

4. The combination with an internal combustion engine provided with the usual exhaust manifold, intake manifold and carburetter, of means for utilizing the heat of the exhaust manifold for heating the lubricating oil used in the engine to volatilize certain constituent parts thereof, means for conveying the volatilized gases to the carburetter, and means for utilizing the low temperatures of the carburetter and intake manifold for cooling the lubricating oil after it has been heated and before it is delivered back to the oil chamber within the engine.

5. The combination with the lubricating system of an internal combustion engine; of a refining device including a chamber, means for delivering lubricant from the system to the chamber; means for heating the lubricant; a suction pipe connecting the chamber with the engine intake whereby the volatile adulterants removed from the lubricant by heating the same, and by the vacuum within the chamber will be delivered to the engine; and means for delivering the lubricant back to the system.

In testimony whereof I hereunto affix my signature this 19th day of June, 1917.

MARION M. McCOY.