E. E. YOUNG.

COMBINED LUBRICATOR AND HUMIDIFIER.

APPLICATION FILED SEPT. 10, 1920.

1,389,176.

Patented Aug. 30, 1921.

2 SHEETS—SHEET 1.

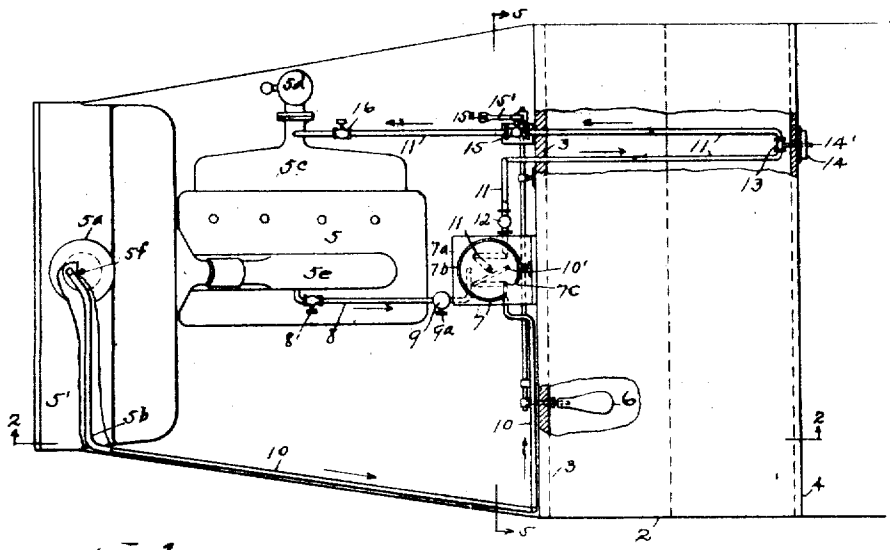


Fig 1

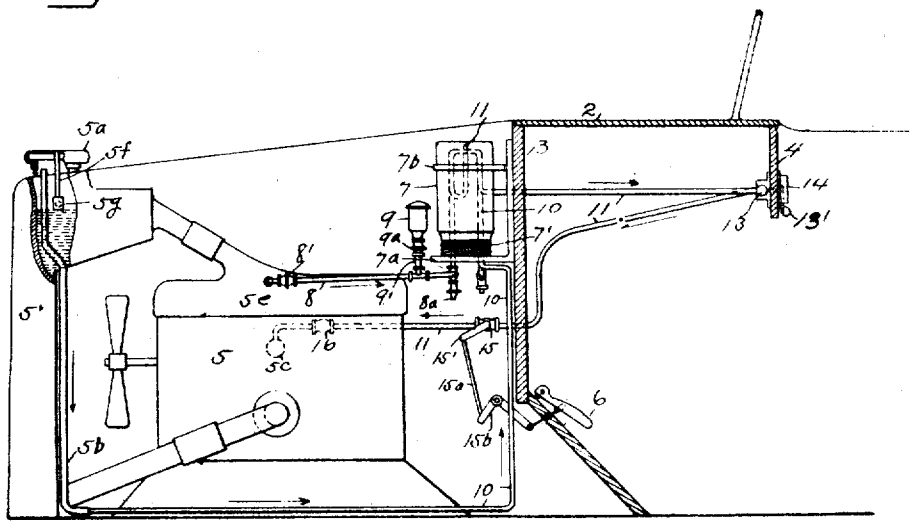


Fig 2

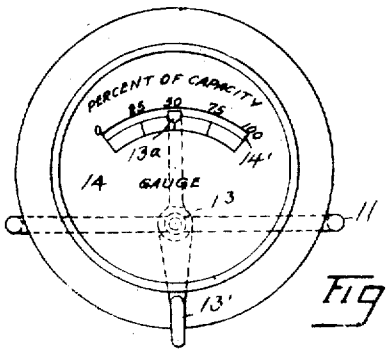


Fig 4

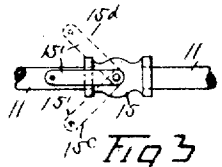


Fig 3

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2 SHEETS—SHEET 2.

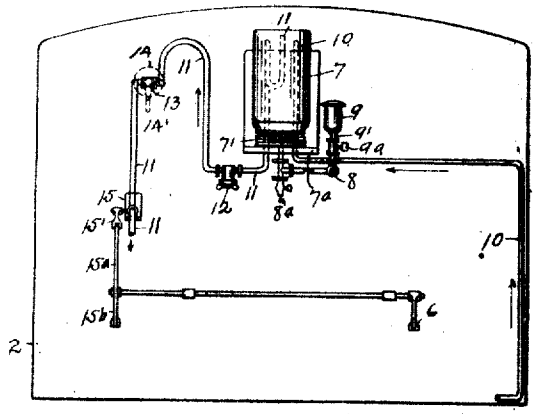


Fig 5

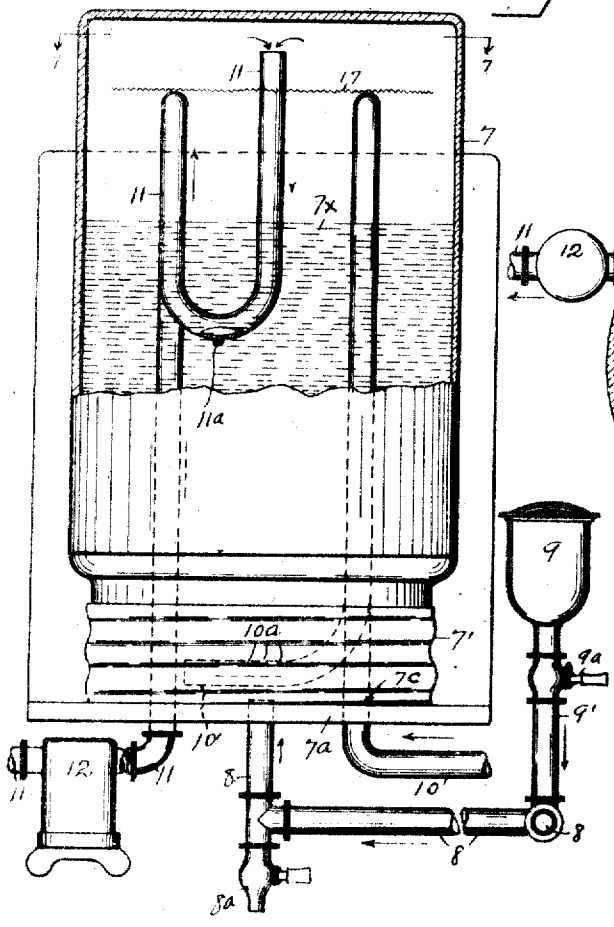


Fig 6

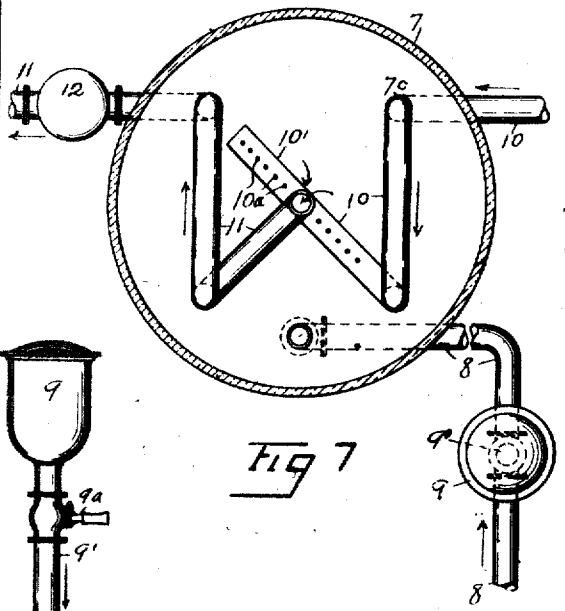


Fig 7

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UNITED STATES PATENT OFFICE.

EUGENE E. YOUNG, OF SYRACUSE, NEW YORK.

COMBINED LUBRICATOR AND HUMIDIFIER.

1,389,176. Specification of Letters Patent. Patented Aug. 30, 1921.

Application filed September 10, 1920. Serial No. 409,462.

To all whom it may concern:

Be it known that I, EUGENE E. YOUNG, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Combined Lubricators and Humidifiers, of which the following is a specification.

This invention relates to combined lubricators and humidifiers, designed for use in connection with internal combustion engines, particularly the common type employed for propelling automobiles, and the like.

The object of the invention is to provide novel, simple, and effective means for preventing the accumulation of carbon in the engine cylinders, for reducing the gas consumption, and for thoroughly and economically lubricating the upper piston rings and valves. A further object is to provide novel means for collecting and mixing the several elements comprising the lubricating and humidifying agent. And a further object is to provide novel and simple means for predetermining the supply, as well as for automatically controlling the admission of the combined mixture into the engine cylinders.

This invention relates particularly to improvements in the devices shown and described in my United States Patent No. 1,305,859, dated June 3, 1919.

The various features and parts of the invention will be understood from the detailed description which follows, and by reference to the accompanying drawings, in which—

Figure 1 is a top view of the front portion of an automobile, to which my improvement is applied. Fig. 2 is a vertical longitudinal section, taken on line 2—2 of Fig. 1. Fig. 3 is an enlarged detail view of the feed-cock. Fig. 4 is a face view of the indicator gage. Fig. 5 is a vertical cross-section, taken on line 5—5 of Fig. 1. Fig. 6 is an enlarged broken elevation of the reservoir in which the oil, water and steam are collected and mixed. And Fig. 7 is a horizontal section, taken on line 7—7 of Fig. 6.

In the drawings, 2 represents the body of an automobile, 3 is the front wall, and 4 is the dash. 5 is the internal-combustion engine, and 5′ is the radiator, the latter having a cap 5^a, and an overflow pipe 5^b. 5^c is the intake manifold, which receives the explosive gas from a carbureter 5^d, and 5^e designates the usual jacket-cap which contains a portion of the cooling water. The intake manifold carries the usual throttle (not shown), which is operated by a foot accelerator 6. The connections between the accelerator and the throttle are well understood and need not be specifically shown or described in this case.

My lubricator and humidifier consists principally of a reservoir or tank 7, preferably comprising a common glass fruit jar, which is preferably inverted, and is held in place by the usual screw cap 7′, the latter being arranged to tightly seal the mouth of the jaw. The cap 7′ is rigidly secured to the top side of a shelf 7^a, which is supported by the wall 3. The top end of the jar 7 is preferably steadied by a clamping band 7^b. By inverting the jar 7, as shown, the shelf 7^a sustains the weight and strain of the various pipes and fittings, and permits the jar to be detached without disturbing these parts. By this disposition and arrangement, the jar 7 may be readily drained and flushed by means of a cock 8^a without necessitating the removal of the jar, or the breaking of the seal between the jar and the cap. The jar 7 is supplied with water at intervals from the cap 5^c, by means of a pipe 8, which connects the said cap with the cap 7′, the pipe 8 being provided with a hand-operated cock 8′, by which the driver may replenish the supply of water in the jar 7. 9 represents an oil-cup which is mounted above and communicates with the pipe 8 by a branch 9′, in which is disposed a similar hand-operated cock 9^a for controlling the feeding of the lubricating oil into the tank 7. The pipe 8 discharges its contents (oil and water) into the extreme bottom end of the tank 7. The broken lines in Fig. 6 show the extent to which the tank 7 should be filled with the water and oil at the start of its operations. Steam or hot moist air, which forms an important element of the combined mixture, is obtained from the radiator 5′, and is carried toward the tank 7 partially through the overflow pipe 5^b, to whose lower end is connected a pipe 10, which extends rearwardly and upwardly and enters the tank at 7^c. Fresh air is admitted to the top of the radiator, for tempering the steam, through a pipe 5^f and a check-valve 5^g, the latter preferably being adjustable for regulating the supply of the

air. The pipe 10 extends upwardly inside the tank 7, to a point well above the highest level of the liquids 7^x, then bends and extends downwardly toward the bottom of the cap 7', where its free end 10' is disposed horizontally, and is provided with a row of fine perforations 10^a, as best seen in Figs. 6 and 7. The object of these perforations is to allow portions of the hot vapor or air to escape in a series of bubbles before it reaches the open end of the pipe, for more readily and effectually aerating the liquid in the tank 7. The vapor and air as it rises to the empty top of the tank carries with it more or less of the oil and water in a very finely atomized state. The vaporous contents of the top of the tank is drawn away by the suctions of the pistons toward the manifold 5^c (and thence into the engine cylinders) through a line of pipe 11, the free end portion of said pipe being disposed in the tank 7. This end of pipe 11 faces upwardly and is open. From its open end pipe 11 extends downwardly a short distance and then bends upwardly and again downwardly and passes out through the cap 7'. The bottom of the first bend of pipe 11 is normally submerged in the liquid 7^x and is provided with a fine port 11^a for admitting small quantities of the water and oil, which becomes mixed with the vapor during its passage through the pipe 11. From the tank 7 pipe 11 conducts the vapor to a combined trap and strainer 12, which entraps and collects the surplus liquid, as well as any foreign substances that the said mixture may contain. From the trap 12 pipe 11 extends to the dash 4 and connects with a gage-cock 13, the latter being controlled by a hand-lever 13', one end of which comprises an indicating point 13^a which plays in a slot 14' of a gage 14. The length of the slot 14' corresponds to the full opening and closing movements of the cock 13, and certain numerals are placed near said slot for indicating the capacity of the cock when adjusted and set in different positions, as best seen in Fig. 4, in which the lever 13' is positioned to indicate that diluting mixture equal to 50% of the maximum capacity of the cock 13 may be drawn from the reservoir 7. The gage 14 may be set and reset at will, but in practice the operator usually first ascertains what proportion of the full capacity of the cock 13 produces the best results, after which he sets the gage lever 13' accordingly and leaves it there. From the cock 13 the products of tank 7 pass into a feed-cock 15, which is operated by a lever 15', the latter being operatively connected by a link 15^a to a bell-crank 15^b, which controls the throttle, and which is operated by the driver through the accelerator 6, in the usual manner. Thus whenever the driver operates the accelerator or adjusts the throttle, the feed-cock 15 is also operated. From the cock 15 the products of tank 7 pass to a safety cock 16, and thence into the manifold 5^c. Cock 16 enables the engineer to entirely shut off the feed of the vapor to the engine when the latter needs repairing or other attention. From the foregoing it will be understood that the feed-cock 15, which is operated by the accelerator 6, finally measures and controls the diluting and lubricating mixture which is allowed to enter into the manifold, where it combines with the gas mixture which is moving toward the combustion chambers. In the present device, when the throttle is closed, as indicated by the position of the accelerator in Fig. 2, the lever 15' is in the position shown by the full lines in Fig. 2 and by the dotted lines 15^c in Fig. 3. When the accelerator is depressed one-half its movable range, the cock 15 is wide open, as indicated by the full lines in Fig. 3, and when the accelerator is depressed to its full extent for opening the throttle correspondingly, the lever 15' is moved to the dotted position 15^d, which closes the cock and prevents any of the products of tank 7 from reaching the manifold 5^c. In other words, when the engine is starting and needs rich and powerful gas for getting the heavy car in motion, none of the diluting mixture is allowed to enter the cylinders to weaken the explosive gas. But as soon as the car gets under head-way, and from that time until it reaches the maximum speed, the cock 15 gradually opens and closes, so that by the time the highest speed is attained, as when the throttle is wide open, only the strongest and richest gas is again being consumed by the engine. By this arrangement, a suitable amount of lubrication is supplied to the cylinders, and at the same time the aqueous vapor which is combined with the oil is admitted to the cylinders in the right proportion and at the right time to properly dilute and save the explosive gas, when hard work is not required of the engine. The aqueous vapor is also employed for moistening the cylinders and for preventing the accumulation of carbon, which generally deposits more freely while the engine is operated by the richer gas.

In Fig. 6 I have shown a wire screen or baffle 17, which is disposed near the top of the pipe 11, for preventing the liquid from bubbling and splashing upwardly and entering the open end of said pipe. The arrows in the several views indicate the direction of the flow of the vapors and liquids through the various conduits.

To replenish the tank 7 with water and oil, the driver first starts the engine and then opens the cocks 8' and 9^a, after which he places a thumb or finger over the air vent in the radiator cap and holds it there until the suctions of the engine, through the me-

diums of the pipe 11, the tank 7 and the pipe 8, draw the liquids into the tank. By closing the air vent, as described, the suctions of the engine produce a vacuum in the tank 7, which effects the refilling of the same. Upon entering the tank, the liquids, owing to the strength and intermittence of the suctions, are agitated to such extent as to thoroughly emulsify and mix the water and oil, and this agitation, in somewhat less violent form, continues until the engine is finally stopped. This insures the proper and consistent mixing of the several ingredients comprising the lubricating and humidifying agent.

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

1. The combination with a radiator and a water cooled internal combustion engine having an intake manifold, of a tank adapted to supply a vapor to said manifold, a pipe for conducting hot vapor from the radiator into the bottom of said tank, an oil cup located outside of the tank, a pipe for conducting a portion of the cooling water from the engine and also oil from said cup into the bottom of said tank, a pipe for conducting aqueous vapor impregnated with oil from said tank to said manifold, and a gage for predetermining the volume of the vapor that may be drawn from said tank.

2. The combination with the radiator and the cooling jacket of an internal combustion engine and the intake manifold thereof, of a transparent reservoir comprising an inverted glass jar whose bottom end is threaded, a screw cap for tightly sealing said lower end, a pipe adapted to supply said jar with water and lubricating oil passing through said cap, a pipe adapted to conduct hot moist vapor from said radiator into said jar, the free end of said pipe being perforated and disposed within and parallel to the plane portion of said cap, a pipe partially disposed in said jar, its free end positioned near the top of the jar above the highest level of the liquid contained by said jar adapted to conduct aqueous vapor mixed with oil toward the intake manifold, and means for preventing the flow of the aqueous vapor toward the intake manifold while the engine is operating at its highest or lowest speeds.

3. The combination with an internal combustion engine having a water jacket and an intake manifold and a radiator, of a tank adapted to receive water from said jacket and hot air from the radiator, an oil-cup, a common pipe tapping said jacket and said oil-cup and connected with the bottom of said tank, means for agitating and mixing the oil, water and hot vapor in said tank, a pipe for conducting a vapor produced by the agitation of the liquid from said tank to said manifold, means for predetermining and indicating the volume of the vapor passing from said tank, a foot accelerator, and a cock located between the indicator and the manifold and operated by said accelerator for timing the flow of the vapor into said manifold.

4. A reservoir adapted to be partially filled with water and lubricating oil, means for admitting hot aqueous vapor into the bottom of said reservoir for aerating said liquids while the vapor rises toward the top of the reservoir, means for agitating the liquids for thoroughly mixing them, a pipe for conducting the vapor from the top of the reservoir toward the intake manifold of internal combustion engine for diluting the explosive gas and for lubricating the cylinders and valves of the engine, and means for stopping the flow of said vapor toward said manifold while the engine is operating at its highest and lowest speeds.

5. A lubricator and humidifier for internal combustion engines, including a reservoir adapted to be partially filled with water received from the cooling jacket of the engine and a less quantity of lubricating oil, the said reservoir having its bottom end threaded, a screw cap for closing and sealing said bottom end, a shelf for supporting said reservoir to which said cap is rigidly secured, a pipe for conducting the oil and water into the reservoir, said pipe passing through said shelf and said cap and having a vent adapted for emptying and draining the reservoir, a tube passing through said shelf and cap for discharging vapor near the bottom of the reservoir, a pipe for drawing off the vapor from said reservoir, the free end of said pipe positioned above the level of the liquid and the body of said pipe passing through said cap and through said shelf, and a gage for controlling the volume of the vapor flowing through said pipe.

In testimony whereof I affix my signature.

EUGENE E. YOUNG.