March 8, 1932. F. G. C. BASHFORD 1,848,455

HUMIDIFIED AIR SUPERHEATER FOR EXPLOSION ENGINES

Original Filed Sept. 27, 1928

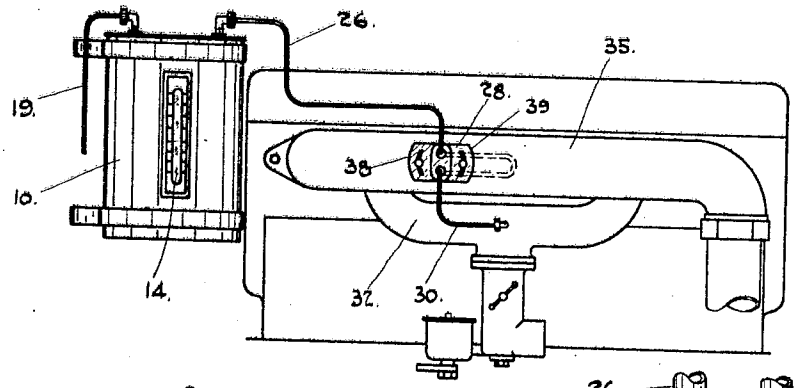


FIG. 1.

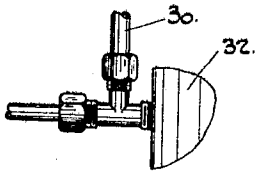


FIG. 4.

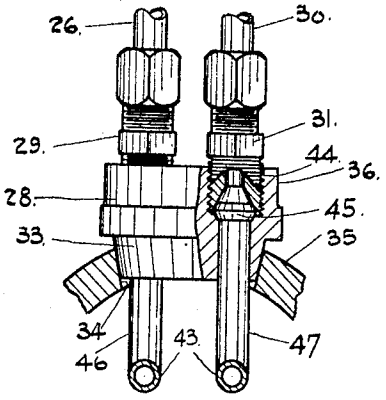


FIG. 3.

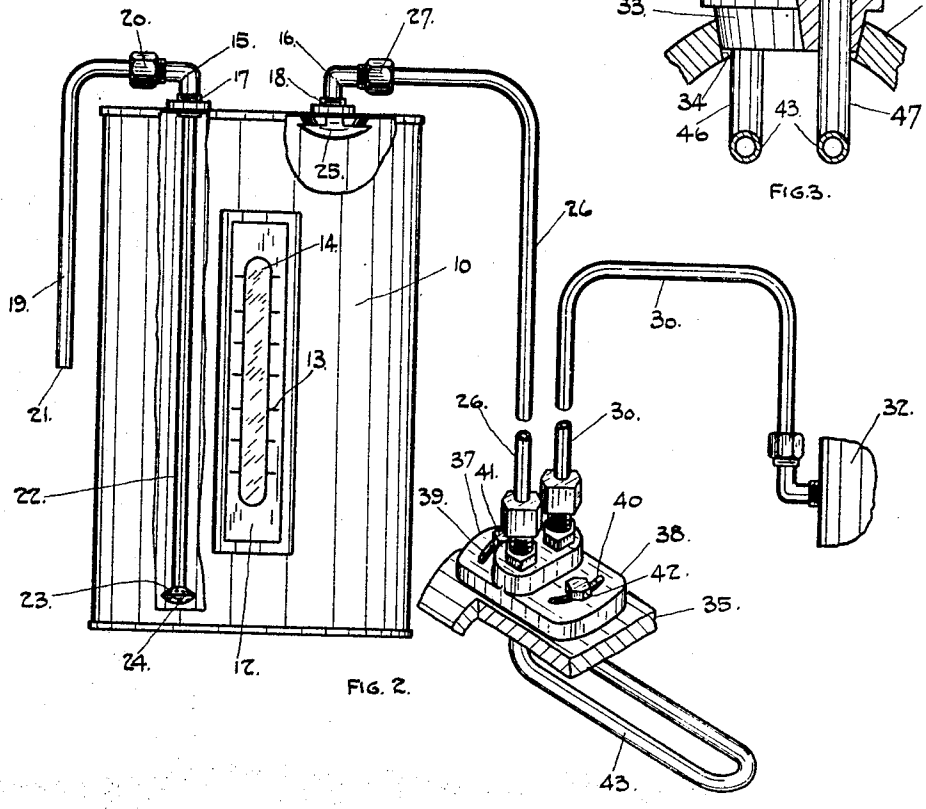


FIG. 2.

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UNITED STATES PATENT OFFICE

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HUMIDIFIED AIR SUPERHEATER FOR EXPLOSION ENGINES

Application filed September 27, 1928, Serial No. 308,592. Renewed August 3, 1931.

The invention relates to air superheater for explosion engines, as described in the present specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially of the novel features of construction pointed out broadly and specifically in the claim for novelty following a description containing an explanation in detail of an acceptable form of the invention.

The objects of the invention are to deliver supplementary air to the heated gases at a high temperature and to humidify this air in passage to the intake manifold; to economize in the consumption of fuel and at the same time gain efficiency in the operation of the machine; to eliminate the accumulation of carbon in the engine cylinders and to clear it out wherever it may gather; to maintain the speed of the engine on long and perilous trips and avoid the overheating of the cylinders due to uninterrupted action; to neutralize the poisonous gases liable to collect in the exhaust and be distributed in enclosures to the danger of the lives of persons therewithin; and generally to provide a simple, durable and efficient anti-carbonizer and superheater at a moderate cost of production and reasonable price to the consumers.

In the drawings, Figure 1 is a plan view of the preferable arrangement of parts.

Figure 2 is an elevational view partially in section and showing the water vessel broken away to disclose the air intake and water filling pipe.

Figure 3 is an enlarged sectional view of the exhaust manifold connection.

Figure 4 is a detail of the connection to the intake manifold.

Like numerals of reference indicate corresponding parts in the various figures.

Referring to the drawings, the numeral 10 indicates the water vessel having a vertical opening therethrough closed in by the frame 12 having graduations 13 thereon and a glass centre 14 showing the level of the water in the vessel, which is preferably formed of metal. The nipples 15 and 16 are secured in the inlet and outlet ports 17 and 18 respectively. The air and water intake pipe 19 is secured by the coupling 20 to the nipple 15 and extends outwardly and downwardly and terminates at the open inlet end 21 intermediate of the height of the vessel.

The pipe 22 extends downwardly from the nipple 15 and terminates very near to the bottom of the vessel in the rose 23 having its perforations 24 form the discharge orifices for the air, as well as passages for the water in charging the vessel.

The dished plate 25 is secured to the fitting of the nipple 16 on the inside of the vessel in order that the air discharge from the vessel shall pass indirectly into and through the nipple. The pipe 26 is secured to the nipple 16 by the coupling 27 and extends to the adjustable joint member 28 and is secured thereto by the fitting 29. The outlet pipe 30 is secured to the joint member 28 by the fitting 31 and extends to the inlet manifold 32 of an internal combustion engine.

The joint member 28 is formed with a tapered or plug end 33 fitting into a correspondingly tapered orifice 34 in the exhaust manifold 35 and adjustable by rotatory movement therein. The body 36 of the joint member 28 extends outwardly from the flanges 37 and 38 and these flanges have the arcual slots 39 and 40 respectively for the set screws 41 and 42 screwed into the casing of the exhaust manifold and engaging said flanges in the finally adjusted position of the joint member.

The fittings 29 and 31 are of conventional design and are secured in the threaded orifices 44 in the joint member and the walls of these orifices are shaped to receive the tapered pipe couplings 45. The pipes 26 and 30 are connected by the looped pipe heater pipe 43 which has the upwardly offset end 46 and 47 cooperating with the couplings 43 in making the connection.

The looped heater pipe 43 is inserted through the opening 34 into the exhaust manifold and rigidly held therein by the joint member 28 consequently the said looped pipe furnishes the connecting link and this link is continuously red hot so that the air laden with moisture passes from the water vessel

into the exhaust manifold within the looped pipe and is discharged therefrom through the pipe 30 into the intake manifold in the form of superheated moist air.

The water vessel is prepared by drawing thereinto through the suction of the engine about a quart of water or about three parts full. After this has been done the air is drawn in through the same pipe and must pass into the water and rise therefrom being drawn through to the heater link of the tubing heavily laden with moisture when it is dried and fed into the intake of the engine.

What I claim is:—

In an internal combustion engine humidifying and superheating device, a water receptacle having an air and water supply pipe depending adjacent the bottom of said receptacle, a discharge pipe extending from the top of said receptacle to the intake manifold of the engine, an adjustable plug fitting on the exhaust manifold of the engine having an attached loop located within the exhaust pipe and to which loop said discharge pipe is joined, and a mushroom-shaped deflector guarding the opening from the receptacle to the discharge pipe.

Signed at Montreal, Canada, this 21st day of July, 1927.

FREDERICK GEORGE CAVENDISH BASHFORD.