

PATENT SPECIFICATION



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191,144

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COMPLETE SPECIFICATION.

Improvements in Humidifiers for Internal Combustion Motors.

I, ALFRED JOHN HENRY HADDAN, a British subject, of the firm of Herbert Haddan & Co., of 31 and 32, Bedford Street, Strand, W.C. 2, London, Chartered Patent Agent, do hereby declare the nature of this invention, a communication to me from abroad by Walter Grover Critchlow and Harry Mason Valentine, both subjects of the United States of America, a co-partnership doing business as Vix Motor Accessories Company, located at No. 716, West Madison Street, Chicago, County of Cook, State of Illinois, United States of America, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in humidifiers or moisteners of the combustible charge for internal combustion motors of the type in which moisture may be conveyed from the water supply of a water cooled motor to the explosive charge either in the form of a vapor or a mist of such finely divided proportions as to be easily air borne and consists of valve controlled moisture admitting means interposed between the discharge end of an associated carburetter and the intake manifold of the motor, said means including a casing provided with a valve and a tubular extension leading from the bottom thereof to a point between the carburetter discharge and said intake manifold, a moisture conveying conduit connected with said casing at the side of the valve opposite to that of said tubular extension, gravity controlled means for relieving the conduit of excess moisture and vacuum relieving means in said casing to ensure correct functioning of said gravity controlled means.

The invention also comprises other details of construction, arrangement and combination of parts all as hereinafter set forth and pointed out in the appended claims.

The object of the invention is the provision of a construction embodying means whereby the quantity of moisture admitted may be under complete control during the operation of the motor when the results of such admission are most easily appreciated and determined.

Another object of the invention is the provision of a device of the character referred to in such form that it may be readily assembled and applied with the ordinary arrangement and construction of internal combustion motors as employed in automobiles and the like, without the necessity of altering any of the mechanisms of the motor; a construction which may be readily installed and which will be economical in manufacture; while at the same time is adapted to be so applied that it may be readily accessible for replacement and repair when occasion should require.

The above enumerated objects and advantages, as well as other advantages inherent in the invention, will all be more readily comprehended from the following detailed description of the accompanying drawings, wherein:—

Figure 1 is a more or less schematic view of a portion of a cylinder block and radiator with the improved humidifier applied thereto.

Figure 2 is a top plan view of the control valve casing, illustrating the manner of its assembly with the intake manifold of the motor.

Figure 3 is a sectional view of an excess water trap.

Figure 4 is a sectional view of the control mechanism shown in Figure 2 and taken on the line 4—4 of said figure.

Figure 5 is a central vertical sectional view illustrating a modified form of control valve.

Figure 6 is a vertical transverse section taken on the line 6—6 of Figure 4 looking in the direction of the arrows.

The particular exemplification of the

invention, as illustrated in the drawings, contemplates its installation intermediate of the tube A of the usual carburetter of the motor and the intake manifold B.

5 In present practice, the inlet end of the intake manifold B is usually provided with an oval embossment, while the tube A of the carburetter, which connects therewith, is usually provided with a laterally

10 extended oval flange similar in shape with the face of the embossment on the end of the manifold, and the flange and embossment are diametrically bored and tapped for the passage of securing bolts C. A

15 block 10 is provided between the flange of the carburetter tube and the embossment on the end of the intake manifold, having an outside configuration similar to that of the parts just referred to and

20 provided with peripheral slots 11 at diametrically opposite points in order that retaining bolts C of similar threads as heretofore used for securing the fuel carburetter in place, but of somewhat greater

25 length, may be used to hold the fuel carburetter and block 10 in proper relation with the intake manifold B. The block 10 is centrally bored to provide a passage

30 12 between the carburetter and intake manifold of the motor and mounted transversely of the bore 12 is a vapor tube 13 (see Fig. 4) provided, preferably on its outside with perforations 14 which are

35 parallel to the axis of the control bore 12 to permit the vapor and moisture to escape therefrom. The block 10, centrally of the bottom, is provided with a hollow

40 extension 15, providing a channel, the inner end whereof communicates with the interior of the vapor tube 13. Extension 15, as clearly shown in Figures 1 and 2, is preferably set at an angle to the

45 planes of block 12, to permit the fuel carburetter (not shown) to be attached immediately in front of the manifold in accordance with present practice and the

50 outer end of extension 15 is turned upwardly and provided with a horizontally disposed flange 16 (see Figure 4) upon which is mounted a control valve casing 17. The casing 17 may be secured to the flange 16 by means of screws 18, or in any other convenient and suitable manner.

55 Journalled transversely of control valve casing 17 and also transversely of the inlet opening in flange 16, is a control valve stem 19 upon which is fixedly secured within the casing, a valve 20 of the butterfly type. The valve stem 19

60 extends through the wall of the casing 17 and is provided with a crank arm 21 which is provided with a rod or connecting means 22 which in turn is connected

65 with the usual throttle control valve D

of the carburetter, so that valve 20 may be operated simultaneously with the throttle of the carburetter by the operator while controlling the motor and operating the car; or the connecting means or rod 70 22 may lead to the dash or instrument board of the motor vehicle and the valve 20 be separately operated from the dash or instrument board.

The control valve casing 17 is provided 75 with a tapped opening at 23, on the opposite side of valve 20 from the inlet port in flange 16, and into the threaded bore 23 is screwed an elbow 24 to the other end whereof is secured, by means of a 80 union 25, a suitable length of flexible conduit 26 which, in turn, is connected by a union 27 and elbow 28 with the top of a water trap casing 29.

The interior of the water trap casing 85 29 is provided with a gravity chamber 30 immediately below and connecting with the bore in elbow 28 through an outlet port 31. Opposite to and immediately below outlet port 31, is provided a 90 tubular extension 32 having the lower end of its bore open, see Figure 3. Upon one side of the tubular extension 32 is an ear 33 to which is pivotally secured ears 34 formed on the center of a valve- 95 plate 35; while the inner end of the valve-plate extends over and constitutes closure means for the open end of the tubular extension 32; while the outer end of the valve plate 35 is shown enlarged to provide 100 sufficient weight to maintain the inner end normally in closed position.

The tubular extension 32 is provided with a lateral tubular extension 36 which extends to one side of the casing 29, see 105 Figures 1 and 3, and this extension 36 is provided with an upwardly disposed threaded inlet orifice 37 provided with a suitable union as at 38, see Figure 1 which receives the overflow pipe 39 lead- 110 ing from the top of the radiator 40.

The top of control valve casing 17 is bored and tapped at 41 to receive a centrally bored plug 42 in which is mounted a ball check valve 43. This 115 check valve is for the purpose of relieving the system from too great a vacuum which would interfere with the action of valve 35 and therefore would prevent the elimination of an excess of water from 120 the system. The operation of the device is as follows: The suction developed by the operation of the cylinders will draw the vapor or very fine mist carried in the system from the ports 14 in tube 13 and 125 the operation of valve 20 will control the amount of vapor or fine mist passing to tube 13. Heavy mist and water will be excluded from the system through the functioning of the water trap, as mist 130

which is not fine enough, to be easily air borne will gravitate in chamber 30 and into the bore of extension 32, where the weight of the accumulated water will cause gravity valve 35 to operate and therefore release the water from the system. The water vapor, liberated from the water in the radiator by the heat developed in the normal operation of the motor, will generally be found to be sufficient, but in the practical operation of the invention it has been found necessary to provide means for controlling the amount of vapor taken from the radiator and also for eliminating such water and heavy spray as may be either splashed or sucked into the overflow pipe from the radiator.

The control valve structure just described permits of the adjustment and regulation of the amount of moisture admitted to the cylinders while the motor is in operation and the car is driven; but as many drivers are inexperienced and uninformed as to the functioning of the motor and as to adjustment of the motor mechanism, there is provided a modified form of control valve, which is illustrated in Figure 5 wherein the control valve stem 19 and valve 20 with their associated parts are entirely removed. In the modified form, the plug 42, carrying the spring-pressed relief ball valve 43, is removed from the bore 41 in the top of the control valve casing 17 and is mounted in the bore 19^a through which the valve stem 19 formerly passed; the bore 19^a for this purpose is made larger and tapped to receive the plug 42. A centrally bored valve seat plug 44, having a tubular extension arising from the valve seat, with laterally disposed outlet ports 44^a therein, is screwed into inlet port 16^a in flange 16 which latter is tapped to receive the same. A centrally bored and exteriorly threaded plug 45 is screwed into bore 41 in the top of control valve casing 17 and into the interior bore of plug 45 is screwed a needle valve 46 whose conical end seats in the opening of the central bore of valve seat plug 44. The upper, outer end of plug 45 is slotted at 47 in order that it may be compressed around needle valve 46, thereby to maintain the needle valve in its adjusted position, after original adjustment, until intentionally and manually altered; and the upper end of needle valve 46 is shown provided with a cross pin or handle 48 whereby the needle valve may be turned without the use of a special tool.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, as communicated to me

by my foreign correspondents, I declare that what I claim is:—

1. A device for admitting moisture to the explosive charge of an internal combustion motor comprising valve controlled moisture admitting means interposed between the discharge end of an associated carburetter and the intake manifold of the motor, said means including a casing provided with a valve and a tubular extension leading from the bottom thereof to a point between the carburetter discharge and said intake manifold, a moisture conveying conduit connected with said casing at the side of the valve opposite to that of said tubular extension, gravity controlled means for relieving the conduit of excess moisture, and vacuum relieving means in said casing to ensure correct functioning of said gravity controlled means.

2. A device for admitting moisture to the explosive charge of an internal combustion motor, comprising in combination with the water supply of a water-cooled internal combustion motor, means adapted to convey moisture from said water supply to the explosive charge of the motor, characterized by a portion of said means constituting a coupling between the outlet tube of the carburetter and the intake manifold of the motor, having a passage disposed transversely therethrough, a valve arranged in said means and operable with the throttle of the motor, automatic vacuum relieving means arranged in said first mentioned means between said valve and the water supply, and a gravity controlled trap for relieving the first mentioned means of excess moisture.

3. A device according to Claim 2, having a block provided with a central bore and adapted to be secured between the outlet of the carburetter and the intake manifold of the motor, said block being provided with a perforated vapour tube closed at one end and disposed transversely of said bore, the lower end of the block being provided with an integral angularly disposed hollow extension arranged in communication with the open end of said tube.

4. A device according to Claim 3, in which the perforations of the vapour tube are parallel to the axis of the central transverse bore of the block.

5. In combination with a water cooled internal combustion motor provided with a radiator, a carburetter and an intake manifold, moisture admitting means comprising an elongated hollow member one end whereof is enlarged to adapt it to be interposed between the carburetter and the inlet orifice of the intake manifold

and transversely bored to provide passage for the explosive mixture, a perforated tube mounted in said enlarged end transversely of the bore, one end of the tube being closed while the other is open to the longitudinal bore of the hollow member, a valve casing secured to the opposite end of said hollow member, said casing being provided with an inlet orifice and an automatically controlled vacuum relieving valve removably secured therein, a valve in said casing between the inlet orifice and point of communication with said hollow member, means for conveying vapour from the radiator of the motor to the inlet orifice of said casing and a gravity controlled trap for relieving said last mentioned means of access of moisture.

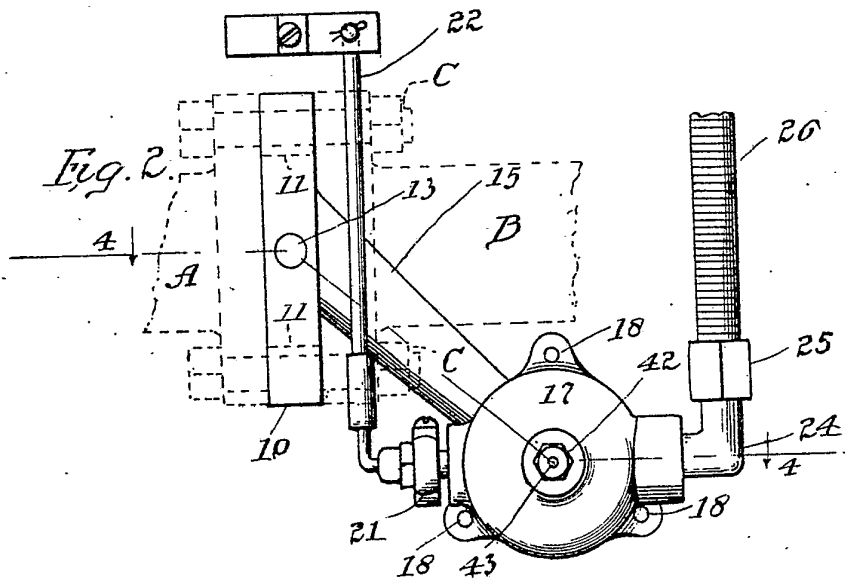
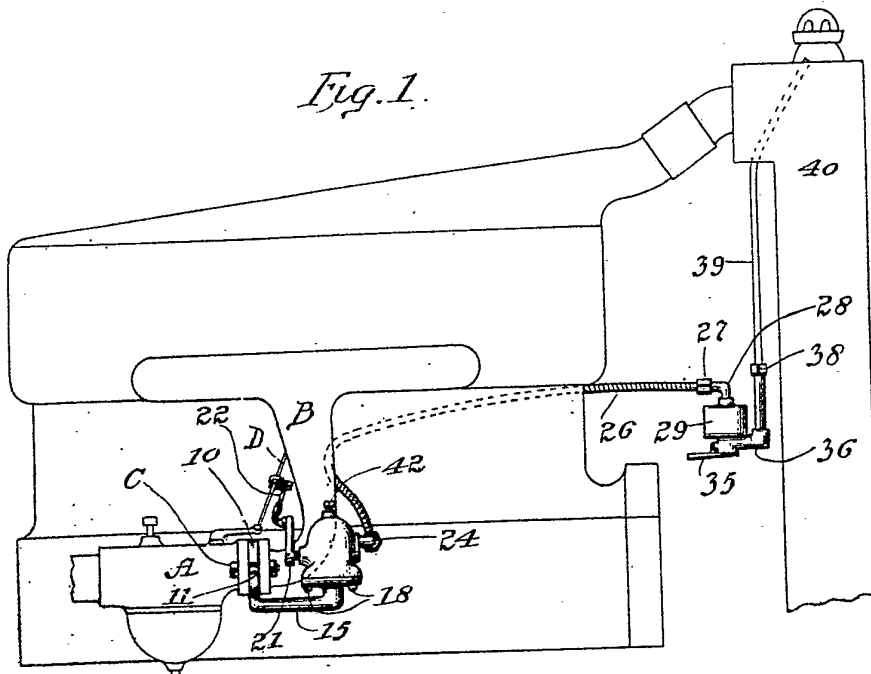
Dated this 4th day of October, 1921.

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2nd Edition

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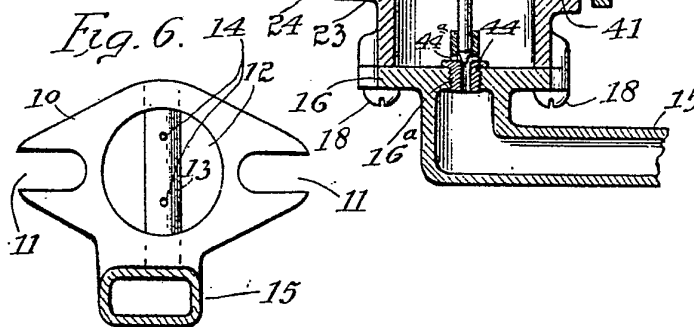
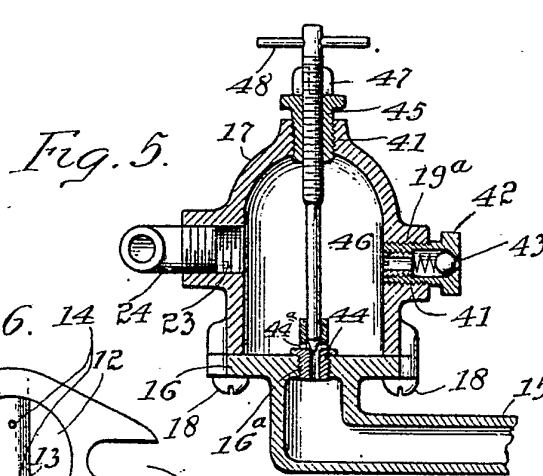
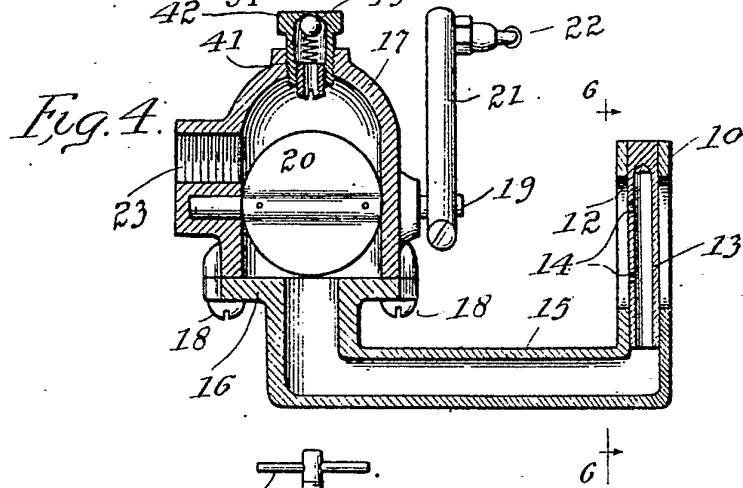
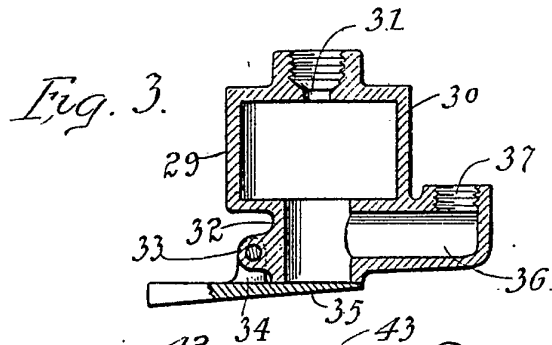


Fig. 1.

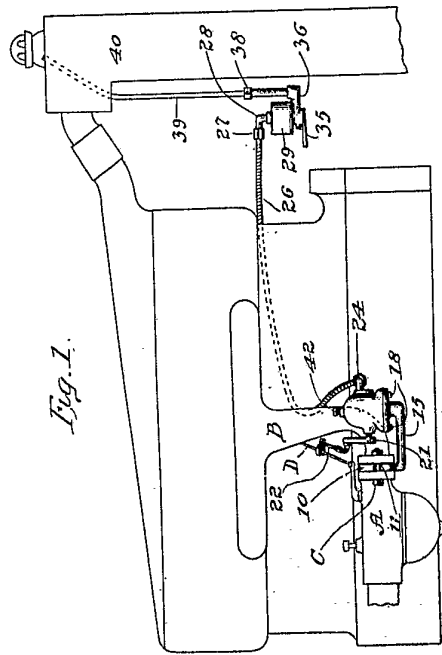


Fig. 2.

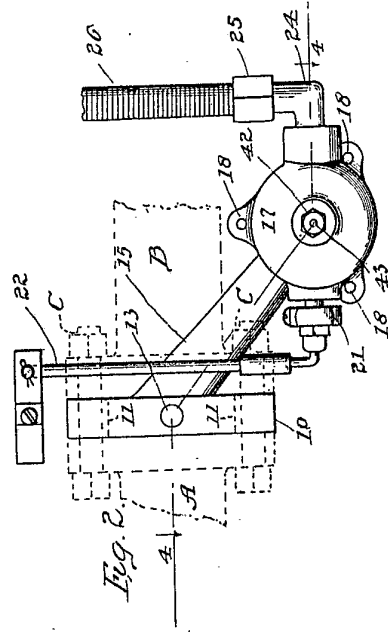


Fig. 3.

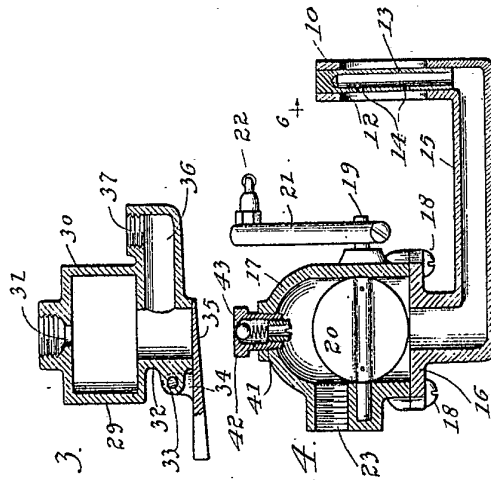


Fig. 4.

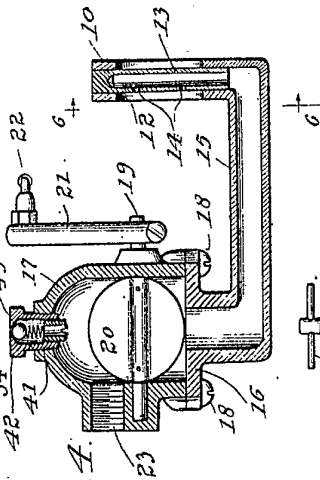


Fig. 5.

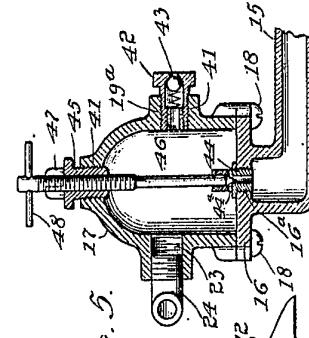
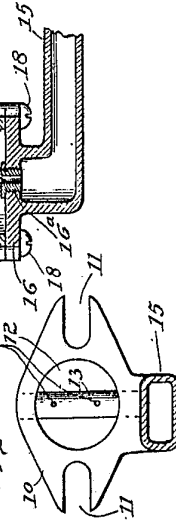


Fig. 6.



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