

G. H. HODGDON.
 DECARBONIZING ATTACHMENT FOR INTERNAL COMBUSTION MOTORS.
 APPLICATION FILED OCT. 27, 1915.

1,211,705.

Patented Jan. 9, 1917.

Fig. 1.

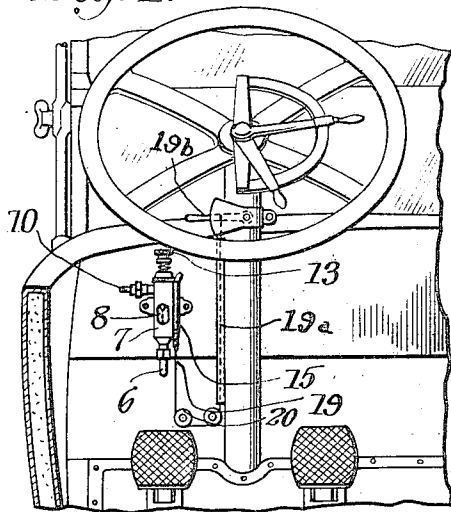


Fig. 2.

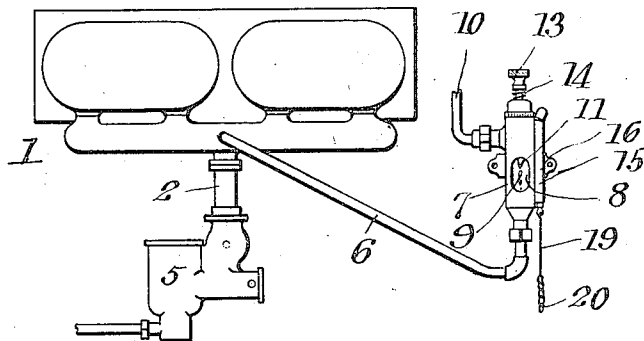


Fig. 3.

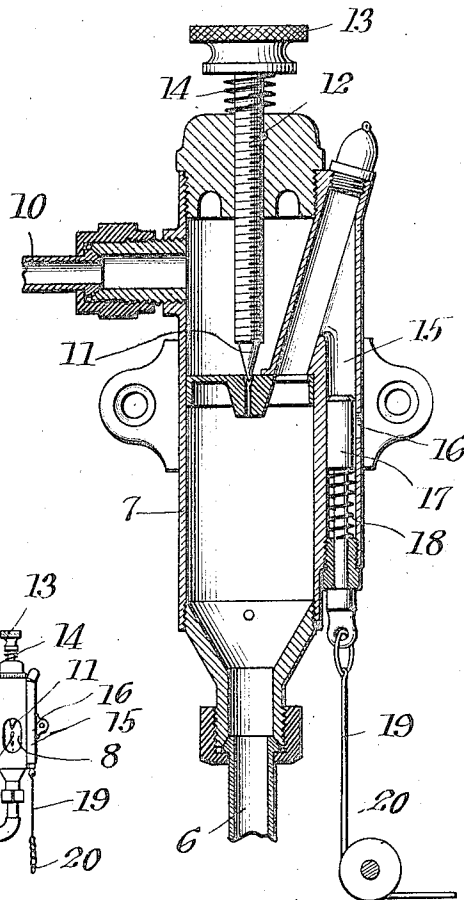


Fig. 4.

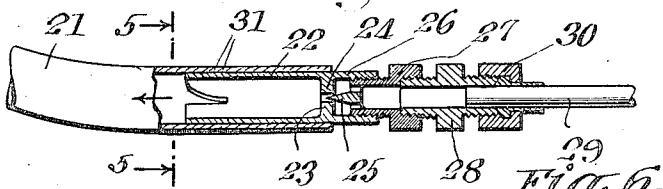


Fig. 5.

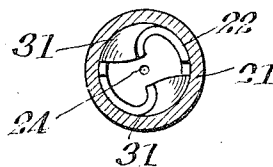
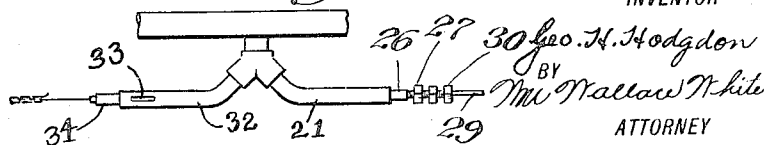


Fig. 6.



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DECARBONIZING ATTACHMENT FOR INTERNAL-COMBUSTION MOTORS.

1,211,705.

Specification of Letters Patent.

Patented Jan. 9, 1917.

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To all whom it may concern:

Be it known that I, GEORGE H. HODGDON, a citizen of the United States of America, residing at 215 West One Hundredth street, borough of Manhattan, city, county, and State of New York, have invented new and useful Improvements in Decarbonizing Attachments for Internal-Combustion Motors, of which the following is a specification.

10 This invention relates to internal combustion engines and in particular to an attachment for such engines which will serve to increase the efficiency and economy of operation of the same.

15 The primary object in view is to provide a simple device adapted to be mounted in a convenient position, such as for instance upon the dash of an automobile body when used in connection with an automobile engine, whereby a regulable quantity of water 20 may be vaporized and aerated and then fed to the combustible mixture of the engine within the manifold of the latter. The attachment is adapted to be connected with 25 any well known type of internal combustion engine without making any material modifications in the construction thereof.

To these ends the invention consists in the combination and arrangement of parts more 30 fully set forth and described hereinafter in the specification and claims and illustrated in the accompanying drawings, wherein:

Figure 1 is a rear elevation of the dash of an automobile body, portions thereof being broken away, showing the regulating device mounted thereon; Fig. 2 is a diagrammatic view showing the manner in which the attachment is connected with the engine; Fig. 3 is a vertical sectional view 40 through the regulating device alone; Fig. 4 is a side elevation partly in section of a modified form of water regulating device having means for atomizing the water without the assistance of air; Fig. 5 is a transverse sectional view on line 5—5 of Fig. 4; and, Fig. 6 is a plan view of the modified 45 form of water regulating and vaporizing device together with an auxiliary air intake device, showing these devices connected with the manifold of an engine, the latter being 50 broken away.

Referring to the drawings by numerals, and in particular to Figs. 1 to 3 inclusive, 1 designates the manifold of an internal combustion engine having a pipe 2 communicat-

ing therewith. This pipe is connected in the customary manner with the usual carburetor 5. Another pipe 6 is connected with the lower end of the vertically extending, elongated casing 7 of my improved water feeding and vaporizing device. This latter is provided with suitable means for securing the same to the dash of an automobile body or to some other convenient support, in the position shown in Fig. 1 of the drawings in particular. The lower portion of this casing 7 forms a mixing chamber and is provided with a view opening 8 which is shielded by means of a transparent member, such as a glass tube 9 fitting snugly within the casing, whereby the latter is rendered air and water tight. The water which is intended to be vaporized and introduced into the manifold of the engine, enters the casing 7 adjacent to its upper end through a supply 75 pipe 10 leading from a suitable source. A needle valve 11 is provided within the casing between its upper and lower compartments. The stem 12 of this valve projects through the upper end of the casing and is in screw-threaded engagement therewith, in order that it may be adjusted readily from the exterior of the casing by means of a manipulating head 13 provided upon the stem. In order to place the stem under tension and thus secure the same against accidental displacement when it has once been adjusted, in spite of the vibration of the support, a helical spring 14 is positioned upon the stem between the upper end of the casing and the manipulating head 13. 90

In order that air may be admitted freely to the interior of the casing 7 so as to become mixed with the water as it is vaporized, a valve chamber 15 is provided exteriorly upon one side of the casing 7 in communication therewith. This casing is provided with an air inlet port 16 and with a valve plug 17, which is mounted for reciprocation within the chamber 15 and is adapted normally to be maintained in a position wherein it closes the port 16 by means of a spring 18. A wire 19 or the like is connected with the valve plug 17 and passes around pulleys 20 and through a protective tube 19^a upon the steering post to a hand lever 19^b situated in a convenient position beneath the steering wheel where it can be readily manipulated by the driver. 100 105

The operation of the device will now be 110

described. If it is desired to inject water vapor into the explosive mixture, without any additional air, the air valve 17 is maintained closed, whereas the manipulating head 13 of the water valve is opened to an extent sufficient to permit water to enter the mixing chamber at the lower end of the casing 7 in successive drops. The desired number of drops per unit of time may be regulated readily by adjustment of the water valve minutely. As the lower end of the casing 7 is in communication with the manifold of the engine, there will be a tendency to create a vacuum in the mixing chamber of the said casing, which will operate to draw in water and air when the proper valves are opened. The drops of water falling through the chamber will be converted into vapor, which vapor will be conducted through the pipe 6 into the manifold where it will become intimately mixed with the explosive gas. The presence of this water vapor in the explosive mixture will render the combustion more complete than it would be otherwise. Consequently, there will be a minimum deposition of carbon between the engine cylinders. Fuel will thus be saved and the engine will be rendered clean and highly efficient in operation. By opening the air valve 17, air will be permitted to enter the mixing chamber of the casing 7 at the same time that water is being injected into the same. As a result, the water will become vaporized as it enters the top of the chamber, when it is fed at precisely the proper rate, and the vapor and air will mix and produce an even more efficient vapor for combination with the carbureted explosive gas. Owing to the provision of the sight opening in the casing 7, the driver may detect readily any cessation of the water feed. He is also enabled to time the drops with precision, by virtue of this sight opening.

In the remaining figures of drawing, a modified form of water feed regulator is illustrated. This device does not provide for the mixture of air direct with the water, but instead provides mechanical means for imparting a swirling motion to the water entering its atomizing chamber whereby it will be effectively converted into vapor. In this instance, there will also be a tendency to create a vacuum within the atomizing chamber, and this will assist in feeding the water and also in vaporizing the same. Means are provided for mixing air with the water vapor at a point near the manifold. In this form of the device, 21 designates a pipe which is intended to be connected with the manifold of the engine and is of sufficient diameter to provide an atomizing chamber. A tubular casing 22 is fitted into the end of this pipe most remote from the manifold and is provided with a transverse wall 23 which divides the same into two chambers. A valve

port 24 is provided in this wall and a needle valve member 25 is threaded into the outermost chamber 26 of the casing and has its needle point associated with the valve port 24. This valve member is tubular in construction and is provided with an interiorly screw-threaded manipulating head 27 at its outer end. This head is in threaded engagement with a pipe coupling 28 which latter is adapted to be secured rigidly to a water supply pipe 29 by means of the clamping device 30. The threads which connect the coupling 28 with the head of the needle valve member 25 and those which connect the latter with the casing 22 are similar in pitch and direction of twist, so that the valve member may be adjusted freely with respect to the casing and the coupling 28 as well. This is essential, owing to the fact that the pipes 21 and 29 are stationarily mounted in practice. Owing to this construction, the water is introduced into the casing through the coupling 28 and channels in the valve member. The device will thus be very compact in construction and will be at no point larger in diameter than the pipe 21.

The inner end portion of the casing 22 is provided with spirally arranged deflecting blades 31. These blades are formed by providing diametrically opposite, axial slots in the casing walls, which slots extend through the inner end of the same, and then bending corresponding edges of the walls at the slots inwardly. These deflecting blades will serve to impart a swirling motion to the water as it passes from the casing 22 to the pipe 21, either in the form of drops or in a stream, depending upon whether the valve 25 is nearly closed or wide open and also upon the position of the device, whether horizontal or vertical. In the present instance, it is shown in a horizontal position, in which it will operate effectively. The motion imparted to the water by means of the deflecting blades will serve to promote vaporization of the water, as assisted by the vacuum created within the pipe 21.

In order that air may be mixed with the water vapor when desired, an air inlet pipe 32 communicates with the pipe 21 at a point near the place of connection of the latter with the engine manifold. This pipe 32 is provided with an inlet port 33 adapted normally to be closed by the spring-actuated valve member 34, which latter is adapted to be manually controlled by means similar to those illustrated in connection with the preferred form of the device.

When this device is attached to an engine having cylinders already fouled with carbon, its use for a short time will serve to clean the carbon from the cylinders so that "knocking" will cease and the engine will run smoothly.

Having thus described the invention, what

it is desired to claim and to secure by Letters-Patent is:

1. The combination with an internal combustion motor having a carbureter and a manifold, of a member communicating with the manifold and having a chamber provided with a valve port in its top wall, a source of supply of water, means for conducting water from the said source to the said port, a controlling valve associated with the port and adapted to cause the water to fall in the form of drops into the chamber to be vaporized therein, the wall of said chamber having a transparent view portion disposed beneath the said valve port, and regulable means for admitting air into the chamber at a point situated above the view portion thereof.

2. A device of the class described comprising

ing a member having a chamber, said chamber having an outlet at its bottom adapted to be connected with the manifold of an internal combustion motor and having an inlet at its top adapted to be connected with a source of water supply, a controlling valve provided in the inlet, the member being provided with a transparent view portion beneath the inlet, and regulable means for admitting air into the chamber at a point situated above the said transparent view portion.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE H. HODGDON.

Witnesses:

DUDLEY B. HOWARD,
JOHN C. SANDERS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."