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W. H. & G. E. RUSSELL.

MEANS FOR CARBURETING AIR.

APPLICATION FILED NOV. 14, 1902. RENEWED APR. 8, 1904.

NO MODEL.

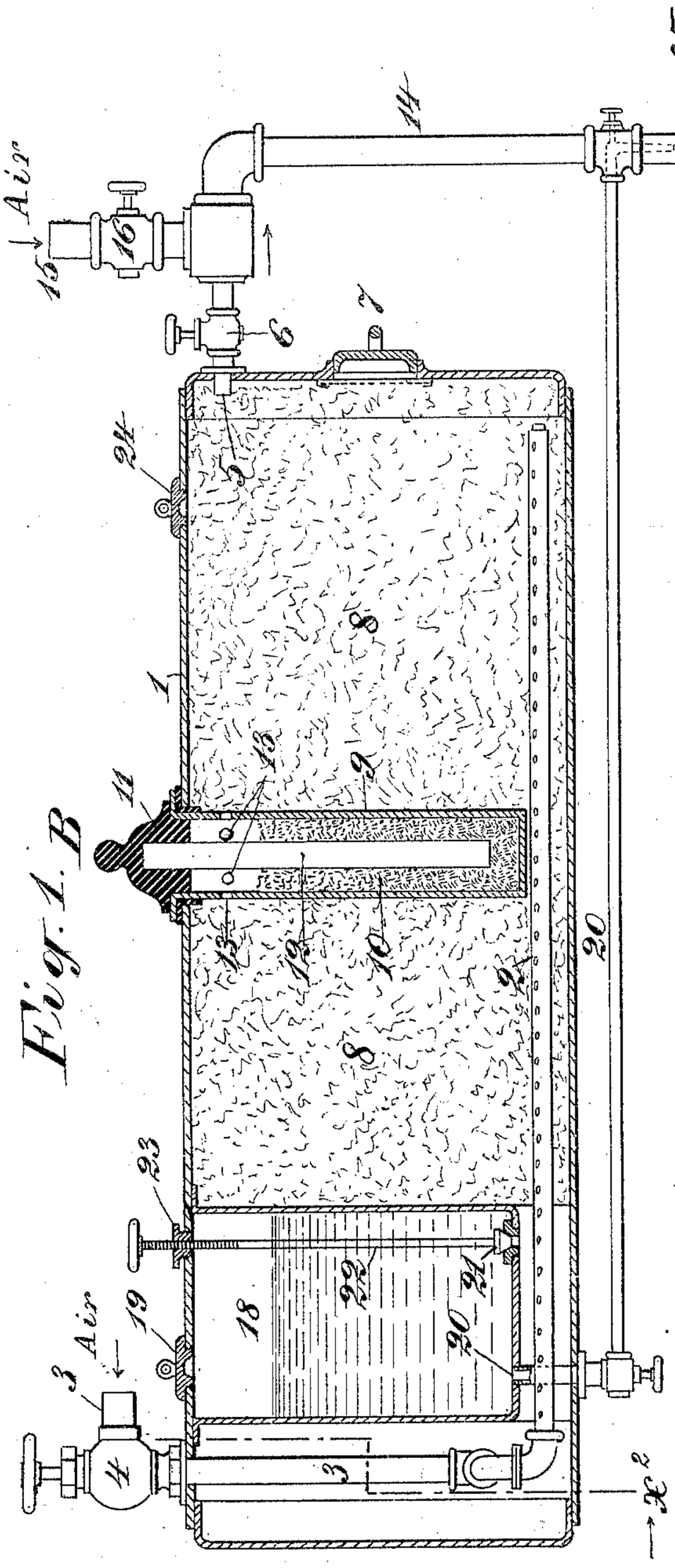
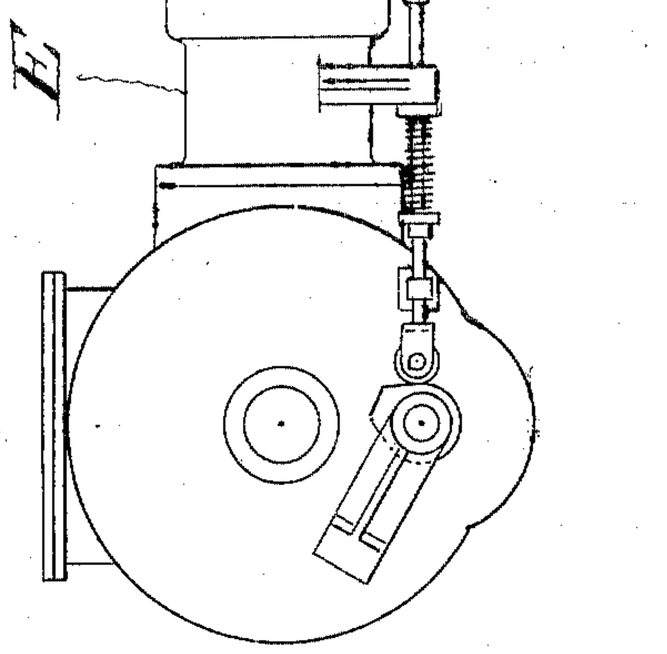


Fig. 1.



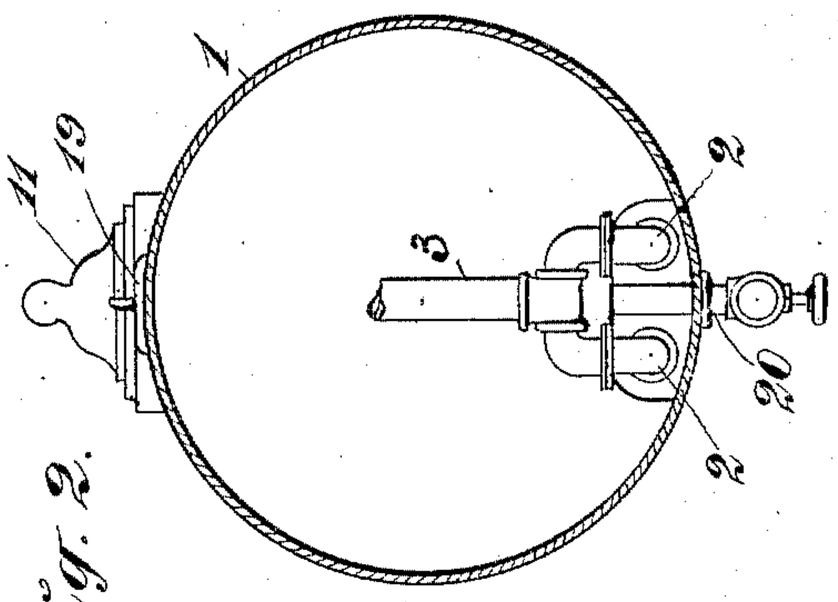


Fig. 2.

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No. 775,859. Patented November 22, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM H. RUSSELL AND GEORGE E. RUSSELL, OF JERSEY CITY, NEW JERSEY, ASSIGNORS TO INTER GAS POWER COMPANY, A CORPORATION OF NEW YORK.

MEANS FOR CARBURETING AIR.

SPECIFICATION forming part of Letters Patent No. 775,859, dated November 22, 1904.

Application filed November 14, 1902. Renewed April 8, 1904. Serial No. 202,235. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. RUSSELL and GEORGE E. RUSSELL, both citizens of the United States, residing in Jersey City, in the county of Hudson and State of New Jersey, have jointly invented certain new and useful Improvements in Means for Carbureting Air, of which the following is a specification.

This invention relates to apparatuses for producing by carbureting a gas which when mixed with a proper proportion of oxygen will provide an explosive mixture suitable for internal-combustion engines—as, for example, those employed for driving autovehicles. The object is in the main to produce cheaply and in a continuous manner a gas which will permit long runs to be made without the necessity of resupplying, to provide a relatively light and safe apparatus which will supply gas under all conditions of the weather, and to provide for emergencies which are apt to arise in running an autovehicle.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is substantially a longitudinal vertical axial section of the apparatus, showing somewhat diagrammatically its application in supplying an internal-combustion engine. Fig. 2 is a transverse section at line x^2 in Fig. 1.

1 is the receptacle of the apparatus, which will be by preference of an elongated cylindrical form, but this cylindrical feature is not essential. Extending through the receptacle, and preferably at or near the bottom thereof, are perforated pipes 2, to which air is supplied through an inlet and inlet-pipe 3, controlled by a suitable inlet-valve 4. At the opposite end of the receptacle from that where the air-inlet valve is situated is the gas-outlet 5, which is controlled by a cock 6. In this end of the receptacle is situated the charging-inlet 7. The receptacle is filled with an absorbent material 8 to take up a liquid hydrocarbon for carbureting. This absorbent material may be any suitable fibrous substance—animal, vegetable, or mineral—or mixed fiber coated with infusorial earth.

The carbureting liquids that may be employed are naphtha, crude petroleum, alcohol, lysol, and turpentine. It is preferred to employ alcohol with a small percentage of turpentine; but the alcohol may be substituted by either naphtha or crude petroleum or by a mixture of these. The lysol is employed in relatively small quantity as a deodorizer for removing or modifying the smell of the naphtha and the empyreumatic odors arising from the burning of the gases in an internal-combustion engine. Where alcohol alone is employed, the use of lysol is not so important. The turpentine is employed in order to enhance the generation of ozone in the apparatus.

Set in the mass of absorbent material is a water-decomposing apparatus, (indicated as a whole by B.) This device comprises a deep cup 9, of brass or copper, set in the crown of the receptacle and insulated therefrom. This cup contains a fibrous material 10, charged with dilute acid, and in it is suspended from a cap 11 a bar or piece of zinc 12. The electrical action set up in the cell decomposes the water of the dilute acid, and hydrogen gas, thus liberated, flows out through apertures 13 in the walls of the cup into the mass of absorbent material 8 in the receptacle.

The operation when the apparatus is employed for supplying a motor is thus: The induction side of the motor being connected with the outlet of the apparatus, air is drawn by suction through the receptacle 1, and thus carbureted. Specifically the construction is as follows:

E designates any form of internal-combustion engine suited for employing explosive charges of carbureted hydrogen gas and air. This engine is connected on its induction side with the gas-outlet 5 by a supply-pipe 14. As the gas is drawn from the receptacle 1 it is mixed with air drawn in at an air-supply inlet 15. As the gas-outlet 5 is controlled by a cock 6 and the air-supply inlet is controlled by a cock 16, it will be obvious that by means of these cocks the exact proportions of the air and gas may be regulated to a nicety and to suit the conditions required. In the supply-pipe 14 is a cock or valve 17, which regu-

lates the amount of the explosive charge which may be taken in at the induction-inlet of the engine at each receiving stroke. Thus the construction provides for regulating the supply of a uniform explosive mixture to the engine in order to modify its speed and power, in lieu of regulating these latter by varying the proportions of the mixture. With the construction described the proportions of the mixture may remain constant and the modifying results be attained by its attenuation.

In some cases it is necessary, or at least desirable, to have at hand means for supplying the engine in an emergency with the vapor of a volatile hydrocarbon, and to provide for such an emergency requirement the means are employed which will now be described.

In the receptacle 1, and preferably at the end opposite to the charging-aperture 7, is an inner chamber or tank 18 for such volatile hydrocarbon. This chamber is filled or charged at a suitable inlet 19 and has a cock-controlled pipe 20, leading from its bottom to the pipe 14, so as to supply vapor direct in an emergency to the pipe for supplying the engine. The liquid hydrocarbon or carbureting liquid in the tank 18 may also be utilized, if required, for saturating the absorbent material 8 in case of necessity, and this will be effected through the medium of an outlet at the bottom of the tank, which is normally closed by a valve 21, which has a long stem 22, that passes out through a plug 23 in the crown of the receptacle.

It will be understood that the interior of the receptacle 1 is open to the atmosphere, and therefore not under pressure above the atmosphere, and it may have at 24 an auxiliary air-inlet to supply air, if desired, nearer the gas-outlet than the main inlet 3.

There may be one or more perforated pipes 2 for the air-supply. Two are shown in the drawings.

It will be noted that in the utilization of the apparatus described the air is drawn, not forced, through the carbureting agent.

Obviously the gaseous mixture produced may be used for illuminating purposes, as well as for operating an internal-combustion engine.

The charging-inlet 7 will be screened with gauze by preference and the liquid carbureting agent forced in in the form of spray. This is taken up by the absorbent material and carried through the mass by capillary attraction. There will be no free liquid in the carbureting-receptacle outside of the emergency-tank 18.

The liquid carbureting agent from the tank 18 may be and often will be used in connection with the gas to supply the engine, especially for starting. Its admission to the pipe 14 is controlled by a needle-valve 25.

It will be noted that there is no free liquid in the cup 9, the dilute acid in the same being all taken up by the fibrous or absorbent material 10. This is very advantageous in the present case, where the carbureter is designed to be used on a rapidly-moving carriage.

Having thus described our invention, we claim—

1. Means for the purpose specified, comprising a receptacle having an air-inlet, a gas-outlet, a mass of absorbent material between said inlet and outlet adapted to be charged with a carbureting liquid, and water-decomposing means embedded in the said absorbent material, said decomposing means comprising a cup with apertures in its sides, a mass of absorbent material in said cup, to be saturated with dilute acid, and a bar of zinc embedded in the mass of fibrous material in the cup.

2. Means for the purpose specified, comprising the main receptacle, the mass of absorbent material therein to be charged with a volatile carbureting agent, and means for decomposing water and supplying the resultant hydrogen to the carbureting agent in the receptacle, said means comprising a deep cup 9, mounted in the wall of the main receptacle and opening exterior to the latter, the cap 11 of said cup, the bar of zinc 12 secured to said cap and extending into said cup, and absorbent material 10 in the cup and about the zinc to receive and take up a dilute acid, said cup having apertures 13 in its sides near the cap for the escape of the liberated hydrogen, substantially as set forth.

3. In an apparatus for the purpose specified, the combination with the receptacle 1, having an inlet for air at one end, a perforated distributing-pipe connected with said inlet, an outlet for gas at the opposite end, and an absorbent material between said inlet and outlet, of a tank within the receptacle to contain a liquid carbureting agent, a cock-controlled outlet-pipe for said tank, opening exterior to the receptacle for supplying the volatile liquid direct, and a valve-controlled outlet for said tank opening to the interior of the receptacle, substantially as set forth.

In witness whereof we have hereunto signed our names, this 12th day of November, 1902, in the presence of two subscribing witnesses.

WILLIAM H. RUSSELL.
GEORGE E. RUSSELL.

Witnesses:
PETER A. ROSS,
WILLIAM J. FIRTH.