H. & C. E. MERRETT.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED MAY 11, 1909.

970,937. Patented Sept. 20, 1910.

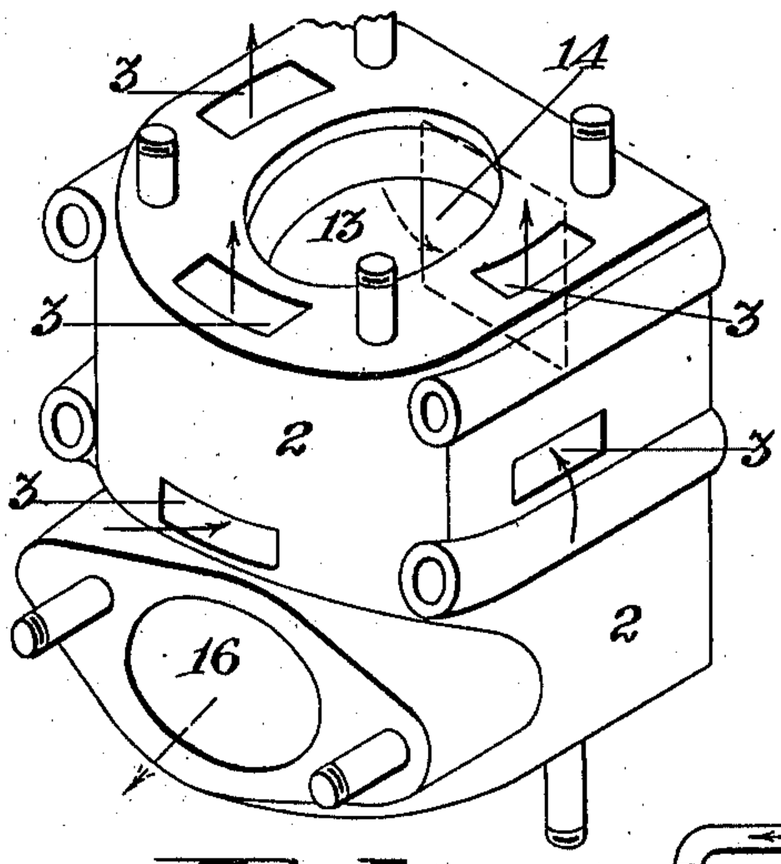

Fig. 1.

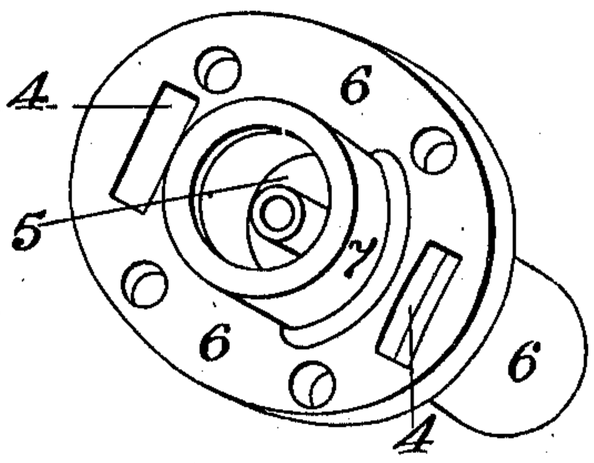

Fig. 2.

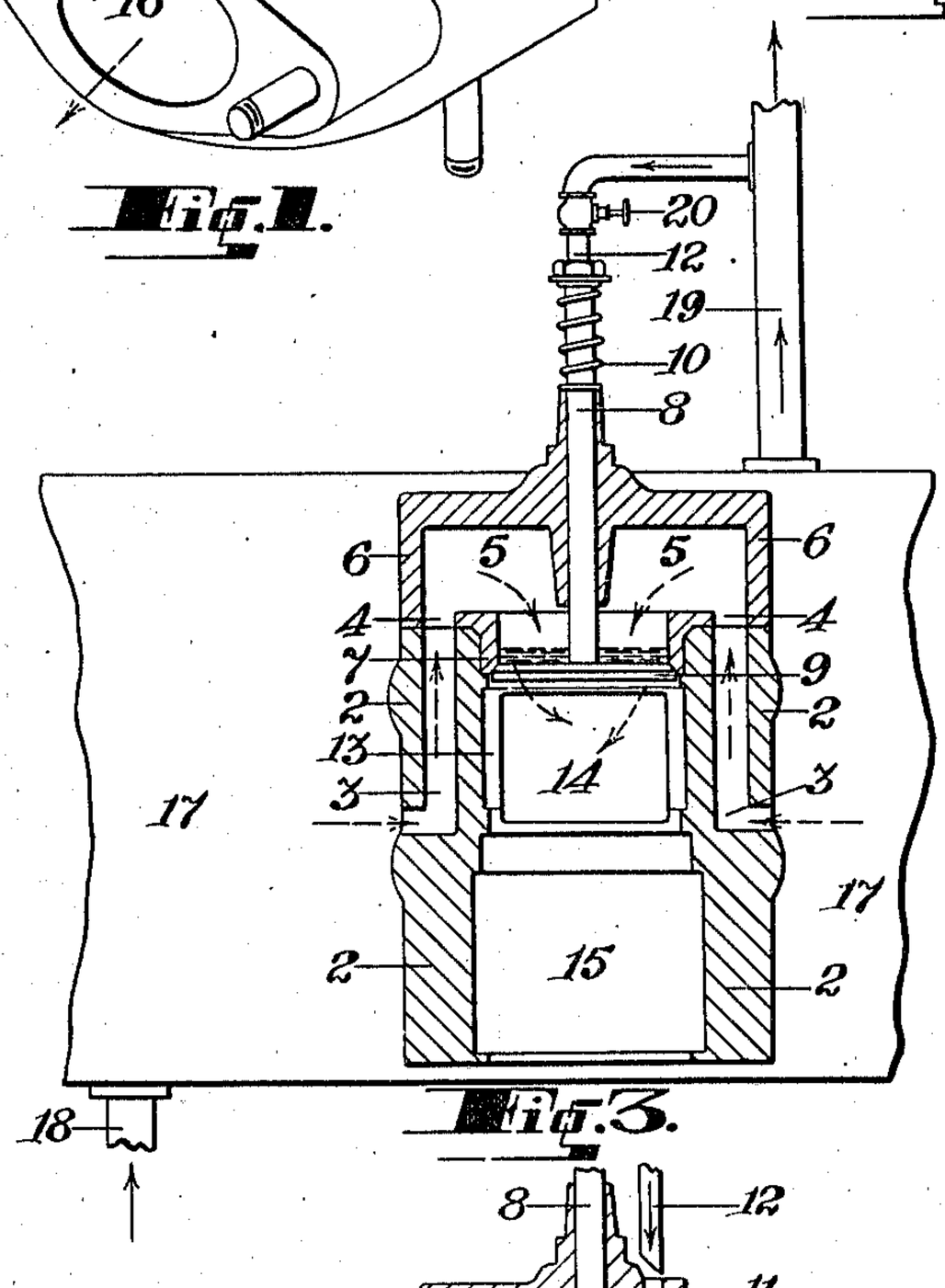

Fig. 3.

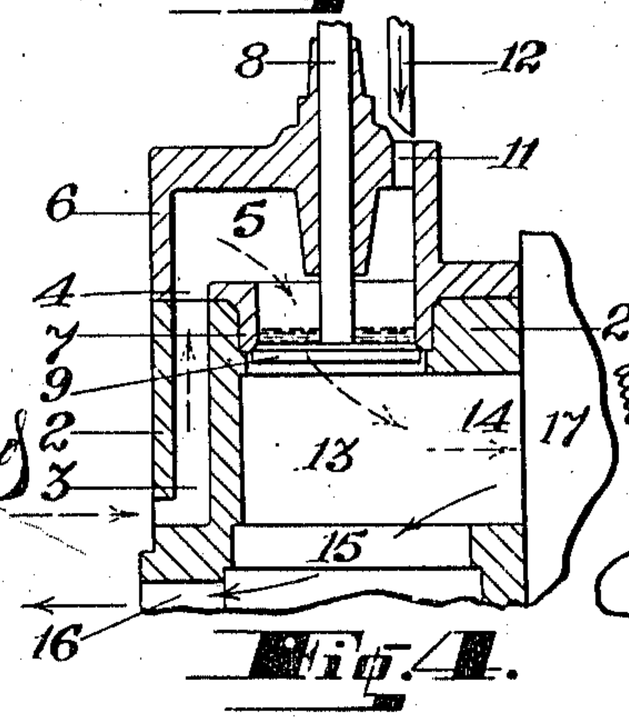

Fig. 4.

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UNITED STATES PATENT OFFICE.

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INTERNAL-COMBUSTION ENGINE.

970,937. Specification of Letters Patent. Patented Sept. 20, 1910.

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To all whom it may concern:

Be it known that we, HENRY MERRETT and CHARLES EDWARD MERRETT, subjects of the King of Great Britain and Ireland, and residents, respectively, of Green Vale Road, East Burwood, a suburb of the city of Melbourne, and 48 Queen's Bridge street, South Melbourne, a suburb of the city of Melbourne, both in the county of Bourke, State of Victoria, and Commonwealth of Australia; have invented certain new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

This invention relates to internal combustion engines and particularly to oil engines in which a charge of gas or vapor and suitable explosive mixture of air is caused to explode in the cylinder of the engine. In the past numerous objections have existed to engines of this description such as the formation of injurious deposits which injured the cylinder and prevented best results being obtained, inefficiency of cylinder lubrication, the inability of an engine to run on "no load" without cooling down and the difficulty of using different classes of fuel without altering valves, ignition, compression, and such like.

The object of this invention is to provide for absolute freedom from objectionable deposits in the cylinder and for the production of an oleaginous mixture therein, complete self lubrication under all conditions and the engine firing itself on any load and not cooling down under "no load." In addition any of the oils usable as fuel may be employed without alteration of the various parts, a fixed air supply is maintained independent of the load, there is no gumming or clogging of the piston rings and the like, and a reduced consumption of fuel is effected when running on reduced loads. Other advantages also will become obvious from the following description.

According to this invention, instead of only air meeting gas or vapor in the engine cylinder to form an explosive mixture, heated air is caused to absorb water or steam dependent upon the type of engine. Loaded with the water or steam the air meets the gas or vapor thereby making an explosive mixture which explodes more readily and with far greater effect. The charge upon burning produces a black lubricating substance of the approximate consistency of vaseline. This renders cylinder lubrication unnecessary. The air, heated in its passage, is admitted by the suction stroke of the piston over an inlet valve absorbing heated water or steam during its entrance and producing a comparatively high temperature mixture in the form of a mist. In some classes of engines steam is used instead of water, the latter being used for example in oil engines and the former in suction gas plants when a suitable valve is provided for its admission. The mist drawn into the cylinder and added to the gas or vapor charge, forms an explosive mixture which is very active and the product of the combustion of which is a very efficient lubricant.

Referring to the drawings which form a part of this specification:—Figure 1 is a view of a valve box to be applied to an engine cylinder. The air inlet ports, cylinder inlet and exhaust are clearly seen. The cover of the box and the exhaust valve are removed for convenience of illustration. Fig. 2 is a view of the underneath of a valve box cover showing two air inlet ports only. The air inlet valve is removed. Fig. 3 is a cross section of a valve box with the cover and air inlet valve in place. The exhaust valve which is of any ordinary type is removed. Portion of the cylinder is shown and the inlet and outlet water circulation pipes to the water jacket thereof. Fig. 4 is a cross section through Fig. 3, portions being broken away for convenience of illustration.

Similar numerals of reference indicate like or corresponding parts where they occur in the several views.

This invention includes an air jacketed valve box through the walls or shell 2 of which are two, three or more air inlet ports 3 communicating with ports 4 leading into a chamber 5 in a cover 6 bolted or otherwise secured to the said box. The number, area and conformation of the air inlet ports 3 will depend upon the size and class of the engine. This valve box is heated by the exhaust gases as they leave the cylinder. Depending from the cover is a circular flange 7 and passing through said cover is an inlet valve spindle 8 having on its lower end an inlet valve 9 bearing and retained against

the lower edge of the flange 7 by a spring 10 around said spindle, said spring resting on said cover.

Through the cover 6 is a hot water inlet 11 (Fig. 4) with which communicates a water supply pipe 12 led off from any part of the cylinder water jacket hereinafter referred to.

Should steam be requisite instead of water a valve of any suitable type may control its admission.

Beneath the inlet valve 9 is a chamber 13 in communication with the cylinder by an inlet 14. Below the chamber 13 is an exhaust valve chamber 15 having an exhaust outlet 16. The bottom of the chamber 13 is formed by the top of an exhaust valve in the chamber 15 but which valve is not shown in the drawings it being of any ordinary and well known character.

The valve box is secured (Fig. 3) to the water jacketed cylinder 17 of the engine by bolts or in any other well known manner. To the cylinder is the usual water jacket inlet circulation pipe 18 and outlet or return pipe 19. Communicating from the return or hot water escape pipe 19 by a branch is the charge water supply pipe 12 controlled by a cock 20.

The cycle of operations with this invention is as follows:—The valve box being attached to the cylinder side of say an oil engine with the cover 6 in position and the inlet valve 9 being retained closed by its spring 10 and the cock 12 allowing water to flow by dripping or with due regulation into the chamber 5 through the inlet 11 and such water having gathered upon the top of the valve 9, presume the piston to make a suction stroke. Upon such a stroke, air is drawn through the ports 3 (the walls of which are hot) and becoming heated during its passage expands. The water above the valve 9 is also heated having come from the water jacket of the engine, and in consequence the incoming heated air entering throught the ports 4 into the chamber 5 has no difficulty in absorbing said heated water or the greater part of it. If steam be used it is absorbed in the same manner. The hot mist so formed is by the suction of the piston drawn through the inlet 14 into the cylinder where it meets the gas or vapor charge. Combustion and explosion readily take place, the residue being a viscous substance which lubricates the cylinder admirably and is easily wiped therefrom when the engine is cleaned. Upon the exhaust stroke of the piston the exhaust passes from the cylinder through the inlet 14, through the chamber 13, past an ordinary exhaust valve into the chamber 15 and through the outlet 16. The exhaust is clean and comparatively cool.

The amount of water admitted into the chamber 5 does not affect an engine's working. Any over plus flows out through the exhaust. Some oil fuels however, require more water than others but as stated an over supply is not detrimental although not perhaps altogether desirable. The air supply is uniform and in actual practice this invention has been found highly advantageous.

Having now described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. In an internal combustion engine, the combination with a cylinder, a valve box communicating with the combustion chamber of the engine below the valve, a valve in the upper part of said box, air inlet passages in the walls of said box extending from a point below to a point above said valve and communicating with the interior of the valve box above the valve and with the atmosphere, and means for admitting water or steam into the box and onto the valve, said valve controlling the inlet of air, water or steam into the combustion chamber.

2. In an internal combustion engine, the combination with a cylinder, a valve box adjacent the port thereof, the portion of the box below the valve communicating with the combustion chamber of the engine, and adapted to be heated by the exhaust, an inwardly opening valve in the upper side of said box, air inlet passages in the walls of said box extending from a point below to a point above said valve and communicating with the interior of the valve box above the valve and with the atmosphere, a spring for normally closing the valve, and means for admitting water or steam into the box above the valve, said valve controlling the inlet of air, water or steam into the combustion chamber.

3. The combination of an explosive engine cylinder, a valve box communicating with the combustion chamber of the engine below the valve and adapted to be heated by the exhaust gases, and provided with air inlet passages in its walls communicating with the interior of the valve box above the valve and with the atmosphere below the valve, a valve in said box, and means for admitting steam or water into the box and onto the valve, said valve controlling the inlet of air, water or steam into the combustion chamber.

4. In combination an explosive engine cylinder, a valve box, the lower part of said box communicating with the combustion chamber of the engine below the valve and adapted to be heated by the exhaust gases, and provided with air inlet passages in its walls communicating with the interior of the valve box above the valve and with the atmosphere below the valve, an inwardly opening valve in said box, means for admitting steam or water into the box above the valve, and a spring for normally closing said valve, said valve controlling the admis-

sion of air, steam or water into the combustion chamber, substantially as described.

5. In an explosive engine, the combination of a cylinder, a valve box having its lower part communicating with the combustion chamber of the engine below the valve and adapted to be heated by the exhaust gases and having air inlet passages in its walls communicating with the interior of the valve box above the valve and with the atmosphere below the valve, a valve closing said passages, and a cover for said valve box provided with an opening for the admission of water or steam into said valve box, said valve controlling the admission of air, steam or water into the combustion chamber, substantially as described.

6. The combination in an explosive engine, of a cylinder, a valve box having its lower part communicating therewith below the valve and adapted to be heated by the exhaust gases and having air inlet passages in its walls communicating with the interior of the valve box above the valve and with the atmosphere below the valve, an inwardly opening valve closing said passages, a cover for said valve box provided with an opening for the admission of water or steam into said valve box above the valve, and a spring for normally closing the valve, said valve controlling the admission of air, steam or water into the combustion chamber, substantially as described.

In testimony whereof we affix our signatures in the presence of two subscribing witnesses.

HENRY MERRETT.
CHARLES EDWARD MERRETT.

Witnesses:
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CECIL W. LE PLASTRIER.