C. WHITE.

GAS ENGINE.

APPLICATION FILED SEPT. 27, 1911.

1,034,549. Patented Aug. 6, 1912.

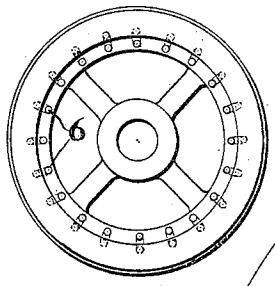
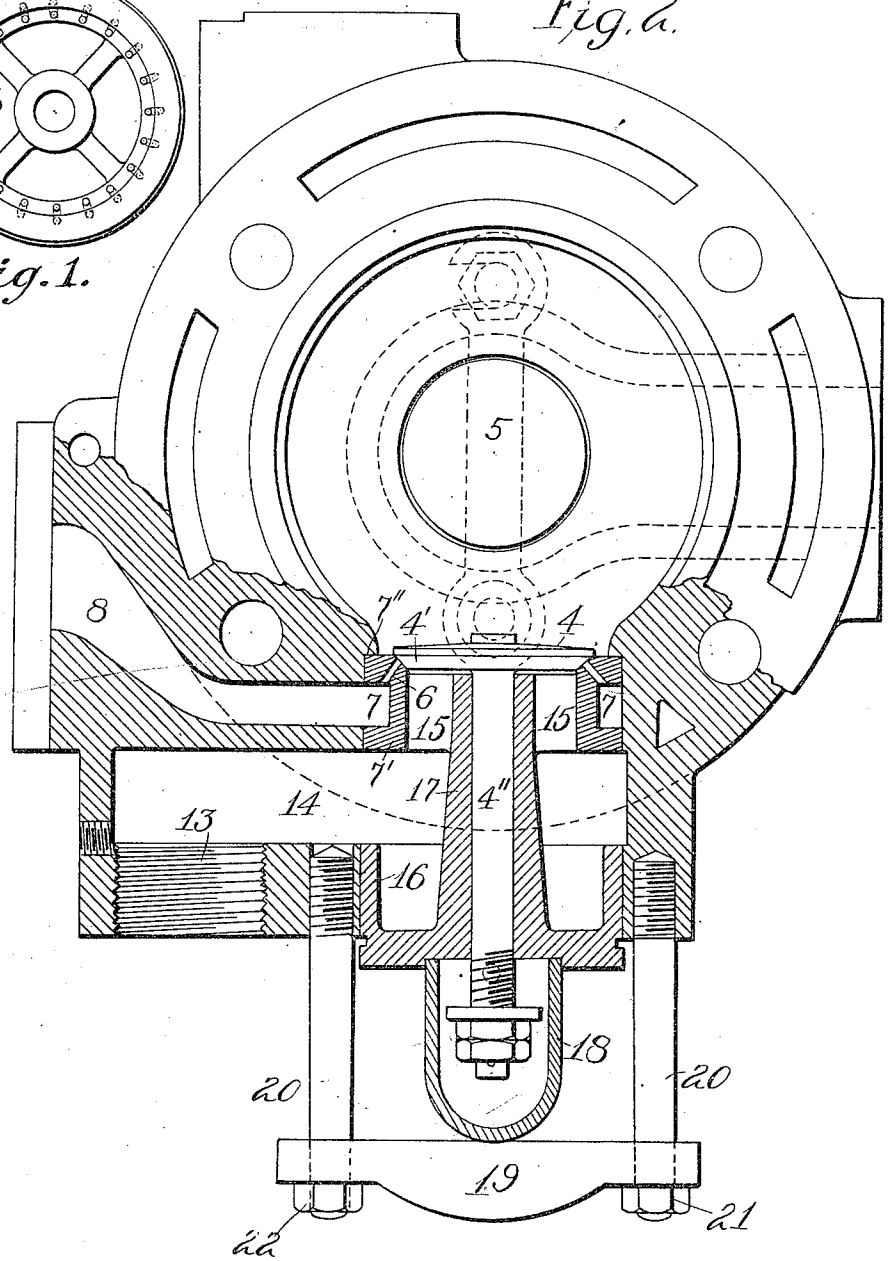


Fig. 1.

Fig. 2.



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GAS-ENGINE.

1,034,549. Specification of Letters Patent. Patented Aug. 6, 1912.

Application filed September 27, 1911. Serial No. 651,603.

To all whom it may concern:

Be it known that I, CHARLES WHITE, a citizen of the United States, residing at Baltimore, Maryland, have invented certain new and useful Improvements in Gas-Engines, of which the following is a specification.

My invention concerns valve mechanism for the admission of air and gas to the cylinder, and it consists in the features and combination and arrangement of parts hereinafter described and particularly pointed out in the claim.

The accompanying drawing shows in Figure 1 a face view of the induction valve seat; Fig. 2 is a view of the inner face of the cylinder head with parts in section to show the induction valve for the gas and air.

In the drawing, 4 is the induction valve and 5 the exhaust valve. The induction valve rests upon a seat having a series of perforations 6 extending therethrough at angles converging toward the axial line of the valve. These openings 6 connect with a channel 7 extending around the valve seat, and this annular channel is in turn connected with the gas supply conduit 8. The air to form the explosive mixture in connection with the gas is introduced into the head through the port 13 from any suitable pipe or connection, and from this port a conduit 14 extends to the induction valve, reaching the same through ports 15 formed within the frame or box which carries the induction valve. These ports 15 lie within the circuit or circular plane of the gas ports 6 before described, and they are kept closed by the disk valve 4 which extends across these ports, the bevel face of the disk at 4′ serving to close the gas ports 6 when in contact with the valve seat. It will be observed from this construction that while the gas may be supplied from all points about the valve disk, that is, through the annular series of ports 6, the gas and air are kept entirely separate from each other, and no mixture of these constituents takes place in the rear of the induction valve, and said mixture can take place only when the induction valve is opened, at which time, of course, the constituents will pass immediately into the combustion chamber. In this way all possibility of any of the explosive mixture passing back through the air pipe into the base of the engine or into the room will be avoided. The induction valve is carried by a frame consisting of the valve seat portion of annular form through which the gas ports 6 and the air ports 15 are formed, the said frame also having a ring-shaped or annular member 16 fitting an opening in the head, the two ring-shaped members being connected by the central portion or stem 17 which provides a guide or bearing for the stem 4″ of the induction valve. This stem extends down into a cup-shaped member 18 which bears on the frame of the valve at its upper end, and at its lower end is supported by a cross bar 19 held by rods 20 screwed into the head of the cylinder. This cross rod is held at one end by a fixed head 21 and at the other end by a nut 22. At this last mentioned end the cross bar is of hook form to engage the rod 20, so that by loosening the nut 22 the rod 19 may be swung aside and the cup 18, together with the frame of the induction valve and the induction valve itself, may all be readily removed from the head for examination or repair. The annular members 16 and 7′ are of the same diameter, and the member 7′ rests against a shoulder 7″ formed in the head which determines the inward position of the induction valve and its frame. The cup 18 is designed to contain oil which may be introduced through a suitable opening therein, and this will furnish lubrication to the stem of the induction valve, acting in the nature of a dash pot for the said stem. This cup not only performs this function, but the additional function of a part of the clamp for holding the valve frame in place, it being observed that the clamping bar 19 engages the rounded end of this cup, and thus the pressure for holding the valve frame and the valve in place is exerted in direct line with the axis of these members, so that the frame will be accurately seated in the head. The induction valve is arranged to work vertically, and the exhaust valve works horizontally and axially of the cylinder of the engine.

While the inlet for the gas is made up of a series of small openings extending through the valve seat, these, in effect, provide what may be termed an annular inlet for the gas. Likewise the inlet for the air is of substantially annular form, being made up of openings disposed at different points about the central stem of the frame.

Reverting to the induction valve of Fig. 2, it will be understood of course that the

passages 8 and 14 for the gas and air, respectively, are formed in the head of the engine, and the valve carrying frame is seated in a socket or boring extending transversely of the said passages, which connect therewith independently, and the valve carrying frame is removable from this socket without disturbing any of the air or gas supply connections or their controlling devices.

I claim as my invention:

In a gas engine, the combination of a head having a passage for the inlet of air and a passage for the inlet of gas, a socket formed in the head transversely of the said air and gas passages, which passages connect independently with said socket, a valve carrying frame seated in said socket, and comprising an inner ring-shaped member having an annular channel communicating with the gas inlet passage, and with openings leading from said channel to a valve seat, and an outer ring-shaped member closing the socket, with the space between the two ring-shaped members communicating with the air inlet passage, the two ring-shaped members being connected by an intermediate portion, ports leading through the inner ring-shaped member communicating with the air passage, and a valve having its stem guided in the frame and arranged to close the gas ports and the air ports in the inner ring, said valve frame being removable independently of the gas or air supply connections, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

CHARLES WHITE.

Witnesses:

SAMUEL HOLTZ,

THOS. W. ELLIS.