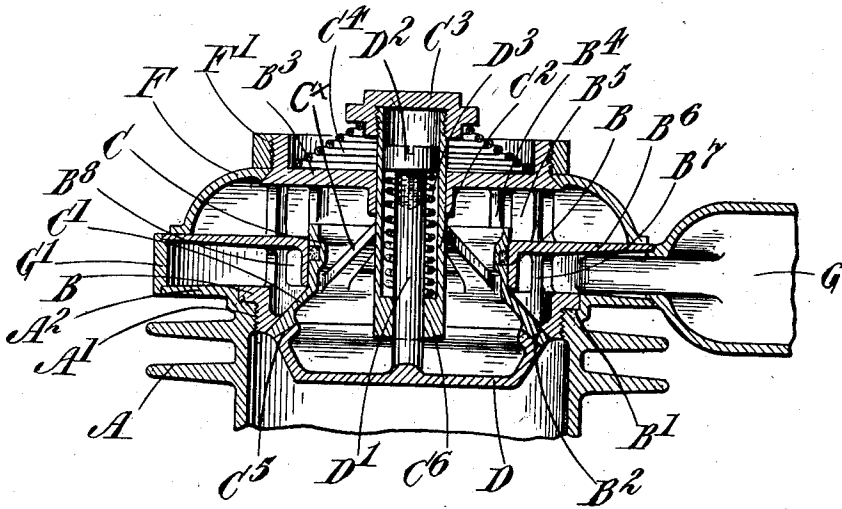


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VALVE FOR INTERNAL COMBUSTION ENGINES.
APPLICATION FILED JUNE 15, 1911.

1,059,210.

Patented Apr. 15, 1913.



Witnesses
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UNITED STATES PATENT OFFICE.

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VALVE FOR INTERNAL-COMBUSTION ENGINES.

1,059,210.

Specification of Letters Patent.

Patented Apr. 15, 1913.

Application filed June 15, 1911. Serial No. 633,335.

To all whom it may concern:

Be it known that I, CHARLES BENJAMIN REDRUP, a subject of the King of England, residing at Canton, Cardiff, in the county of Glamorgan, Wales, England, have invented certain new and useful Improvements in Valves for Internal-Combustion Engines, of which the following is a specification.

This invention is for improvements in or relating to valves for internal combustion engines and has for its object to provide a valve which occupies little space and that is readily removable from the cylinder.

In the accompanying drawing which is a central section through the valve parallel with its axis of movement, the engine-cylinder A is screw-threaded at A¹ to receive the screw-threaded end of an approximately cylindrical shell or casing B. Assuming the valve to be in a vertical position, the base of the casing is screw-threaded to engage the cylinder and shouldered at B¹ to make a fluid-tight joint therewith. The interior edge of this base is shaped to form a seating B² and mounted in the central portion of the cylindrical shell B is a sleeve C. This sleeve has an enlarged end C¹ that constitutes a mushroom-valve and coöperates with the seating B². The sleeve is guided in the cylindrical part of the casing and carries by arms C^x a central hollow stem C² which is guided in a top plate B³ that closes the end of the cylindrical shell B. The hollow stem C² is covered by a cap C³ and a spring C⁴ operating between the plate B³ and the cap C³ normally keeps the valve C¹ upon its seating.

The central cylindrical portion of the shell B is connected to the plate or end wall B³ by a cylindrical part B⁴ having in it a number of perforations B⁵ which constitute inlet ports and communicate with the interior of the sleeve C. The same central portion of the casing has a surrounding flange B⁶ and this is connected to the base portion of the shell by a second cylindrical part B⁷ perforated to provide exhaust ports B⁸ which lie outside the sleeve C.

The inner side of the lip of the valve C¹, which may be referred to as the hollow mushroom-valve, is shaped to provide a seating C⁵ and mounted concentrically within the valve C¹ is a second mushroom-valve D. This valve engages the seating C⁵ and has a central stem D¹ that extends up into the hollow stem C² of the valve C. The stem

D¹ has a head D² conveniently formed of a screw entered into the end of the stem and this head is larger than the stem. A coiled spring D³ surrounds the stem D¹ and operates against the underside of the head D² and the closed end C⁶ of the hollow stem C².

The valve end of the induction pipe is conveniently spread and made ring-shaped as at F so that it can lie upon the flange B⁶ and be clamped against this and the plate B³ of the casing B by a ring-nut F¹. Similarly the exhaust pipe G is conveniently spread and made to take the form of a ring or eye G¹ which is clamped between a flange A² on the cylinder and the flange B⁶ of the casing B when the casing is screwed into place. The particular method of securing the induction and exhaust pipes forms no part of the present invention.

It will be seen that this concentric arrangement of valves is very convenient as the whole is compact and being all carried by the casing B can be readily screwed into place as a single unit. The valve C¹ is mechanically operated by mechanism not shown and controls the conduit G by preventing the escape of the gases in the cylinder thereto when closed and by permitting the exhaust gases to escape between it and the seating B² when opened, whence they pass through the ports B⁷ into the ring-shaped portion G¹ of the conduit and finally to the conduit itself. Similarly the valve D controls the induction conduit F, the gases being permitted to enter the cylinder A only when the valve is opened by suction against the action of its spring D³. The gases then traverse the ports B⁵ of the sleeve and enter the cylinder between the seating C⁵ of the valve C¹ and the opposing portion of the valve D.

It will be seen that the allotment of each valve to the conduit it is intended to control, is effected by placing the ports B⁵, B⁸ in two different planes and situating the valve seating B² between the ports B⁵ and the cylinder of the engine, the cylindrical portion of the sleeve C with its enlargement C¹ being made to slide in and extend through that part of the casing B which lies between the ports B⁵ and B⁸.

What I claim as my invention and desire to secure by Letters Patent is:—

1. The combination with a combustion engine cylinder, of an inlet and an exhaust valve; a cylinder casing closed at one end by

a plate (B³) and shaped at the other end (B¹) for securing in a socket in the cylinder wall, said casing being further provided with a transverse flange (B⁶) which extends inwardly from the cylindrical casing to constitute a guide for the exhaust valve and outwardly in a plane opposed to that part of the wall of the cylinder in which the socket for the casing is provided, the wall of the casing being perforated on both sides of the flange (B⁶); said exhaust valve providing a valve seat for the inlet valve, and an annular plate (G¹) gripped between this outwardly directed portion of the said flange (B⁶) and the cylinder wall, substantially as and for the purpose described.

2. The combination with a combustion engine cylinder, of an inlet and an exhaust valve; a cylinder casing closed at one end by a plate (B³) and shaped at the other end (B¹) for securing in a socket in the cylinder wall, said casing being further provided with a transverse flange (B⁶) which extends inwardly from the cylindrical casing to constitute a guide for the exhaust valve and outwardly in a plane opposed to that part of the wall of the cylinder in which the socket for the casing is provided, the wall of the casing being perforated on both sides of the flange (B⁶), said exhaust valve constructed to provide a seat for the inlet valve, an annular cover plate (F) supported at one edge of the transverse flange (B⁶) and

at the other edge on the outer closing plate (B³), and means for holding the said annular plate in position, substantially as described.

3. The combination with a combustion engine cylinder, of an inlet and an exhaust valve; a cylinder casing closed at one end by a plate (B³) and shaped at the other end (B¹) for securing in a socket in the cylinder wall, said casing being further provided with a transverse flange (B⁶) which extends inwardly from the cylindrical casing and outwardly in a plane opposed to that part of the wall of the cylinder in which the socket for the casing is provided, the wall of the casing being perforated on both sides of the flange (B⁶), said exhaust valve constructed to provide a seat for the inlet valve; resilient connections between said valves, an annular cover plate (F), and a ring (F¹) screwed on the outside of the closing plate (B³) engaging said annular cover plate and holding it in position, substantially as described.

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

CHARLES BENJAMIN REDRUP.

Witnesses:

A. M. HAYWARD,
HARRY B. BRIDGES.