

PATENT SPECIFICATION



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481,933

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COMPLETE SPECIFICATION

Improvements in Rotary Valve Internal Combustion or other Engines or Pumps

I, ROLAND CLAUDE CROSS, a British subject, of 33, Midford Road, Combe Down, Bath, Somerset, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to rotary valve internal combustion or other engines or pumps, of the kind including a two part housing for the valve and wherein the pressure in the engine cylinder is utilized for loading the housing parts in their application to the valve member with a view to providing a fluid tight seal therebetween.

In this Specification the term "floating" denotes that the member so described is yieldable in relation to other parts so as to be capable of transmitting varying pressures applied thereto to another member contacting therewith, whether the said floating member be actually displaced or not. The term "stationary" where applied to a part denotes that that part is not floating in the above sense. Further, for simplicity, it will be assumed that the engine cylinder is vertically disposed and the rotary valve is mounted at the upper part thereof. Where the arrangement differs the correspondence of parts will be obvious to those skilled in the art.

In my prior Specifications Nos. 451,917 and 467,620 arrangements of the aforesaid kind are described and illustrated, wherein both housing members float, the lower housing member being fixed to and floating with the cylinder, and the cylinder pressure is applied to the lower housing member, part of said pressure being transmitted from said lower housing member to the upper housing member through a reducing lever system, so that the pressure exerted upon the valve by the housing members is less than the cylinder pressure.

Further, in my prior Specification No. 474,521 an embodiment of the arrangement according to my previously mentioned Specifications is described, wherein the lower housing member is yieldingly

mounted in or on the cylinder.

According to the present invention, in a rotary valve internal combustion or other engine or pump, including floating lower and upper valve housing members, wherein the pressure in the cylinder is applied to the lower housing member and part of said pressure is transmitted from said lower member to the upper member through a reducing lever system, the rotary valve and both the lower and upper housing members therefor are mounted entirely within the cylinder. Preferably, the cylinder is closed at the top by a cover plate, which entirely conceals the valve mechanism.

An embodiment of the invention is illustrated by way of example in the accompanying drawing, in axial sectional view, in conjunction with an internal combustion engine.

Referring to the drawing, the rotary valve 1, the upper housing member 2 and the lower housing member 3 are mounted entirely within the cylinder 4, which is closed at the top by a cover plate 5 secured to the cylinder by means of screw bolts 6. Both housing members 2 and 3 are provided with packing rings 7. The lower housing member 3 is suspended from the cover plate 5 and is applied with initial pressure to the valve 1 by means of springs 8 and tie rods 9. The lower housing member 3 is suitably shaped to receive the cylinder pressure, which is transmitted therefrom through a lateral presser element 10 to the upper housing member 2. The latter is fulcrumed about a semi-spherical projection 11 of the cover plate 5, so that the upper housing member 2 will act as a two armed reducing lever, the leverage of which and consequently the pressure applied thereby to the valve member 1 in relation to the cylinder pressure will depend upon the radial distances apart of the presser element 10 and of the projection 11 from the axis of the cylinder.

It will be unnecessary to describe in any further detail the operation of the engine, as this is common knowledge, also, further information regarding the valve

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loading system of which the present invention forms an embodiment is available in my aforesaid prior Specifications. It will be sufficient to mention that the combustion chamber 12 of the cylinder 4 houses a piston 13 as usual, the cylinder having a tapped bore 14 for the reception of a sparking plug and an oil circulatory system for lubricating and cooling the rotary valve being provided, comprising an inlet 15 and an outlet 16 leading to and from the valve through the lower housing member 3. The oil lubricating and cooling system may conveniently include a scraper 17 and may be generally constructed and arranged according to my prior Specification No. 423,474.

It is to be understood that, when employing the word "cylinder" herein as the enclosing member for the rotary valve and its housings, this includes either a simple extension of the actual cylinder in which the piston operates according to the embodiment illustrated, or an extension thereof which is not co-axial and/or not necessarily of the same diameter.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A rotary valve internal combustion or other engine or pump, including floating lower and upper valve housing members, wherein the pressure in the cylinder is applied to the lower housing member and part of said pressure is transmitted from said lower member to the upper member through a reducing lever

system, characterized in that the rotary valve and both the lower and upper housing members therefor are mounted entirely within the cylinder.

2. A rotary valve internal combustion or other engine or pump according to Claim 1, wherein the lower housing member is suspended from an element mounted at the top of the cylinder and is applied with initial pressure to the valve by means of springs and tie rods or equivalent.

3. A rotary valve internal combustion or other engine or pump according to Claim 2, wherein the element mounted at the top of the cylinder forms a cover plate entirely concealing the valve mechanism.

4. A rotary valve internal combustion or other engine or pump according to Claim 2 or 3, wherein the upper housing member forms a two armed reducing lever, the fulcrum of which is carried by the member mounted at the top of the cylinder.

5. A rotary valve internal combustion or other engine or pump, according to any of the preceding claims, wherein both the upper and lower valve housing members are provided with packing rings for sealing purposes.

6. A rotary valve internal combustion or other engine or pump, substantially as herein described with reference to the accompanying drawing.

Dated this 1st day of December, 1937.
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27, Chancery Lane, London, W.C.2,
Agent for Applicant.

[This Drawing is a reproduction of the Original on a reduced scale.]

