PATENT SPECIFICATION

411,010

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PROVISIONAL SPECIFICATION.

Improvements in Rotary Valves of Internal Combustion Engines and Pumps.

I, ROLAND CLAUDE CROSS, a British subject, of 33, Midford Road, Odd Down, Bath, do hereby declare the nature of this invention to be as follows:—

This invention relates to improvements in rotary valves of internal combustion engines and pumps. It concerns valve bodies formed or provided with ports having springy lips adapted to be pressed on the valve member such as by fluid pressure to provide a seal for preventing leakage of pressure fluid or gases between the valve and its housing wall. For example, in prior specification No. 276,890 there is disclosed a washer located in a valve port recess and having a springy lip; again in my prior specification No. 373,660 there is shown, inter alia, a valve housing fitted with a liner having a lipped port.

As pointed out in my aforesaid prior specification No. 373,660 there are advantages in constructing the springy lip with a continuous edge tending to project into the space occupied by the valve, but normally pressed back by the valve, and thus resiliently contacting with the valve surface permanently during operation independently of fluid pressure.

It has been demonstrated in practice that when an initial springy contact is absent leakage occurs, and the probability is that an equal pressure is built up on both faces of the lip which inevitably leads to a slight clearance, either of a sustained or intermittent nature, between valve and lip; the lip may vibrate, and although the clearance is infinitesimal and possibly of short duration it is nevertheless sufficient to destroy the perfect seal obtainable by a lip resiliently pressed by the valve.

Although for most practical purposes the liner construction of my aforesaid prior invention is necessary, if expense is not of prime importance, as for example when building engines for racing purposes or special jobs, the lip may be machined directly on the valve housing itself. Accordingly the present invention has for its object to construct a valve housing which itself is formed with the springy lip around the port or each port, projecting normally into the valve space and pressed down into intimate resilient contact with the valve when the latter is inserted. The construction is preferably one where the housing is in sections in which case a section of the housing containing the lipped port may be readily removed.

Thus, in one embodiment, the said invention consists of a valve construction comprising a valve member and a valve body, wherein part of the valve body is formed as a separate unit containing a port or ports having resilient lips upturned towards the valve member. The said unit is preferably provided with external cooling means. The invention also includes the separate unit itself which may be supplied and used as a replacement fitting.

By such a construction the lower portion (i.e. the separate unit) of the valve housing may be made of different metal to either a cylinder to which it is attached or the other part or parts of the housing. In the event of a defective port the lower portion only of the housing need be replaced, and in any event the sectional construction affords ease of inspection of the valve and housing.

It is to be understood however that the invention includes one-piece as well as sectional valve housing formed integrally with lipped ports as aforesaid.

Dated this 2nd day of October, 1933.

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Agent for the Applicant.

COMPLETE SPECIFICATION.

Improvements in Rotary Valves of Internal Combustion Engines and Pumps.

I, ROLAND CLAUDE CROSS, a British subject, of 33, Midford Road, Odd Down, Bath, 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 improvements in cylindrical rotary valve constructions for internal combustion engines and pumps, of the type provided with valve housings having ports formed or provided with springy lips adapted to be pressed on the valve member to provide a seal for preventing leakage of pressure fluid or gases between the valve and its housing wall. For example, in prior specification No. 276,890 there is disclosed a washer located in a valve port recess and having a springy lip; again, in my prior specification No. 373,660 there is shown, inter alia, a valve housing fitted with a liner having a lipped port.

As pointed out in my aforesaid prior specification No. 373,660 there are advantages in constructing the springy lip with a continuous edge tending to project into the space occupied by the valve, but normally pressed back by the valve, and thus resiliently contacting with the valve surface permanently during operation independently of fluid pressure.

It has been demonstrated in practice that when an initial springy contact is absent leakage occurs, and the probability is that an equal pressure is built up on both faces of the lip which inevitably leads to a slight clearance, either of a sustained or intermittent nature, between valve and lip; the lip may vibrate, and although the clearance is infinitesimal and possibly of short duration it is nevertheless sufficient to destroy the perfect seal obtainable by a lip resiliently pressed by the valve.

Although for most practical purposes the liner construction of my aforesaid prior invention is necessary, if expense is not of prime importance, as for example, when building engines for racing purposes or special jobs, the lip may be machined directly on the valve housing itself. Accordingly the present invention has for its object to construct a cylindrical valve housing with the springy lip formed integrally on its arcuate face in a continuous and unbroken manner around the port or each port, projecting normally into the valve space and pressed down into intimate resilient contact with the valve when the latter is inserted. The construction is preferably one where the housing is in sections in which case a section of the housing containing the lipped port may be readily removed.

An embodiment is illustrated in the accompanying drawing wherein there is shown a transverse section of a rotary valve housing on top of the cylinder of an internal combustion engine.

In the embodiment, the said invention comprises a valve housing 1, wherein part 2 of the valve housing is formed as a separate unit containing a port or ports 3 having or each having a continuous unbroken resilient lip 4 upturned towards the space to be occupied by the valve member. The said unit is preferably provided with external cooling means. The invention also includes the separate unit 2 itself which may be supplied and used as a replacement fitting.

By such a construction the lower portion (i.e. the separate unit 2) of the valve housing may be made of different metal to either a cylinder 4* to which it is attached or the other part or parts of the housing. In the event of a defective port the lower portion only of the housing need be replaced, and in any event the sectional construction affords ease of inspection of the valve and housing.

With two sections as illustrated flanges 5 may be used as shown so that the parts may be assembled and fixed by bolting or the like.

It is to be understood however that the invention includes one-piece as well as sectional valve housings formed integrally with lipped ports as aforesaid.

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 valve construction for cylindrical rotary valves of internal combustion engines or pumps and of the type set forth characterised in that the port or ports disposed on the arcuate face of the valve housing is or are formed integrally with a continuous unbroken springy lip normally tending to project towards the valve space and resiliently pressed back in use by the valve.

2. A valve construction according to Claim 1 further characterised in that the valve housing is constructed from two or more separate sections assembled and secured together, one of said sections containing the said lipped port.

3. A valve construction according to Claim 2 wherein the section containing the lipped port is made of a metal different from that of the rest of the valve housing.

4. A valve construction according to the preceding Claims 1 and 2, or 3, wherein the part of the valve housing containing the said lipped port is adapted by flanges or equivalent to be detachably interposed between an adjoining part of the valve housing and the cylinder of an internal combustion engine or pump.

5. A valve construction substantially as herein set forth with reference to the accompanying drawings.

Dated this 8th day of February, 1934.

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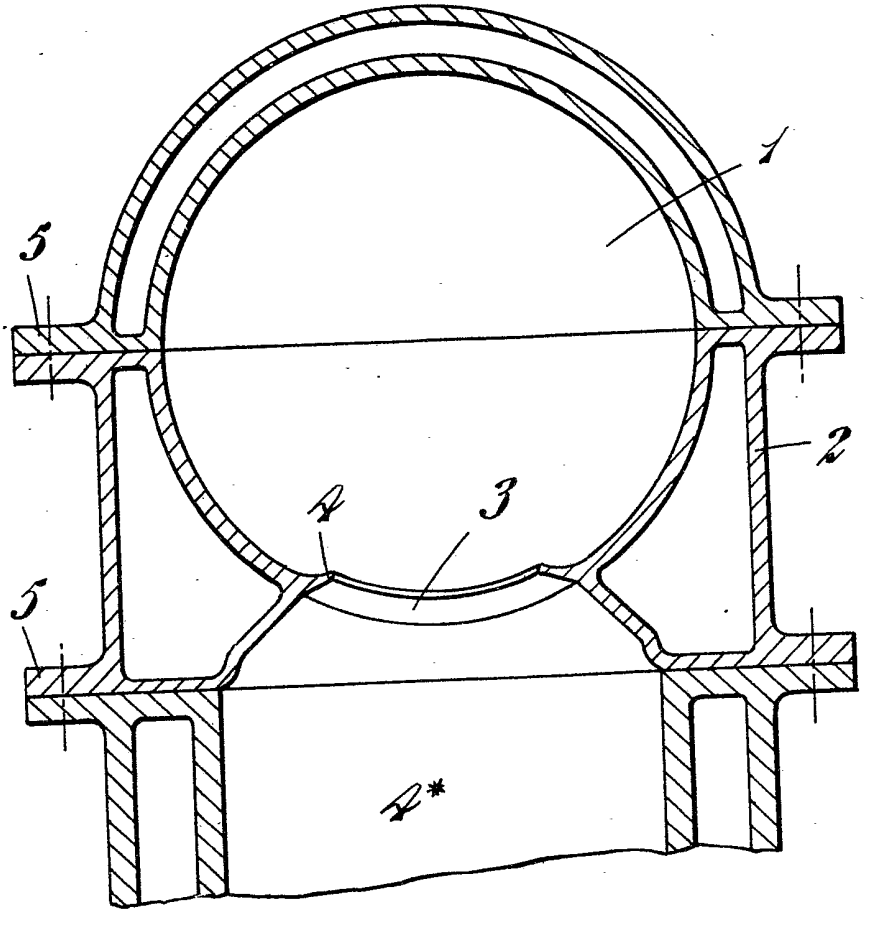

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