

PATENT SPECIFICATION

259,400

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PROVISIONAL SPECIFICATION.

Improvements in and relating to Rotary Valves for Engines, Pumps and the like.

We, ROLAND CLAUDE CROSS, of 199, Wellsway, Bath, and REGINALD LUTHER MUNDAY, of Tyne Villa, Bloomfield Road, Bath, both British subjects, do hereby declare the nature of this invention to be as follows:—

This invention has reference to rotary distributing valves for engines, pumps and the like of the kind employing longitudinally disposed pressure-retaining vanes resiliently mounted in a slot in the cylindrical valve housing. An object of the invention is to provide for the definite longitudinal location of the vane with respect to the valve.

Further, in valves of the type mentioned, there are sometimes employed spring rings at each end of the valve to maintain end pressure, as for instance is described in the specification of our co-pending Application No. 246,687 and another object of the present invention is to ensure that the vanes and rings shall not touch each other, and so to increase the efficiency of the valve.

A further object is so to construct the vanes that whilst they are at all times resiliently pressed outwards on to the valve, they are nevertheless secured against abnormal movement into their slots due to any irregularities, whilst means are provided to definitely locate vane spring longitudinally in the vane slot.

In attaining the above objects we provide that the vane shall come into working contact only between the inner ring on each end of the valve, the face of the vane being recessed to pass by the rings, and only a fine clearance being allowed between the vane and the inner rings aforesaid.

In order that the longitudinal location of the vane and the valve may be main-

tained, we provide that the vane should be located by the valve itself as by means of raised toes or a toe on the vane fitting either into annular grooves in the valve or over the ends of the valves.

Where the toes on the vane engage over the ends of the valve, two toes would be necessary, but where the vane is located by a groove in the periphery of the valve one toe would provide adequate location, but two or more grooves may be provided where it is desirable to reduce wear to a minimum.

It has been found that an irregularity may tend to allow gas pressure to get between the face of the vane and the valve, causing the vane to be pressed downward in its slot against the pressure of the vane spring, thus leaving the valve. To obviate this possibility and to serve the additional purpose of locating the spring under the vane, we provide a toe on each end of the bottom of the vane, the length of such toe being that the face of the vane is in direct line with, or just slightly below the face of the valve housing.

We do not limit ourselves to the exact details of construction, for instance, the toes may not be formed integral with the vane but may be in the form of pegs driven into the vane or loose ball or any similar means.

Dated this 29th day of October, 1925.

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COMPLETE SPECIFICATION.

**Improvements in and relating to Rotary Valves for Engines,
Pumps and the like.**

We, ROLAND CLAUDE CROSS, of 199, Wellsway, Bath, and REGINALD LUTHER MUNDAY, of Tyne Villa, Bloomfield Road, Bath, both British subjects, 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 has reference to rotary distributing valves for engines, pumps and the like of the kind employing longitudinally disposed pressure-retaining vanes resiliently mounted in a slot in the cylindrical valve housing. An object of the invention is to provide for the definite longitudinal location of the vane with respect to the valve.

Further, in valves of the type mentioned, there are sometimes employed spring rings at each end of the valve to maintain end pressure, as for instance is described in the Specification of our co-pending Application No. 246,687, and another object of the present invention is to ensure that the vanes and rings shall not touch each other, and so to increase the efficiency of the valve.

A further object is so to construct the vanes that whilst they are at all times resiliently pressed outwards on to the valve, they are nevertheless secured against abnormal movement into their slots due to any irregularities, whilst means are provided to locate definitely the vane spring longitudinally in the vane slot.

The present invention, with the foregoing in view, consists of the provision of means to prevent the longitudinal displacement of the pressure-retaining vanes in relation to the valve, viz. by employing annular grooves in the valve in which lie members, one for each groove, projecting from the valve-engaging edge of each pressure-retaining vane. In conjunction therewith, the valve-engaging edge of the vane may be recessed to afford a clearance for any valve rings employed.

To house the spring employed to keep the vanes against the valve, we form a recess along the slot-engaging edge of the vanes, in which is located the spring.

The valve portion of an internal combustion engine according to our aforesaid prior application as it would be modified by the present improvements

will be described and illustrated in the accompanying drawings by way of example.

In said drawings:—

Figure 1 is a longitudinal section taken on the inclined plane I—I (Figure 2) through a pressure-retaining vane.

Figure 2 is a transverse section on the line II—II (Figure 1).

Briefly describing the engine (which, however, forms no part of the present invention) 1 is a cylindrical valve chamber, 2 is a port therein leading to the combustion chamber, 3 is the engine cylinder, 4 is the rotary distributing valve, 5 is the division web or partition of the valve (which is not seen in the outside elevation of the valve 4 depicted in Figure 1, but extends diagonally from end to end of the valve), 6 is the valve spindle, 7 and 8 are the exhaust and inlet ports respectively of the valve 4, 9, 9 represent spring rings to maintain end pressure, 10 the longitudinal pressure-retaining vanes mounted in vane slots 11 formed in the valve casing, 12, 12 are springs which tend normally to press the vanes 10 out of their slots on to the cylindrical valve face, and 13 are cooling jackets. The induction pipe is designated by the numeral 14 and the exhaust by 15. Also, as in our previous application, to which the foregoing brief description generally relates 16, 16, indicate helical grooves to maintain the pressure of oil at the middle of the valve.

In attaining the objects hereinbefore set forth we provide that the vane shall come into working contact with the valve only between the inner rings 9 on the ends of the valve 4, the face of the vane being recessed at 17 to pass by the rings, and only a fine clearance being allowed between the vane and the inner ring aforesaid.

In order that the longitudinal location of the vane 10 and the valve 4 may be maintained, we provide that the vane should be located by the valve itself as by means of raised toes 18, 18 or a toe on the vane fitting either into annular grooves 19, 19 in the valve 4 or over the ends of the valves.

Where the toes 18 on the vane 10 engage over the ends of the valve 4, two toes would be necessary, but where the vane is located by a groove such as 19

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in the periphery of the valve one toe would provide adequate location, but two or more grooves may be provided where it is desirable to reduce wear to a minimum; and this form is shown as an example.

It has been found that an irregularity may tend to allow gas pressure to get between the face of the vane and the valve, causing the vane to be pressed downward in its slot 11 against the pressure of the vane spring 12, thus leaving the valve. To obviate this possibility and to serve the additional purpose of locating the spring 12 under the vane, we provide a toe 20 on each end of the bottom of the vane, the length of such toe being such that the face of the vane is flush with, or just slightly below the face of the valve housing.

We do not limit ourselves to the exact details of construction, for instance, the toes 18 and 20 may not be formed integral with the vane but may be in the form of pegs driven into the vane, or loose ball or any similar means, may be employed. In the case of a loose ball, same would partly enter the groove 19, and partly enter a pocket or recess on the vane.

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

1. In rotary distributing valves of the kind set forth the employment of annular grooves in the valve in which lie members, one for each groove, projecting from the valve-engaging edge of each pressure-retaining vane, substantially as described and for the purpose specified.

2. In rotary distributing valves according to Claim 1, the construction wherein the vanes are integrally formed with projecting toes at or near each end which constitute the members engaging the

annular grooves of the valve, substantially as described.

3. In rotary distributing valves cooperating with pressure-retaining vanes as claimed in any of the preceding claims, recessing the valve-engaging edge of the vanes to afford a clearance from the valve rings mounted towards each end of the valve substantially as described.

4. The improvement in and relating to rotary distributing valves of the kind set forth which consists in forming a recess along the inner or slot-engaging edge of the pressure-retaining vanes, between the ends thereof, in which recess is located the spring which normally tends to push the vane against the valve.

5. In rotary distributing valves according to Claims 2 and 4, a pressure-retaining vane having projections one at each end which engage respectively annular grooves formed on the valve, spring rings mounted on said valve between said annular grooves, recesses formed in the vane edge to afford a clearance from said valve rings, said vane also having projections on the edge not facing the valve, the latter projections forming a recess between them in which a vane spring is located substantially as described.

6. Valves and pressure retaining vanes and rings constructed, arranged and operating substantially as herein described with reference to the accompanying drawings.

Dated this 18th day of December, 1925.

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

Fig. 1.

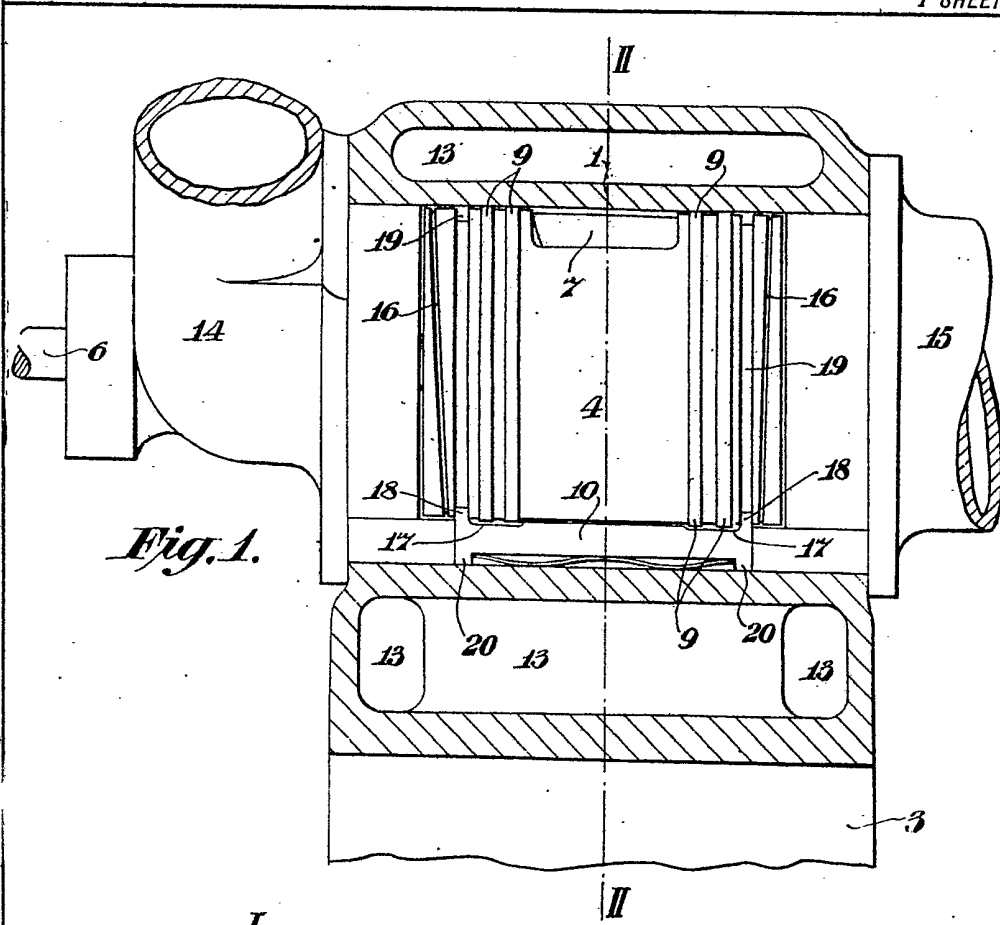


Fig. 2.

