



PATENT SPECIFICATION

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278,566

Complete Accepted: Oct. 13, 1927.

COMPLETE SPECIFICATION.

Improvements in or relating to the Valves of Internal Combustion Engines.

Communication from:—PORTER ENGINE DEVELOPMENT INC., a corporation organized under the laws of the State of New York, United States of America, and having its principal business office at 2, Rector Street, City of New York, State of New York, United States of America, Manufacturers.

I, LEONARD MELLERSH-JACKSON, a subject of the King of Great Britain, of the firm of Haseltine, Lake & Co., Chartered Patent Agents, 28, Southampton Buildings, Chancery Lane, London, W.C. 2, in the County of Middlesex, 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 consists in a novel packing for use in connection with rotary valves for internal combustion engines, which packing prevents leakage around the cylinder port, ensures proper lubrication of the parts, cools the parts and provides sufficient pressure of the packing sealing ring on the valve to obtain a gas tight engagement without too much friction.

It is already known to employ packing rings or obturators consisting of, or having insertions of, oil absorbing material such as felt, or consisting of metal with suitable outlets for oil, which is circulated underneath the ring under pressure so that it passes out to the surface of the packing to lubricate the valve.

Further, I have myself proposed to use an improved packing consisting of a spring pressed sealing ring of self lubricating bearing material preferably metal, saturated with oil. I have, however, discovered that such oil impregnated sealing rings will only keep oil for a limited time so that unless some means are provided for supplying oil to the ring the engine has to be taken down for replacing sealing rings from which the oil is exhausted.

To remove this trouble, according to the present invention, I provide an improved packing consisting of self lubricating bearing material, means being provided for supplying oil thereto to keep the packing oil impregnated and cool the packing.

The following description and drawings illustrate the application of the invention to an internal combustion engine of the rotary valve type, in which the cylinder has a common inlet and discharge port, the valve chest has separate inlet and discharge ports and the valve has a peripheral bridge port located in the same plane as the cylinder and valve chest ports. In this case, as is hereinafter set forth, the ring holder has special features and the oil circulating ducts are so constructed that a particularly efficient packing arrangement is obtained.

In the accompanying drawings:

Fig. 1 represents a detail vertical cross section through so much of an internal combustion engine of the rotary valve type as includes this invention.

Fig. 2 represents an enlarged detail cross section at the cylinder port.

Fig. 3 represents a plan view of the sealing ring holder.

Fig. 4 represents a plan view of the packing advancing spring.

Fig. 5 represents an edge view of the same.

The cylinder is denoted by 1, the combustion chamber by 2 and the cylinder port by 3. The valve 4 is rotatably mounted in the valve chest 5, which rotary valve is provided with a peripheral bridge port 6. The valve chest is also provided with a motive fluid inlet port 7 and an exhaust port 8 leading respectively to and from the face of the rotary valve 4. The ports 3, 6, 7 and 8 are all located in the same plane.

The cylinder 1 is provided with an annular packing chamber 9 surrounding the cylinder port 3 between the inner and outer walls 10 and 11 and opening to the face of the rotary valve 4. Within

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this chamber 9 is located a packing which surrounds the cylinder port 3. This packing is shown as comprising a sealing ring 12 of oil impregnated self-lubricating bearing material and a holder therefor having an inner side wall 13, an outer side wall 14 and a perforated bottom 15, the holes 16 of which open communication between the oil space at the bottom of the packing chamber and the bottom of the sealing ring 12. Spring means are employed for advancing the packing to hold the sealing ring 12 against the face of the valve, which spring means is herein shown as a radially corrugated spring washer 17 located in the space between the bottom of the packing chamber 9 and the perforated bottom 15 of the sealing ring holder.

Means are provided for circulating lubricating oil through the space between the bottom of the sealing ring holder and the bottom of the packing chamber so that not only may oil be constantly fed to the sealing ring, to be absorbed thereby as required, but also circulated for cooling the packing and the adjacent parts sufficiently to prevent their becoming overheated. This is provided for by the oil inlet passage 18 and the oil outlet passage 19, preferably arranged at points diametrically opposed.

To prevent leakage of the oil or the gas, the inner wall 13 of the sealing ring holder has its top and bottom edges beveled to form thin resilient lips 20, 21 engaging the inner wall of the packing chamber 9, the bottom edge of the outer wall of the hole being also beveled to form a thin resilient lip 22, snugly engaging the outer wall of the said packing chamber. These lips may be slightly sprung so that they will snugly embrace their respective walls to prevent leakage thereby and carbon deposits thereon.

From the above description it will be seen that a packing is provided in which the sealing ring of self-lubricating bearing material may be kept impregnated with oil passing through the perforated bottom of the holder, from the supply which is being circulated through the packing chamber for cooling the parts, the packing advancing spring being at all times immersed in the oil to prolong its life and efficiency. It will also be seen that by providing the sealing ring holder with thin resilient lips which press snugly against the walls of the packing chamber, all liability of leakage past the holder is obviated and carbon deposits prevented on said walls.

Any suitable oil impregnated self-lubricating hard material may be used

for the sealing ring 12, such for instance, as "Genalite" made by the General Electric Company of Schenectady, New York, genalite being a moulded porous material comprising bronze and graphite, so combined that the material will absorb by capillary attraction from 2% to 3% by weight of lubricating oil.

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

1. In an internal combustion engine, a rotary valve having a packing consisting of self lubricating bearing material, and means for supplying oil to the packing to keep it oil impregnated.

2. In an internal combustion engine, a rotary valve according to Claim 1, in which the self lubricating bearing material is metal.

3. In an internal combustion engine, a rotary valve according to Claim 1 or 2, having spring means for holding the packing against the valve.

4. In an internal combustion engine, a rotary valve according to Claim 3, wherein the packing includes a sealing ring of oil impregnated self lubricating bearing material, spring means for holding the sealing ring against the valve, and means for supplying oil to the sealing ring to keep it oil impregnated.

5. In an internal combustion engine, a rotary valve according to Claim 4, having resilient means carried by the ring holder for preventing oil and gas leakage thereby.

6. In an internal combustion engine, a rotary valve, a cylinder having a port and a chamber surrounding it, a packing around said port within said chamber, said packing including a sealing ring of oil impregnated self lubricating bearing material, and a holder therefor, spring means in said chamber for holding the sealing ring against said valve, and means for supplying oil to the sealing ring to keep the ring oil impregnated, said holder having thin resilient lips snugly engaging the side walls of the chamber to prevent oil and gas leakage thereby.

Dated this 31st day of January, 1927.

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15, Park Row, New York, N.Y., U.S.A.,
Agents for the Applicant.

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

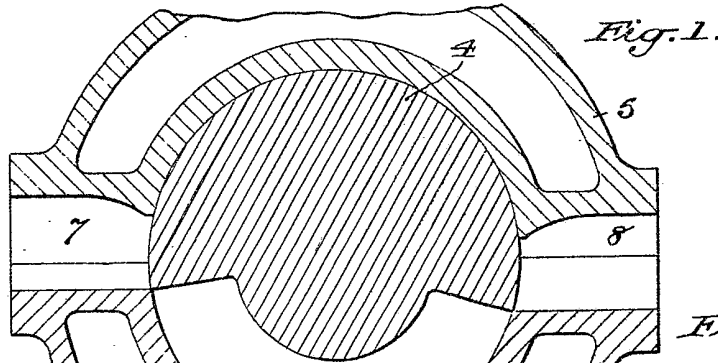


Fig. 1.

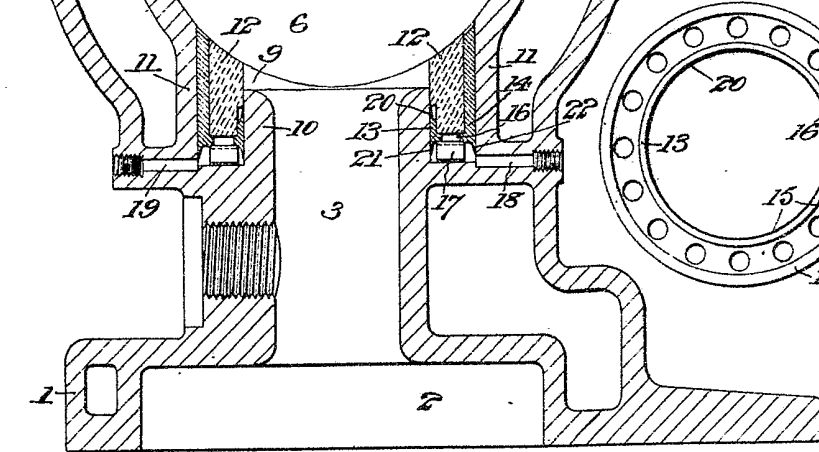


Fig. 2.

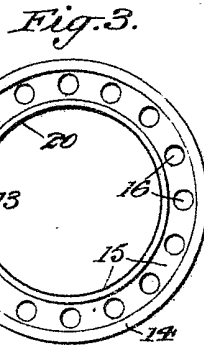


Fig. 3.

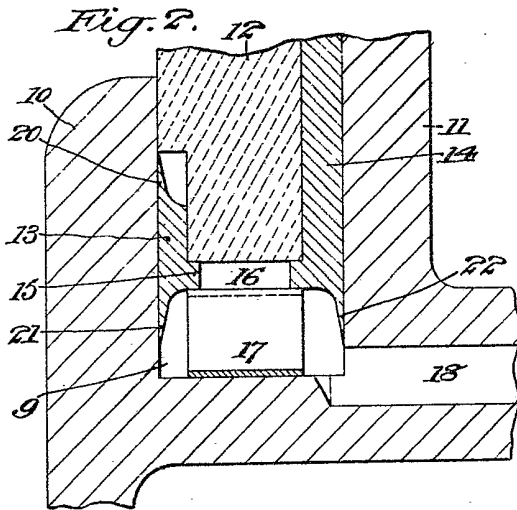


Fig. 4.

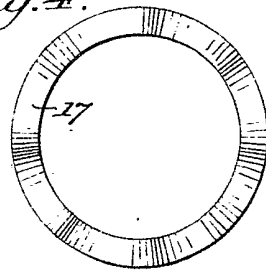


Fig. 5.