F. STOKES.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED APR. 10, 1920.

1,353,289. Patented Sept. 21, 1920.

Fig. 1.

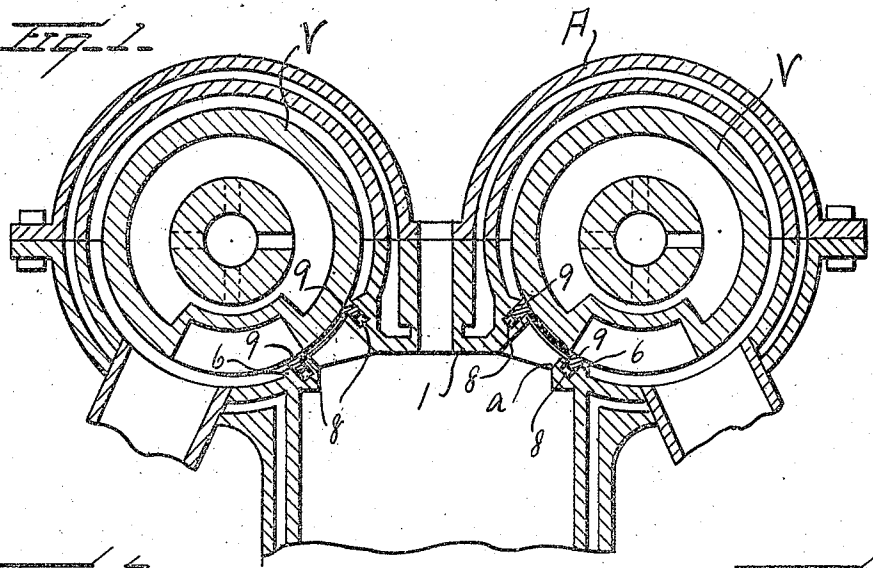


Fig. 2.

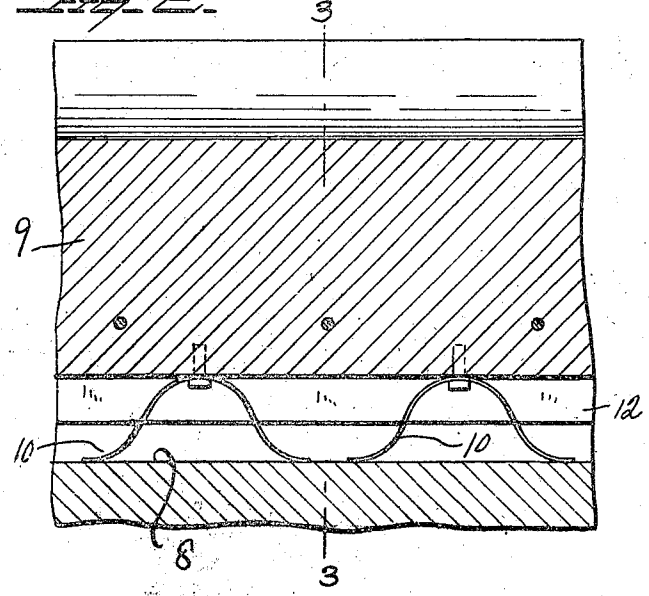


Fig. 3.

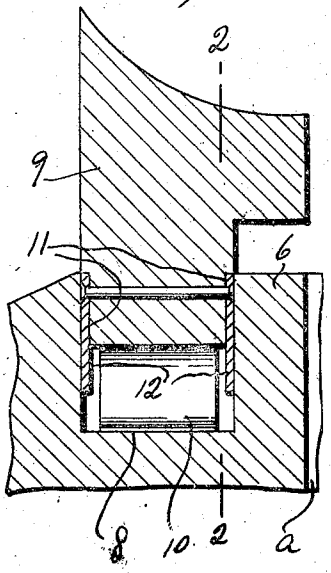
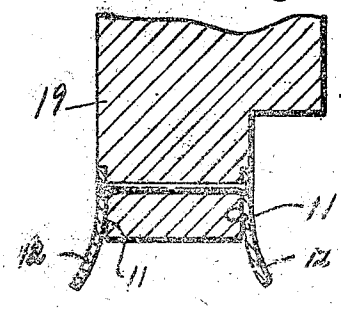


Fig. 4.



Inventor

F. Stokes

By Watson E. Coleman

Attorney

UNITED STATES PATENT OFFICE.

FREMONT STOKES, OF LITTLE ROCK, ARKANSAS.

INTERNAL-COMBUSTION ENGINE.

1,353,289 Specification of Letters Patent. Patented Sept. 21, 1920.

Application filed April 10, 1920. Serial No. 372,867.

To all whom it may concern:

Be it known that I, FREMONT STOKES, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented certain new and useful Improvements in Internal-Combustion Engines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain improvements in internal combustion engines and is an improvement on the structure disclosed in my co-pending application, Serial No. 275,950, filed February 10, 1919, and it is an object of the invention to provide a novel and improved engine of this general type wherein rotary valves are employed for controlling the intake and exhaust ports and wherein each of said ports is substantially defined by a packing coacting with the valve and which packing is yieldingly supported in order to compensate for the expansion of the coacting rotary valve when the motor is in operation.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved engine whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a fragmentary sectional view taken through an internal combustion engine illustrating an embodiment of my invention;

Fig. 2 is an enlarged fragmentary longitudinal sectional view, illustrating in detail the means for constantly urging the packing member outwardly;

Fig. 3 is a sectional view taken substantionally on the line 3—3 of Fig. 2; and

Fig. 4 is a fragmentary sectional view of the packing member before applied.

As disclosed in the accompanying drawings, C denotes a cylinder comprised in an internal combustion engine and which has in communication therewith through the head 1 thereof a port *a* which may constitute either an intake port or an exhaust port. The port *a* is in communication with a casing A and in which is arranged a rotatable valve V. As the foregoing elements are particularly disclosed in my co-pending application, Serial No. 275,950, hereinbefore referred to, a detailed explanation and description is believed to be unnecessary. The port *a* is defined by a lip 6 extending inwardly of the casing A. The lip 6 is provided in its outer face with a continuous channel or groove 8 adapted to receive the packing member 9. The packing member 9 has direct contact with the periphery of the valve V and said member 9 is constantly urged in a direction toward the valve V through the instrumentality of the spring 10 of requisite tension. As herein disclosed, each of the springs is of a bow-type having its central portion secured to the inner face of the member 9 with its extremities bearing against the base wall of the channel 8. The packing member 9 readily yields or moves inwardly of the groove 8 as the valve V expands during the operation of the motor whereby no hindrance or obstruction is offered to the requisite rotation of the valve V. The member 9 also operates to prevent leakage and also compensates for wear thereupon. The member 9 fits loosely within the channel or groove 8 and the outer portion of said member 9 normally projects beyond the lip 6. The extended portion of the member 9 is of increased transverse diameter so that the greater bearing surface will be provided for contact with the periphery of the valve V. As the member 9 fits loosely within the groove or channel 8 there would ordinarily be a leakage of gas therearound on the compression stroke but in order to avoid this leakage the inserted portion of the member 9 is provided in its side faces with the rabbets 11 in which are secured the marginal portions of the spring strips or plates 12 of a width to extend inwardly of or beyond the inserted face of the member 9. Initially, each of the strips or plates 12 is curved in cross section with said curvature disposed in a direction away from the member 9. However, when the member 9 is inserted within the groove or channel 8, said strips or plates 12 are pressed inwardly to substantially a straight position so that the same constantly have close contact with the side walls of the channel or groove 8 and thereby provide an

effectual seal to prevent leakage of gas under compression. It is also to be noted that the outer faces of the strips or plates 12 when the member 9 is applied are substantially flush with the adjacent faces of said member 9.

From the foregoing description, it is thought to be obvious that an engine constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof, and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:—

1. An engine of the character described comprising, in combination, a cylinder, a casing provided with a port in communication with the cylinder, said casing being provided with an inwardly directed lip substantially defining the port, a rotary valve mounted within the casing, the outer face of the lip being provided with a channel, a packing member arranged within the channel, yieldable means for constantly urging the packing member toward the valve for contact therewith, and means coacting with the opposed side faces of the channel and the packing member to effect a seal therebetween, said means comprising spring plates carried by certain of said faces and contacting with the remainder of the faces.

2. An engine of the character described comprising, in combination, a cylinder, a casing provided with a port in communication with the cylinder, said casing being provided with an inwardly directed lip substantially defining the port, a rotary valve mounted within the casing, the outer face of the lip being provided with a channel, a packing member arranged within the channel, yieldable means for constantly urging the packing member toward the valve for contact therewith, and spring plates secured to the portions of the side faces of the packing member within the channel and extending beyond the inner face of said member, said extended portions of the plate being in close contact with the side walls of the channel.

3. An engine of the character described comprising, in combination, a cylinder, a casing provided with a port in communication with the cylinder, said casing being provided with an inwardly directed lip substantially defining the port, a rotary valve mounted within the casing, the outer face of the lip being provided with a channel, a packing member arranged within the channel, yieldable means for constantly urging the packing member toward the valve for contact therewith, and means coacting with the opposed side faces of the channel and the packing member to effect a seal therebetween, the means for constantly urging the packing member into contact with the valve comprising a plurality of springs secured to the inner face of the packing member, each of said springs being bowed with their extremities in contact with the base of the channel.

In testimony whereof I hereunto affix my signature.

FREMONT STOKES.