A. DICKERSON.

ROTARY VALVE.

APPLICATION FILED FEB. 15, 1921.

1,414,692. **Patented May 2, 1922.**

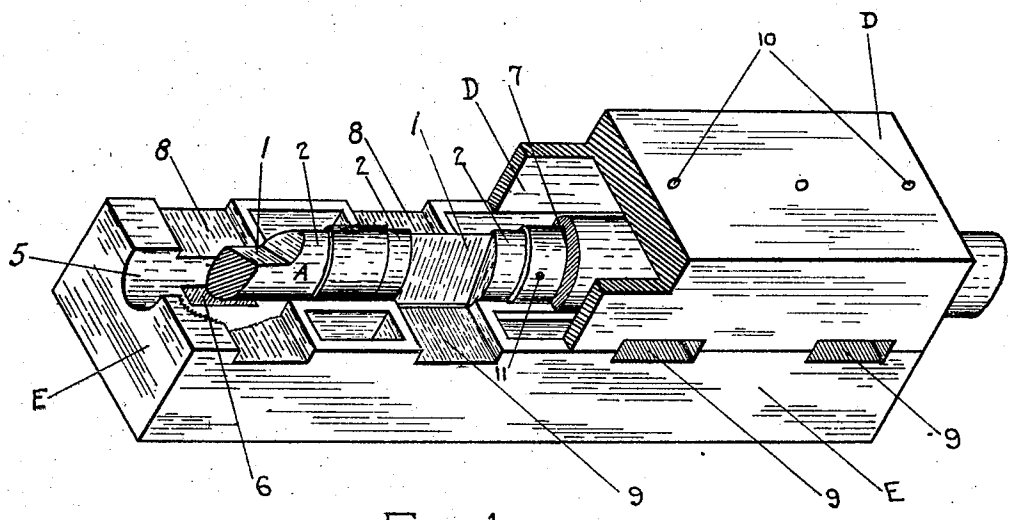


FIG. 1.

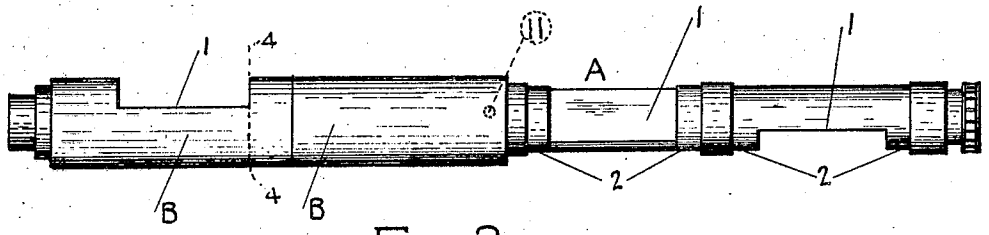


FIG. 2.

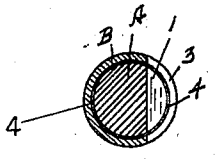


FIG. 4.

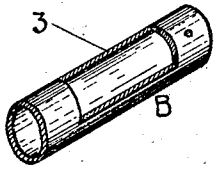


FIG. 3.

Arthur Dickerson

INVENTOR

BY J. M. Thomas

ATTORNEY

UNITED STATES PATENT OFFICE.

ARTHUR DICKERSON, OF SALT LAKE CITY, UTAH, ASSIGNOR TO DICKERSON ENGINE COMPANY, OF SALT LAKE CITY, UTAH, A CORPORATION.

ROTARY VALVE.

1,414,692. Specification of Letters Patent. Patented May 2, 1922.

Application filed February 15, 1921. Serial No. 445,219.

To all whom it may concern:

Be it known that I, ARTHUR DICKERSON, a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Rotary Valves, of which the following is a specification.

My invention relates to valves for internal combustion engines, and has for its object to provide a rotary valve stem with ports cut therein and on which are carried packing sleeves with ports cut therein which coact with the ports of said valve stem to allow gas to pass to the cylinders of an engine and exhaust therefrom, and to prevent the expansion and contraction of the valve and its casing due to the heat of the exploded gas in the engine from interfering with the operation of the valve.

These objects I accomplish with the device illustrated in the accompanying drawings in which similar letters and numerals of reference indicate like parts throughout the several views and as described in the specification forming a part of this application and pointed out in the appended claims.

In the drawings in which I have shown a substantial embodiment of my invention, Figure 1 is a view in perspective of the valve casing with the valve in place therein, parts cut away. Figure 2 is a plan view of the valve stem with two of the bearing sleeves thereon and two portions of the valve stem without the sleeves. Figure 3 is a view in perspective of one of the bearing sleeves. Figure 4 is a section on line 4—4 of Figure 2.

In operating the rotary valve patented to me on May 27th, 1919, No. 1,304,744, in connection with an internal combustion engine, I have found that under the extreme expansion of continuous use with heavy loads that the valve will stick or become so expanded as to not act with the rapidity and accuracy required, and to obviate such difficulties I have provided a solid metal valve stem A having segments cut out to form combined ports of ingress and egress 1, one of which ports is provided for each cylinder. The said valve stem has a portion adjacent each of said ports 1 concentrically turned off to less diameter than the main portions of said stem, as shown at 2. Cylindrically shaped sleeve bearings B are secured on said valve stem, and abutting end for end, cover practically all of the circumferential face or periphery of said valve stem, and each of said sleeve bearings has a segment portion cut therefrom in alinement with the said ports 1 of the stem, as shown at 3. The diameter of the bore of each of said sleeve bearings B is the same as the diameter of the uncut portions of said valve stem, thus providing a space 4 between the turned off portions 2 of said stem and the inner face of said sleeve bearings B. The general appearance of the valve of the present invention, which consists of the stem A and bearings sleeves B, is the same as the valve in said prior patent, yet when examined it will be found to have a space between the sleeve bearings and the valve stem adjacent the said ports 1, as shown at 4, which space prevents the expansion of the parts to such an extent as will interfere with the proper functioning of the valve.

I provide a valve case within which the valve is operated consisting of two plates D and E which are bolted together and the bottom plate E is bolted on the upper end of the engine cylinders as a closure therefor. The said plate E is semi-cylindrically recessed throughout its length, as at 5, to form part of the bearing for said valve, and from the bottom of said recess, the ports 6 are cut, which ports exit centrally to the interior of each cylinder. The said plate D is also semi-cylindrically recessed, as at 7, throughout its length to coact with the said recess 5 as a bearing for the said valve. The said plates D and E have the ingress ports 8 cut through their side walls, a portion in each plate, connecting the intake manifold of the engine with the ports 1 of the valve, also on the opposite side from said ports 8 are cut the exhaust ports 9, a portion in each plate, connecting the exhaust manifold of the engine with the said ports 1 of the valve. Lubricating openings 10 are provided in said plate D to admit oil to each end of said sleeve bearings B. The said sleeve bearings are fastened to said stem by the tap screws 11. The operation of the valve is as follows:—with the valve stem A, geared or otherwise connected with the crankshaft of the engine, it will be rotated synchronously with the crank shaft of the engine and timed in unison with the action of the pistons of said engine. The explosive gas will be drawn from the intake manifold of the engine through the respective

ports 8 of the casing and ports 1 of the valve; and as directed by said ports 1 into the cylinder chambers through the respective ports 6. When the gas in any particular cylinder has been fired, the next stroke of its piston will drive the exploded gas out through said port 6, port 1 and the exhaust port 9. The uncut portions of the said sleeve bearings B will act as closures for the respective ports 6 of the plate E of the engine and the heat of the explosions will be directly against the sleeve bearings B, and as the wall of each is comparatively thin the expansion will be limited and the temperature will be absorbed by the valve casings D and E. The space 4 surrounding the valve stem adjacent the ports 1 and 3 will prevent the valve from coming in contact with and overheating said sleeve bearings when the said stem expands under the heat of the explosions. I thus provide a new and novel valve stem coacting with new sleeve bearings to form a new rotary valve for use with internal combustion cylinders. As will be obvious the same space 4 may be provided by counter boring the interior of said sleeve bearings adjacent the ports 3 therein, and having described my invention I desire to secure by Letters Patent and claim:—

1. A rotary valve comprising a valve stem having segments cut therefrom to form ports; other portions of said valve stem adjacent said ports having less diameter than the main portions of said stem; cylindrically shaped bearing sleeves secured on said stem with an interior bore fitting the main portions of said stem and spaced from the portions of said stem having less diameter; with segment ports cut in said sleeve bearing in alinement with the ports of said valve stem.

2. In a rotary valve the combination with a casing having ingress and egress ports therein and centrally bored to form a bearing for a rotary valve; other ports connecting the interior of said casing with the interior of explosion chambers; a valve stem with segment portions cut therefrom and with the portions of said stem adjacent said ports having less diameter than other portions; cylindrical sleeves secured on said valve stem and spaced concentrically from the smaller portions of said stem and closely fitting the other portions thereof; and ports in said sleeves in alinement with the ports in said valve stem.

In testimony whereof I have affixed my signature.

ARTHUR DICKERSON.