H. F. HOLMQUEST.

VALVE FOR GAS ENGINES.

APPLICATION FILED AUG. 27, 1914.

1,147,023.

Patented July 20, 1915.

2 SHEETS—SHEET 1.

Fig. 1

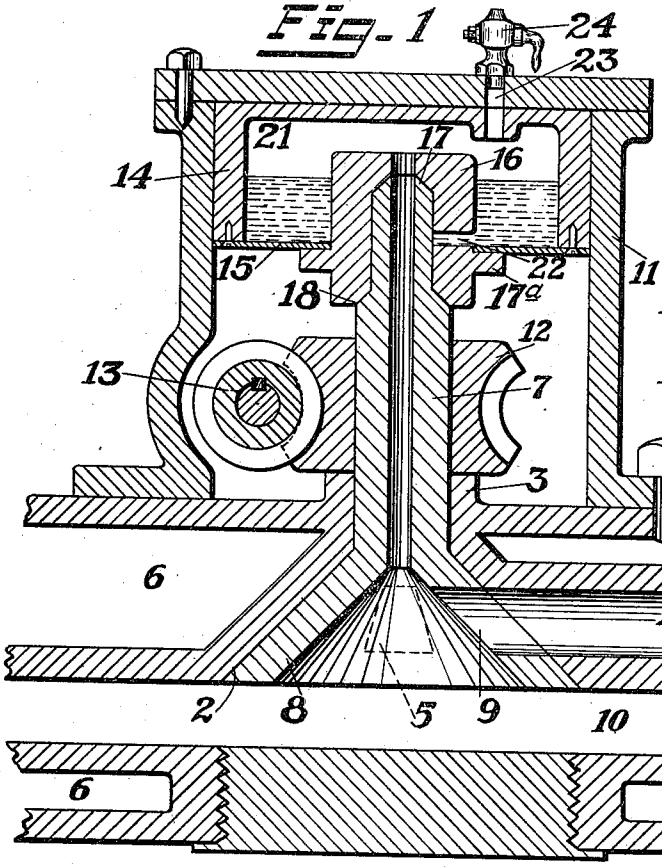
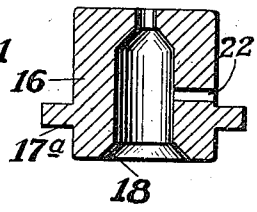


Fig. 5



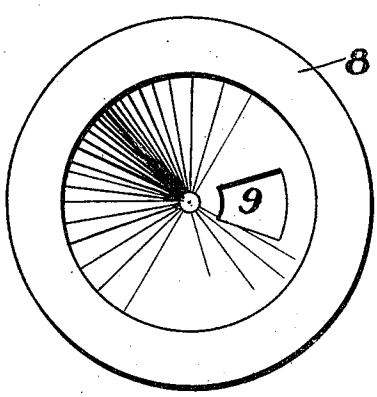


Fig. 3

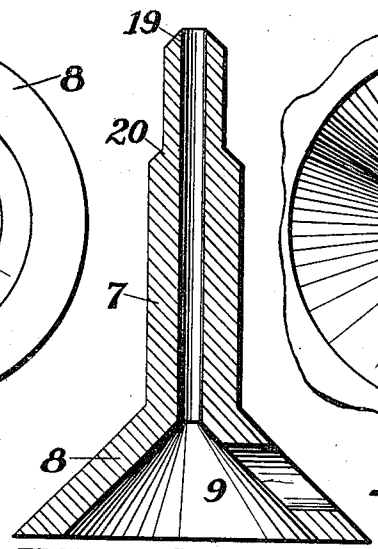


Fig. 2

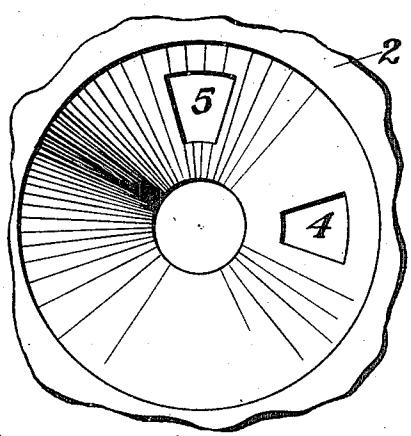


Fig. 4

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2 SHEETS—SHEET 2.

Fig. 6

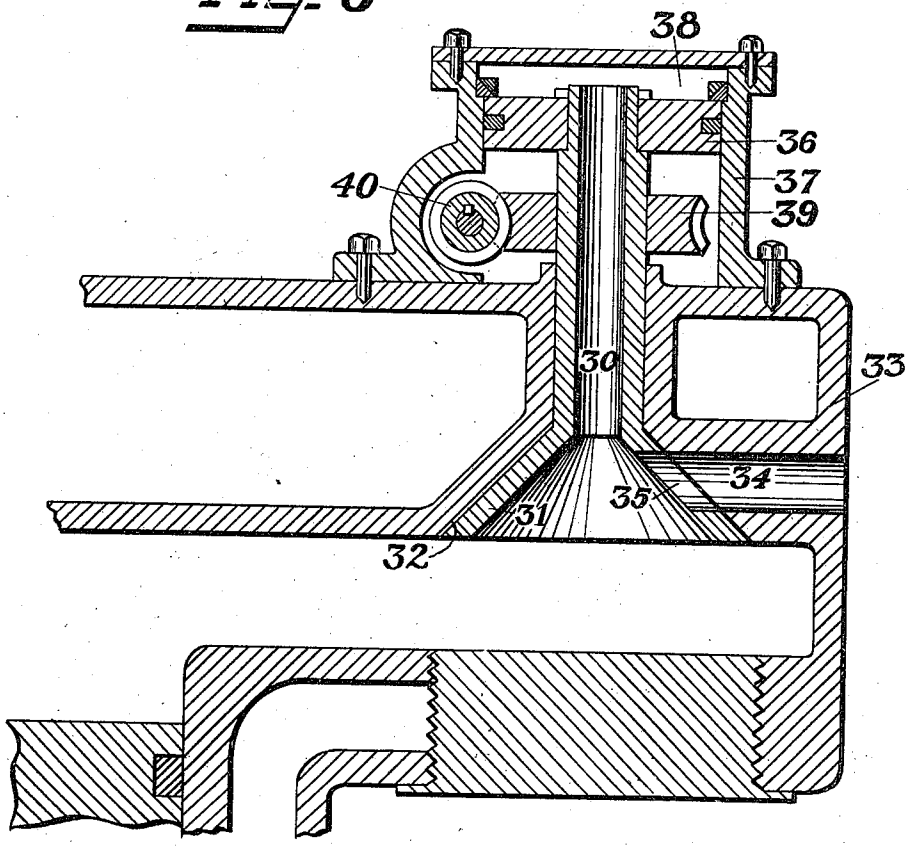
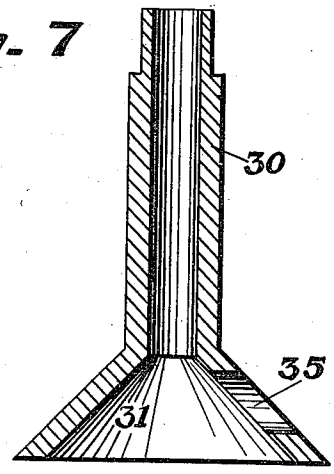


Fig. 7



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UNITED STATES PATENT OFFICE.

HERMAN F. HOLMQUEST, OF LYNBROOK, NEW YORK.

VALVE FOR GAS-ENGINES.

1,147,023. Specification of Letters Patent. Patented July 20, 1915.

Application filed August 27, 1914. Serial No. 858,836.

To all whom it may concern:

Be it known that I, HERMAN F. HOLMQUEST, a citizen of the United States, and a resident of Lynbrook, Long Island, New York, in the county of Nassau and State of New York, have invented certain new and useful Improvements in Valves for Gas-Engines, of which the following is a specification.

The object of the present invention is to provide a form of valve that turns or rotates on its seat, in which the pressure of the fluid that operates the engine, and which presses the valve very tightly against its seat will be to a certain extent counterbalanced or relieved, and which is effected by permitting the same fluid pressure to pass through the valve stem and engage a portion of the valve member.

In the accompanying drawings representing embodiments of my invention, Figure 1 is a section through a portion of an engine at the valve casing. Fig. 2 is a section through the valve member. Fig. 3 is an end view of the valve member. Fig. 4 is a plan view of the casing showing the valve seat. Fig. 5 shows separately the bearing block.

In the construction illustrated, 1 represents the portion of a valve casing of an engine of the explosive type, that is provided with a conical seat portion 2 leading to an outlet 3. This seat portion 2, is provided with one or more ports, and is shown as provided with two ports 4 and 5, at a quadrant's distance removed. These ports are intended to communicate with the inlet and the outlet ports of the engine by suitable pipes or passages. The casing 1 may be provided with the usual chambered portions 6 for a water jacket for cooling purposes.

The valve seat portions 2 and 3 are engaged by a valve member composed of a tubular stem 7 whose bore is open throughout its length, and at one end the stem connects with a conical shell or valve 8 adapted to engage the conical valve seat 2 as shown in Fig. 1; the valve stem 7 fitting in the cylindrical portion 3 of the casing. The valve 8 is provided with one or more ports as may be desired, a single port 9 being shown of a size to register alternately with the ports 4 and 5 of the valve casing, as the valve is turned or rotated. In the usual four-cycle gas engine, this valve would be rotated in a half-timed relation to the crank shaft, and from the position of this port the valve could first register with the port 4 to admit a charge, then rotating clock-wise, make a three-quarter advance before the outlet port 5 is uncovered. Another quarter turn brings it to the other port 4 to complete a revolution. But it will be understood that the arrangement of the ports in the valve and valve seat can be varied to suit the requirements, and forms no essential part of the invention. The other end portion of the valve stem 7 is arranged to coöperate with a disk or plate, that is contained in a suitable casing or chambered member which communicates through the bore of the valve stem with the chamber or passage 10 at the valve seat, so that the fluid pressure may be exerted through the bore 9 of the valve. In the form shown in Fig. 1, I provide a casing 11 surrounding the valve stem, in which at the intermediate portion a gear 12 is secured to the stem 7, and is engaged by a suitable driving member such as a worm 13 that projects into the casing 11, and serves to rotate the valve in the proper timed relation in the operation of the engine.

Inside the casing 11 I provide a chambered member, shown in the form of a cap 14 that is closed by a flexible disk 15. This disk has a central opening into which projects a block 16 having a flange 17ª to limit its entrance through the disk or plate 15. This block is provided with a bore that has two seat portions 17 and 18 of conical form arranged to engage corresponding conical seat portions 19 and 20 on the valve stem 7, portion 19 being at the upper extremity of the valve stem. From Fig. 1 it will be seen that the fluid pressure from the chamber 10 passing through the bore 9 of the valve stem will exert itself in the chamber 21 of the member 14, and will act on the flexible plate 15 to press it, and also the block 16 in the direction of the valve head 8, and hence will exert pressure on the two seat portions 19 and 20 of the valve stem. This pressure will be in the opposite direction to the pressure tending to seat the valve, and therefore will counteract, or to a certain extent, counterbalance the fluid pressure that holds the valve 8 on its conical seat. If desired a port 22 may be formed in the block 16, and a supply of oil may be placed in the chamber 21 of the member 14, to pass through the

opening 22 and lubricate the seats 19 and 20 of the valve. The oil can be admitted through an opening 23 provided with a cock 24.

Having thus described my invention what I claim is:

1. In a rotary engine valve, a casing having a conical valve seat containing one or more ports, a valve member comprising a tubular stem provided with a diverging shell at one end to form a conical valve adapted to engage said valve seat and which is provided with a port that will register with the valve seat port when the valve member is turned, a flexible stationary disk secured to the casing, a stationary bearing block carried by said disk and provided with a bore into which said valve stem extends, a seat portion in the bore of the block, and a seat portion on the valve stem engaging the block seat, whereby the fluid pressure from the valve communicated through the stem will flex the disk to cause the block to press the valve stem to counteract pressure on the valve.

2. In a rotary engine valve, a casing having a conical valve seat containing one or more ports, a valve member comprising a tubular stem provided with a diverging shell at one end forming a conical valve adapted to engage said seat and which is provided with a port that will register with the valve seat port when the valve member is turned, said casing inclosing the other end of the valve stem, a closed chambered member fixed in said casing having secured at one side a flexible apertured plate, a block located in the plate aperture and provided with a bore containing one or more seat portions into which said valve stem projects, the valve stem having one or more seat portions engaging the seat portions of the block, whereby fluid pressure from the valve shell acting through the stem and block will flex said plate to cause the block to press on the valve stem to counteract the fluid pressure on the valve shell.

3. In a rotary engine valve, a casing having a conical valve seat containing one or more ports, a valve member comprising a tubular stem provided with a diverging shell at one end forming a conical valve adapted to engage said seat and which is provided with a port that will register with the valve seat port when the valve member is turned, said casing inclosing the other end of the valve stem, a closed chambered member fixed in said casing having secured at one side a flexible apertured plate, a block located in the plate aperture and provided with a bore containing one or more seat portions into which said valve stem projects, the valve stem having one or more seat portions engaging the seat portions of the block, whereby fluid pressure from the valve shell acting through the stem and block will flex said plate to cause the block to press on the valve stem to counteract the fluid pressure on the valve shell, said block having a lateral port arranged to admit oil to its bore adjacent the said seat portion.

4. In a rotary engine valve, a casing having a conical valve seat containing one or more ports, a valve member comprising a tubular stem provided with a diverging shell at one end forming a conical valve adapted to engage said seat and which is provided with a port that will register with the valve seat port when the valve member is turned, said casing inclosing the other end of the valve stem, a closed chambered member fixed in said casing having secured at one side a flexible apertured plate, a block located in the plate aperture and provided with a bore containing one or more seat portions into which said valve stem projects, the valve stem having one or more seat portions engaging the seat portions of the block, whereby fluid pressure from the valve shell acting through the stem and block will flex said plate to cause the block to press on the valve stem to counteract the fluid pressure on the valve shell, a gear on said valve stem at the intermediate portion, and a driving member extending into the casing to engage the gear and turn the valve.

HERMAN F. HOLMQUEST.

Witnesses:
CHAS. W. LA RUE,
CAROL M. ROMAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

Correction in Letters Patent No. 1,147,023.

It is hereby certified that in Letters Patent No. 1,147,023, granted July 20, 1915, upon the application of Herman F. Holmquest, of Lynbrook, New York, for an improvement in "Valves for Gas-Engines," an error appears requiring correction as follows: Strike out sheet 2, of the drawings, containing figures 6 and 7; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 7th day of September, A. D., 1915.

[SEAL.]

J. T. NEWTON,

Acting Commissioner of Patents.