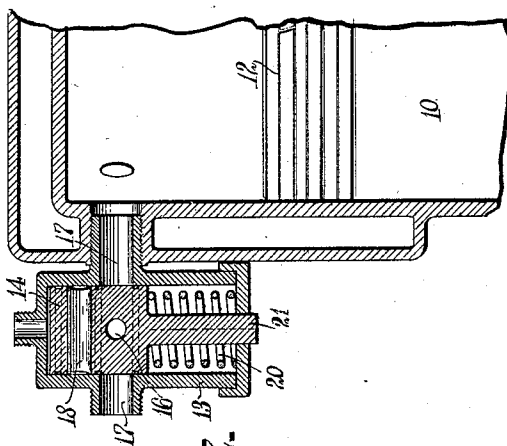
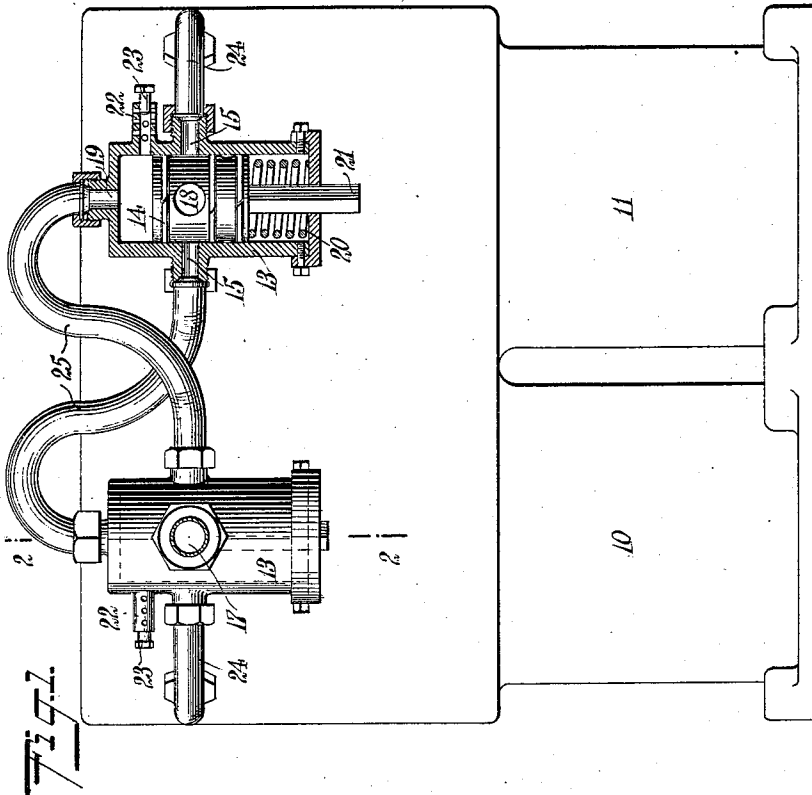


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VALVE FOR MOTORS.
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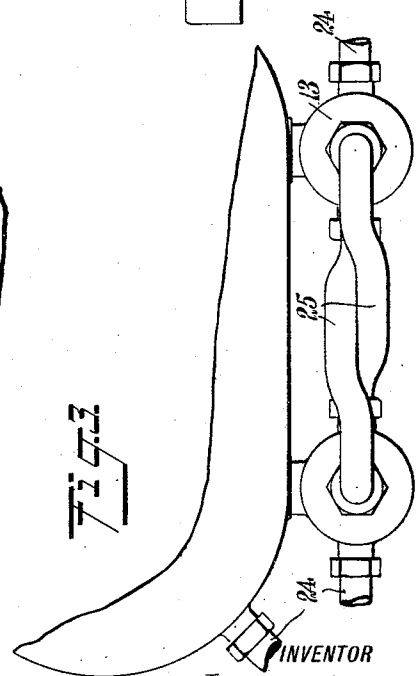
1,008,687.

Patented Nov. 14, 1911.

2 SHEETS—SHEET 1.



WITNESSES:
Benedict J. [Signature]
C. W. Fairbank



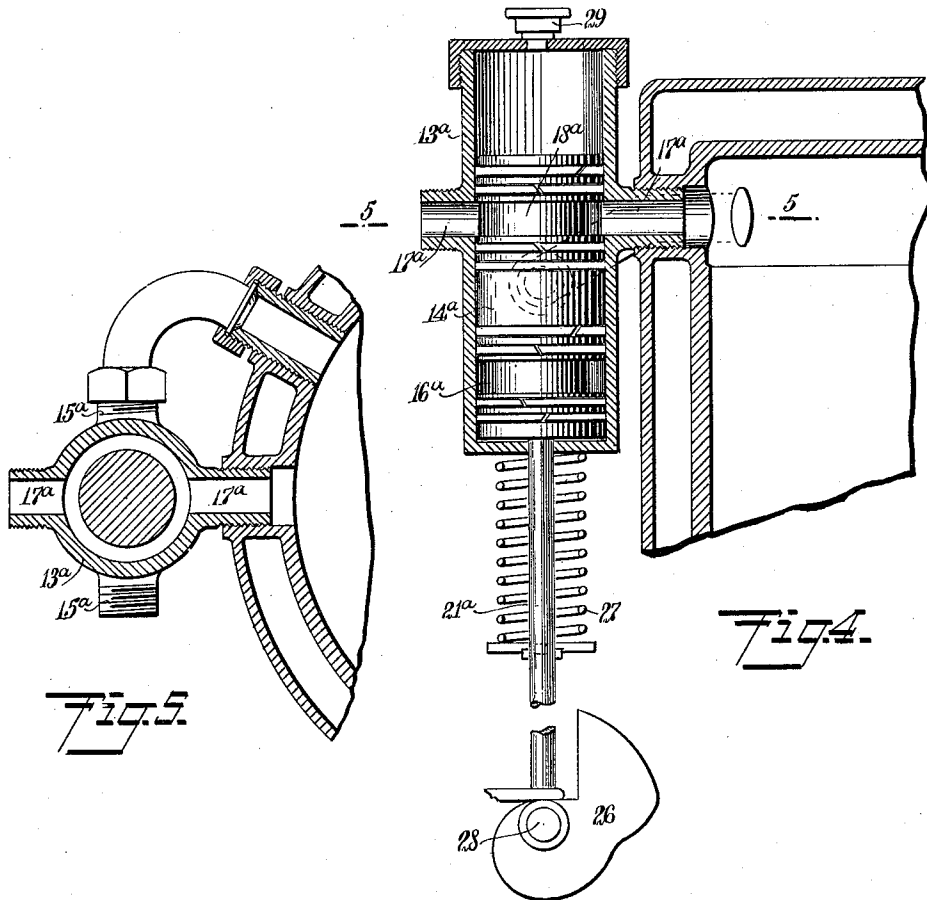
INVENTOR
Jean Marie Barbé
BY *Munroe*
ATTORNEYS

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INVENTOR
Jean Marie Barbé
BY *Munsco*
ATTORNEYS

UNITED STATES PATENT OFFICE.

JEAN MARIE BARBÉ, OF NEW YORK, N. Y.

VALVE FOR MOTORS.

1,008,687.

Specification of Letters Patent.

Patented Nov. 14, 1911.

Application filed July 9, 1910. Serial No. 571,111.

To all whom it may concern:

Be it known that I, JEAN MARIE BARBÉ, a citizen of the Republic of France, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Valve for Motors, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in valve mechanism for controlling the admission and escape of fluid from the cylinders of compressed air engines, steam engines, internal combustion engines or the like.

My improved valve is in the form of a piston movable lengthwise of a small corresponding cylinder, the piston being provided with passages, which are brought into and out of communication with the supply and exhaust ports of the engine cylinder at the proper time during the reciprocation of the engine piston. Both the inlet port and the exhaust port of the engine cylinder communicate with the valve cylinder or casing, and means are provided for reciprocating the valve piston, so as to permit the admission of gas or air to the engine cylinder and the escape of the exhaust gas. The mechanism for reciprocating the valve piston may involve mechanical connections with the main shaft of the engine, or may include fluid pressure means.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which—

Figure 1 is a side elevation of a two-cylinder engine provided with my improved valve mechanism, one of the valves having its casing shown in section; Fig. 2 is a longitudinal section taken on the line 2—2 of Fig. 1; Fig. 3 is a top plan view of a portion of the mechanism shown in Fig. 1; Fig. 4 is a longitudinal section through a portion of a single cylinder in which the valve piston is mechanically reciprocated; and Fig. 5 is a transverse section on the line 5—5 of Fig. 4.

The specific construction illustrated in Figs. 1, 2 and 3, is especially adapted for multiple cylinder engines, and is so constructed that the exhaust gas escaping from one engine cylinder may be utilized for operating the valve of another engine cylinder. The mechanism is operative with only two

cylinders, and, therefore, I have only illustrated two cylinders in the accompanying drawings, but it is evident that a larger number of engine cylinders might be employed if desired. The two engine cylinders 10 and 11, are illustrated as being mounted side by side, and provided with a water jacket common to both. Within each engine cylinder is a corresponding piston 12, but the details of construction of the engine cylinder and piston constitute no portion of my invention, and a detailed illustration or description of such parts is unnecessary. Secured to the side of each cylinder or mounted adjacent thereto, is a valve cylinder or casing 13, having a piston 14 therein. At diametrically opposite points in the wall of the cylinder, there are two ports 15, 15, which may communicate with each other through a passage 16 in the piston 14, when the latter is in one predetermined position. At two other points in the wall of the cylinder, are ports 17, 17, which may communicate with each other through a passage 18 in the piston 14, when the said piston is in a second predetermined position. As illustrated, the ports 15 and 17 are all in the same transverse plane, although this is not at all necessary. The passages 16 and 18 are out of communication with each other, and are so disposed that gas may flow through one but is prevented from flowing through the other. In one cylinder head, there is a port 19, through which gas may be delivered to the valve cylinder or casing, and against one end or face of the valve piston. Within the opposite end of the valve casing or cylinder, is a coil spring 20, normally tending to force the piston toward the port 19, and there is also a stem 21 which may slide through the cylinder head and prevent a rotation of the valve piston in respect to the casing. At the end of the valve cylinder, adjacent the inlet port 19, is a tubular boss 22 having a series of perforations therethrough, and a plug 23 for closing the outer end of the boss. With this plug forced inwardly to its limiting inward position, all of the perforations in the boss will be closed and gas cannot escape through said boss. By varying the positions of the plug, the number of open perforations may be controlled and the freedom of the escape of gas also controlled.

In connecting up the valve casing with the engine cylinders, one of the ports 17 is

connected to the interior of the engine cylinder, so as to form an inlet port for the latter, and the other port 17 is adapted to be connected to a suitable source of supply of motive fluid. One of the ports 15 is connected by a pipe 24 with the exhaust port of the engine, and the other port 15 is connected by a pipe 25 with the port 19 of the other valve casing.

The operation of this form of the device is as follows: With the parts in the position indicated in Figs. 1 and 2, the engine piston in the cylinder 11 will be traveling downwardly under the pressure of the motive fluid entering the ports 17, 17 and the passage 18. The piston valve 14 connected with the engine cylinder 11 will be kept down by the pressure of the exhaust gas from the engine cylinder 10, which is at this time moving upwardly. When the piston in the cylinder 11 reaches the lower end of its stroke, the piston in the cylinder 10 will have reached the opposite end of its stroke and the exhaust from the engine cylinder 10 will be completed. The valve piston 14 of the engine cylinder 11 may then move so as to close the inlet and open the outlet. The return of the piston forces the gas out through the outlet to the valve piston of the other engine cylinder, which is thus opened to permit the entrance of more motive fluid. This form is not adapted for use with internal combustion engines, but only with engines employing motive fluid under pressure.

Instead of operating the valve piston automatically, I may operate it mechanically, as shown in Figs. 4 and 5. This form is especially adapted for internal combustion engines, and involves a valve cylinder 13^a and a valve piston 14^a. Instead of delivering gas to the end of the valve cylinder, I provide the valve piston with a stem 21^a, normally pressed against a cam 26 by a coil spring 27. The valve cylinder has ports 17^a, 17^a, through which the charge may be delivered to the engine cylinder, and ports 15^a, 15^a through which the exhaust gas may flow. These two sets of ports are not in the same transverse plane, and the piston 14^a is provided with annular passages 16^a and 18^a, one of which connects the two ports 17^a, 17^a, and the other of which may at a different time, connect the ports 15^a, 15^a. The cam 26 is mounted on a two-to-one shaft 28, and is of such form that it may permit the piston 14^a to move to one limiting position, as shown in Fig. 4, so as to permit of the inflow of gas through the ports 17^a. The piston retains about this position for approximately a quarter of a revolution of the

shaft, after which the piston 14^a is raised to bring the passage 18^a out of communication with the ports 17^a, but not to a sufficient extent to bring the passage 16^a into communication with the ports 15^a. The piston remains in this position through approximately one-half of a revolution of the two-to-one shaft, that is, during the compression and explosion strokes of the engine piston, and the piston is then forced upwardly to a third and limiting position to bring the passage 16^a into communication with the ports 15^a, 15^a. The valve piston is held in this position during the exhaust stroke of the engine piston, and the valve piston is then permitted to suddenly return to the position indicated in Fig. 1, to reopen the inlet and close the exhaust. The cylinder 13^a may have its upper end open to the air, so that there will be no compression of gas, or it may be provided with a port suitably protected to prevent the admission of dust and dirt. There may, if desired, be provided a grease cup 29, by means of which lubricating oil may be delivered to the valve cylinder to lubricate the valve piston.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. An engine having two cylinders each provided with an inlet and an exhaust, a valve cylinder for each of said engine cylinders and connected to said inlet and said exhaust of the same, a piston within each of said valve cylinders, and serving to control said inlet and said exhaust, and a conduit leading from the exhaust port of one valve cylinder to the other valve cylinder to introduce fluid pressure at the end thereof, to operate the piston in the latter valve cylinder.

2. An engine having two cylinders, each provided with an inlet and an exhaust, a valve cylinder for each of said engine cylinders and connected to said inlet and said exhaust of the same, a piston within each of said valve cylinders, and serving to control said inlet and said exhaust, a conduit leading from the exhaust port of one of said valve cylinders to the end of the other of said valve cylinders, to operate the piston in the latter, and springs for resisting the movements of said valve pistons in predetermined directions.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JEAN MARIE BARBÉ.

Witnesses:

C. W. FAIRBANKS,

PHILIP D. ROLLHAUS.