

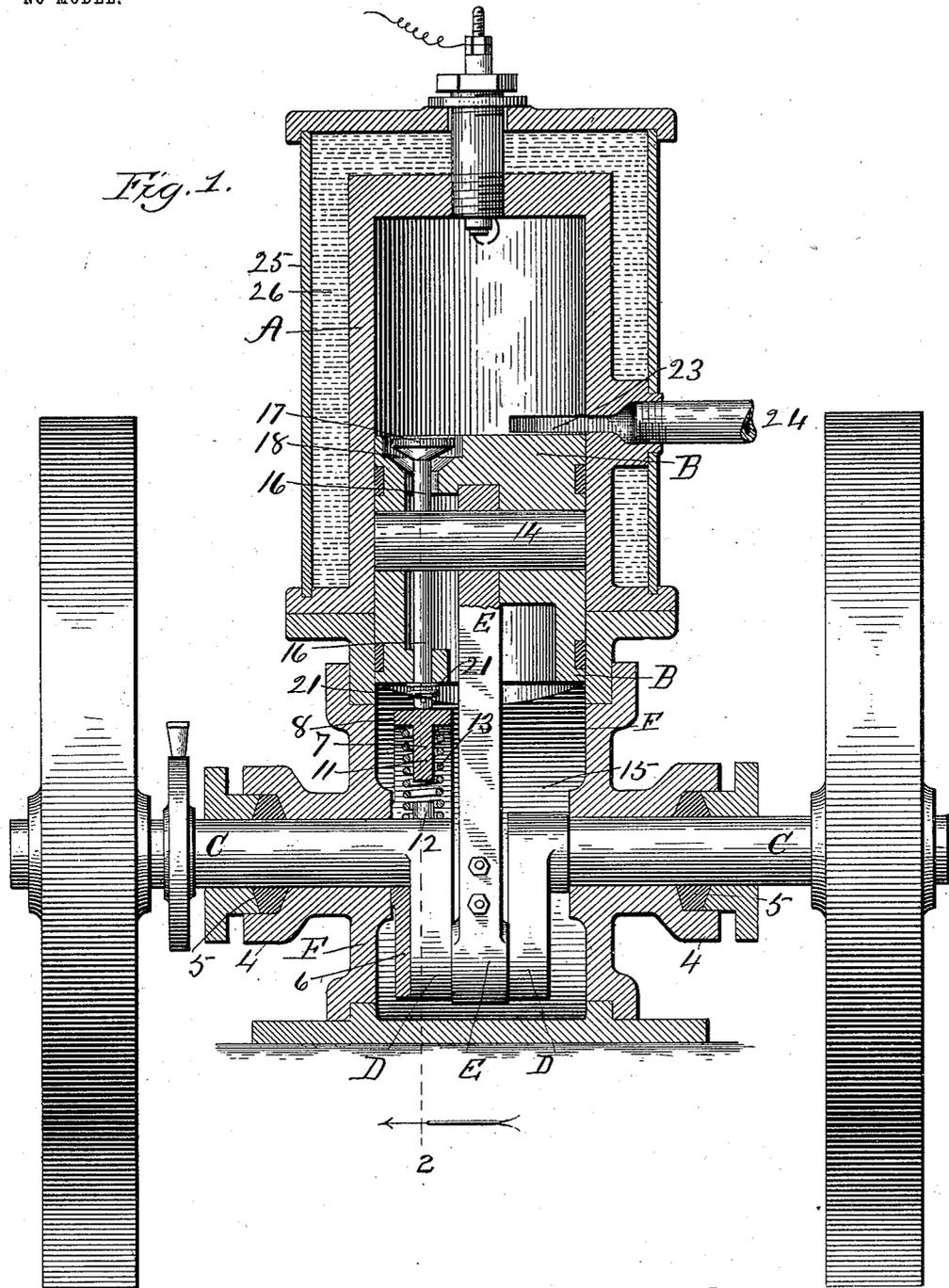
No. 748,477.

PATENTED DEC. 29, 1903.

A. BUCHNER & E. P. McCLURE.  
VAPOR ENGINE GOVERNOR.  
APPLICATION FILED MAR. 19, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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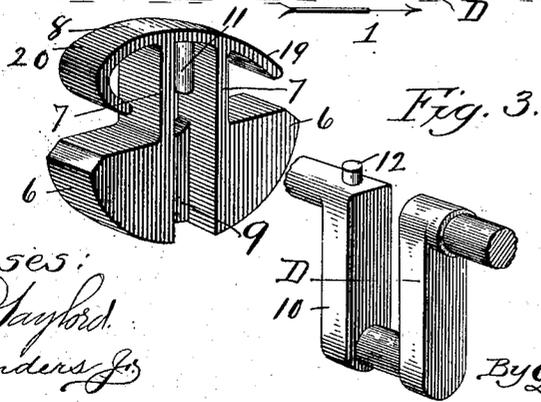
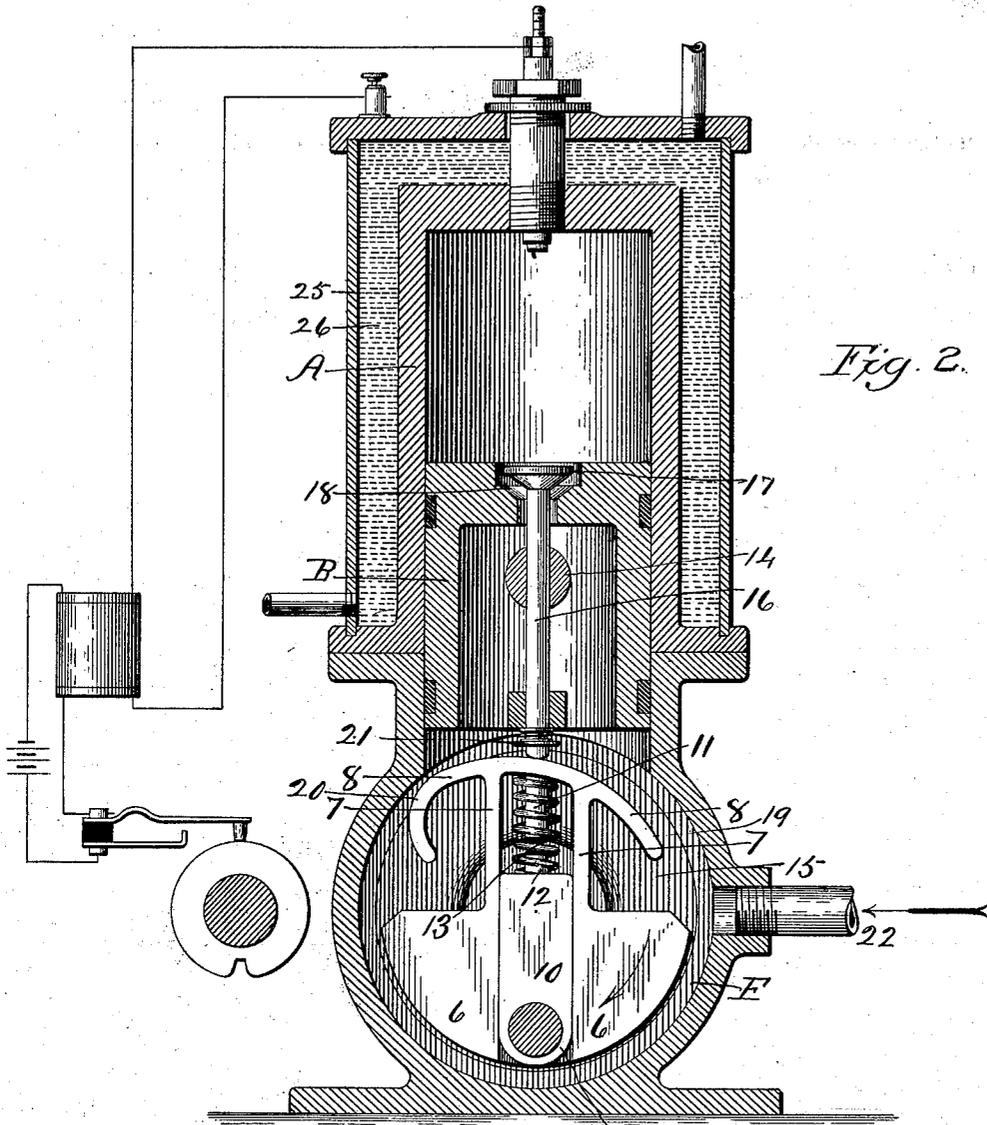
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

ALBERT BUCHNER AND ELMER P. McCLURE, OF CHICAGO, ILLINOIS.

## VAPOR-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 748,477, dated December 29, 1903.

Application filed March 19, 1902. Serial No. 98,941. (No model.)

*To all whom it may concern:*

Be it known that we, ALBERT BUCHNER and ELMER P. McCLURE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Vapor-Engine Governors; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to governors of the centrifugal type, and is more especially intended for use in gas or vapor engines of the two-cycle type, and has for its object to provide a simple, convenient, and efficient device that will automatically regulate the speed of the engine and proportion the volume of the explosive charge admitted in accordance with the variable amount of power required.

In the drawings, Figure 1 is an elevation and part section of a gas-engine embodying the improved features. Fig. 2 is a vertical longitudinal section on line 2, Fig. 1, looking in the direction indicated by the arrow; and Fig. 3 is a detached view in perspective of the governor and double-crank connection.

The different parts of the engine comprise the cylinder A, the piston B, the crank-shaft C, the double crank D, the connecting-rod E, and the chambered base F, on which the cylinder is mounted. The base is provided on opposite sides with tubular projections 4, which provide journal-bearings for the crank-shaft and the stuffing-box attachment 5.

The governor comprises an integral compound weight structure and cam consisting of the bifurcated weight part 6, the companion web projections 7, and the segmental cam 8, supported on the web ends, as shown in Figs. 2 and 3.

The governor-weight is provided on the inner side with a recess 9, Fig. 3, the depth of which is about equal to the width of the edge of the crank-arm 10, on which the governor is loosely mounted, and places one-half of the weight on each side of the crank-arm, as shown in Fig. 2. In this position the governor-weight is adapted to have a sliding movement on the crank-arm both in the direction of and away from the center. A pin 11 is mounted in the inner side of the cam and

extends toward the center, but stops short of a corresponding pin 12, fixed in the crank. A coil-spring 13 is mounted on these pins and is compressed between the adjacent surfaces of the cam-plate and the crank, as shown in Figs. 1 and 2. The intervening space between the ends of the pins provides for the sliding movement of the governor-weight without the ends contacting. When the engine is in motion, the centrifugal action draws the weight outwardly away from the center against the pressure of the spring, which pulls inwardly and returns the weight to its normal position as the engine slows up to a stop.

The piston may be of the usual construction and is provided with the bearing-pin 14, to which the upper end of the connecting-rod E is attached. The cylinder-space in which the piston moves and the chamber 15 in the base open into each other, the chamber forming a reservoir for the explosive mixture and from which it is conducted into the cylinder.

A valve-stem 16 is inserted longitudinally through the piston and has a valve 17 mounted on the upper end thereof, which back-seats downwardly in closing the passage 18, opening into the cylinder through the inner end of the piston. The lower disengaged end of the valve-stem extends below the corresponding end of the piston and with which the cam-plate has an intermittent contact once in each revolution when the same is on the upper side and the piston on the down-stroke, as shown in Figs. 1 and 2.

The crank rotates in the direction indicated by the arrow on the governor-weight, so that the low side 19 of the cam comes in contact with the stem first and passes to the higher part 20 as the engine revolves, thus gradually opening the valve for the admission of the explosive charge. When the cam passes out of contact, the valve is seated by a coil-spring 21, mounted on the lower end of the valve-stem. The contacting contour of the cam may be varied as circumstances may require in giving a greater or less lift to the valve-stem by imparting a longer or shorter or an earlier or later contact, in accordance with the position of the governor-weight, and the opening to be given to the valve in controlling the amount of the explosive mixture to be ad-

mitted for each charge in accordance with the load on the engine. The explosive mixture is conducted into the chamber in the base through a pipe 22.

5 The exhaust-port 23 opens into a pipe 24, through which the exhausted charge escapes.

The cylinder is inclosed by a water-jacket 25, providing a water-space 26, through which a cooling liquid circulates.

10 The electrical igniting appliance shown is made the subject-matter of a separate application herefrom, and a description of the same will therefore be omitted.

The piston is shown in its lowest position, 15 the exhaust-port being uncovered and the admission-valve partly open, so as to let in a portion of the new charge to assist in expelling the residue of the exploded charge. The upward travel of the piston, however, closes the exhaust-port before any of the new charge 20 can escape therethrough, which is the usual operation of an engine of this type.

It is apparent that this form of governor may be applied to steam-engines by mounting 25 the same on any part of the crank-shaft and making a suitable connection with the valve-chest.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

30 1. In a gas-engine, the combination with a piston, of an inlet-valve and stem carried by said piston, a crank-arm, a governor-weight and cam part forming an integral structure 35 and having a sliding movement on said crank, both in the direction of and away from the center of axis in proportioning the volume of the explosive charge admitted into the cylinder, substantially as set forth.

40 2. In a gas-engine, the combination with a valve-stem and inlet-valve carried by the piston, of a crank-arm, a governor-weight carrying a segmental cam part and loosely mounted 45 on the crank-arm and having a rotary movement therewith and a sliding movement thereon in proportioning the volume of the explosive charge in accordance with the load on the engine, substantially as set forth.

50 3. In a gas-engine, the combination with a double crank, of a governor-weight carrying a cam part and loosely mounted on one of the arms of said crank, a valve-stem and an inlet-valve mounted thereon and adapted to be

opened by the action of the cam part, substantially as set forth.

55 4. In a gas-engine, the combination with the crank-arm of a combined governor-weight and cam part having a sliding movement on said crank-arm, and an inlet-valve, located in the passage through which the explosive charge 60 is admitted and provided with a stem ending in position to be periodically contacted by the cam part in opening said valve at the proper time, substantially as set forth.

65 5. In a gas-engine, the combination with the crank, of a governor-weight carrying a segmental cam part and movably mounted on said crank, a valve-stem having its outer end located in the path of the cam part to be periodically contacted thereby, and the inlet- 70 valve mounted on the inner end of said stem and back-seating in the fuel-passage, substantially as set forth.

75 6. In a gas-engine, the combination with the crank, of a combined governor-weight and cam part, a piston, an inlet-valve stem inserted longitudinally therethrough, the valve 80 mounted on the inner end of said stem and back-seating in said piston, said valve being opened at the proper time for the admission 80 of the explosive charge by the cam part contacting the outer end of the valve-stem, substantially as set forth.

85 7. In a gas-engine, the combination with a crank, of a governor-weight provided with a segmental cam part and having a sliding 90 movement on said crank, both away from and toward the center of axis, a spring located between the crank and cam part, a piston, a valve-stem extending longitudinally 90 therethrough and having an inlet-valve mounted on the inner end thereof which back-seats in closing the passage through the piston and is periodically opened by the cam 95 part contacting the outer end of the valve-stem at the proper time, and means for closing said valve when the cam part passes out of contact, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

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ELMER P. McCLURE.

Witnesses:

L. M. FREEMAN,  
L. B. COUPLAND.