No. 870,627. PATENTED NOV. 12, 1907.

L. C. JACKSON.

GOVERNOR FOR EXPLOSIVE ENGINES.

APPLICATION FILED DEC. 27, 1901.

2 SHEETS—SHEET 1.

FIG. 1.

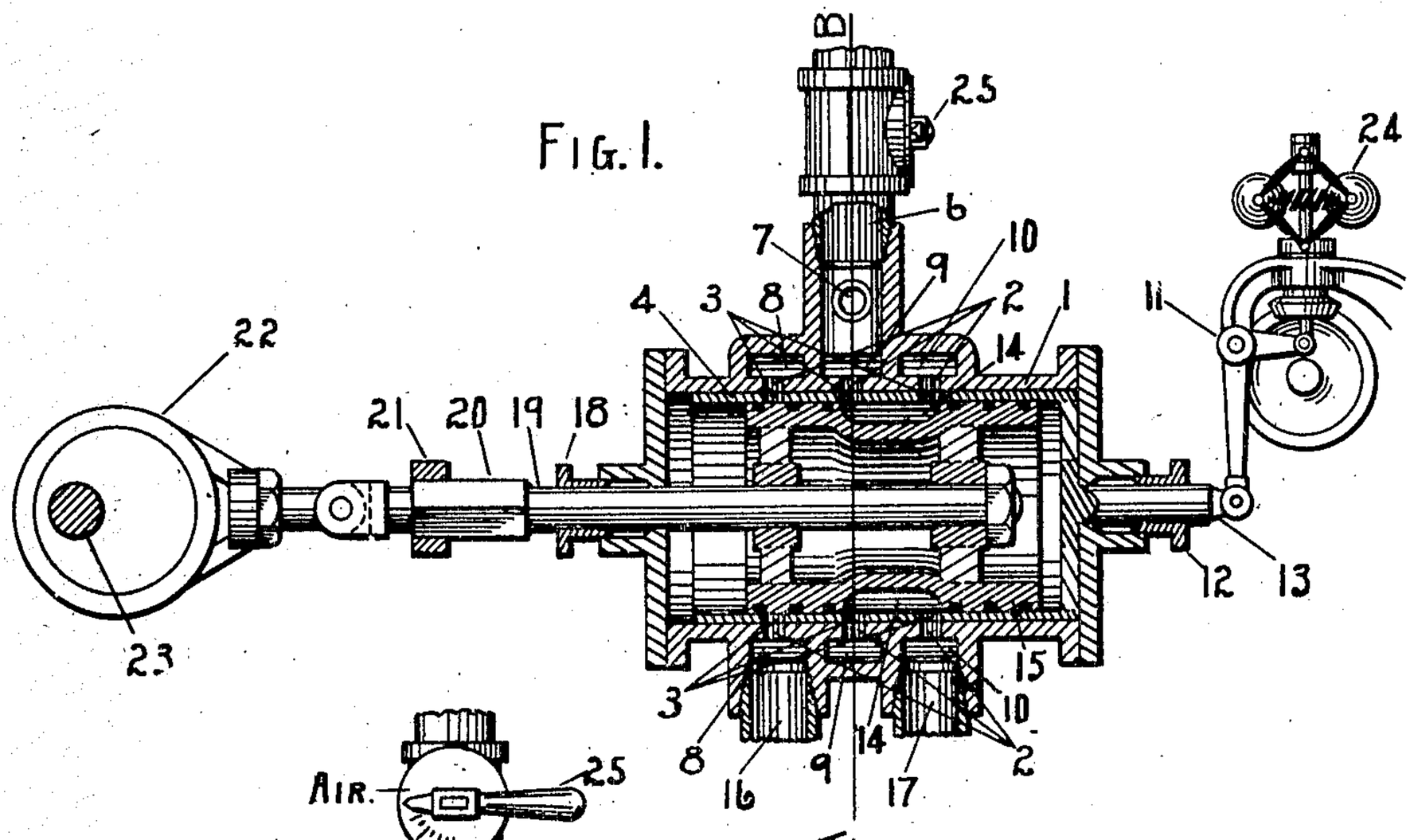


FIG. 3.

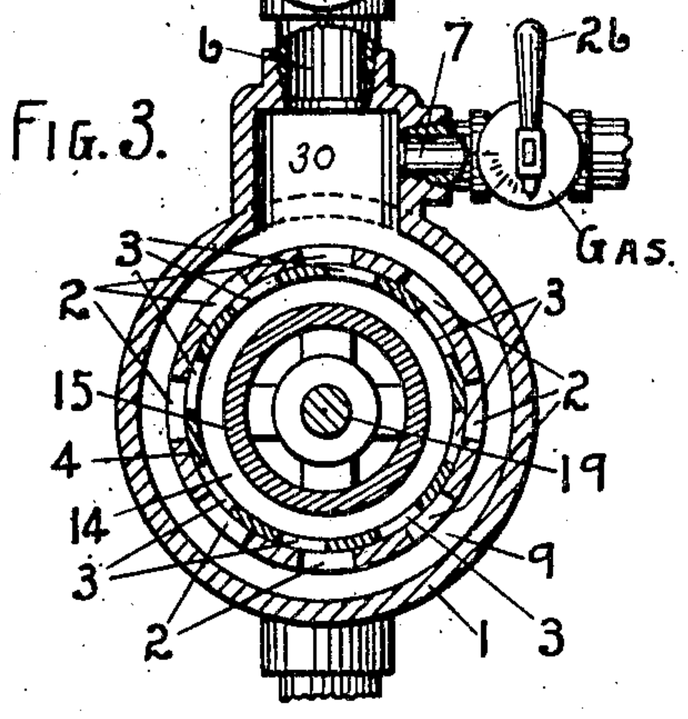


FIG. 2.

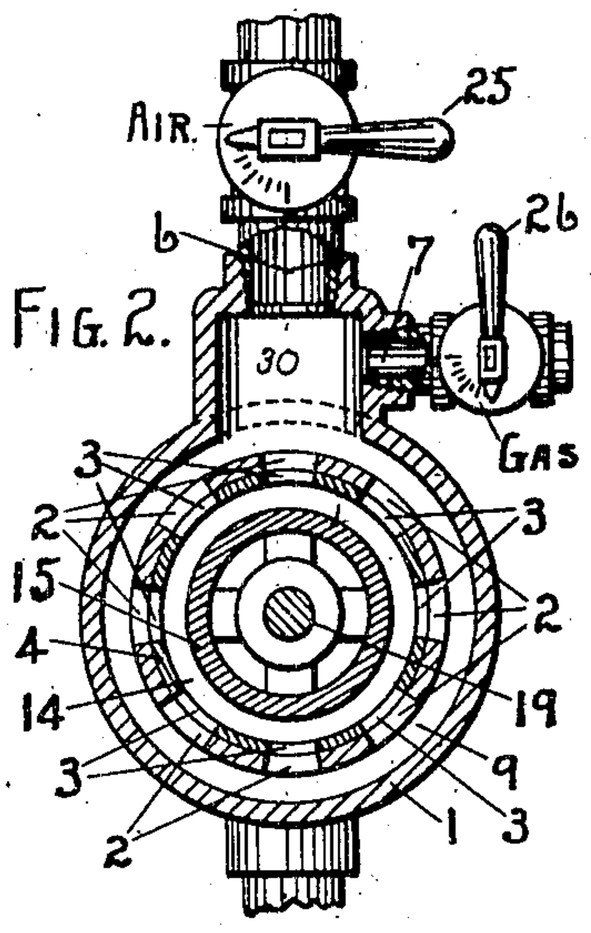
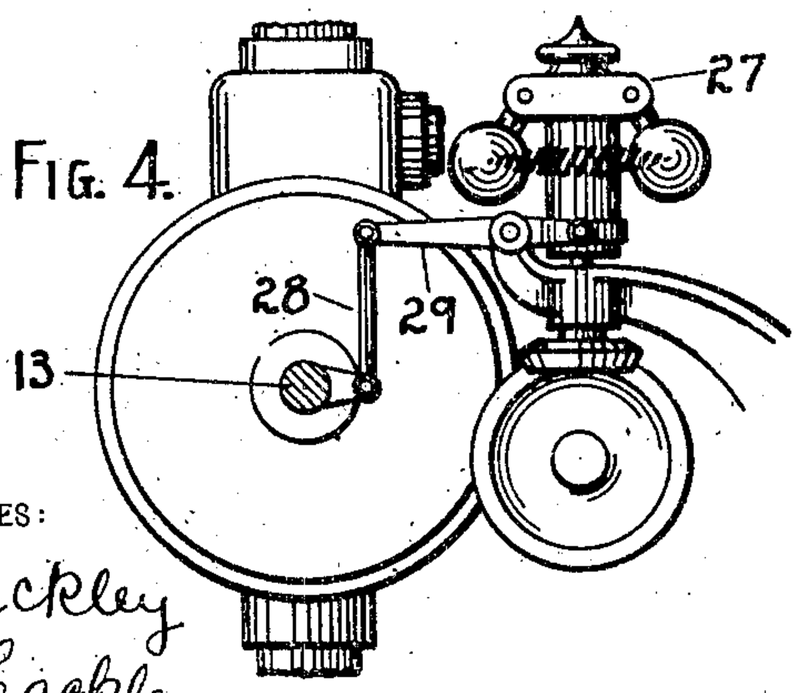


FIG. 4.



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2 SHEETS—SHEET 2.

Fig. 5

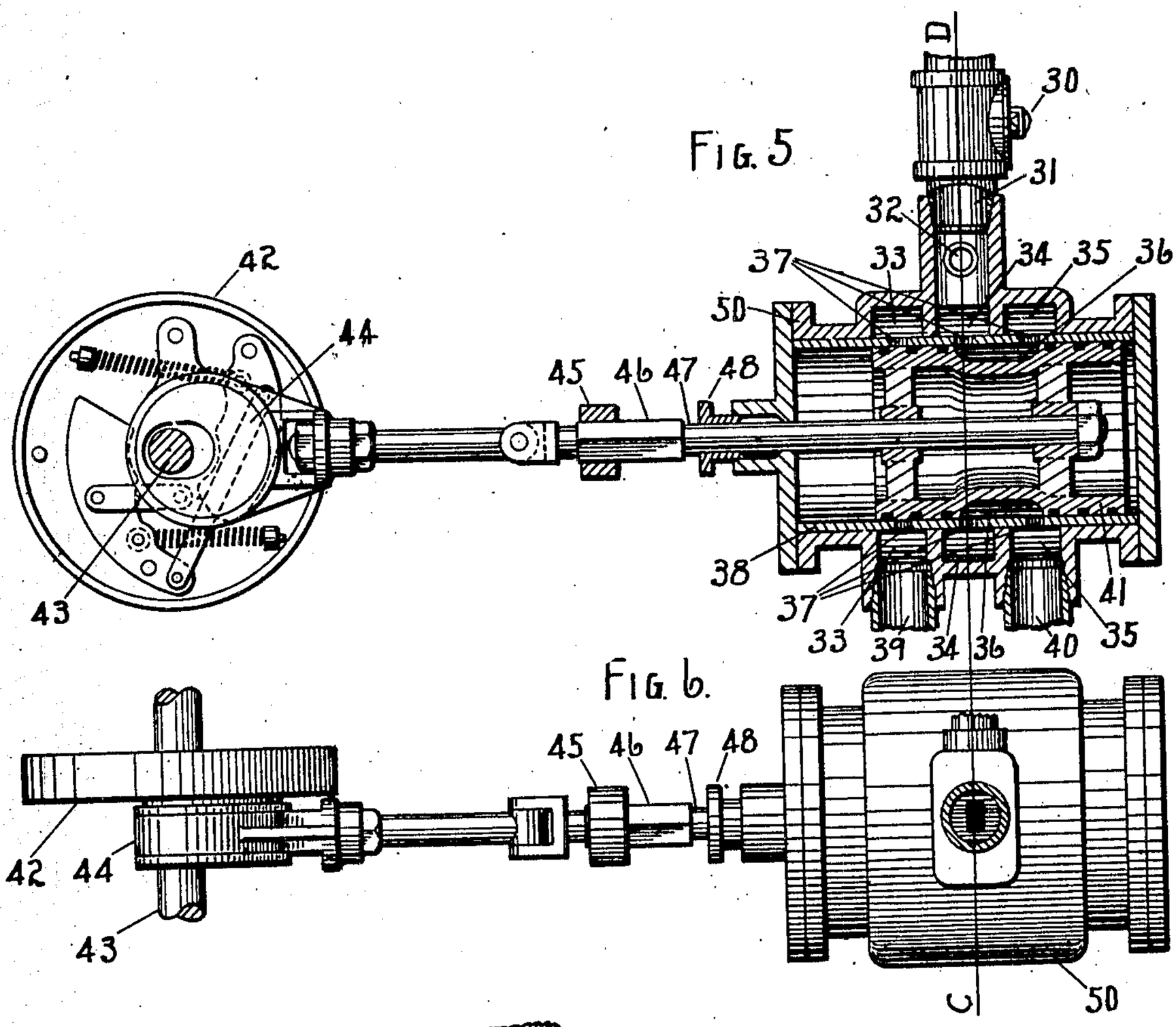
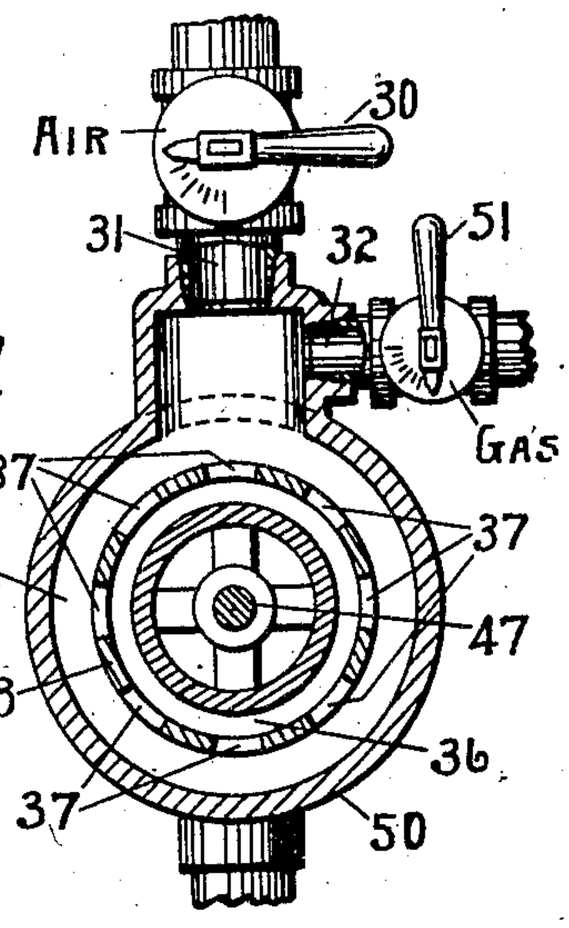


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

LUCIAN C. JACKSON, OF WARREN, PENNSYLVANIA.

GOVERNOR FOR EXPLOSIVE-ENGINES.

No. 870,627. Specification of Letters Patent. Patented Nov. 12, 1907.

Application filed December 27, 1901. Serial No. 87,462.

To all whom it may concern:

Be it known that I, LUCIAN C. JACKSON, a citizen of the United States, and a resident of Warren, in the county of Warren and State of Pennsylvania, have invented certain new and useful Improvements in Governors for Explosive-Engines, of which the following is a specification.

My invention relates to explosive engines and particularly to a governing mechanism therefor.

The object of my invention is to provide a governor of simple construction embodying a maximum degree of strength, effectiveness, and durability.

Figure 1 is a longitudinal section. Fig. 2 is a section taken on line A B, Fig. 1. Fig. 3 is a view similar to Fig. 2, the parts being in another position. Fig. 4 is a view showing a modification. Fig. 5 is a longitudinal section showing another modification. Fig. 6 is a plan view of the mechanism shown in Fig. 5. Fig. 7 is a section taken on line C D of Fig. 5 and 6.

Referring to Fig. 1, 1 is the casing of a throttling valve having passages 8, 9, and 10. Openings 2 in casing 1 communicate with openings 3 in a cutoff valve 4, which is interposed between casing 1 and piston valve 15. A groove or passage 14 is formed around the valve 15 for the purpose of bringing passage 9 into communication with first one passage 10 and then the other passage 8. Air and gas are drawn through pipes 6 and 7 into the mixing chamber 30 and thence to passage 9, through openings 2 and 3, then through passage 14, around piston valve 15 to first one cylinder (not shown) through passage 10 and pipe 17 and then through openings 2 and 3 to passage 8 and pipe 16 to the other cylinder (not shown). A governor 24 of the ordinary fly ball type is connected to the cut off valve 4 by bell crank 11 and shaft 13.

When the speed of the engine increases above the point at which the governor is set to operate, the governor shifts the cut off valve 4 longitudinally in casing 1, by means of lever 11, and cuts off more or less of openings 2 and consequently reduces the charge of fuel drawn through, depending on the load of the engine. In this way the speed of the engine is held constant, irrespective of the load. If more load is thrown on the cut off valve is shifted to give more fuel to the engine. If the load is very small or entirely thrown off, the openings are nearly cut off so that just sufficient fuel is fed to the engine to keep up a steady speed. The proportion of gas to air is regulated by indicator cocks 25 and 26 and remains constant when the cocks are set. The governor simply regulates the amount of mixture to the engine, and not the quality.

An eccentric 22 is mounted on shaft 23 and revolves at one-half the speed of the engine. This eccentric reciprocates the piston valve 15 so that passage 14 brings first one outlet passage 10 and then the other outlet passage 8 into communication with inlet passage 9. The valve is shown in position at the middle of a suction stroke of one cylinder and the opening 3 of cut off valve, giving full passage to openings 2 in casing 1. Obviously with a one-cylinder engine, only one outlet passage would be employed.

In Fig. 4, the cut off valve is shown connected to a governor 27 in such a manner that the valve is revolved a limited distance for the purpose of cutting off openings 2 of casing 1.

Fig. 3 shows a section through Fig. 4 and the valve in such a position that the openings 2 are partly closed, the governor having commenced to act.

In Fig. 5, I have shown a casing 50 similar to casing 1 of Fig. 1. 38 is a lining in casing 50 and having openings 37. Piston valve 41 corresponds to valve 15 in Fig. 1 and reciprocates to bring passages 33, 34, and 35 into communication with each other. The shifting of the valve, however, is performed in a different manner from that previously described.

When the speed of the engine increases above the point at which the governor is set to act, the weights throw out and swing the eccentric 44 across the shaft 43 and thus shorten the throw of the eccentric, and, consequently, the travel of the valve. This operates to keep the speed constant without regard to load. If there is no load, the engine runs with scarcely any fuel; therefore, the parts are almost closed. When a load is thrown on, the engine slows down, the weights close in, the throw of the eccentric is increased, and enough fuel is supplied to bring the speed to the normal.

Obviously, many changes may be made in the particular construction disclosed without departing from the spirit of the invention.

What I claim is:—

1. The combination of a casing having an air inlet and a gas inlet, communicating with a mixing chamber having an outlet passage, mixture ports communicating with said passage, a reciprocating valve device having an external annular chamber designed for receiving a mixture from said mixture ports and delivering same to outlet ports, a sleeve having ports designed to register with said ports and a governing device which is adapted to automatically vary the capacity of said ports, substantially as set forth.

2. The combination of a casing having an air inlet and a gas inlet, communicating with a mixing chamber having an outlet passage, mixture ports communicating with said passage, a reciprocating valve device having an external annular chamber designed for receiving a mixture from said mixture ports and delivering same to outlet ports, a sleeve having ports designed to register with said ports, a governing device which is adapted to automatically vary the capacity of said ports and a reciprocating valve device having a definite length of stroke and adapted to open and close certain ports, substantially as set forth.

3. The combination of a casing having an air inlet and a gas inlet, communicating with a mixing chamber having an outlet passage, mixture ports communicating with said passage, a reciprocating valve device having an external annular chamber designed for receiving a mixture from said mixture ports and delivering same to outlet ports, a sleeve having ports designed to register with said mixture

and outlet ports, a governing device which is adapted to automatically vary the capacity of said ports, a reciprocating valve device having a definite length of stroke and adapted to open and close said outlet ports and positively operating by means of an eccentric secured to a shaft which revolves at one-half the speed of the engine crank shaft, substantially as set forth.

4. In a regulating valve device for controlling the supply of air and other gases to a gas engine, the combination, with air and gas inlets, of a mixing chamber and passage having mixture ports and a reciprocating valve device having an external annular chamber receiving a mixture from said mixture ports, said valve device in constant communication with said mixture ports and which is adapted to be brought into and out of communication with outlet ports, a sleeve having ports designed to register with said mixture and outlet ports and a governing device which is adapted to automatically vary the capacity of said ports, substantially as set forth.

5. In a regulating valve device for controlling the supply of air and other gases to a gas engine, the combination, with air and gas inlets, of a reciprocating valve device having an external annular chamber, movable into communication with mixture and outlet ports and means to vary the capacity of said ports, substantially as set forth.

6. In a regulating device for controlling the supply of air and other gases to a gas engine, the combination, with air and gas inlets, of a casing, a valve device having an external annular chamber, located and movable within said casing and means for moving said valve into communication with ports and passages from said casing to the combustion chamber of an engine only during its suction stroke, substantially as set forth.

7. In a regulating device for controlling the supply of air and other gases to a gas engine, the combination with air and gas inlets and of a reciprocating valve device having an external annular chamber and an annular sleeve surrounding said reciprocating valve device, the valve device controlling the direction of flow of the mixture of air and other gases and the sleeve controlling the quantity of such mixture, substantially as set forth.

8. In a regulating valve device for gas engines, the combination with air and gas inlets, of a reciprocating valve device having an external annular chamber, movable into communication with mixture and outlet ports, means to vary the capacity of said ports, and means to regulate the air and gas inlets, substantially as set forth.

9. In a regulating valve device for controlling the supply of air and other gases to a gas engine, the combination with air and gas inlets, and means to control said air and gas inlets, of a casing with ports, and a hollow reciprocating valve device having an external annular chamber movable into communication with said ports and means to vary the capacity of said ports, substantially as set forth.

Signed at Warren, in the county of Warren, and State of Pennsylvania; this 10th day of December 1901.

LUCIAN C. JACKSON.

Witnesses:

GEORGE F. HENRY,

JOHN A. HAWKE.