W. O. PLATT.

GOVERNING VALVE FOR GAS ENGINES.

APPLICATION FILED OCT. 6, 1909.

984,023.

Patented Feb. 14, 1911.

2 SHEETS—SHEET 1.

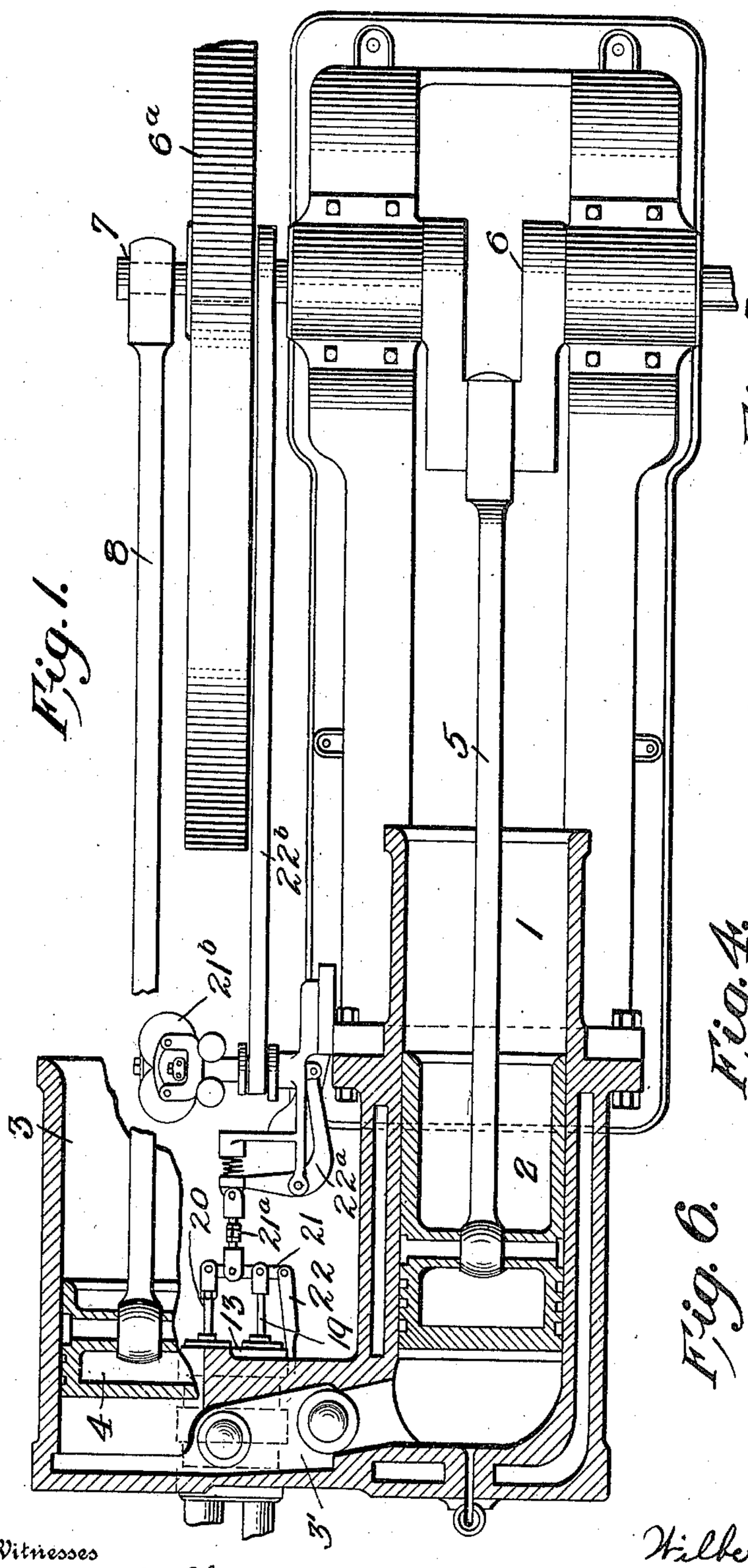

Fig. 1.

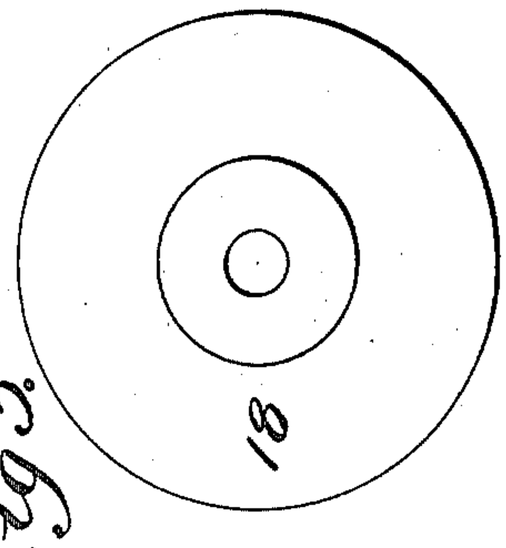

Fig. 5.

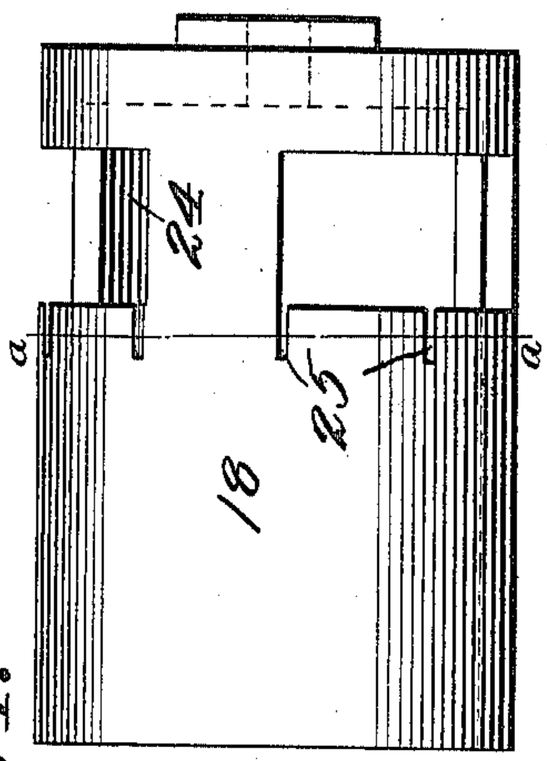

Fig. 4.

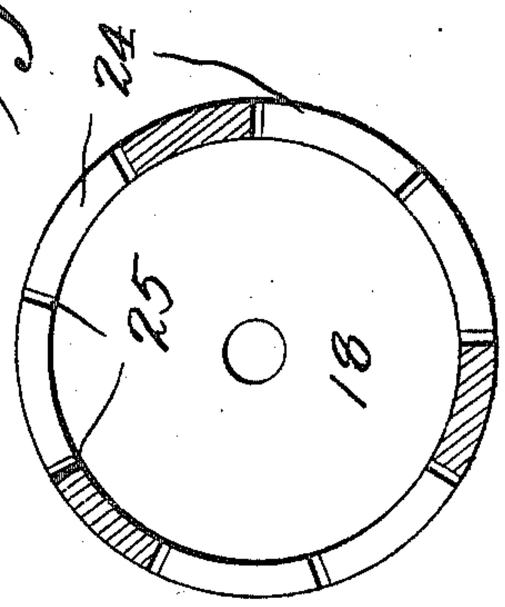

Fig. 6.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

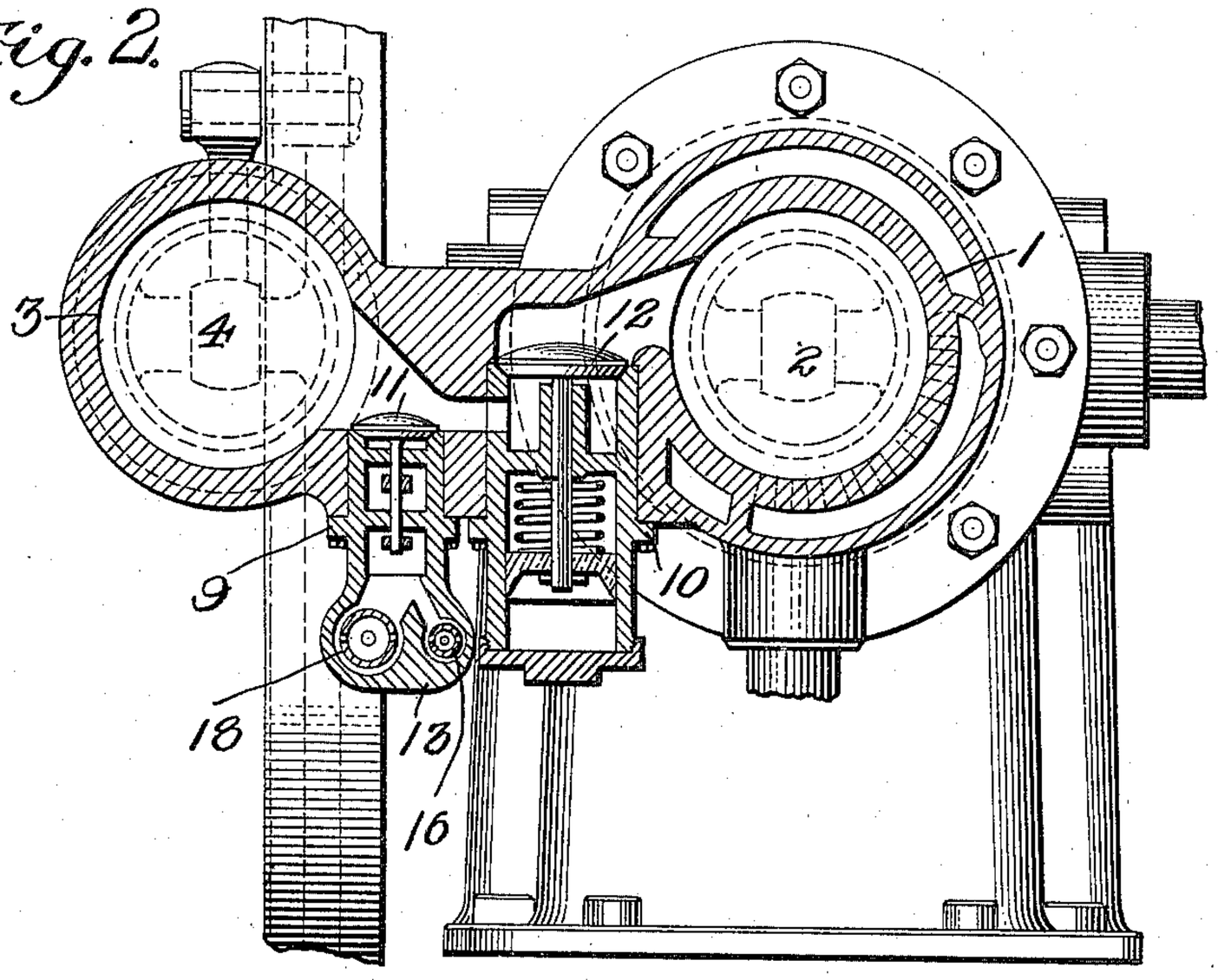
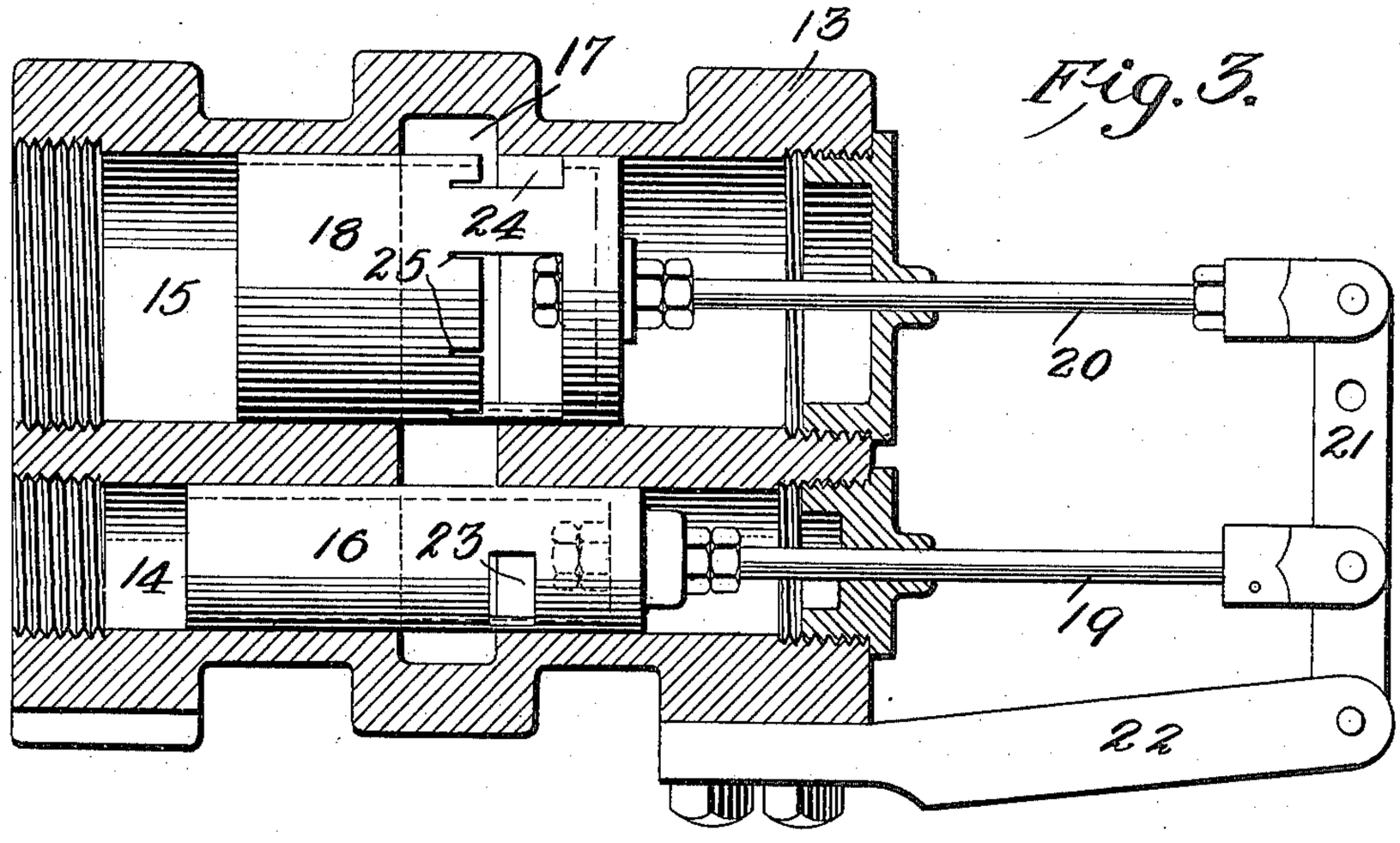


Fig. 3.



Witnesses,
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UNITED STATES PATENT OFFICE.

WILBER O. PLATT, OF OIL CITY, PENNSYLVANIA, ASSIGNOR TO JOSEPH REID GAS ENGINE COMPANY, OF OIL CITY, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

GOVERNING-VALVE FOR GAS-ENGINES.

984,023. Specification of Letters Patent. Patented Feb. 14, 1911.

Application filed October 6, 1909. Serial No. 521,193.

To all whom it may concern:

Be it known that I, WILBER O. PLATT, a citizen of the United States, residing at Oil City, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Governing-Valves for Gas-Engines, of which the following is a specification.

This invention pertains to internal combustion engines, more particularly to the fuel feeding regulating means therefor, and has for its purpose to further improve on that general type of fuel feeder shown in the patent granted to Joseph Reid, No. 607,276, dated July 12, 1898.

This type of fuel feeder embodies in its structure a supply cylinder adapted to receive charges of air and gas, which charges after commingling are delivered to the explosive chamber of the engine. To properly proportion these charges of air and gas it is necessary that their respective inlet valves vary in dimension corresponding to the proportions of mixture required, and to accomplish which the gas intake valve is of considerably less dimension than the valve of the air intake. To have these valves in proper working condition there must necessarily be some difference between the diameters of the valves proper and the holes in which they operate, and thus when substantially in closed position there must necessarily be slight spaces through which the elements of combustion leak into the mixing chamber by reason of the vacuum created in the pumping or supply cylinder. Owing to the fact that the leakage through the gas valve is not in the same proportion as the leakage of the air valve, as the gas is to the air in the charge, the mixture occasioned by said leakage is improportionate in that it contains a greater proportionate amount of gas than air, and with the increase in suction there is a corresponding increase in the excess of gas in the mixture. The vacuum produced in the charge forming cylinder has a retarding effect on the engine and there is the further fault of a tendency to back firing. In overcoming these defects this invention embodies the idea of providing means whereby a constant charge, or proportionate excess of air to gas, is admitted to the mixing chamber whereby to neutralize the normal excess of gas above referred to.

With these objects in view the invention is described in further detail in the following specification, set forth in the claims, and illustrated in its preferred structure in the accompanying drawings wherein,

Figure 1 is a plan view of a gas engine, partly in section, showing the application of the present invention. Fig. 2 is a vertical longitudinal section of the same on an enlarged scale. Fig. 3 is a vertical sectional view showing the controller in detail. Fig. 4 is a side elevation of the air valve. Fig. 5 is a top plan view thereof. Fig. 6 is a transverse section of Fig. 5 along the line *a*—*a*.

Referring more in detail to the several views, in which like reference characters designate corresponding parts in the different figures shown, 1 designates the cylinder of the explosive engine, 2 the piston adapted to reciprocate therein, 3 the cylinder of the supply pump, and 4 its piston. The cylinders 1 and 3 are preferably cast integral. The numeral 5 indicates the pitman connected with the piston 2 that drives the crank shaft 6 on which shaft is mounted a fly wheel 6^a, and said shaft carries on its far end a crank pin 7 mounted eccentric to the fly wheel. A pitman 8 connects the pin 7 with the piston 4 and imparts reciprocating movement thereto.

Intermediate the cylinders 1 and 3, *i. e.* within the web portion 3′ connecting them, is located the valve mechanism 9, 10, 11 and 12 controlling the charge forming cylinder and explosive cylinder respectively, which valve mechanism is substantially that disclosed in the above mentioned patent and need not therefore be described here.

The valve casing 9 has formed integral therewith at its lower portion a valve casing 13 which latter casing in its structure comprises a pair of cylinders 14 and 15 arranged in parallel.

The cylinder 14 has operating therein a cylindrical and tubular valve 16 which valve controls the gas inlet into the mixing chamber 17, and the cylinder 15 has a like valve 18 reciprocating therein and adapted to control the inlet of air into said chamber. The valve 18 is of considerably greater diameter than the gas inlet valve whereby the proper proportion of air may be admitted to effect perfect combustion. The valves 16 and 18 are respectively provided with stems 19

and 20 which at their opposite ends are pivotally connected with a swinging arm 21 that is in turn fulcrumed upon a fixed arm 22 bolted or otherwise secured to the cylinder casing 13.

Each of the valves 16 and 18 is provided with a plurality of apertures 23 and 24 respectively which apertures, as will be clear, are adapted to register with the chamber 17 common to both of said valves. By reason of so disposing the valve stems 19 and 20 on the arm 21 it will be clear that as said arm is moved the inlet apertures 23 and 24 of the valves are brought into register with the chamber 17 in such relative relation that the proper proportion of air and gas is admitted into the mixing chamber. The arm 21 connects by a turn buckle coupling 21^a with the governor controlled bell-crank lever 22^a. The governor 21^b is operated by a belt 22^b that extends to the shaft 6.

As above stated, there is necessarily some leakage of the gas and air into the mixing chamber and as pointed out this mixture is improportionate, as to the amount of air, and to remedy which the cylindrical shell or valve 18 is provided with a plurality of apertures 25 in that portion of the valve that normally registers with the chamber 17, or immediately adjacent the openings 24. These apertures are shown preferably as a series of cuts or slots through the thickness of the shell and disposed lengthwise thereof. The number of these slots or perforations and their length or size depends on the type of the engine, being varied to suit each size of engine. It is possible to perforate the casing itself in such manner that communication would be established between the chamber 17 and the atmosphere. The structure herein shown is preferred, however, for the reason that it is better adapted to the purpose by reason of the variation in the opening that is required, all dependent, of course, on the speed at which the engine is running. It may be further mentioned that this improvement is in no manner limited to this particular type of invention but may with equally beneficial results be used on a single valve working two fluids where both fluids go through two different ports in the same valve before mixing, as for instance, in a gas engine using blast furnace gas; and the principle is equally adapted to puppet valves.

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

1. In a fuel feeder controller for explosive engines, the combination with a casing having a mixing chamber, of valves operable within said casing and admitting air and gas to the mixing chamber, said air valve provided with slots in one of its marginal edges, said slots adapted to constantly register with the mixing chamber, and means for proportionately varying the admission openings of said valves.

2. In a fuel feeder controller for explosive engines, the combination with a casing having a mixing chamber, of valves operable within said casing and admitting air and gas to the mixing chamber, said valves arranged in parallel, said air valve provided with slots in one of its marginal edges, said slots adapted to constantly register with the mixing chamber, and means for proportionately varying the admission openings of said valves.

3. In a fuel feeder controller for explosive engines, the combination with a casing having a mixing chamber, of valves adapted to reciprocate within said casing and admit air and gas to the mixing chamber, said valves being of substantially cylindrical tubular structure and disposed in parallel, outlet openings in said valves adapted to register with the mixing chamber, said air valve having slots cut therein immediately adjacent its outlet opening, said slots adapted to constantly register with the mixing chamber whereby air is continuously admitted thereto, and means for proportionately varying the position of said valves.

The foregoing specification signed at Oil City, Pa., this 30th day of September, 1909.

WILBER O. PLATT.

In presence of—
PEARL PROPER,
JOHN L. MATTOX.