No. 891,064. PATENTED JUNE 16, 1908.

A. HEATHCOCK & L. RUSH.

ENGINE GOVERNOR.

APPLICATION FILED AUG. 9, 1907.

2 SHEETS—SHEET 1.

Fig. 1

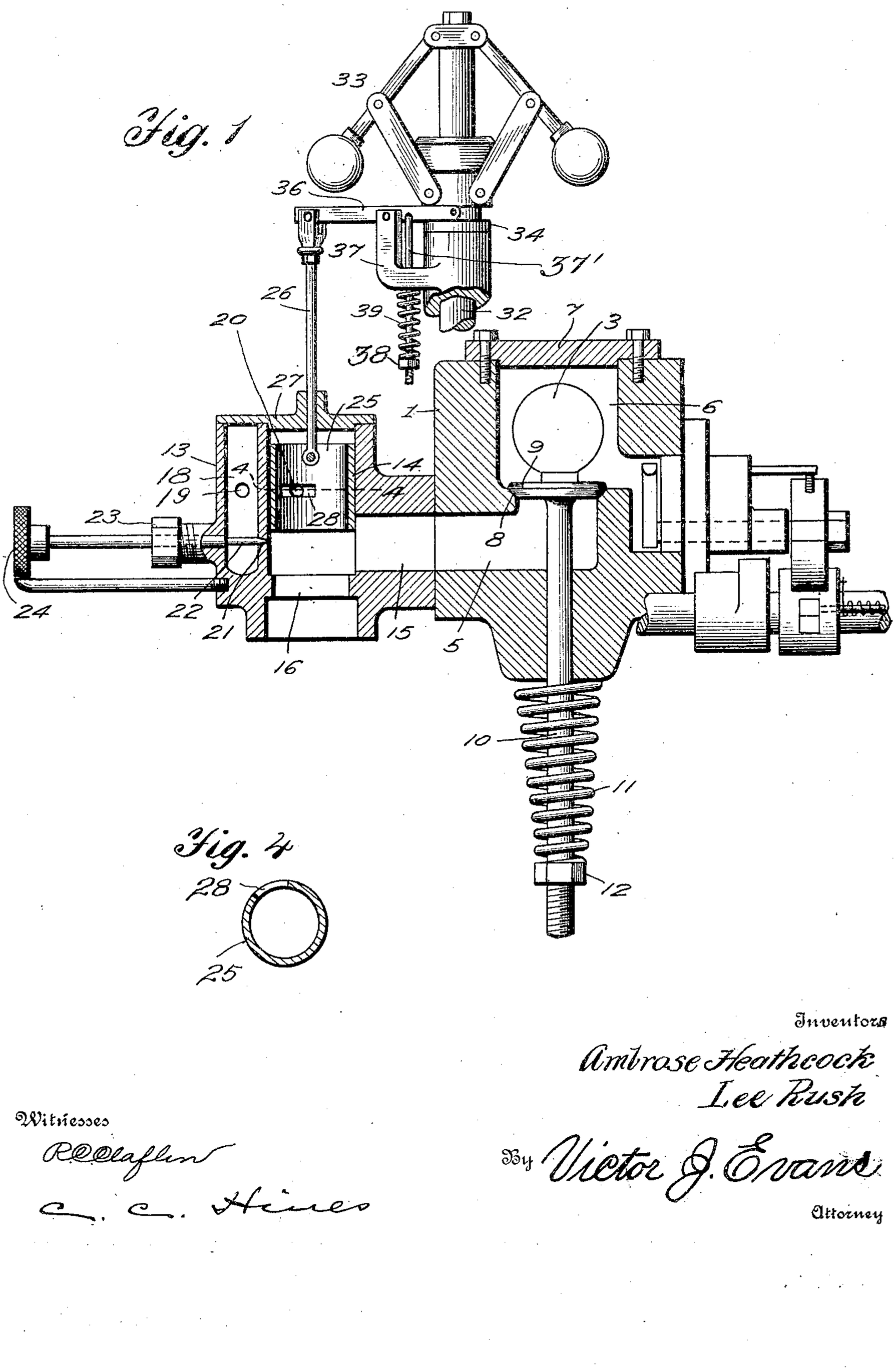

Fig. 4

Witnesses

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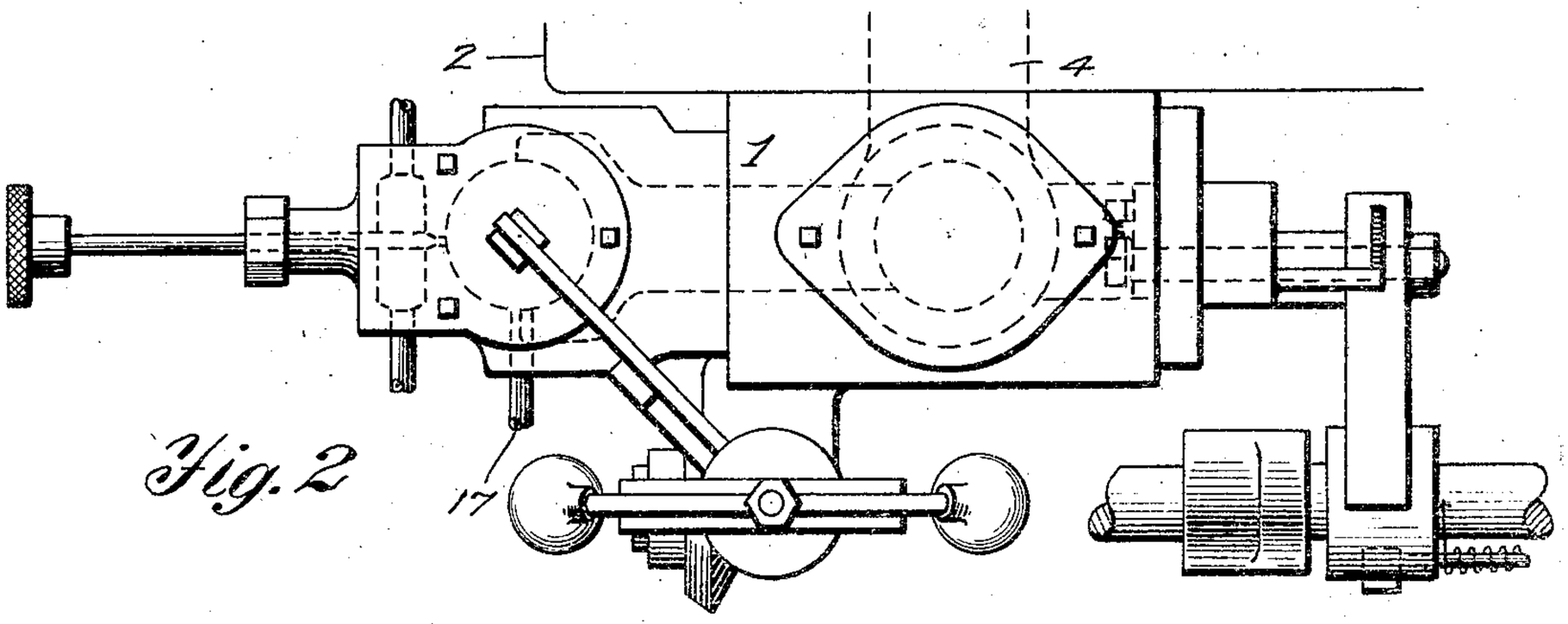

Fig. 2

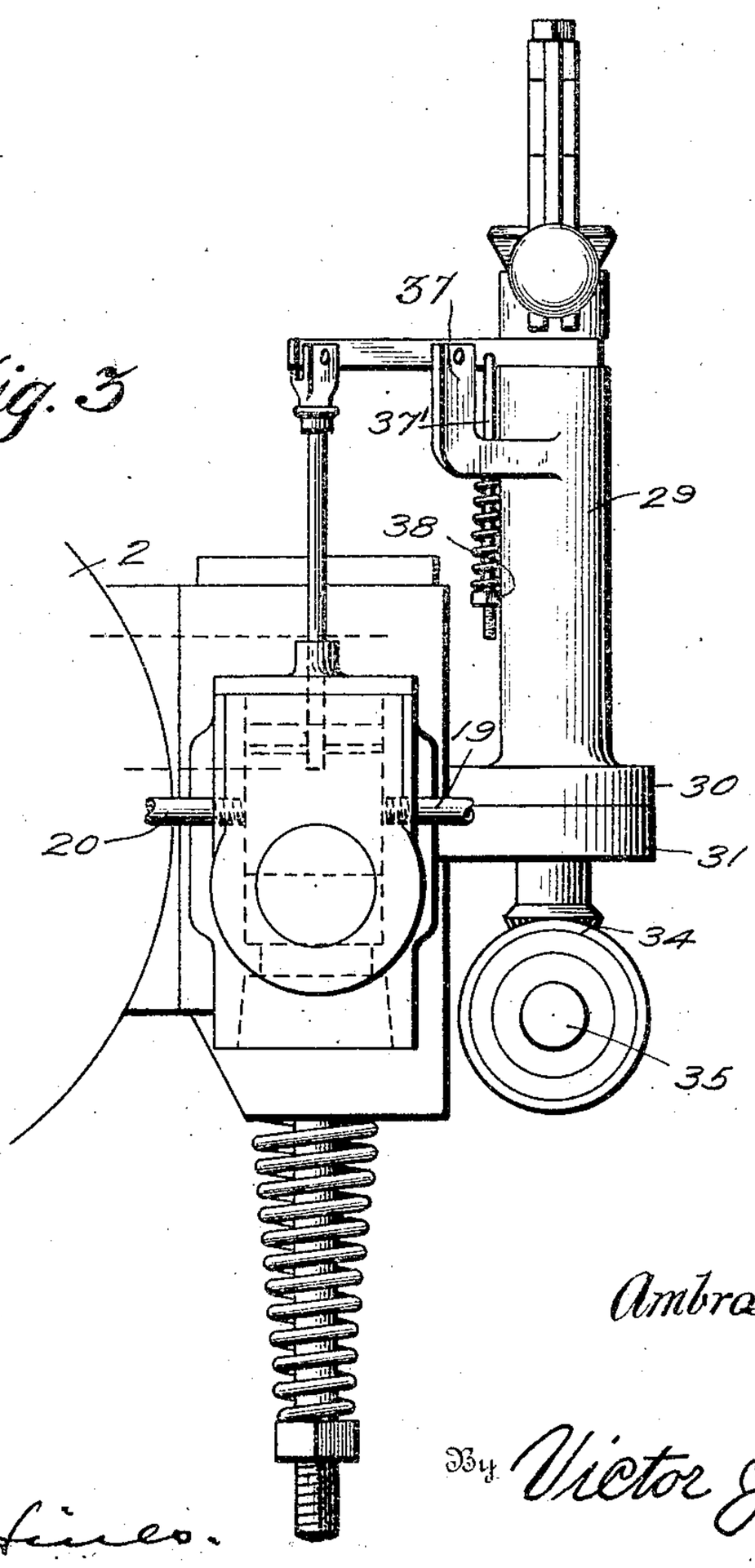

Fig. 3

Witnesses

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UNITED STATES PATENT OFFICE.

AMBROSE HEATHCOCK AND LEE RUSH, OF JACKSON, TENNESSEE.

ENGINE-GOVERNOR.

No. 891,064. Specification of Letters Patent. Patented June 16, 1908.

Application filed August 9, 1907. Serial No. 387,888.

To all whom it may concern:

Be it known that we, AMBROSE HEATHCOCK and LEE RUSH, citizens of the United States of America, residing at Jackson, in the county of Madison and State of Tennessee, have invented new and useful Improvements in Engine-Governors, of which the following is a specification.

This invention relates to governors for explosive engines using alcohol, kerosene, crude oil, gas or gasolene as the motive agent, the object in view being to provide a governor mechanism of simple construction with valve mechanism coöperating therewith to throttle and regulate the admission of gas and air or gas and the particular hydro-carbon employed in such a manner as to secure a sensitive operation and to supply a proper amount of fuel to obtain and maintain a steady running action of the engine.

The invention consists of the novel features of construction and combination of parts hereinafter fully described and claimed, and is illustrated in the accompanying drawings, in which:—

Figure 1 is a vertical longitudinal section through the valve mechanism, and showing the associated governor, the latter being partly broken away, as its full illustration is not needed in this view. Fig. 2 is a top plan view of the mechanism. Fig. 3 is an end elevation thereof. Fig. 4 is a sectional view of the throttle valve.

Referring to the drawings, the numeral 1 designates an admission valve casing, designed to be secured in any preferred manner to the engine cylinder 2, and provided with a supply port 3 communicating with a port 4 leading to the combustion or explosive chamber of the engine. The explosive mixture enters said casing through a feed passage 5 communicating with a chamber 6 in the upper portion of the casing, from which the port 3 leads, the top of said chamber being closed by a suitable removable cover 7. A valve seat 8 is formed at the point of junction of the feed passage with the chamber 6 for an admission valve 9, adapted to open under vacuum formed by the piston on its out stroke. The stem 10 of the valve slides in an opening in the bottom of the casing and projects below the same, a coiled spring 11 being arranged about said stem between a nut 12 thereon and the bottom of the casing, whereby the valve is normally held closed. The action of the spring may be regulated by adjusting the nut to control the action of the valve.

Secured in any suitable manner upon one side of the casing 1 is a chest or throttle valve casing 13, provided with a valve chamber 14, from which leads a feed passage 15 connecting the same with the passage 5. In communication with the lower end of the chamber 14 is an air inlet 16 opening through the bottom of the casing, and connected with the side of the casing in any preferred manner is a pipe 17 for the supply of gas, when the latter is employed as a motive agent. Formed in the casing alongside the chamber 14 is a fuel pocket or chamber 18, designed to receive a store or supply of gasolene or other suitable hydrocarbon, when such a fuel is used, the hydrocarbon being fed thereto through a supply pipe 19 entering one side of the pocket. At the opposite side of the pocket is an overflow pipe 20, through which the hydrocarbon when passing above a determined level exhausts to the exterior. In practice, the pipe 20 may lead back to the source of supply of the hydrocarbon, or the latter may be discharged into any suitable receptacle.

The hydrocarbon feeds from the pocket into the valve chamber through a restricted communicating port 21 governed by a needle valve 22 extending to the exterior through a stuffing box 23, the outer end of the stem of the valve being provided with a knob 24 by which said stem may be rotated to adjust the valve to cut off or regulate the size of the feed passage. The valve stem has a screw-threaded engagement with the wall of the stuffing box to effect its in and out adjustment, as will be readily understood. When the valve 9 is opened by the formation of a vacuum under the action of the engine piston, a quantity of the gasolene is drawn from the pocket through the port 21 into the chamber 14 and there commingles with the air simultaneously drawn through the port 16, the two agents combining to form the explosive mixture which flows through the port 3 into the combustion chamber of the engine. It will be understood that the passage of the gasolene through a minute feed port in the manner described causes its conversion into a spray or vapor, which readily commingles with the in-drawn air.

Operating in the chamber 14 is a sliding throttle valve 15, pivotally connected with the lower end of a rod or stem 26 movable through an opening in a cover plate 27 cover-

ing the normally open upper end of the valve chamber and fuel pocket. This valve in action controls both the air inlet 16 and gasolene feed port 21, thus simultaneously regulating their admission at required periods to the combustion chamber of the engine. The valve is of the hollow type, and is provided with a feed port 28 to register with the gas supply pipe 17, so that it will regulate the admission of gas when this character of fuel is employed with air to form the explosive mixture.

Arranged on one side of the admission valve casing 1 is a hollow standard 29 having a base flange 30 suitably fastened to a supporting flange 31 projecting from the casing. Journaled in this standard is the shaft or stem 32 of an ordinary centrifugal governor 33 having a grooved sliding collar 34 connected in the usual manner by links to the weighted arms of the governor. The lower end of the shaft is adapted to be driven by miter gearing 34 from a shaft 35 receiving motion from the engine gearing, whereby the governor is operated. A lever 36 is centrally fulcrumed upon an arm 37 extending from the standard 39 and is pivotally connected at its outer end to the valve stem 26 and provided with a yoked inner end of ordinary construction having pins engaging the annular groove in the sliding and rotating collar 34, whereby said lever will be swung in a vertical plane as the collar rises and falls to transmit motion to the valve 25. By this construction the operation of the throttle valve by the governor is accomplished in a simple manner so that the valve will be adjusted to regulate the feed of the explosive mixture to the engine in accordance with the requirements of the latter, the amount of fuel being increased when the engine is running below normal speed and decreased proportionately when the normal speed is limited. A rod 37′ is pivotally connected at its upper end to the collar engaging arm of the lever and slides through an opening in the arm 37, said rod being threaded at its lower end to receive a nut 38, between which and the arm 37 is a spring 39 surrounding the rod and exerting its expansive pressure to resist upward movement of the collar 34. This spring opposes a resistance to the movement of the governor, and by means of the nut its resistance may be increased or diminished to regulate the action of the governor to adjust the valve to a greater or less degree, whereby the speed of operation of the engine may be controlled to a nicety.

Having thus described the invention, what is claimed as new, is:—

1. In a governor for explosive engines, a casing having a feed passage, an air inlet and fuel inlets, a valve governing one of said fuel inlets, a hollow sliding valve controlling said passage and the inlets, said valve having a side port to register with the other fuel inlet, and a governor controlling said hollow valve.

2. In a governor for explosive engines, a casing provided with a valve chamber having an outlet port, air and gas inlet ports communicating with the chamber, and a valved fuel inlet also communicating with the chamber, a sliding throttle valve in the valve chamber controlling the fuel port and air inlet, said valve being of hollow form and having an admission slot to coöperate with the gas inlet, a stem connected with the valve, a governor, a lever operated by the governor and connected with the stem, and means for opposing a varied resistance to the movement of the lever.

3. In a governor for explosive engines, a casing having a valve chamber provided with air and gas inlets, and formed with a fuel pocket provided with a port opening into the chamber, a valve governing the port, a sliding throttle valve controlling the air inlet, gas inlet and feed port, and a governor for operating the valve.

4. In a governor for explosive engines, a casing provided with a valve chamber having an outlet port, air and gas inlet ports communicating with the chamber, and a pocket at one side of the chamber and having a port communicating therewith and provided with a fuel inlet, a sliding throttle valve in the valve chamber controlling the fuel port and air inlet, said valve being of hollow form and having an admission slot to coöperate with the gas inlet, a stem connected with the valve, a governor, a lever operated by the governor and connected with the stem, and means for opposing a varied resistance to the movement of the lever.

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

AMBROSE HEATHCOCK.
LEE RUSH.

Witnesses:
J. W. VANDER,
F. I. TAYLOR.