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F. G. HOBART.

FEED GOVERNOR FOR OIL ENGINES.

APPLICATION FILED JULY 27, 1903.

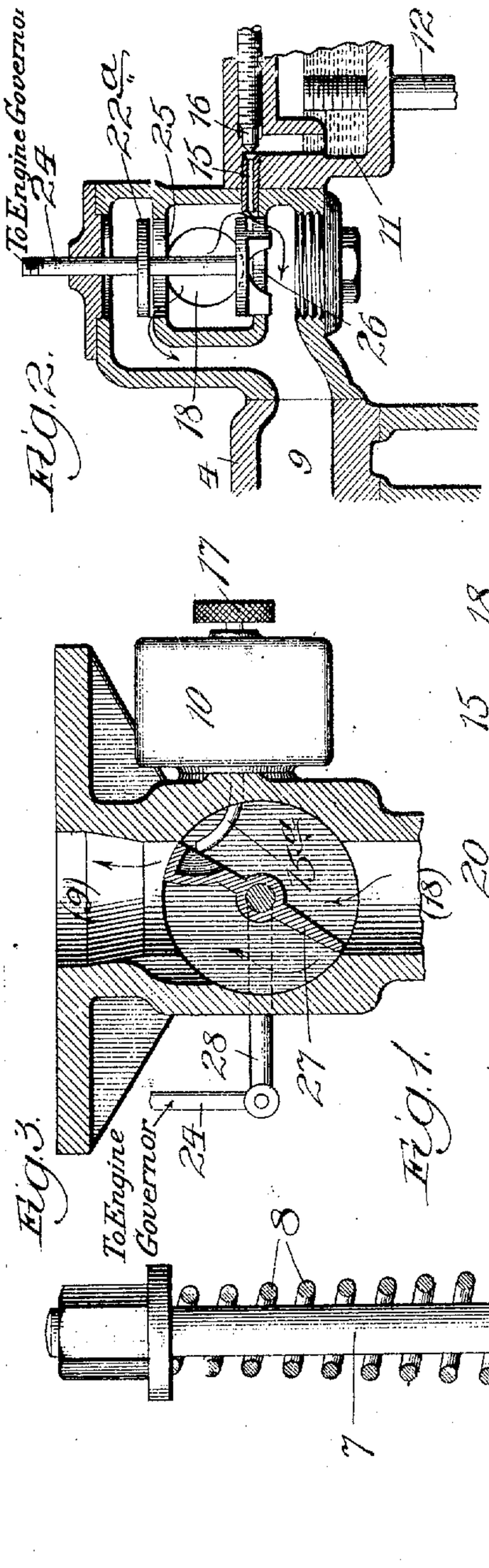

FIG. 2.

FIG. 3.

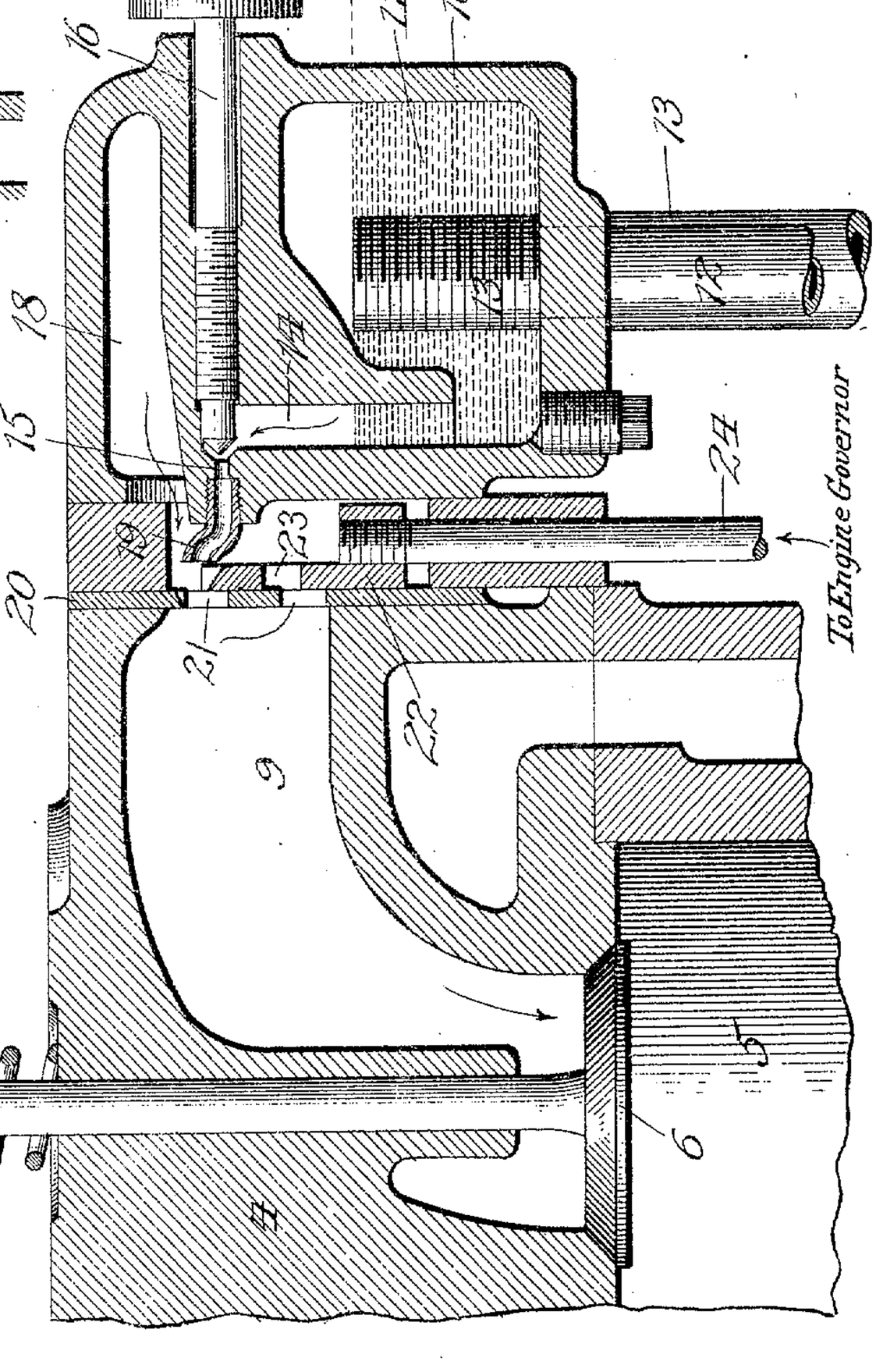

FIG. 1.

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FRANKLIN G. HOBART, OF BELOIT, WISCONSIN, ASSIGNOR TO FAIRBANKS, MORSE & CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FEED-GOVERNOR FOR OIL-ENGINES.

No. 846,471. Specification of Letters Patent. Patented March 12, 1907.

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To all whom it may concern:

Be it known that I, FRANKLIN G. HOBART, a citizen of the United States, residing at Beloit, in the State of Wisconsin, have invented certain new and useful Improvements in Feed-Governors for Oil-Engines, of which the following is a specification.

My invention relates to explosive vapor engines, and particularly to means for regulating the feed of hydrocarbon fuel for such engines to be mixed with air, as in common gasolene engines. The objects of the invention are, to provide mechanism by which the mixture of air and volatile oil may be controlled by a throttling valve operated by the engine; to provide for independently regulating the amount of oil and governing the amount of mixture of oil vapor and air, and to provide a simple and cheap construction for the accurate introduction of the fuel into oil using engines. These objects, together with other advantages which will hereinafter appear, I attain by means of the construction illustrated in preferred forms in the accompanying drawings, wherein,—

Figure 1 is a sectional view through the suction valve and end of the cylinder of a gasolene engine and through my oil feeding device attached thereto.

Figure 2 illustrates a modification of the governor valve, shown by a vertical section similar to that of Figure 1.

Figure 3 is a horizontal section of an air inlet provided with another modified form of governor valve.

In the type of engine which uses a volatile hydrocarbon mixed with air for an explosive mixture in the cylinder of the engine, when it is desired to control the action of the engine by a throttling system, there has been heretofore great difficulty experienced in throttling the amount of the mixture without at the same time interfering with the suction created through the inlet and therefore interfering with the proper amount of oil fed from the reservoir. These difficulties are largely overcome by use of my throttling device and by placing it in a particular position with relation to the inlet of air and the oil feed regulating valve.

In the accompanying drawings, Figure 1, 4 indicates the head of the casing of an engine and 5 the cylinder thereof. 6 is a common suction inlet valve which is mounted upon the shank 7 extending outside of the casing and held normally closed by means of the spring 8. The chamber 9 for mixing volatile oil and air is supplied through the regulable openings, hereafter described. On the side of the cylinder adjacent to the mixing chamber 9 leading to the suction valve, I place a casing 10 having an oil reservoir, which is fed by means of an inlet pipe 12 and the oil level kept at the point indicated by the letter *x* by means of an overflow pipe 13. A passage 14 leads from the oil chamber 11 through the valve opening 15 and a nozzle 19 leading through orifices 21 into the mixing chamber. The valve opening 15 for feeding the oil is controlled by means of a needle choke valve 16 which has a hand-wheel 17 on the outside.

The air inlet passage 18 communicates also through the openings 21 with the chamber 9 and the oil nozzle 19 is placed in the air passage and close up to and opposite one of the passages 21, which may be formed in the cover plate 20. Operating immediately in front of this nozzle, to govern the area of the openings 21, is a sliding valve 22, having openings corresponding with openings 21, and which is fixed upon the end of rod 24, this rod being connected to a proper governor attached to the engine so as to be reciprocated to and fro as the speed of the engine changes, for the purpose of moving plate 22 and constricting the passages 21. It will be observed that the sliding valve moves in a plane approximately coinciding with that of the end of oil nozzle 19. This position is of great importance because it will be observed that the throttling action takes place immediately at the point where the air comes in contact with the oil vapor before entering into the mixing chamber 9. This results in gaining a uniform quality of the mixture at varying speeds of the engine; it is obvious that if the nozzle 19 were projected inside of openings 21, then as the slide valve becomes nearly closed, the suction would increase through the small opening and feed the oil in an undue quantity through the inlet 15, while on the other hand, if the nozzle 19 were some distance back of the regulating orifices 21 there would be less suction on the oil when the said opening was constricted.

In Figure 2 I have shown a modification in which the movable part 22ª of the sliding valve, carried on the governor stem 24, is made cylindrical and opens and closes two orifices 25, 26, by which the air from passage 18 and the oil vapor from inlet 15 enter the mixing chamber 9 as before. The oil inlet is located close to the orifice 26, for the reason hereinbefore mentioned.

In Figure 3 is shown another modification in which the openings from the air inlet 18 and the oil inlet 15ª are controlled by a damper or butterfly valve 27 mounted to rotate in the passage and which may be operated by any convenient means, such as the crank arm 28, attached to the governor stem 24. The oil nozzle 15ª is located close to one of the openings of the valve.

It will be understood that any desired form of governor may be used upon the engine which will reciprocate some part so as to raise the rod 24 and constrict the passages 21, 26 etc. by moving the valve, as the engine unduly increases its speed, and vice versa; the form of governor not being important. It will be understood that the chamber 18 communicates directly with the outside air as customary with gasolene engines.

By this mechanism, I am enabled by a throttling system to accurately control the amount of mixed air and oil entering the mixing chamber without materially affecting the feed of oil, so that at whatever speed the engine may run, the quality of the mixture for the explosion remains the same, it being well known that there is an economical proportion of oil and air which should not vary as the load upon the engine varies. The many advantages of the device will readily occur to those familiar with the art.

Having thus described my invention and illustrated its use, what I claim as new, and desire to secure by Letters Patent, is the following:

1. In an oil feeding device the combination with a casing having a mixing passage and a suction valve, of an air inlet and an oil feed device provided with an orifice leading into the mixing passage, and a cut off valve operated by the engine governor for constricting the passage of air into said passage operating just at the inlet orifice for the oil, substantially as described.

2. The combination with an oil reservoir, of an oil inlet leading into the engine mixing chamber and a controlling valve therefor, an air inlet leading into the mixing chamber and surrounding the oil inlet and a valve automatically moved by the engine governor operating to constrict the passage for admission of the air and oil mixture just opposite to the point of the oil inlet, substantially as described.

3. In an explosion engine the combination with a governor, a cylinder, mixing chamber and suction valve therefor and an oil feed pipe, of an air chamber surrounding the mouth of the said pipe and having an opening leading to the mixing chamber, and a valve slidable over the mouth of said pipe and the opening of said mixing chamber to control the vapor, and means whereby the valve may be controlled.

4. The combination with an engine casing having a mixing chamber and an air inlet thereto, of an upturned oil inlet suction tube situated inside the air inlet, a sliding valve constricting the opening of the air inlet at the end of the oil tube and automatically moved by a suitable engine governor.

5. The combination with an engine cylinder of a reciprocating rod and automatic means for reciprocating it, a sliding plate upon said rod, openings for air and oil into the mixing chamber controlled by said sliding plate, an oil inlet tube opening into the mixing chamber and having its end opposite said sliding plate, whereby the opening for admission of air and oil vapor is controlled just at the point where the air and oil are mixed, substantially as described.

6. In combination in an oil feed governor valve, a mixing chamber, an oil reservoir kept at a constant level, an upstanding suction feed pipe from the oil reservoir, an air chamber surrounding the mouth of said pipe and having an opening leading to the mixing chamber, and a valve slidable over the mouth of said pipe and the opening of said mixing chamber to control the vapor, and means whereby the valve may be controlled.

7. In a gas engine the combination with an air chamber and a slide valve for controlling the inlet from said chamber to the cylinder of the engine, of an oil reservoir and an upturned suction inlet pipe for the oil located immediately behind the said slide valve, whereby the vapor of oil and air is controlled immediately at the inlet of the oil, substantially as described.

In testimony whereof I have hereunder signed my name in the presence of the two subscribed witnesses.

FRANKLIN G. HOBART.

Witnesses:

ANNA KILGORE,

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