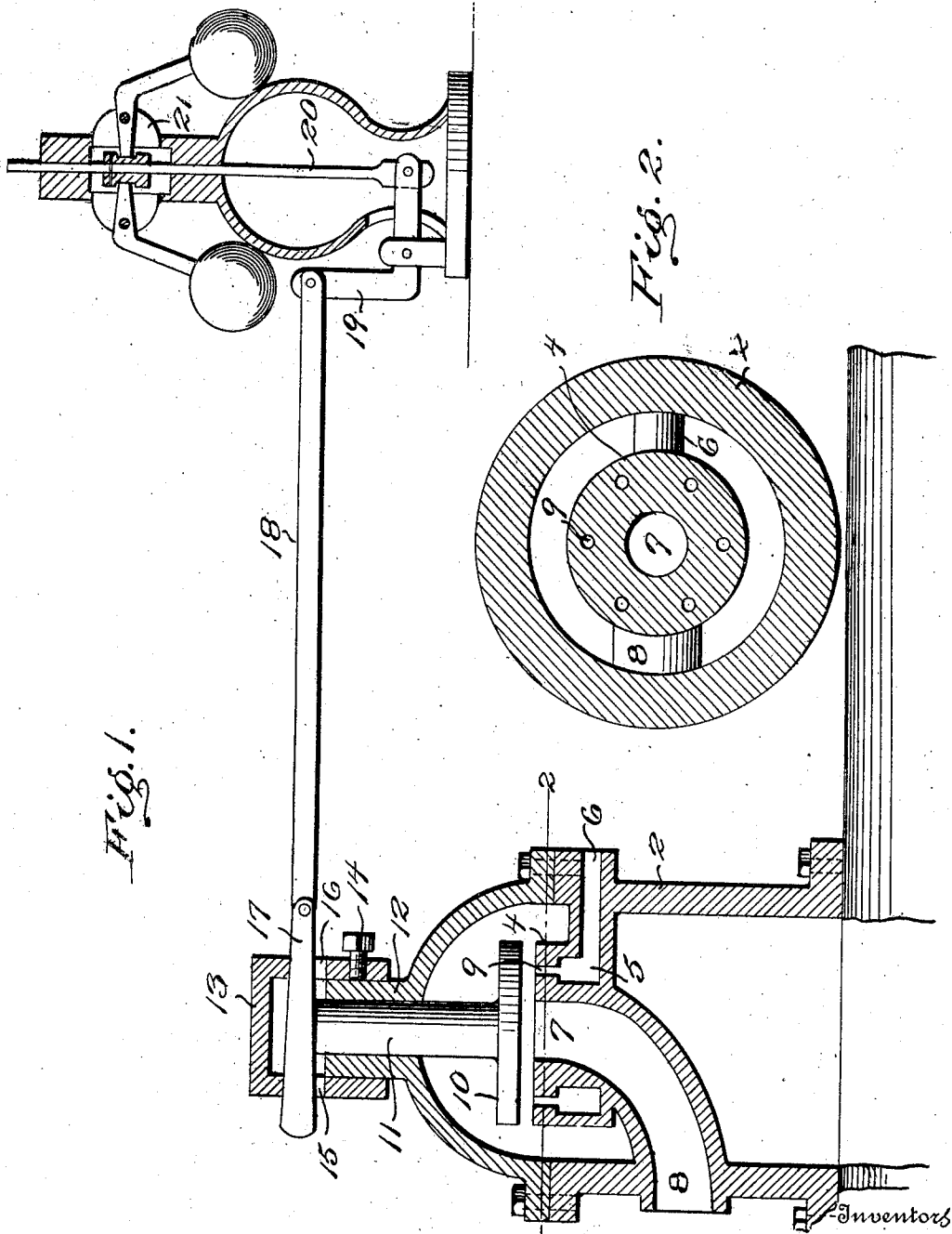


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GOVERNOR FOR GAS ENGINES.
APPLICATION FILED APR. 10, 1911.

1,059,176.

Patented Apr. 15, 1913.



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY H. LOCKE AND CLEMENT W. BORING, OF BRADFORD, PENNSYLVANIA.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, HENRY H. LOCKE and CLEMENT W. BORING, citizens of the United States, residing at Bradford, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Governors for Gas-Engines, of which the following is a specification, reference being had therein to the accompanying drawing.

Our invention relates to improvements in governors for gas engines.

The object of our invention is to provide a governor of this character in which the supply of both the air and gas to the engine cylinder is regulated so that no matter at what speed the engine is running, the proper mixture will be supplied to the engine cylinder.

Another object of our invention is to provide a more simple, cheap and effective governor of this character in which the speed of the engine may be more readily governed and having certain details hereinafter more fully described.

In the accompanying drawing—Figure 1 is a vertical sectional view of an engine cylinder showing our improved governor attached thereto. Fig. 2 is a horizontal sectional view taken on the line 2—2, of Fig. 1.

In speed governors for gas engines, where the gas only is reduced and the full amount of air is supplied the mixture is not as rich as it should be, and very little power is obtained in the engine. Where both the air and gas are reduced, the proper mixture is obtained getting the full strength of the charge, yet reducing the amount of charge and slowing down the engine.

Referring now to the drawings, 1 represents the engine cylinder, having secured at one end the valve chamber 2, which is in communication with the engine cylinder. Supported within the upper end of the valve chamber and spaced from the walls thereof is an annular member 4, having an annular gas passage 5, communicating with the gas supply pipe 6. The central portion of said annular chamber is provided with an opening 7, connected with the air supply pipe 8. The annular gas passage 5, is provided with a series of openings 9, communicating with the upper face of the annular member 4. The opening 7 communicating with the air supply pipe 8, also communicates with the upper end of the an-

annular member 4. Resting upon the upper end of the annular chamber 4 is an enlarged annular flat valve 10, which closes both the annular air passage and also the gas passages 9. The upper face of the valve 10 is provided with an upwardly extending stem 11, which extends outwardly through the valve chamber 2. By this arrangement it will be seen that the suction or vacuum at the end of the cylinder will lift the valve 10 of the annular member 4 and allow the proper amount of air and gas to pass into the valve chamber, and from there into the end of the cylinder. The upper end of the valve 4 is provided with an annular flange 12, through which the valve stem 11 extends. Surrounding the said upwardly extending portion 12 and extending above the same is a cap 13, which is held thereon by a set screw 14. This set screw allows of a vertical adjustment of the cap on the flange. The said cap is provided with upwardly arranged openings 15 and 16 through which passes a wedge-shaped member 17.

The valve stem 11 engages the lower face of the wedge-shaped member 17 and by moving the member 17 to the left or right the limit of upward movement of the valve is changed. The outer end of the wedge-shaped member 17 is pivotally connected to a link 18, which has its outer end pivotally connected to a bell-crank lever 19, operated by a governor-rod 20 of the governor 21.

From the foregoing description it will be seen that the speed governor 21 is connected to and driven by the engine and when the engine speeds up the rod 20 is lowered by the governor, throwing the upper end of the bell-crank 19 to the right, drawing the link 18 and moving the wedge-shaped member 17 so that the upward movement of the valve cannot be as great as when the wedge is in the extreme position to the left. This, as will be readily understood governs the amount of air and gas fed to the engine.

While we have shown this specific manner of governing the upper movement of the valve stem, it will be understood that this may be varied without departing from our invention.

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

1. The combination with a gas engine, of a valve chamber in communication with the cylinder of the engine, an annular gas sup-

ply chamber within the valve chamber and having communication with the upper end of the valve chamber, an air supply extending into the valve chamber and up through the annular gas chamber, a valve resting upon the annular chamber and closing the gas chamber and air supply, a valve stem carried by the valve and extending through the valve chamber and automatic means for regulating the upward movement of the valve stem, whereby the movement of the valve from the annular chamber is regulated.

2. The combination with a gas engine, of a valve chamber in communication with the cylinder, an annular gas supply chamber within the valve chamber and having communications with the upper end of the valve chamber, an air supply extending into the valve chamber and extending through the gas chamber and in communication with the valve chamber through the center of the gas chamber, a valve of an area less than that of the valve chamber and closing both the air chamber and gas supply, a valve stem extending through the valve chamber, and means for regulating the upward movement of the valve stem.

3. The combination with a gas engine, of a governor geared thereto, a valve chamber in communication with the engine cylinder, a gas and air supply for the chamber, a valve normally closing said air and gas supply and opened by the suction within the engine cylinder, a valve stem carried by the valve and extending upwardly through the valve chamber, a cap vertically adjustable upon the upper end of the valve chamber, and surrounding the valve stem, and having oppositely arranged openings, a wedge-shaped member extending through said openings and engaging the upper end of the valve stem, and means operated by the governor for moving the said wedge-shaped member transverse the valve stem, substantially as shown and described.

4. The combination with a gas engine, of a valve chamber having its lower end in communication with the engine cylinder, an annular gas supply chamber within the valve chamber and in communication with the upper end thereof and spaced from the wall thereof and forming an air space therearound, an air supply extending through the valve chamber and up through the an-

nular gas chamber, and a valve resting upon the annular chamber and closing the gas and air communications and opened by the suction of the engine cylinder.

5. The combination with a gas engine, of a valve chamber having its lower end in communication with the engine cylinder, an annular gas supply chamber within the valve chamber and in communication with the upper end thereof, and spaced from the wall thereof and forming an air space communicating with the upper and lower ends of the chamber, an air supply extending centrally through the gas chamber, a valve resting upon the annular chamber and closing the gas and air communications and opened by the suction of the engine cylinder, and a valve stem carried by the valve and extending through the upper end of the chamber, and automatic means governed by the engine for regulating the upward movement of the valve stem.

6. The combination with a gas engine, of a valve chamber having its lower end in communication with the engine cylinder, an annular gas supply chamber within the valve chamber and in communication with the upper end thereof and spaced from the wall thereof and forming a space therearound, an air supply extending through the valve chamber and up through the annular gas chamber, a valve resting upon the annular gas chamber and closing the gas and air communications and opened by the suction of the engine cylinder, a valve stem carried by the valve and extending out through the upper end of the valve chamber, a cap vertically adjustable on the chamber and into which the valve stem extends, said cap having oppositely arranged openings, a wedge extending through said openings and engaging the valve stem, and means operated by the engine governor for moving the wedge transverse of the cap whereby the movement of the valve is regulated.

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

HENRY H. LOCKE.
CLEMENT W. BORING.

Witnesses:

HERMAN H. NORTH,
EDWARD JIFKINS.