No. 880,835. PATENTED MAR. 3, 1908.

H. STOLTENBERG.

VALVE MECHANISM FOR GAS ENGINES.

APPLICATION FILED JUNE 12, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

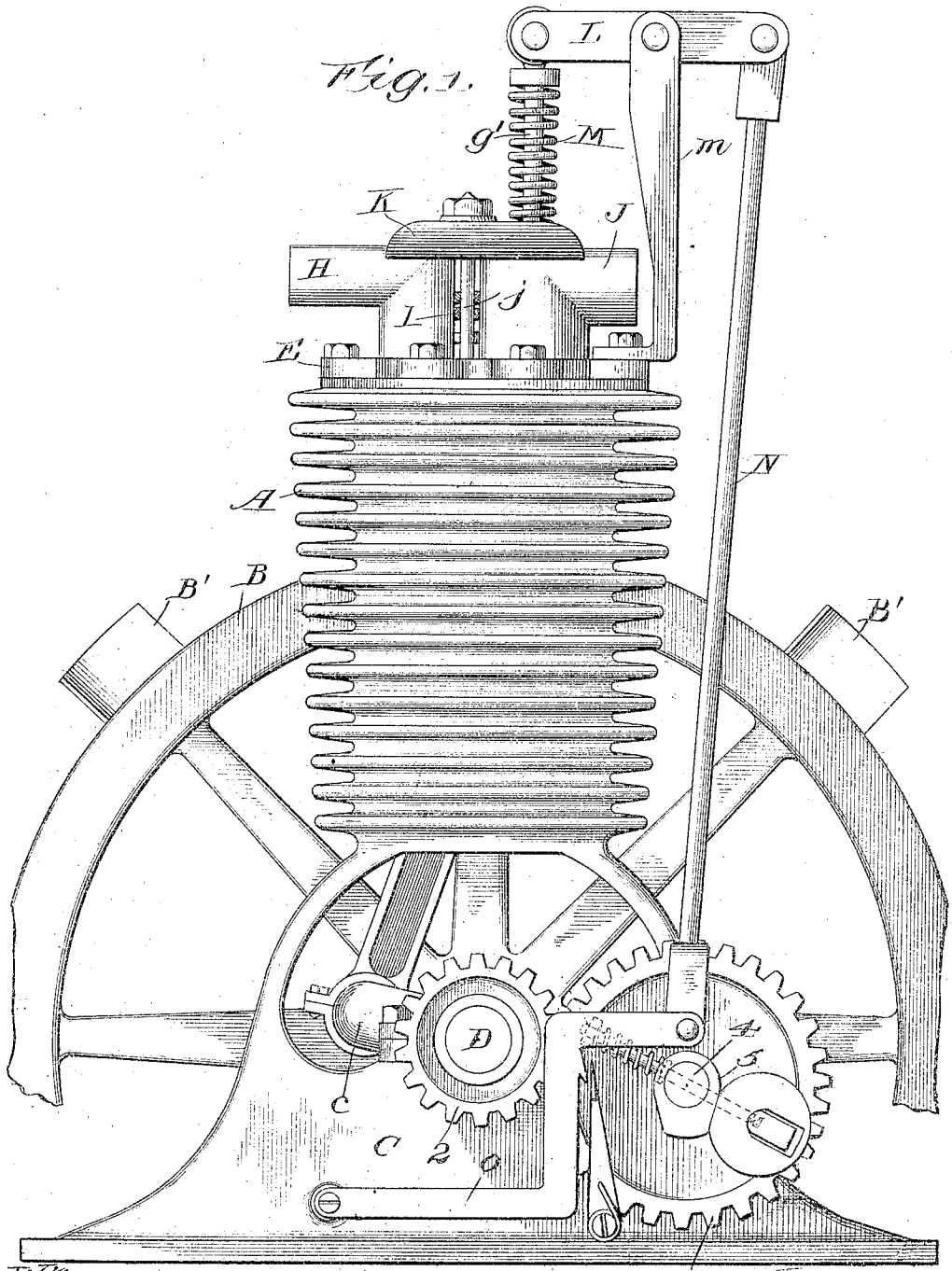

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Fig. 2.

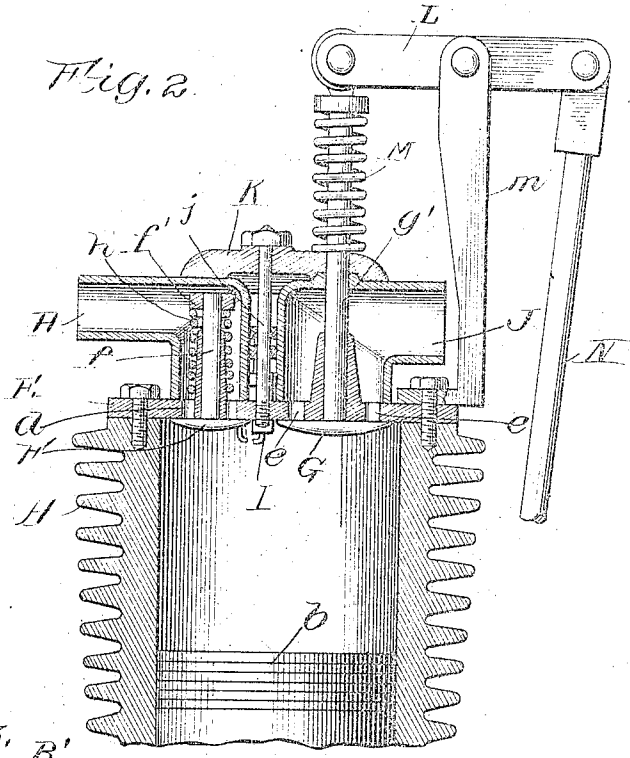
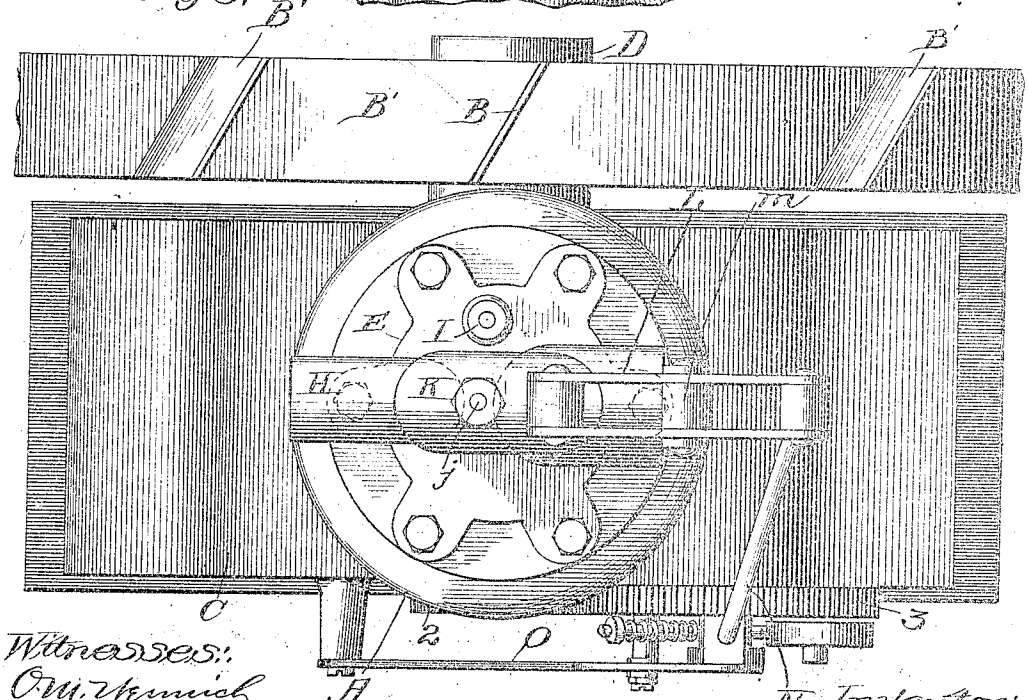


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY STOLTENBERG, OF DAVENPORT, IOWA, ASSIGNOR TO WHITE LILY WASHER COMPANY, OF DAVENPORT, IOWA, A CORPORATION OF IOWA.

VALVE MECHANISM FOR GAS-ENGINES.

No. 880,835. Specification of Letters Patent. Patented March 3, 1908.

Application filed June 12, 1905. Serial No. 264,886.

To all whom it may concern:

Be it known that I, HENRY STOLTENBERG, a citizen of the United States, and a resident of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Valve Mechanism for Gas-Engines, of which the following is a full, clear, and exact description.

My invention relates to gas-engines, and its object is to so construct the closed end of the cylinder that easy access can be had to the inlet and exhaust-valves for repair or otherwise. I also provide effective and simply constructed means for operating said exhaust-valve, the details of which will be more fully described and particularly pointed out in the claims.

In the drawings:—Figure 1 is a side elevation of a gas engine embodying my invention. Fig. 2 is a transverse vertical section of the upper part of the same. Fig. 3 is a plan view thereof.

Reference being had to the drawings A represents a suitable vertically disposed cylinder which is supported on a suitable base C, in the side walls of the lower portion of which the drive-shaft D is journaled. This shaft is actuated in the usual manner by a pitman connected at its upper end to the piston head *b* in the cylinder A, and at its lower end to the crank *c* of the drive-shaft. The head E for the closed end of the cylinder may be either cast in one piece therewith, or may consist of a suitable plate bolted or otherwise secured thereto, and provided with an inlet port *d* and an exhaust port *e*, which are preferably, located diametrically opposite each other, and with a suitable sparker I.

The inlet and outlet ports are normally closed by inverted mushroom valves F and G respectively, the spindles *f* and *g'* of which extend up through vertically elongated guide bearings in the central bosses of the ports. The upper end of the spindle of the inlet valve is provided with a suitable nut *f'* and between this nut and the base of the guide-bosses a coil expansion spring *h* surrounds the same and keeps the head of the valve normally closed up against the under side of the inlet port. An L-shaped pipe section or elbow H fits over the inlet-port, and incloses within the vertical branch thereof, the spindle of the inlet valve F, which latter is considerably shorter than the spindle of the exhaust valve G, as will hereinafter more fully appear. A similar L-shaped pipe or elbow J fits over the exhaust port except that its branches are greater in diameter. The height of elbow J is the same, however, as elbow H, and the horizontal branches of each extend radially outwards in opposite directions and in alinement with one another. These elbows are removably held in position by means of a bridge K, which consists of a bar of metal of such length as to extend from one elbow to the other with the underside of the ends thereof concaved to rest upon and fit over said elbows above the vertical branches thereof. This bridge is secured in the position shown so as to clamp the elbows in place by means of a bolt *j*, which extends down through the bridge between the vertical branches of the elbows, and through the head E of the cylinder and has a nut on its upper end with which to tighten it.

As stated, the spindle of the exhaust valve G is longer than that of valve F, and it extends through suitable openings in the upper wall of the elbow J and the adjacent end of the bridge and has its upper end pivotally connected to the contiguous end of the walking-beam L by a pivot bolt the ends of which are journaled in the ends of corresponding parallel links composing said beam, thus permitting the spindle to reciprocate vertically. Between the bridge K and the end of the walking-beam, spindle *g'* is surrounded by a coil expansion spring M which operates to keep the exhaust port *e* normally closed. The walking-beam is fulcrumed mediate its ends to a post *m* the foot of which is secured to the head E, preferably, by one of the bolts securing said head to the cylinder, and the outer end of said beam is connected by a suitably bent vertically disposed connecting-rod N to the uppermost extremity of a Z-shaped lever O.

The ends of the drive-shaft extend through their bearings in the base C of the cylinder A, and one end thereof is provided with a fly-wheel B, the periphery of which is provided with a series of obliquely arranged vanes B' of sufficient dimensions, which, when the fly-wheel revolves create a lateral current of air which blows towards and past the cylinder and keeps the same comparatively cool.

The outer circumference of the cylinder is provided with a series of circumferential flanges which provide a greater area of condensing surface, as shown, and the current of air from the vanes of the fly-wheel is enabled to more effectively cool the cylinder.

The connecting rod N is reciprocated up and down to operate the exhaust-valve by means of a suitable cam 5 mounted on the shaft 4 of a revolving pinion 3, which latter engages a pinion 2 fast on the adjacent extended end of the drive-shaft D. By the gearing of pinons 2 and 3 the latter is made to revolve once during every two revolutions of the former. Thus during operation every second revolution of the drive-shaft the cam 5 is brought in contact with the lower edge of the upper horizontal arm of lever O, thereby raising the same and rod N connected thereto and causing the exhaust-valve to be open during the period cam 5 is in contact with said lever O.

The means for controlling or regulating the speed of the engine is made the subject-matter of a separate application filed in my name and it is therefore unnecessary to describe the details and operation of the governor mechanism illustrated in the drawings.

What I claim as new is:—

1. A gas-engine comprising a cylinder having a closed end provided with an inlet port and an outlet port therein, valves therefor, an independent tubular housing for each port that is removably placed over the same and out of communication with each other, and common means which alone secures said housings in place and in which the spindle of one of said valves is journaled.

2. A gas-engine comprising a cylinder having a closed end provided with an inlet port and an outlet port therein, valves therefor, an independent housing for each port that is removably placed over the same and out of communication with each other, and a bridge-plate engaging the upper portion of said housings which alone secures the same in place and in which the spindle of one of said valves is journaled.

3. A gas-engine comprising a cylinder having a closed end provided with an inlet port and an outlet port therein, valves therefor, an independent elbow for each port that is removably placed over the same and out of communication with each other, and a bridge-plate engaging the upper portion of said elbows which alone secures the same in place and in which the spindle of one of said valves is journaled.

4. A gas engine comprising a cylinder having a closed end provided with an inlet and an outlet port therein, valves therefor, an independent tubular elbow placed over each of said ports and out of communication with each other, the horizontal portions of said elbows leading in substantially opposite directions, a bridge connecting and spanning the space between said elbows which alone secures said elbows in place, and in which the spindle of one of said valves is journaled, and a bolt for connecting said bridge to the closed end of said cylinder.

5. A gas engine comprising a cylinder having a closed end with an inlet and an exhaust port therein, normally closed mushroom valves therefor the spindles of which extend upwards through said closed end, an elbow placed over the exhaust port and out of communication with said inlet elbow and having an opening in its top up through which the spindle of the exhaust valve extends, means for actuating said exhaust valve, and a bridge-plate engaging the upper portion of said elbows which alone secures said elbows in place, and in which said spindle is journaled.

In testimony whereof I have hereunto set my hand this 5th day of June, A. D., 1905.

HENRY STOLTENBERG.

Witnesses:
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