(No Model.)

W. C. ROSSNEY.

GAS REGULATOR AND EQUALIZER FOR GAS ENGINES.

No. 420,169. Patented Jan. 28, 1890.

Fig. 1.

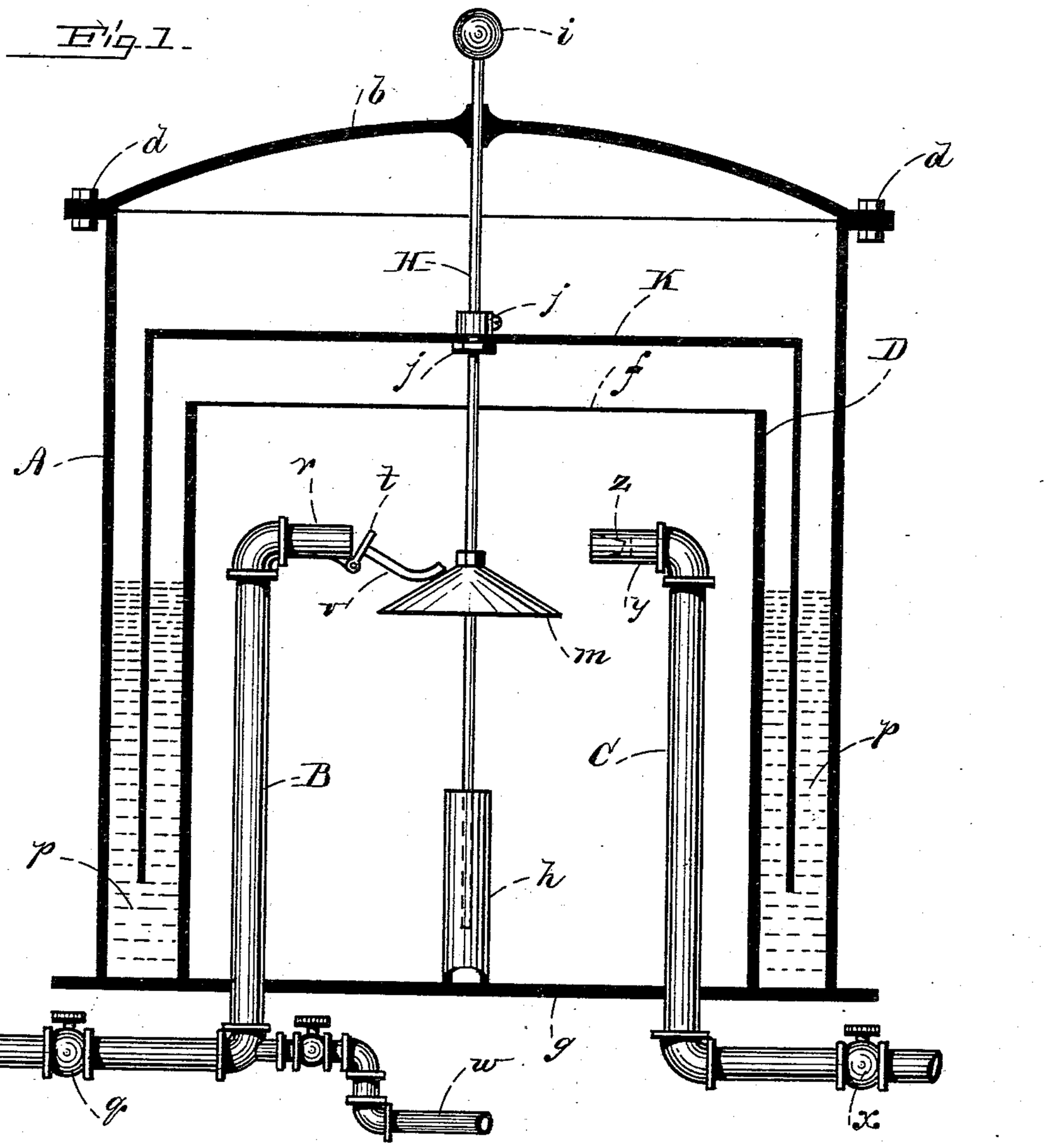


Fig. 2.

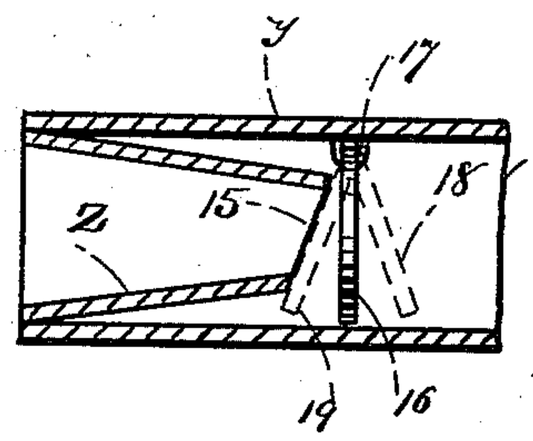
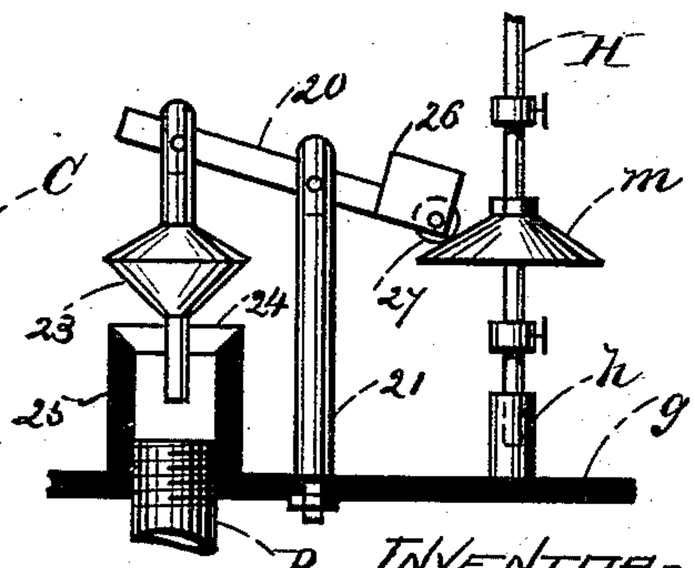


Fig. 3.



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GAS REGULATOR AND EQUALIZER FOR GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 420,169, dated January 28, 1890.

Application filed August 14, 1889. Serial No. 320,711. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. ROSSNEY, of Hyde Park, in the county of Norfolk, State of Massachusetts, have invented a certain new and useful Improvement in Gas Regulators and Equalizers for Gas-Engines, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central vertical section of my improved regulator, parts being shown in elevation; Fig. 2, an enlarged sectional view of the back-pressure valve, and Fig. 3 a sectional elevation illustrating certain modifications in the formation of the main valve.

Like letters and figures of reference indicate corresponding parts in the different figures of the drawings.

In gas-engines wherein the piston is driven by the explosion of ordinary illuminating or water gas the force thereof causes a back-pressure of gas in the main pipes, which frequently extinguishes the lights in other places supplied from said pipes. To overcome this, it has become customary to employ large rubber bags or receivers, into which the gas is forced by the concussion, and which serve in part to equalize this pressure. The action of the gas upon the material of these bags rapidly causes them to become brittle or decomposed, rendering them dangerous to use and necessitates their frequent renewal. Moreover, the direct pressure of the gas in the main pipes varies to a great extent and renders the action of the engine uneven.

My invention is designed to overcome these and other objections, and in carrying it out I make use of means which will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A represents the body of the regulator, and B the supply and C the discharge pipe. The body is constructed of cast-iron and is cylindrical in form. A cover *b* is secured thereto by bolts *d*. A vertical cylinder D is secured to the bottom *g* within said body, said cylinder being open at its top *f*. A vertically-arranged socket or guide-tube *h* is secured centrally to the bottom *g* within the cylinder. A spindle H, provided on its upper end with a knob or weight *i*, is fitted to slide vertically through the center of the cover *b*, the lower end of said spindle working in the guide *h*. An inverted dome or bell K is secured centrally to the spindle by nuts *j* and incloses the cylinder D, the mouth of said dome being immersed in a seal of glycerine, mercury, or similar material *p*, disposed between the cylinder and body walls. A vertically-adjustable cone-shaped disk *m* is secured to the spindle H within the cylinder.

The supply-pipe B is provided with an ordinary valve *q* and enters the body vertically through the bottom *g* and within the cylinder. The upper end *r* of the supply is turned horizontally toward the spindle, and a gravity-valve *t* is hinged to the lower edge of the mouth thereof. The valve *t* is provided with a curved arm *v*, which normally rests upon the disk *m*. A small pipe *w* taps the pipe B below the regulator and supplies the pilot-light of the engine.

The discharge C has an ordinary valve *x* outside the regulator and enters vertically through the bottom thereof within the cylinder. The upper end *y* of the discharge is turned horizontally toward the spindle. Within the mouth of this horizontal portion a cone-shaped piece of piping *z* (see Fig. 2) is inserted in the inner end of said pipe, being inclined at 15 to form a valve-seat. A swinging valve 16 is hinged at 17 by its upper edge within the pipe *y* in position to engage the seat 15. The gravity-valve *t* is normally open. The gas entering through pipe B causes the dome K to rise and carry with it the spindle H, to which it is secured. The disk *m* on said spindle, engaging the valve-arm *v*, elevates said arm as the dome rises and closes or partially closes the valve *t*, thus reducing the supply of gas. At the forward stroke of the engine-piston, which creates a vacuum in the piston-cylinder, the gas rushes into the discharge C, causing the swinging valve 16 to assume the position shown by dotted lines 18 in Fig. 2. As the gas thus supplied to the en-

gine is exploded by the pilot-light in the ordinary manner and is forced back through pipe C by the recoil, the valve 16 is swung back against its seat 15, (see dotted line 19, Fig. 2,) closing said pipe and preventing the escape of gas under increased pressure back into the regulator. It will be seen that by the use of this construction the recoil from the engine can have no effect upon lights supplied from the main pipes.

The variations of pressure in the main pipe being determined, the position of the dome on the spindle H may be so fixed as to regulate the supply of gas to the engine at any desired pressure by means of the disk *m* and valve *t*, in a manner readily understood by all conversant with such matters without a more explicit description.

In Fig. 3 a lever 20 is pivoted in the top of a standard 21, secured to the bottom *g*, between the tube *h* and supply B. A cone-valve 23 is pivoted to one end of the lever, and a seat 24 therefor is formed in a tube 25, into which the supply B opens. A counter-balance 26 is disposed on the opposite end of the lever, and a wheel 27 is journaled therein, said wheel resting on the disk *m*. The spindle H, rising, as described, forces the cone-valve 23 downward into its seat 24 and checks the flow of gas into the regulator.

Having thus explained my invention, what I claim is—

1. The combination of a body, a cylinder therein, a spindle passing through the cover of said body, a liquid-sealed dome attached to said spindle and inclosing said cylinder, a supply-pipe provided with a valve, a disk on said spindle for engaging the arm of said valve, an outlet-pipe extending into said cylinder and provided with a horizontal inlet-tube, a cone-shaped mouth-piece within said tube, provided with an inclined valve-seat at its inner end, and a swinging valve hung within said tube adjacent to said valve-seat, substantially as described.

2. In a gas-regulator, the body A, dome K, and spindle H, bearing the disk *m*, in combination with the supply B, provided with the valve *t*, having the arm *v*, the discharge-pipe C, provided with the pipe *z*, having the inclined seat 15, and the swinging valve 16, arranged to operate substantially as described.

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