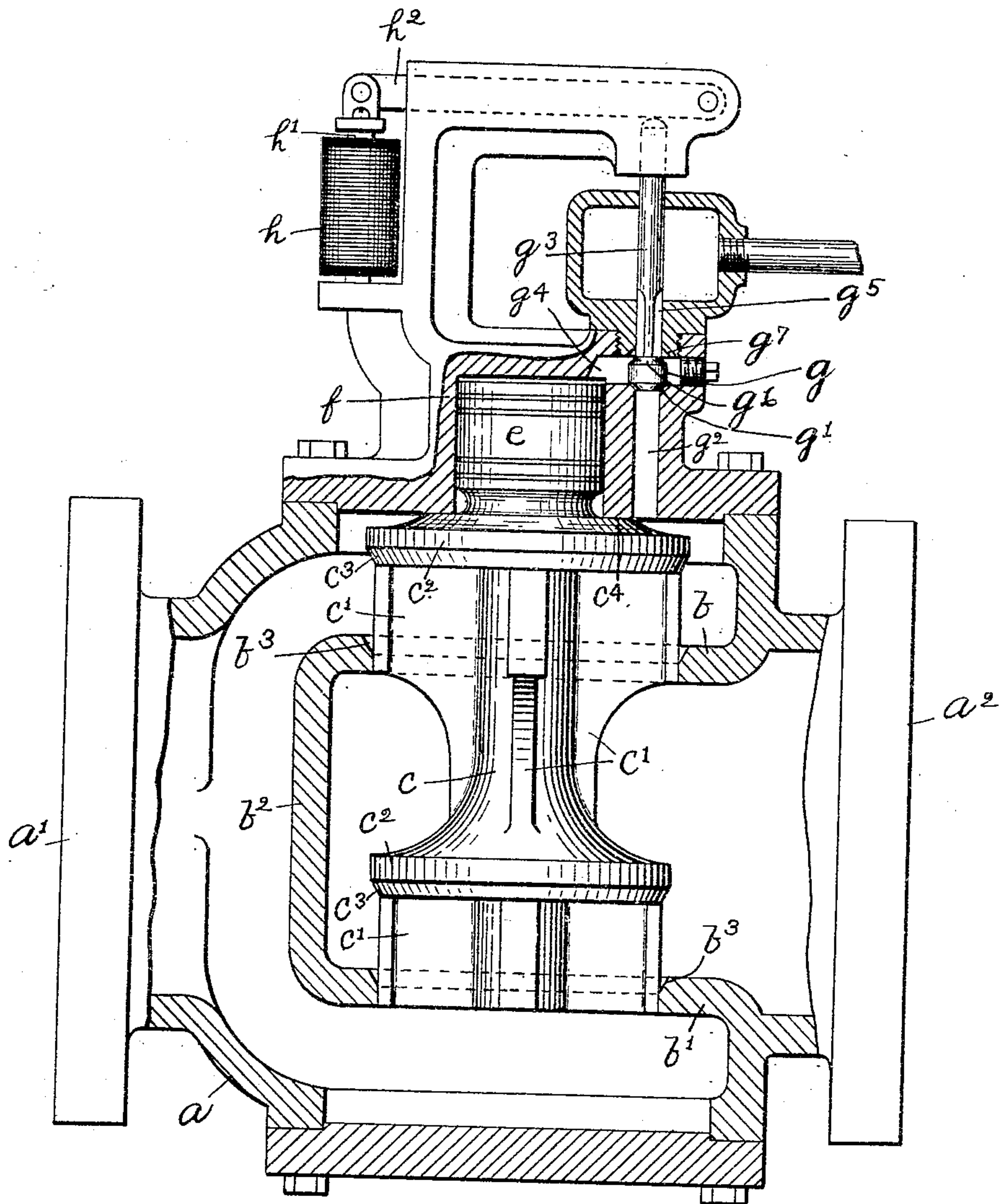


912,384.

Patented Feb. 16, 1909.



Witnesses:  
 H. B. Davis.  
 Cynthia Doyle

Inventor:  
 James L. Kimball  
 By Davis & Harman.  
 Atty.



# UNITED STATES PATENT OFFICE.

JAMES L. KIMBALL, OF SALEM, MASSACHUSETTS, ASSIGNOR TO LOCKE REGULATOR COMPANY,  
OF SALEM, MASSACHUSETTS, A CORPORATION OF MAINE.

## AUTOMATIC ENGINE STOP-VALVE.

No. 912,384.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed May 8, 1907. Serial No. 372,615.

*To all whom it may concern:*

Be it known that I, JAMES L. KIMBALL, of Salem, county of Essex, State of Massachusetts, have invented an Improvement in Automatic Engine Stop-Valves, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to automatic engine-stop valves, and has for its object to provide a balanced puppet-valve comprising two connected disks movable toward and from two valve-seats which are provided in the partition wall within the valve-case, with a piston which is connected to the uppermost disk and which moves in a cylinder on the valve-case, the pressure area of the piston being such that when added to the pressure areas of the disks the valve will be balanced and will fall by gravity and close upon its seats, and when subtracted therefrom, the valve will be unbalanced and will be lifted from its seat by the pressure of steam within the case; and also to provide the cylinder in which the piston moves with a vent leading to the atmosphere and with a port leading to the valve-case, and means for controlling said vent and port, whereby the vent may be opened and the port closed to unbalance the valve, in order that it may be lifted from its seats by the steam pressure within the case, or the vent may be closed and the port opened to balance the valve, permitting it to fall by gravity.

The figure shows in vertical section an automatic engine stop valve embodying this invention.

$a$  represents the valve-case, which is of any suitable shape and construction, having an inlet  $a'$  and an outlet  $a^2$ . A partition wall is contained in said case which separates the inlet  $a'$  and the outlet  $a^2$ , and said wall is designed to support and guide a vertically movable puppet-valve. The partition wall, herein shown, comprises two horizontal portions  $b$ ,  $b'$ , which extend inward from one side of the case, at points above and below the outlet  $a^2$ , to a point near the opposite side thereof, and from front to back of the case, and a vertical portion  $b^2$ , connecting said horizontal portions  $b$  and  $b'$ . The horizontal portions  $b$ ,  $b'$  of the partition wall are each formed with a circular hole through it, and said holes are arranged

one above the other and in line with each other, and each hole is beveled at the top as at  $b^3$ , to provide a seat for the puppet-valve. The puppet-valve has a cylindrical central portion or stem  $c$ , of a diameter considerably less than the diameter of the puppet holes, having webs  $c'$ , extending radially from it, which substantially fit said holes, so that when the puppet-valve is placed in the support, said webs will act to guide its vertical movements. Circular portions or disks  $c^2$  are formed or provided on said stem  $c$ , the edges of which are beveled at their under sides, as at  $c^3$ , to fit upon the valve seats  $b^3$ , and said disks are arranged at a distance apart corresponding to the distance between the two valve seats, so that both disks will close on their respective valve seats at the same time, and the uppermost disk is made larger in diameter than the lowermost disk.

The puppet-valve has at its upper end a piston  $e$ , which enters a cylinder  $f$ , formed or mounted on the valve-case  $a$ , said cylinder being of suitable size to receive the piston and permit the latter to work up and down therein. Means are provided for venting the cylinder  $f$ , as will be hereinafter described, in order that the piston may be moved up into the cylinder unrestrained or against the absence of pressure, and that the steam which is contained in the valve-case may by acting upon the valve, operate to thus move upward the piston, under such conditions.

The piston is made quite small in diameter, but its pressure area is such that when added to the pressure area of the disks the valve will be balanced and will fall by gravity upon its seats and when subtracted therefrom said valve will be moved away from its seats by the pressure within the case.

The top of the uppermost disk  $c^2$  is ground as at  $c^4$ , to engage a ground seat surrounding the open end of the cylinder, so that when the puppet-valve is open and the piston moved upward, said disk will engage said seat and will prevent leakage of steam into the cylinder. Means are provided for closing the vent and for admitting steam to the cylinder to equalize the pressure on the piston, and as soon as the pressure is thus equalized the valve closes, falling upon its seat by gravity. The means herein shown



for thus accomplishing this result consists of an auxiliary valve  $g$ , normally held upon its seat  $g'$ , and closing a port or passage  $g^2$  leading to the interior of the valve-case, and when opened the steam from the valve-case is admitted to the cylinder. The auxiliary valve  $g$  is held on its seat by an electro-magnet  $h$ , the armature  $h'$  of which is normally held in its attracted position. The armature carrying lever  $h^2$  overlies the stem  $g^3$  of the auxiliary-valve  $g$ , and mechanically holds it on its seat against the pressure of steam contained in the valve-case. When the armature is retracted the steam pressure acting upon the auxiliary valve lifts it. The steam from the port which is controlled by the auxiliary valve, passes through a passage  $g^4$  leading to the cylinder. The stem  $g^3$  of the auxiliary valve is made cylindrical and passes through a hole in the valve case and along that portion of the stem which passes through said hole, one or more recesses  $g^5$ , are formed, which are so disposed with respect to the case that when the auxiliary valve is closed on its seat, said recesses provide a vent for the cylinder, and just below said recesses the stem is provided with a beveled portion  $g^6$ , which when the stem is raised, closes on a seat  $g^7$ , and closes the vent.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In an automatic engine-stop valve, a valve-case, a partition wall therein having two alined valve-seats, a cylinder on said case having a vent and also having a port communicating with the interior of the valve-case, means for opening and closing said vent, and means for opening and closing said port, a puppet-valve in said case comprising two connected disks movable

toward and from said seats, and a piston connected to said valve, made smaller in diameter than the disks thereof, which moves in said cylinder, the pressure area of which, when added to the pressure areas of the disks balances the valve, permitting it to fall by gravity upon its seats, and when subtracted therefrom unbalances the valve, permitting it to be lifted from its seats by the pressure within the case, substantially as described.

2. In an automatic engine-stop valve, a valve-case, a partition wall therein having two alined valve-seats, a cylinder on said case having a vent and also having a port communicating with the interior of the case and also having a ground seat surrounding its open end, means for opening and closing said vent, and means for opening and closing said port, a puppet-valve in said case comprising two connected disks movable toward and from said valve-seats, the uppermost disk having a ground face adapted to engage said ground seat when the valve is open, and a piston connected to said valve made smaller in diameter than the disks thereof, which moves in said cylinder, the pressure area of which, when added to the pressure areas of the disks balances the valve, permitting it to fall by gravity upon its seats and when subtracted therefrom unbalances the valve permitting it to be lifted from its seats by the pressure within the case, substantially as described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JAMES L. KIMBALL.

Witnesses:

B. J. NOYES,  
H. B. DAVIS.