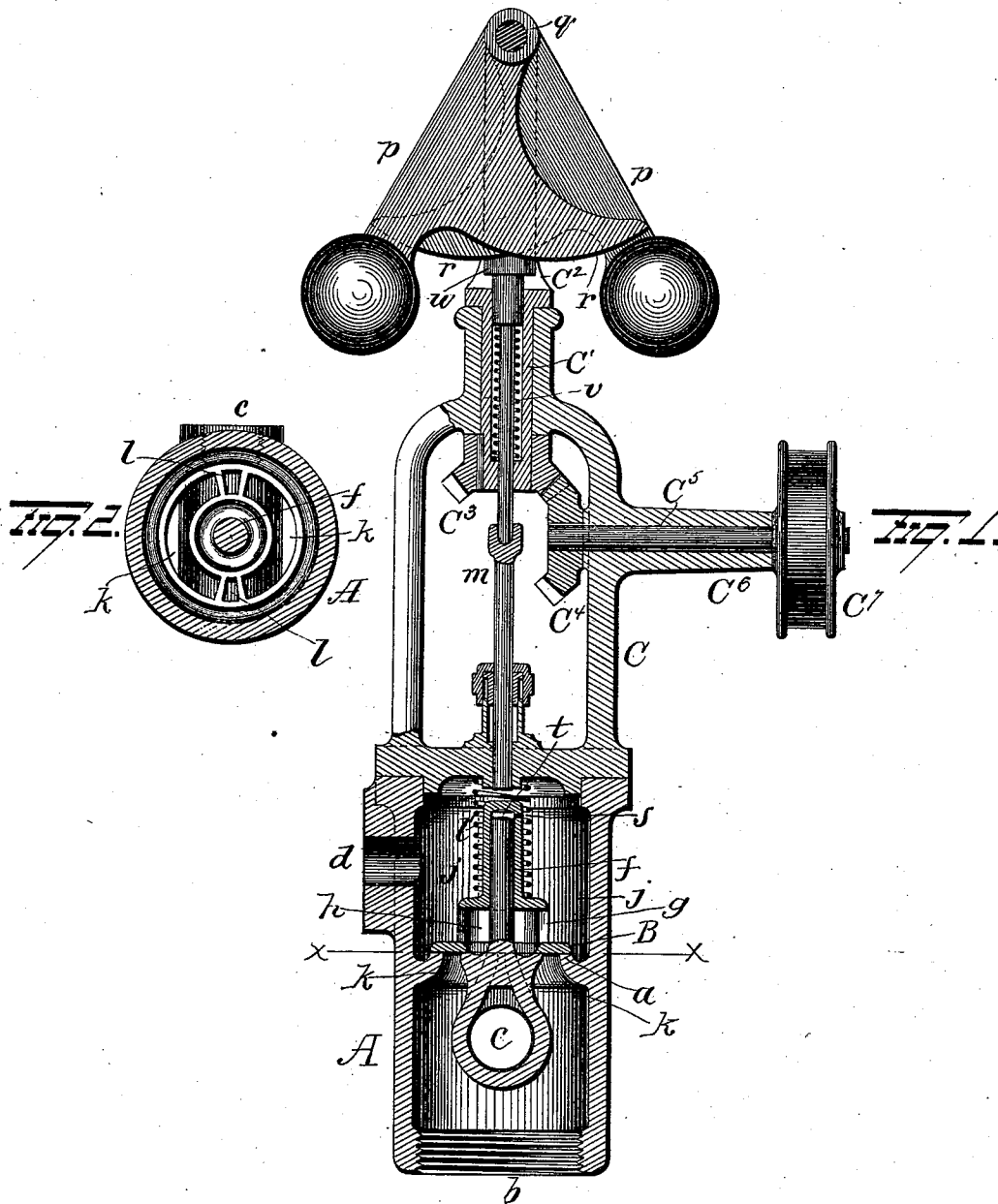


(No Model.)

S. VIVIAN & F. A. RIDER.
VALVE FOR GAS ENGINES.

No. 532,849.

Patented Jan. 22, 1895.



Witnesses
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UNITED STATES PATENT OFFICE.

SIMON VIVIAN AND FRANK A. RIDER, OF FORT WAYNE, INDIANA,
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VALVE FOR GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 532,849, dated January 22, 1895.

Application filed January 20, 1894. Serial No. 497,529. (No model.)

To all whom it may concern:

Be it known that we, SIMON VIVIAN and FRANK A. RIDER, of Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Valves for Gas-Engines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to an improvement in valves for gas engines,—the object of the invention being to produce simple and efficient means for mixing air and gas for a gas engine and properly governing the supply of the mixed air and gas to the engine.

With this object in view the invention consists in certain novel features of construction and combinations and arrangements of parts as hereinafter set forth and pointed out in the claims.

In the accompanying drawings: Figure 1 is a sectional elevation. Fig. 2 is a cross section on the line $x-x$ of Fig. 1.

A represents the valve casing which is made with a large air inlet b , a comparatively small gas inlet c , and a port d adapted to communicate with the cylinder of a gas engine and conduct air and gas thereto.

Within the casing A, a valve seat a is made, on which a puppet valve B is located, said puppet valve being adapted to move up and down upon a spindle f and is made with openings g by means of which a chamber h is made to be always in communication with a chamber j in the upper portion of the casing A and with said chamber j , the port d communicates.

The valve B is adapted to normally cover air passages k, k and gas passages l, l —said valve being retained normally on its seat by means of a spring v . A small opening s establishes communication between the chamber t (formed by the upper end of the spindle f and the upper end of the valve B) and the chamber j , thus producing, in effect, a dash pot and thereby preventing all shock or jar to the valve B as it returns to its seat after having been operated in the manner hereinafter explained.

When the valve B is lifted from its seat the

air and gas will pass into the chamber j directly by way of the outer edge of the valve face and also by way of the inner edge of the valve face through the chamber h . It is apparent that the quantity of air passing through the ports k, k , is in direct proportion to the lift of the valve B and it is also evident that the quantity of gas passing through the ports l, l , is also in direct proportion to the lift of the valve B. Therefore at all positions of the valve, the proportion of air and gas entering the chamber j will be the same and hence any amount of mixture that may pass into the chamber j must at all times be composed of the same relative amounts of air and gas.

Located above the valve casing A, is a frame C, in the upper end of which a sleeve C' is revolvably mounted, said sleeve terminating at its upper end in a yoke C^2 , and provided at its lower end within the frame C, with a pinion C^3 , to which motion is imparted by a pinion C^4 carried by a shaft C^5 . The shaft C^5 is mounted in a hollow arm C^6 projecting from the frame C and at its outer end is provided with a pulley C^7 , to which motion is imparted from the engine. Weighted governor arms p, p , are suspended from the center pin q at the upper end of the yoke C^2 and said arms are made with edges or faces r, r , eccentric with the pivot q . These eccentric faces are adapted to bear on a movable head w inserted in the upper end of the sleeve C' and connected with or made a part of a jointed stem m , which latter is adapted to control the operation of the valve B. A spring v is located in the sleeve C' , and bears at its respective ends on the head w and an internal shoulder at the bottom of the sleeve.

The position of the movable stem m which is actuated by the governor, controls the amount of the lift of the valve B, which in turn allows more or less of the explosive mixture to enter the engine cylinder according to the requirements of the load on the engine. The governor arms p, p , suspended from the center pin q are rotated by means of the gearing above described or any other suitable gearing, from the engine, the position of the arms in relation to the axis of rotation being determined by the speed of the engine, as is

usual with centrifugal governors. As the arms p, p move outward or away from the center of rotation, the faces r, r , which are made eccentric with the center pin g , as above explained, cause the stem m to take a downward movement, by means of which the lift of the valve B is lessened so that when the arms p, p , are at their extreme outer position the valve B will be held firmly to its seat, thereby preventing any mixture from entering the cylinder. As the speed of the engine decreases the arms p, p , move inward, the movable stem m being released and the valve B permitted to rise and mixed air and gas again enter the cylinder.

It is evident that slight changes might be resorted to in the form and arrangement of the several parts described, without departing from the spirit and scope of our invention and hence we do not limit ourselves to the exact construction herein set forth, but,

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a mixing and governing valve for gas engines, the combination with a casing and a valve seat having gas and air inlets, of a valve adapted to close said gas and air inlets, a chamber in said valve adapted to conduct air and gas to the interior of the casing, and means for controlling the action of said valve whereby to regulate the simultaneous admis-

sion of air and gas to the interior of the casing above the valve, substantially as set forth.

2. The combination with a casing, a valve seat therein having gas and air ports alternately arranged in a circle and a spindle, of a valve adapted to move up and down thereon, said valve constructed to cover these ports, it being located sufficiently far from the spindle and the inner wall of the casing so that spaces are formed for the passage of air and gas at each edge thereof, substantially as set forth.

3. In a mixing and governing valve for gas engines, the combination with a casing, a valve seat therein having gas and air ports, and a spindle, of a valve adapted to move up and down upon the spindle, said valve removed a distance from the spindle and having its face constructed so that the air and gas will pass into the chamber above the valve directly by way of the outer edge and also by way of the inner edge of the valve, substantially as set forth.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

SIMON VIVIAN.
FRANK A. RIDER.

Witnesses:

FRANK. B. PHILLIPS,
SEYMOUR D. BOYD.