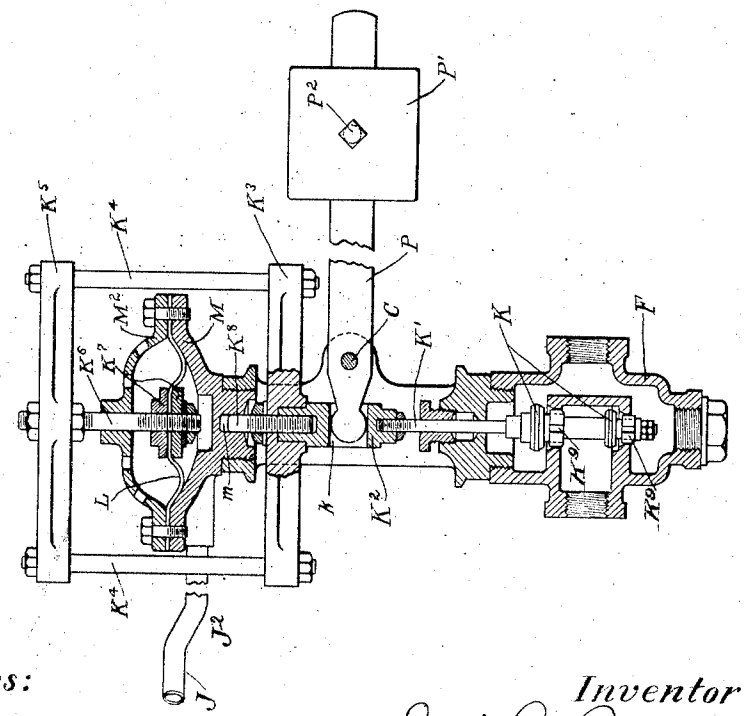
G. H. BEEBE.

VACUUM GOVERNOR.

APPLICATION FILED JAN. 12, 1907.

927,446. Patented July 6, 1909.



Witnesses:

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GEORGE H. BEEBE, OF MARSHALLTOWN, IOWA, ASSIGNOR TO THE FISHER GOVERNOR COMPANY, OF MARSHALLTOWN, IOWA, A CORPORATION OF IOWA.

VACUUM-GOVERNOR.

No. 927,446. Specification of Letters Patent. Patented July 6, 1909.

Application filed January 12, 1907. Serial No. 351,937.

To all whom it may concern:

Be it known that I, GEORGE H. BEEBE, a citizen of the United States, residing at Marshalltown, in the county of Marshall and State of Iowa, have invented certain new and useful Improvements in Vacuum-Governors, of which the following is a specification.

This invention relates to governors especially adapted for use in connection with vacuum systems of heating, and has for its object to improve the construction of such devices with a view to increased efficiency and simplicity.

In the form herein illustrated the governor is intended to control the admission of pressure fluid to the pump which produces the vacuum, causing said pump to run faster or slower depending on whether the vacuum is too slight or too high with reference to the point desired.

The accompanying drawing shows a longitudinal sectional view of a vacuum governor embodying the features of my invention.

F is a valve casing adapted to be connected in the supply pipe running from the boiler to the pump. In the casing F is a puppet valve K, the stem K′ of which valve extends upward through a stuffing box of common construction in the upper wall of the valve casing F. Upon the upper end of the stem K′ is mounted a slotted member K^2, the slot *k* of which is adapted to receive one end of a pivoted lever to be presently described. The upper end of the member K^2 carries a yoke comprising a lower cross bar K^3, upright bars K^4 and an upper cross bar K^5.

Supported by the valve casing F, or in any other suitable way, is a casing M comprising upper and lower sections having peripheral flanges by which they are secured together. Within the casing M is a diaphragm L, the edges of said diaphragm being secured between the flanges on said casing-sections. The inside of the casing M above the diaphragm L is at all times in communication with the atmosphere by suitable means, such as ports in the upper wall of said casing. Below the diaphragm L the interior of the casing is adapted to contain water and communicates through a pipe J with the vacuum system being controlled. The pipe J ordinarily is connected with the return pipe of the heating system a short distance above the pump. Said pipe is bent upwardly in one or more places, as at J^2, from its point of connection with the diaphragm casing in order to retain water in said casing so that the steam in the pipe may not reach the diaphragm L. A rod K^6 fixed in the upper cross bar K^5 extends through an opening in the upper section of the casing M and is secured to the diaphragm L by means of plates K^7 lying at opposite sides of said diaphragm and screw-threaded on or otherwise secured to the rod K^6. It will be seen that any movement of the diaphragm L will, through the members K′, K^2 and yoke K^3, move the valve K. A pin K^8 fixed in the upper end of the member K^2 and in the cross bar K^3 lies in a recess *m* in the lower section of the casing M, and together with the rod K^6 serves as a guide for the yoke and its connected parts. This arrangement obviates the necessity for having fluid-tight joints at the sliding parts, since none of the guides enter the vacuum side of the casing M.

Pivotally mounted at any suitable point, as at C, is a lever P, one end of which lies within the slot *k* in the member K^2, the other end carrying a weight P′ movable along said lever, means such as a set screw P^2 being used to secure it in position. The weight P′ is fixed on the lever P^2 in any desired position according to the height of the vacuum it is desired to maintain. If only a slight vacuum is wanted the weight is set close to the pivot C and if a high vacuum is to be had the weight is set farther out toward the end of the lever. When the vacuum becomes less than the predetermined amount, the weight P′ on the lever P overcomes the weight of the yoke and connected parts and the pressure of the atmosphere on the diaphragm L and raises said yoke, said diaphragm and the puppet valve K, allowing more steam to pass to the pump and increasing the speed of said pump so that a higher vacuum will be created. When the vacuum has reached a point where the atmospheric pressure on the diaphragm L is sufficient to overcome the weight of the counterbalance lever P the valve K will gradually be closed and the speed of the pump thereby reduced.

If desired, the valve K may be arranged so that it will never fit its seat tightly, as by providing one or more slots in its periphery, in order that the pump may be kept running at all times. An enlarged portion K^9 may be provided adjacent the valve disks, said portion sliding in the valve seat and having slots

therein for permitting the steam to pass through the valve, the purpose of such a construction being to prevent a sudden rush of steam to the pump when the valve is opened and to secure a more even control over the vacuum.

I claim as my invention:

1. In a vacuum governor, in combination, a casing; a diaphragm in said casing, the upper side of said diaphragm being open to atmospheric pressure, the other side of said diaphragm being exposed to the vacuum; a rod connected to the middle portion of said diaphragm and extending through the upper wall of said casing; a yoke surrounding said casing and having its upper end secured to said rod; a valve and valve casing; a member connecting said yoke and said valve; and a weighted lever pivoted on a part stationary with reference to said casings and engaging said member.

2. In a vacuum governor, in combination, a casing; a diaphragm in said casing, the upper side of said diaphragm being open to atmospheric pressure, the other side of said diaphragm being exposed to the vacuum; a rod connected to the middle portion of said diaphragm and extending through the upper wall of said casing; a yoke surrounding said casing and having its upper end secured to said rod; a pin fixed in the lower end of said yoke and sliding in a recess in said casing, said pin and said rod serving to guide said yoke and its connected parts in substantially a straight line; a valve and valve casing; a member connecting said yoke and said valve; and counterbalancing means.

Signed at Marshalltown, in the county of Marshall and State of Iowa, this seventh day of January, A. D. 1907.

GEORGE H. BEEBE.

Witnesses:

CASSIUS M. NORTON,

LILLIAN NORTON.