

No. 814,063.

PATENTED MAR. 6, 1906.

D. F. MORGAN.
DIAPHRAGM VALVE.

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Fig. 2.

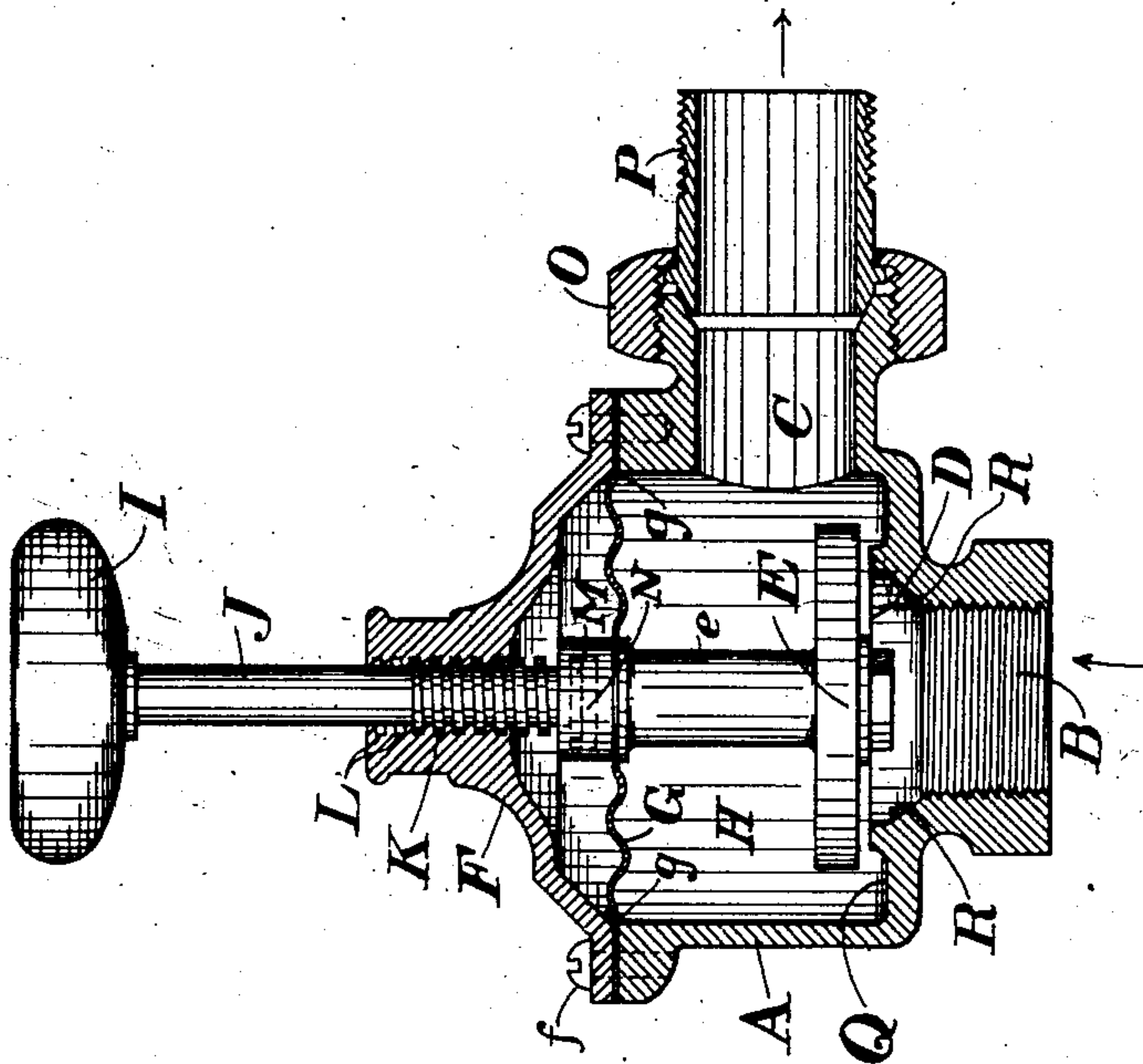
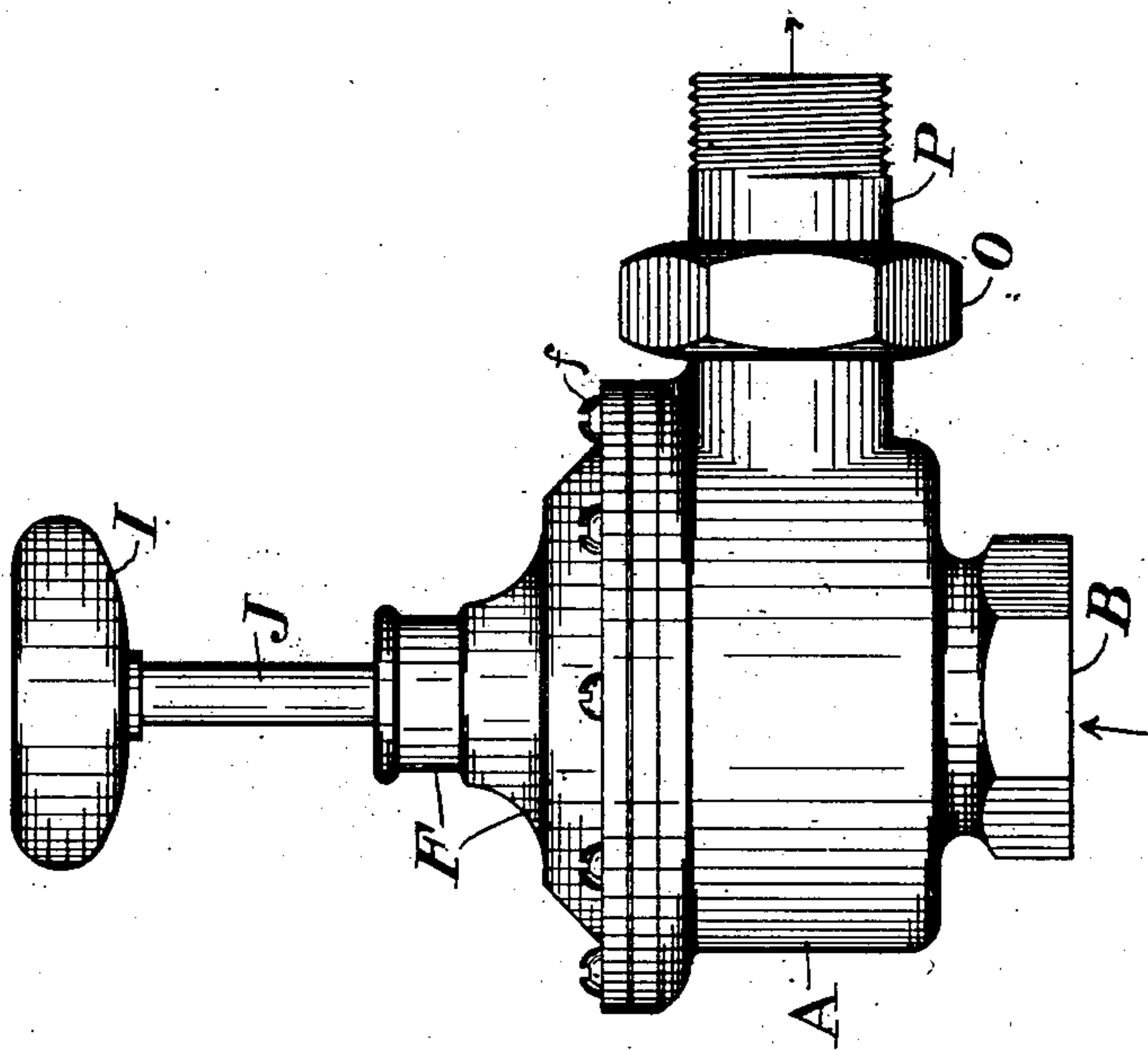


Fig. 1.



Witnesses.

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DIAPHRAGM-VALVE.

No. 814,063.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DOCTOR FRANKLIN MORGAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Diaphragm-Valves, of which the following, when taken in connection with the drawings accompanying and forming a part of this specification, is a full and complete description sufficient to enable those skilled in the art to which it pertains to understand, make, and use the same.

In vacuum steam-heating systems constructed with the intent to drive the air therefrom by raising the pressure of the steam therein to above atmospheric pressure and then to permit the pressure of the steam therein to fall below atmospheric pressure and provided with means, as seals, to prevent return of air to the system it has been found that a source of considerable annoyance relative to the maintenance of a vacuum throughout such system arises from the leakage of air thereinto around the stems of the valves employed to control the admission of steam to the radiators of the system.

This invention relates to the valves attached to the radiators of such a steam-heating system as is hereinbefore referred to to control the admission of steam to the radiators of the system.

The object of this invention is to obtain a valve which may be attached to the radiator in vacuum steam-heating systems which will perform the several functions required of such valves and which will at the same time require no packing to render the same airtight and which nevertheless prevents the admission of air therethrough into such steam-heating system.

A further object of the invention is to obtain a valve of the character described which will be durable, slightly in appearance, and simple in construction.

As is hereinafter fully shown and described, I in making an operative and durable valve with a metal diaphragm am forced to lessen the longitudinal movement of the valve-stem over what has been done, and to do this and retain the area of discharge over the valve-seat have made use of the flaring outlet and raised valve-seat. In raising the valve-seat I dispose of the wall of water of condensation which otherwise was formed,

and in enlarging the diameter of the valve-seat and outlet I reduce the speed and pressure of the incoming steam and am enabled to have small movement to the valve without restricting the passage-way.

In the drawings referred to, Figure 1 is an elevation of a valve embodying this invention, and Fig. 2 is a vertical sectional view of a valve embodying the invention.

A reference-letter applied to designate a given part is used to indicate such part throughout both the figures of the drawings wherever the same appears.

A is the body part of the casing of the valve.

B is the inlet; C, the outlet.

D is the valve-seat, and E the valve thereof.

F is the cover or top of body part A, and ff are screws securing cover F in place on the body part A.

G is a metallic diaphragm secured between body part A and top F. Diaphragm G is closed tightly onto the top of body part A and may be brazed or soldered thereto, if desired, so as to obtain the closed chamber H.

g is the junction of diaphragm G and the top of body part A. The stem e of valve E is also secured to the diaphragm G to obtain an air-tight joint.

Longitudinal movement of valve-stem e is obtained by raising and depressing the diaphragm G when the same is attached to such valve-stem, and rotatable movement of the valve-stem is prevented by its being secured, as described, to the diaphragm. The longitudinal movement of stem e raises and lowers the valve E, thus unseating and seating such valve.

I is the hand-wheel by means of which the valve is operated, and J is the stem of hand-wheel I. Stem J is provided with screw-threads K thereon, engaging with the screw-threads L in top F, and is also provided with the annular flange M at the lower end thereof engaging with the annular recess N in the upper end of stem E.

O is an ordinary union joint by means of which the valve-casing is attached to nipple P of a radiator.

It will be observed that the seat D is of greater diameter than is the inlet B and that such seat is raised above the bottom Q of chamber H.

R is the flaring upper end of inlet B to chamber H, by means of which the diameter

of the valve-seat D is made greater than is the diameter of the inlet.

Rotation of hand-wheel I in one direction raises the valve E and rotation of such hand-wheel in the opposite direction lowers such valve.

By flaring the upper end of the inlet B, as at R, to the valve-seat D, I find that an operative valve is obtained wherein the movement of the valve E and its stem e is so limited as to permit the use of metallic diaphragm G of comparative small diameter. It will be observed, further, that the side walls of the body part A of the casing of the valve are substantially cylindrical. By this construction I obtain sufficient clearance between the periphery of valve E and the walls of the chamber H to avoid choking the opened valve by water of condensation flowing there-through from the radiator to an extent interfering with the flow of steam therethrough into the radiator, although, as hereinbefore stated, the valve is raised to a limited extent and as permitted by the diaphragm without strain thereon.

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

1. In a valve, the combination of a casing

provided with an inlet and an outlet, the wall of such inlet raised above the floor of the chamber into which the inlet discharges, and such inlet provided with a flaring upper end and with a valve-seat thereto of larger diameter than is such inlet, a diaphragm secured in the casing to obtain a closed chamber, a valve coacting with the valve-seat, such valve provided with a stem and such stem secured to the diaphragm, and means to move the stem longitudinally; substantially as described.

2. In a valve, the combination of a casing provided with a valve-chamber therein and such chamber provided with an inlet and an outlet, such inlet provided with a flaring upper end and with a valve-seat thereto of larger diameter than is such inlet, and the chamber in which the valve is placed provided with a substantially horizontal floor with the valve-seat raised above the floor, a diaphragm secured in the casing to close the chamber in which the valve is placed, a valve to coact with the valve-seat, and means to move the valve longitudinally.

DOCTOR FRANKLIN MORGAN.

In presence of—

CHARLES TURNER BROWN,
CORA A. ADAMS.