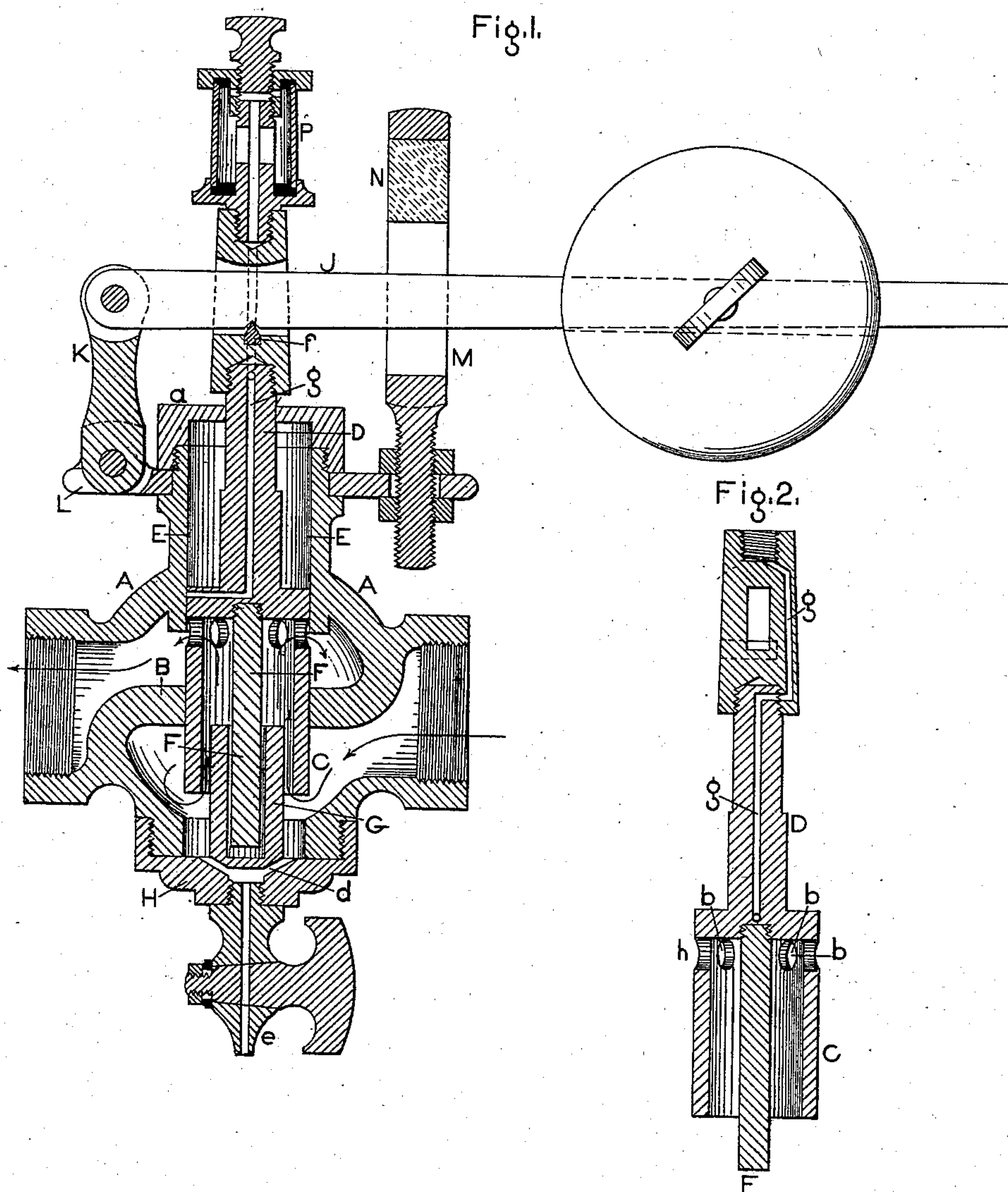


J. DANBY.
Pressure-Regulator Valve.

No. 223,891.

Patented Jan. 27, 1880.



Witnesses:

W. P. Grant,
H. F. Kircher

Inventor:

James Danby,
by *John A. Giedersheim*
ATTORNEY.

UNITED STATES PATENT OFFICE.

JAMES DANBY, OF WILMINGTON, DELAWARE, ASSIGNOR TO JOHN S. McDANIEL, OF SAME PLACE.

PRESSURE-REGULATOR VALVE.

SPECIFICATION forming part of Letters Patent No. 223,891, dated January 27, 1880.

Application filed September 29, 1879.

To all whom it may concern:

Be it known that I, JAMES DANBY, of Wilmington, in the county of New Castle and State of Delaware, have invented a new and useful Improvement in Pressure-Regulator Valves for Steam and Fluids, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a vertical section of the valve embodying my invention. Fig. 2 is a vertical section of a detached portion at a right angle to that shown in Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

Referring to the drawings, A represents the shell of the valve, and B the wall between the inlet and outlet branches thereof. C represents a plunger, which is closed at the top and open at the bottom, fitted in the opening in the wall B. and suspended from a stem, D, which passes through the top cap, *a*, of the shell.

In the upper part of the plunger C are openings *b*, which communicate with the interior of the plunger and exit-branch of the valve, and the upper portion of the shell provides a chamber for the play of the plunger, its inner face constituting the seat of said plunger, as at E. Depending from the top plate of the plunger is a stem, F, which enters a tubular guide, G, rising from the bottom of the shell, and plays therein, whereby the plunger is guided and caused to work true, and the bottom of the shell is in the form of a cup, H, which receives the condensed steam, and is formed with passages *d*, for causing the escape of the same and preventing freezing of the valve, a suitable cock, *e*, being provided for opening and closing the passages.

J represents a weighted lever, which is passed freely through a vertical slot in the upper part of the stem D, and has its bearing on said stem, for which purpose the bottom wall of the slot has a knife-edge, *f*, which enters a notch on the lever. The axis of the lever is on a link-fulcrum, K, which is pivoted to a yoke, L, encircling the upper part of the shell, and from said yoke rises a slotted guide, M, through which the lever is passed, the upper part of the guide being occupied by or provided with a piece, N, of rubber or other elastic material,

forming a stop against which the lever may strike and be cushioned when a sudden or extraordinary high pressure of steam is exerted on the plunger C. Surmounting the stem D of the plunger is a lubricator, P, and in said stem is a duct, *g*, which communicates with the lubricator and directs the lubricant therefrom to the seat E of the plunger, whereby provision is made for lubricating the plunger and causing it to move with ease and smoothness.

Circumscribing the exterior of the openings *b* at the top of the plunger C is a groove, *h*, which, when the steam escapes through said openings when uncovered, permits the steam to pass from one opening to the other, and thus provides an extra way or channel for the steam, whereby the sensitiveness of the valve is increased.

The weight or load of the lever is adjusted relatively to the required pressure of the steam to be maintained. The steam enters the plunger from below and exerts its pressure thereon, and escapes through the openings *b* to the place of service. When the pressure increases the plunger rises and the openings are covered by the seat E, the effect whereof is to reduce the volume of steam passed off; and when the pressure decreases the plunger falls and uncovers the openings to a greater extent, thus allowing the escape of a greater volume of steam, the reduction or increase in the volume of steam directed from the valve continuing until the proper pressure is restored, and thus an equable pressure is maintained.

As the lever rests on the knife-edge *f*, and is pivoted to the link-fulcrum K, and the latter is pivoted to the yoke L, the lever is raised and lowered with the utmost freedom, and thereby assists in increasing the sensitiveness of the valve.

If desired, the stem F may be tubular and receive the guide G without affecting the operation of these parts.

The cylinder E is formed with an annular exterior flange around its upper portion and screw-threaded above said flange. The upper end of said cylinder is closed by a cap, *a*, which consists of a circular head and an annular internally screw-threaded flange, whereby said

cap screws upon the threaded upper end of
said cylinder. A yoke, L, sits in the space
between said cap and the flange on said cylin-
der. When said cap is screwed home it serves
5 the double purpose of closing the upper end of
the cylinder and clamping the yoke tightly in
position. By unscrewing the cap the yoke and
attached parts are disengaged from the cylin-
der. The same movement serves to open the
10 cylinder itself. This yoke serves as a base for
fulcrum-link K, which is pivoted thereto, and
also for guide M, which is arranged to be ad-
justable up and down through an aperture in
said yoke on the side opposite to said fulcrum-
15 link. The lower end of this guide is screw-
threaded and provided with two nuts, one of

which is above the yoke and one below it. By
means of these nuts and this screw-threaded
end the said yoke may be adjusted up or down,
so as to limit the throw of lever J, as desired. 20

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

In combination with cylinder E and yoke L,
secured thereon, the guide M, having elastic 25
stop-pad N and a screw-threaded shank, which
is vertically adjustable through said yoke by
means of nuts, substantially as set forth.

JAMES DANBY.

Witnesses:

JOHN A. WIEDERSHEIM,
A. P. GRANT.