BROADBENT & CULVER.

Stop Valve.

No. 112,216. Patented Feb. 28, 1871.

Fig: 1

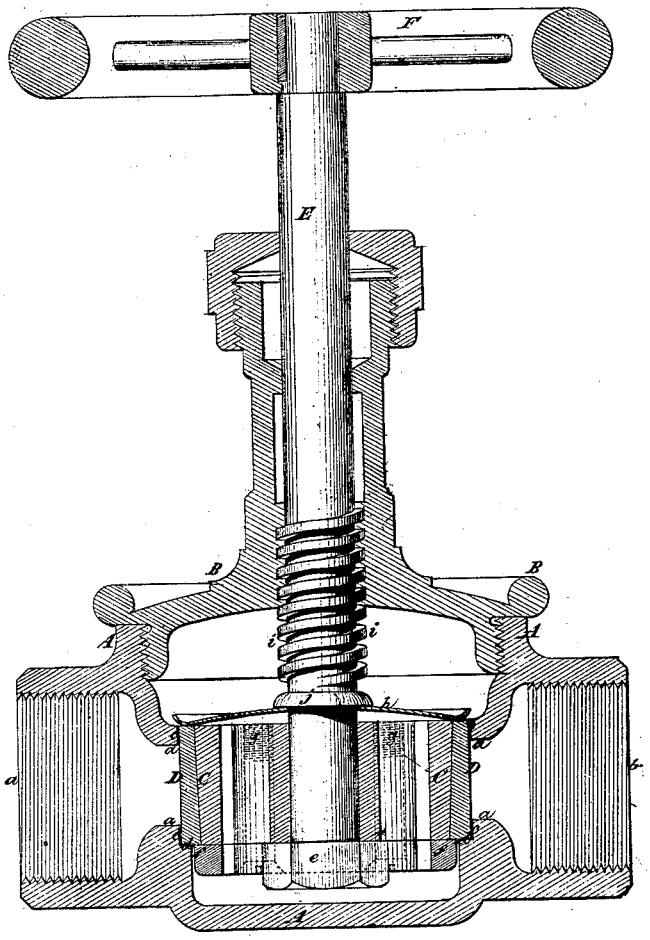
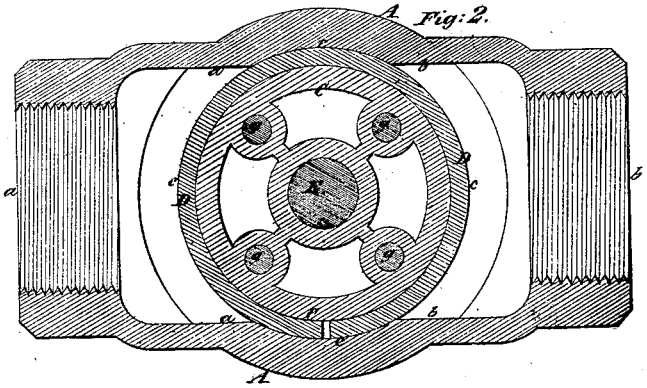


Fig: 2.



Witnesses

Fred. B. Haynes

R. L. Babcock

Sidney Broadbent

Willard B. Culver.

per Brown Cooke & Co

Attorneys

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

SIDNEY BROADBENT AND WILLARD B. CULVER, OF SCRANTON, PA.

IMPROVEMENT IN STOP-VALVES.

Specification forming part of Letters Patent No. **112,216,** dated February 28, 1871.

To all whom it may concern:

Be it known that we, SIDNEY BROADBENT and WILLARD B. CULVER, of Scranton, in the county of Luzerne and State of Pennsylvania, have invented a new and Improved Stop-Valve; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification.

This stop-valve has a cylindrical casing and seat; and the valve proper consists in an expanding piston, operated by an internal conical expander on its center spindle, acting in conjunction with a stop-shoulder below or behind the seat, and with or without a spring.

Figure 1 is a central vertical section; and Fig. 2, a horizontal section.

Similar letters of reference indicate corresponding parts in both figures.

A is the casing, of cylindrical form, provided with inlet and outlet passages *a b*, on opposite sides, and having a removable cover, B, which may be screwed in or otherwise secured. This casing is bored truly at *c c*, to form the cylindrical seat for the expanding piston, and a stop-shoulder, *d*, is left at the bottom of the bore, as shown in Fig. 1.

The expanding piston or valve proper is composed of two principal parts, viz., the conical expander C and the surrounding ring D. The ring is cut like an ordinary piston-packing ring. This exterior is cylindrical, to correspond with the seat *c c*, and its interior conical, to fit the conical expander C. This expander consists of an inverted frustum of a cone of slight taper, either hollow or solid, having a flange, *f*, on its lower or smaller end, for the support of the ring D, and it is fitted loosely to the central spindle E, between a collar, *j*, formed on the said spindle, and a nut, *e*, screwed onto the lower or inner end thereof.

The flange *f* is, for convenience of placing the ring on the expander C, made of a separate piece and screwed to the expander by screws *g g*.

A spring, *h*, is applied under the collar *d* to press upon the ring D and exert a constant tendency to press it downward or inward on the smaller portion of the expander, where it fits easily.

The spindle has cut upon it, above or outside of the valve, a screw-thread, *i*, which works in a female screw-thread in the cover B, and is furnished at its upper or outer end with a suitable handle, F.

The valve is opened by turning the handle and thereby raising the spindle to bring the ring D above the inlet and outlet-passages *a b*, and is closed by turning the handle in the opposite direction, and thereby bringing the ring opposite to the said passages.

When the valve is open the ring D is on the lower part of the conical expander, where it is held in contact with the flange *f* by means of the spring *h*, and in this position of the ring it assumes its normal or unexpanded condition, and is small enough to pass loosely into its seat.

In screwing down the spindle to close the valve, the expander and ring move together until the ring comes in contact with the stop-shoulder *d* at the bottom of the seat *c*, to which position Fig. 1 represents it as having arrived, and a continued downward movement of the spindle causes the collar *j* of the spindle to move down the expander within the ring, and thereby expand the latter until it fits tightly within the seat, and perfectly closes the passages *a b*.

When the spindle commences to be raised to open the valve, the spring *h*, pressing on the ring D, holds it down to the shoulder *d* until the expander C has risen a short distance, and so left the ring free to assume its normal condition, in which it is loose within the seat; and the flange *f*, then coming in contact with the bottom of the ring, causes the continued upward movement of the spindle and expander to raise the ring without friction within the seat.

The expanding ring, thus working within the seat without friction, is not subject to wear or cutting, and this, with its expanding action in closing, insures great tightness, which is not impaired by wear.

The spring *h* is not absolutely indispensable, but it tends to the more perfect insurance of the construction of the ring D, and its constant passage into and from its seat without injurious friction.

The screw-thread may be arranged upon

the spindle otherwise than as specified, or the valve-spindle might be operated by a lever instead of by a screw.

We do not claim, broadly, an expanding plug-valve; but

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The arrangement of the conical expander C, the external expanding ring D, the stop-shoulder *d*, the spindle E, cylindrical seat *c*, and passages *a b*, substantially as and for the purpose herein described.

2. The combination of the spindle E, ring D, conical expander C, and spring *h*, substantially as and for the purpose herein specified.

SIDNEY BROADBENT.
WILLARD B. CULVER.

Witnesses:
A. H. WINTON,
J. H. PHELPS.