

Nov. 10, 1925.

1,560,656

R. W. BROWN

DIAPHRAGM VALVE

Filed Sept. 22, 1923

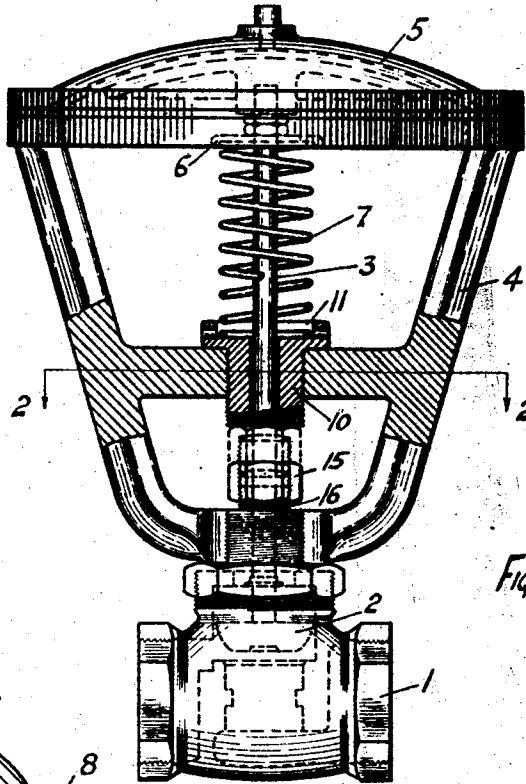


Fig-1

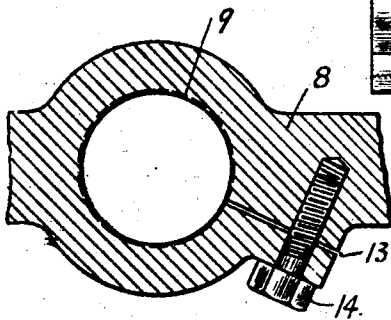


Fig-2

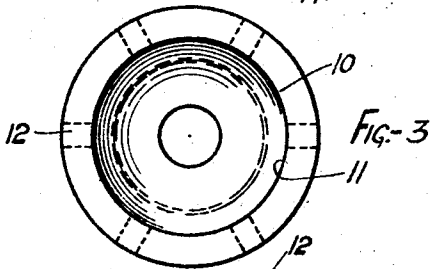


Fig-3

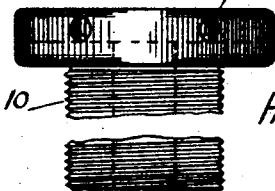


Fig-4

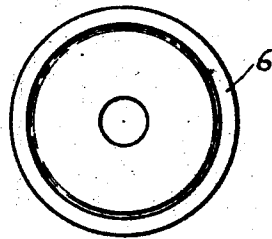


Fig-5



Fig-6

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UNITED STATES PATENT OFFICE.

ROY W. BROWN, OF AKRON, OHIO, ASSIGNOR TO THE FIRESTONE TIRE AND RUBBER COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

DIAPHRAGM VALVE.

Application filed September 22, 1923. Serial No. 664,275.

To all whom it may concern:

Be it known that I, ROY W. BROWN, a citizen of the United States, and a resident of Akron, county of Summit, State of Ohio, have invented certain new and useful Improvements in Diaphragm Valves, of which the following is a specification.

The invention relates to valves of the type known as diaphragm valves in which control of fluid flow or pressure is controlled by differentials between pressure upon a suitable elastic diaphragm and a regulatable spring. This type of valve is old and well known, the purpose of the invention being to improve thereon.

One of the objects of the invention is to provide a substantial and easily adjustable device for regulating the pressure of the spring. Another object is the provision of a spring of larger diameter than formerly used so as to obtain greater accuracy and constancy of spring pressure. A still further object is the provision of an arrangement by which the packing gland may be easily replaced without interference with the spring or without dismantling the entire valve structure.

In the drawing is shown one form of the device in which

Figure 1 is a side elevation of the complete diaphragm valve a portion thereof being shown in section.

Figure 2 is a section on the line 2 2 of Figure 1,

Figures 3 and 4 are plan and elevation respectively of the lower adjustable spring container,

Figures 5 and 6 are plan and elevation, respectively, of the upper spring cup.

In the drawings 1 represents the usual valve casing through which passes the fluid to be regulated. The valve is shown in dotted lines at 2 and is provided with the vertically extending stem 3. On the upper part of the valve casing is carried the diaphragm supporting spider 4, the diaphragm housing being indicated by the numeral 5. The stem extends to and is attached to the flexible expansible diaphragm as shown in dotted lines in Figure 1.

On the upper end of the valve stem is carried the inverted cupped disk 6 which receives the upper end of the coil spring 7

which acts in opposition to the diaphragm. Across the lower portion of the spider at some distance from the base thereof is the transverse web or bar 8, the central point of which is provided with a screw threaded aperture 9 in which is mounted an adjustable plug 10, the upper end of which is formed as a cup or recess 11 to house the lower end of the spring 7. The walls of the cup are provided with holes 12 by means of which the cup can be rotated to adjust the tension of the spring 7. The bar 8 may be split as shown at 13 and provided with a bolt 14 by which the bearing is tightened and the cup fixed in adjusted position.

By providing the bridge piece or cross bar 8, a shorter, larger diameter spring may be used and an easy means of spring adjustment provided. The shorter spring gives a greater load acceleration resulting in a more desirable ratio between valve opening and pressure on the diaphragm.

The construction also has another advantage in that the nut 15 which carries the usual packing gland may be removed from its seat on the screw threaded stem 16, to enable the packing gland to be replaced, without changing the spring tension or dismantling the valve. The elevated position of the nut is shown in dotted outlines in Figure 1. This is of considerable advantage in operating valves of this type.

It will be appreciated that changes and modifications may be made in specific embodiments of the invention and within the scope of the claim attached.

I claim:

A diaphragm valve construction comprising a valve casing, a diaphragm, a supporting spider for the diaphragm, a cross-bar on the spider intermediate said casing and said diaphragm, said cross-bar having an aperture therein, a valve stem extending through the spider and said aperture, a spring surrounding the valve stem between said diaphragm and said cross-bar, a plug threaded in said aperture forming a seat for said spring and adapted to adjust the same, said cross-bar being split into said aperture to provide a clamp for securing said plug in an adjusted position.

ROY W. BROWN.