

920,556.

Fig. 1.

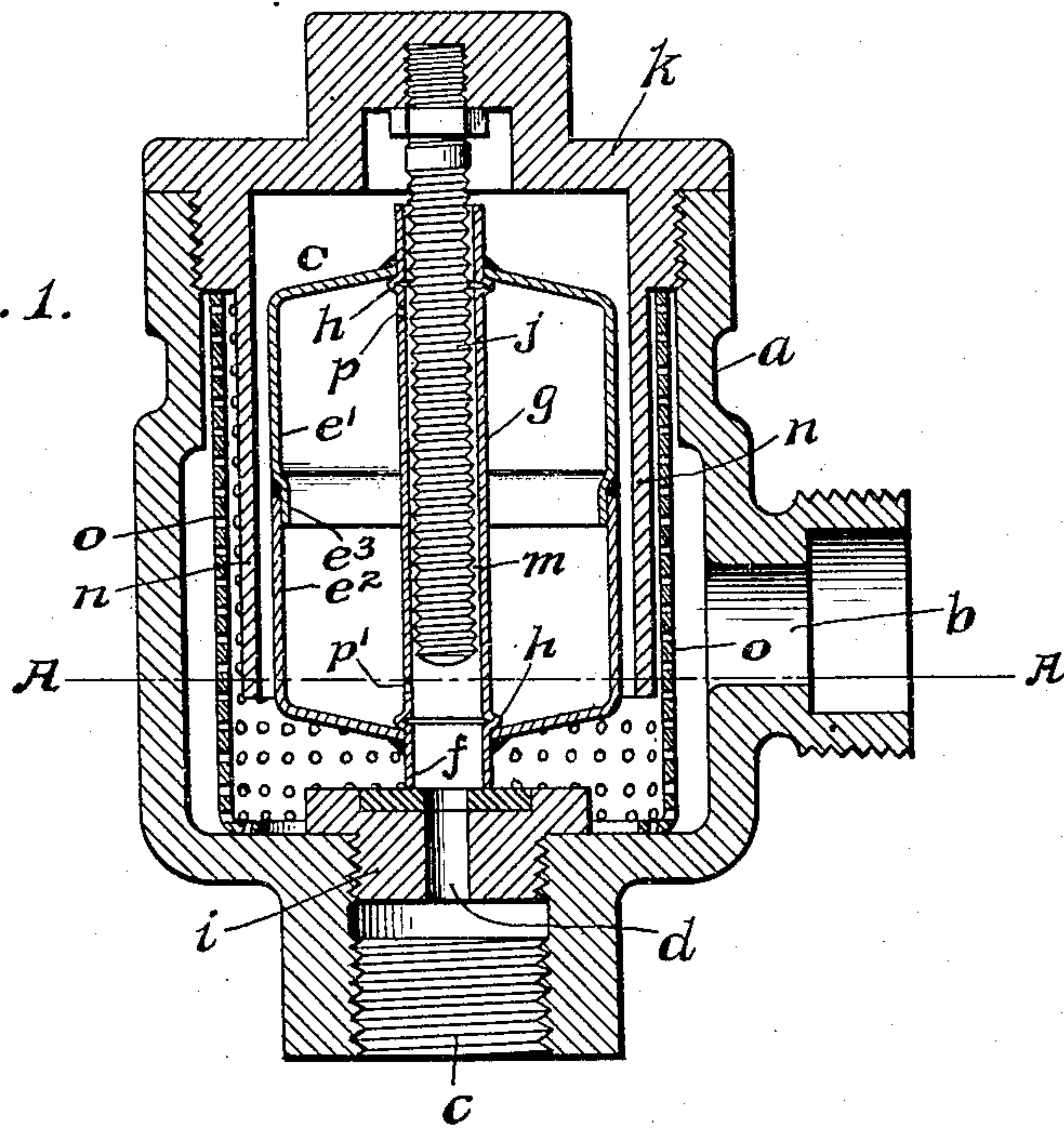
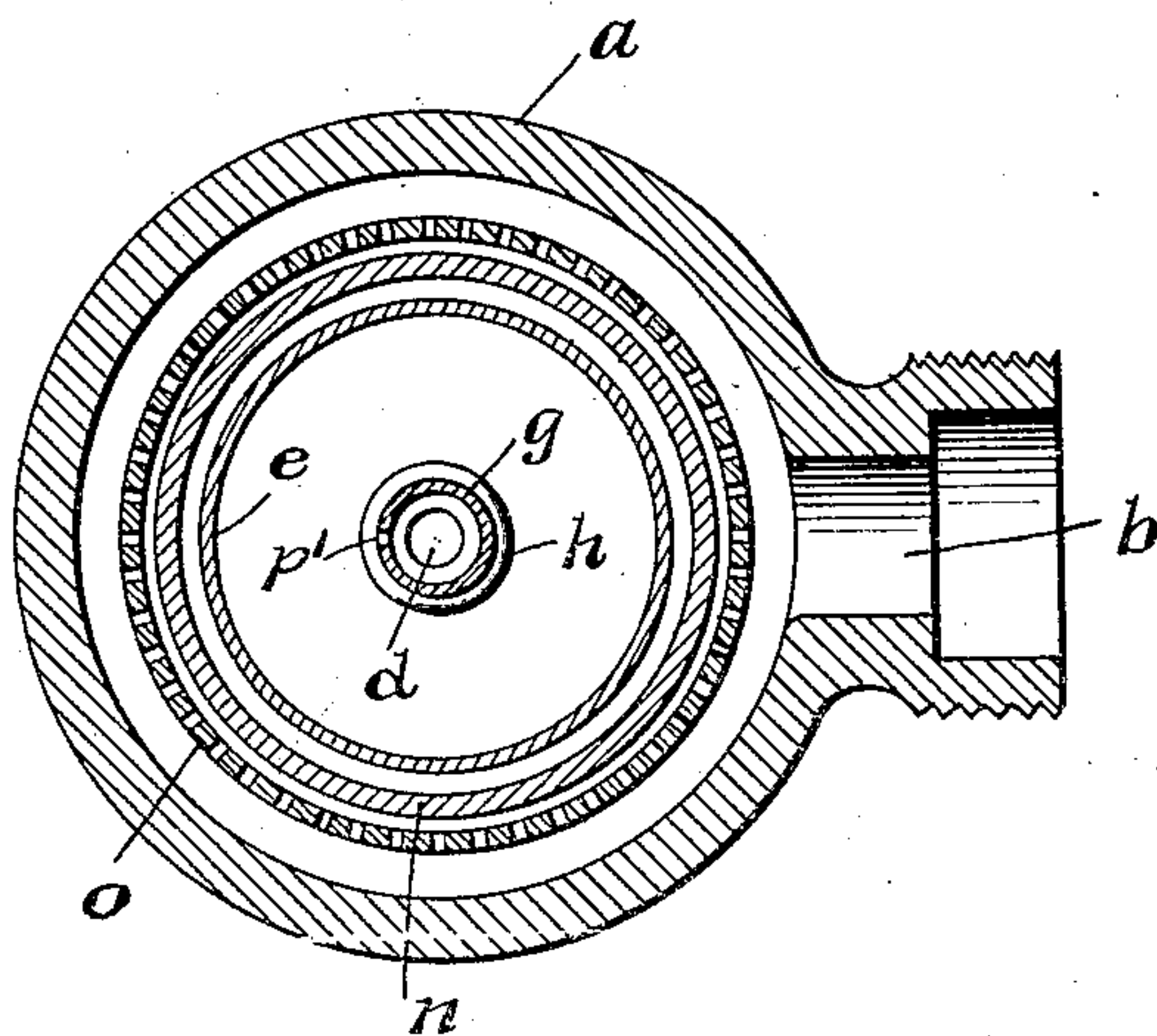


Fig. 2.



Daniel Webster, Jr.
P. M. Kelly

James Logan Fitts

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 Attorney

UNITED STATES PATENT OFFICE.

JAMES LOGAN FITTS, OF MERCHANTVILLE, NEW JERSEY, ASSIGNOR TO WARREN WEBSTER & COMPANY, A CORPORATION OF NEW JERSEY.

WATER AND AIR RELIEF VALVE.

No. 920,556.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed April 4, 1907. Serial No. 366,244.

To all whom it may concern:

Be it known that I, JAMES LOGAN FITTS, of Merchantville, county of Camden, and State of New Jersey, have invented an Improvement in Water and Air Relief Valves, of which the following is a specification.

More particularly my invention relates to that class of valves in which the valve-piece is operated by a movable part, or motor, controlled by the conditions existing in the valve-body. When the movable part consists of a hollow shell it is necessary that it shall be kept free from water to prevent it becoming water logged and inert. As this movable part is frequently subjected to violent movements under the action of water hammering or a sudden inrush of water, it is subjected to considerable strain, and in certain forms is liable to break open at the seams and admit water to the interior. This is particularly the case in that class of valves in which the movable part consists of a hollow shell carried by a tube the end of which carries the valve-piece. Owing to the connection of the shell with said tube, the greatest jars are felt at the points of connection, and it is one of the objects of my invention to so unite the tube and shell as to materially strengthen the structure and greatly reduce the liability of the opening of the joints under the jars to which the shell and tube are subjected.

It is also an object of my invention, while obtaining increased strength, to simplify the construction and the assembling of the parts and to render the structure reversible so that either end may be used to control the outlet.

It is a further object of my invention to provide means to cause the immediate extraction of any water which may find its way into the shell, so that the shell may be kept empty and efficient, even if a small leak is formed in the exterior or in the joints.

In the drawings: Figure 1 is a vertical sectional view of a valve device embodying my improvements; and Fig. 2 is a horizontal section of the same on the line A—A of Fig. 1.

a is the valve-body having an inlet *b* and outlet *c* and the valve-passageway or thoroughfare *d*, which latter is preferably in a removable threaded seat piece *i* screwed into the body.

e is a motor which carries the valve-piece and constitutes a movable part controlled

by the conditions, such as the accumulation of water, in the valve-body. This part *e* consists of a hollow shell carried by a central tube *g*, the end of which constitutes the valve-piece *f*. This tube *g* is swaged up near each end to form annular shoulders *h* and the shell is composed of two cup-shaped members *e'* *e''* having apertures by which they are fitted over the tube with the edges of the metal at the apertures resting against the shoulders and soldered to them. The outer edges of the cup-shaped members *e'* *e''* are fitted one under the other and are soldered together as at *e'''*. The tube *g* projects at each end beyond the shell, so that the part *e* is reversible and either end may be used as the valve-piece.

j is a guide rod which is carried by the cap *k* and extends a substantial distance into the tube *g*. This guide is preferably provided with a spiral groove *m* forming a spiral air passageway between the tube and guide from the thoroughfare *d* to the upper part of the valve-body above the float.

n is a depending wall carried by the cap and surrounding the shell and preferably extending below the inlet *b*; and *o* is a screen surrounding the wall and shell and clamped between the cap and base of the valve-body.

p is a small orifice in one end of the tube *g* forming an inlet into the upper part of the shell, and *p'* is a similar orifice in the other end of the tube forming an outlet from the lower part of the shell.

The upward movement of the shell and its tube *g* to open the thoroughfare *d* is caused by the accumulation of water in the valve-body.

It is essential to the proper operation of the shell that water should be excluded from the interior; and heretofore this has been difficult to accomplish owing to the liability of the joints between the tube and outer body breaking open and admitting water. The use of the shoulders *h*, *h'*, which act as supports for the edges of the metal of the shell and to which those edges are soldered materially strengthens the joints and reduces the liability of openings being formed. The shoulders also insure the proper fitting together of the parts *e'* *e''* with the tube *g* projecting at the proper distance at each end to form a valve-piece *f* thus rendering the device reversible.

The girth seam *e'''*, which results from

making the shell of two members e' e^2 results in materially strengthening the cylinder, and when the edges are properly lap-seamed and soldered there is little liability of the joint breaking open. In addition to these precautions for preventing the entry of water into the shell from the outside, I provide the small openings p p' in the tube g to effect the immediate discharge of any water that may enter. This construction is particularly useful when the valve is used in vacuum systems in which a suction or low pressure is maintained in the outlet. Owing to the fact that the upper aperture is near the upper part of the guide j , while the lower one is near the opening d , it results that there will be a reduction in the suction at the upper aperture p . There will therefore always be a lower pressure or greater suction on the lower aperture p' than on the upper, so that any water that may find its way into the shell e will immediately be extracted through the lower aperture into the tube g and thence through the passage-way d .

While I have shown my improvements embodied in a valve having the surrounding wall n and screen o , these, as well as other details of construction which do not affect the improvements in the construction and operation of the shell e and its tube g , may be varied or omitted without affecting the invention.

What I claim is as follows:

1. A reversible fitting for steam radiator valves consisting of a tube g , either end of which is adapted to be the valve-piece, swaged up near its ends to form annular in-

tegral shoulders h h , and a hollow shell having apertures fitted over said tube with the metal at said apertures resting against the shoulders and soldered to them.

2. A valve consisting of a body having an inlet and an outlet, a tube carrying a tubular valve-piece controlling the outlet, a hollow shell carried by said tube and controlled by the accumulation of water in the body to operate the valve-piece, said tube being provided near the top and bottom with small openings into the interior of the shell, and a guide-piece extending into said tube substantially beyond the small upper opening therein and forming with the walls of the tube a restricted passage way between the interior of the body and the outlet and extending past the upper small openings in the tube.

3. A valve consisting of a body having an inlet and an outlet, a tube carrying a tubular valve-piece, a hollow shell carried by said tube and controlled by the accumulation of water in the body to operate the valve-piece, a spirally grooved guide piece extending into said tube and forming with the walls thereof a restricted spiral passage-way between the interior of the valve-body and the outlet, said tube being provided near the top and bottom with small openings into the interior of the shell.

In testimony of which invention, I have hereunto set my hand.

JAMES LOGAN FITTS.

Witnesses:

PHILIP Y. QUINN,
HENRY A. STRATTON.