

(No Model.)

J. N. MURPHY.
VALVE.

No. 575,768.

Patented Jan. 26, 1897.

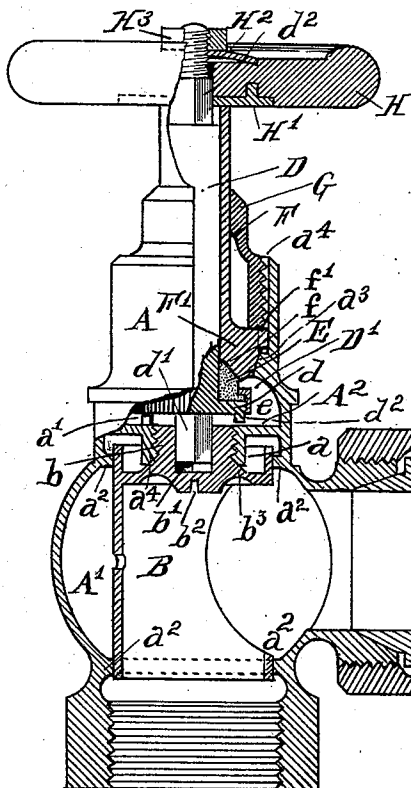


Fig. 2.

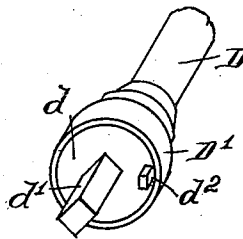


Fig. 3.

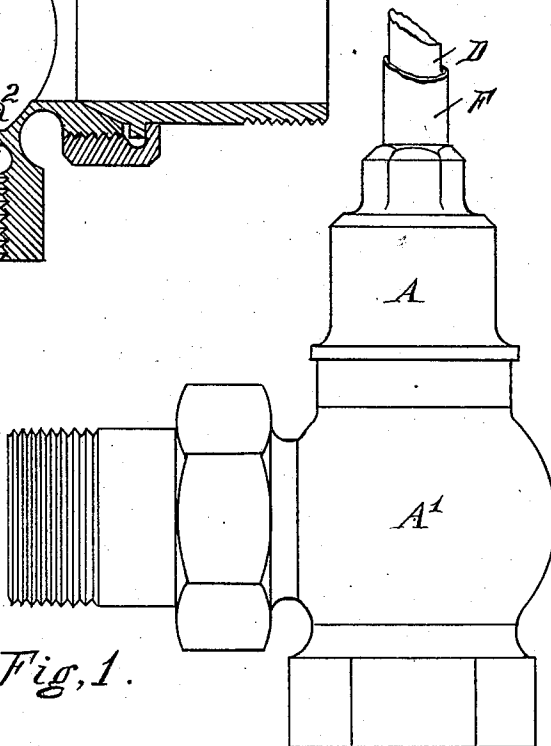


Fig. 1.

Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN N. MURPHY, OF SPRINGFIELD, ILLINOIS, ASSIGNOR TO THE PACK-
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VALVE.

SPECIFICATION forming part of Letters Patent No. 575,768, dated January 26, 1897.

Application filed January 20, 1896. Serial No. 576,125. (No model.)

To all whom it may concern:

Be it known that I, JOHN N. MURPHY, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Valves, of which the following is such a full, clear, and exact description as will enable those skilled in the art to which it appertains to make and use my said invention.

The purposes of my invention are to provide a valve-body of novel and improved form constructed in a single piece, to provide an improved union-sleeve in the valve-body adapted to form a steam-tight joint with the valve-body, to provide a packing-ring adapted to seat on the under side of the union-sleeve and adapted to be pressed against same by the action of the steam or fluid within the valve, to provide means whereby said union-sleeve and said packing-ring may be conveniently removed through the top of said valve for replacement or repair, to provide simple and effective means for the adjustment of said packing-ring in contact with said union-sleeve, to provide means of improved construction for connecting said packing-ring with the valve-stem, to provide novel and improved means for connecting the valve within the valve-body with said valve-body in such manner that the valve may turn freely therein, and to provide novel and improved means adapted to limit the rotation of the valve-stem.

With these ends in view my invention consists in certain novel features of construction and combinations of parts shown in the annexed drawings, to which reference is hereby made, and hereinafter particularly described and specifically claimed.

Referring to the drawings, Figure 1 is a side elevation of the complete valve. Fig. 2 is a vertical longitudinal section on the axis of the valve. Fig. 3 is an enlarged detached view of a part of the valve-stem and connected parts as viewed from the under side.

Similar letters of reference designate like parts in all of the views.

The valve-body consists of a cylindrical part A and an enlarged globular part A'. Within the valve-body is an integral diaphragm A², which is provided with an integral

downwardly-extended annulus *a*, which has a female screw, as shown in Fig. 2. On the upper surface of the diaphragm is an upwardly-projecting lug *a'*, against which a lug *d*² on the under side of the packing-ring plate strikes to limit the movement of the valve-stem, as hereinafter described. On the inside of the globular part of the valve-body are annular projections *a*².

The cylindrical valve or gate B fits and turns within the annuli *a*². The upper part of the valve B is closed and is provided with a screw *b*, which fits in the annulus *a*. In the end of this screw is a square hole *b'*, adapted to receive the squared lower end of the valve-stem. In the under side of the top of the valve B is a slot *b*², adapted to receive a screw-driver or other instrument by which the valve may be turned when inserting or removing the screw *b*.

The valve-stem D in the greater part of its length is cylindrical in form and near its lower end has an integral packing-ring plate *d*. The lower end *d'* of the valve-stem is squared to fit in the socket *b'* in the top of the cylindrical valve B. The upper end *d*² is squared to fit in the plate connected with the hand-wheel, as shown.

The packing-ring E is preferably made of some soft or composition metal, but Jenkin's packing-ring or other suitable packing-ring may be used without departing from my invention. The packing-ring E is supported on the packing-ring plate *d* and surrounds the valve-stem. It has near its lower end an annular ledge *e*. A screw-ring D' screws on the plate *d* and is provided with an inwardly-projecting ledge which presses against the ledge *e* of the packing-ring and retains the packing-ring in position on the packing-ring plate. The upper surface of the packing-ring is beveled or cone-shaped, so as to make close contact with the under surface of the union-sleeve.

The union-sleeve consists of a sleeve F and an integral conical plug F'. The plug F' has at its lower end an internal conical cavity *f*, and the inclined surface of the packing-ring E seats on the surface of the cavity *f*. In the cylindrical part of the body A is an annular projection *a*³, having a true surface on which the plug F' seats. In the top part of the

valve-body are diametrically opposite channels a^4 , in which lugs f' on the plug F' fit. The lugs f' serve to prevent the turning of the plug. The nut G screws into the valve-top and presses against the upper surface of the plug F' . The hand-wheel H has on its under side a plate H' , in which the squared upper part of the valve-stem fits. A dished washer H^2 rests in a recess in the upper surface of the hand-wheel and the screw at the upper end of the valve-stem projects through said washer. A nut H^3 connects the valve-stem with the hand-wheel in such manner that the nut may be turned, so as to draw the packing-ring into close contact with the under surface of the plug and take up any wear of the packing-ring. The dished washer H^2 is sufficiently elastic to yield under undue pressure, so as not to injure the packing-ring by forcing it too hard against the under surface of the plug.

On the under side of the packing-ring plate d is a downwardly-projecting lug d^2 , which engages with the lug a' on the diaphragm to limit the rotation of the valve-stem.

The upper end of the sleeve F abuts against the under side of the plate H' on the hand-wheel in order to admit of vertical adjustment of the valve-stem and connected parts by means of the nut H^3 , as hereinbefore set forth.

By reference to the drawings it will be seen that when the nut G is unscrewed and withdrawn from the valve-top the valve-stem and the plug may both be lifted out through the valve-top, thereby greatly facilitating replacement or repair of the parts of the valve.

At the lower end of the annulus a is an internal beveled surface a^4 , which forms a seat against which a conical surface b^3 at the base of the screw b abuts, so as to form a tight joint between the screw and the annulus.

It is obvious then that when it is desired to remove the valve-stem and connected parts, as hereinbefore described, it is only necessary to turn the screw b sufficiently to form a close contact of the surfaces a^4 and b^3 and effectually stop any leakage while replacement or repair is being made.

The operation of the valve is obvious from the description.

I have shown my improvements as applied to a hot-water valve, but they may obviously be applied to other valves without departing from the spirit of or sacrificing any of the advantages of my invention.

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

1. A valve-body having a globular part provided with internal annular projections and an integral cylindrical part having an internal annulus, also having a diaphragm separating said parts said diaphragm being provided with an annulus having an inclined seat at its lower end; in combination with an internal valve having a screw fitting in the annu-

lus on said diaphragm and having at the base of said screw a conical surface seating on the inclined surface of said annulus, also having a socket in said screw; a valve-stem provided with a packing-ring plate and having a squared end fitting in said socket; a packing-ring connected with said packing-ring plate; a union-sleeve inclosing said valve-stem and having in its end a conical cavity on which said packing-ring seats, said union-sleeve being also adapted to seat on the annulus within the cylindrical part of the valve-body; a nut screwing in the valve-top and bearing on said union-sleeve and a hand-wheel connected with said valve-stem, the upper end of said union-sleeve abutting against the under side of said hand-wheel; as set forth.

2. In a valve, a valve-stem provided with a packing-ring plate and having its upper and lower ends squared, also having its upper end screw-threaded, in combination with a packing-ring, a screw-ring connecting said packing-ring with said packing-ring plate, a union-sleeve seating on an annulus within the valve-body and having in its lower end a conical recess in which said packing-ring seats, a hand-wheel, a plate connected with said hand-wheel and fitting on the upper squared part of the valve-stem, a dished washer supported on said hand-wheel and a nut working on the screw at the upper end of said valve-stem and in contact with said washer; as set forth.

3. In a valve the combination of a valve-body having an upper and a lower part, separated by a diaphragm, said lower part having internal annular projections and said upper part having an internal annulus, also having diametrically opposite channels, said diaphragm having an annulus provided with a seat at its lower end, also having an upwardly-projecting lug, a valve screwing into said annulus and seating on the under side thereof, said valve being provided with a socket, a valve-stem fitting in said socket and having a packing-ring plate provided with a lug, adapted to engage with a lug on the diaphragm, a packing-ring, a screw-ring connecting said packing-ring with the packing-ring plate, a union-sleeve seating on the annulus in the upper part of the valve-body and having a conical recess on which said packing-ring seats, also having lugs working in the channels in the valve-body, a hand-wheel fitting on the upper end of the valve-stem and provided with a plate against which the upper end of the union-sleeve abuts, a dished washer on said hand-wheel, a nut on the valve-stem working against said washer and a nut in the valve-body bearing on said union-sleeve; as set forth.

In witness whereof I have hereunto subscribed, at Springfield, Illinois, this 14th day of January, 1896.

JOHN N. MURPHY.

Witnesses:

JOSEPH M. GROUT,
JAMES T. GARRETSON.