No. 731,633. PATENTED JUNE 23, 1903.

W. C. TROUT.

STEAM FEED VALVE.

APPLICATION FILED DEC. 26, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

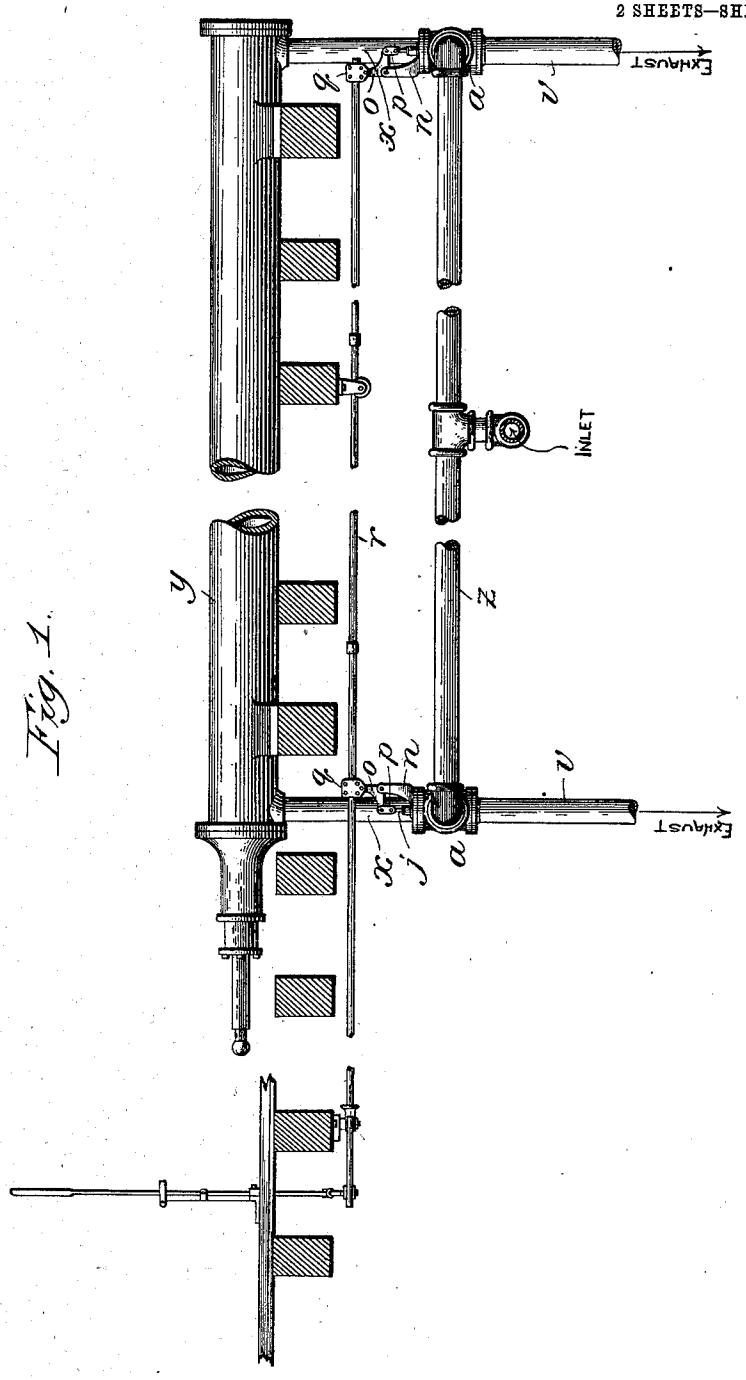


Fig. 1.

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By Thomas F. Sheridan,
Att'y.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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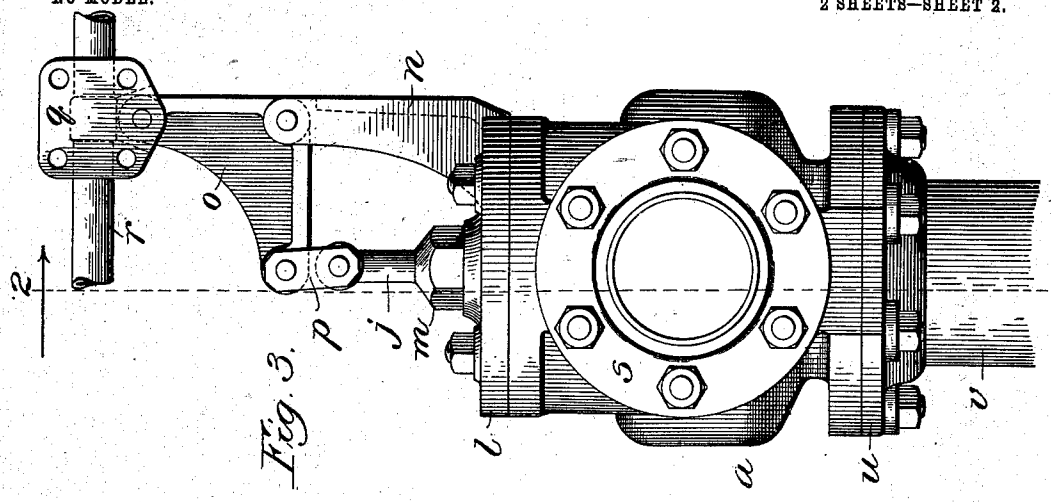


Fig. 3.

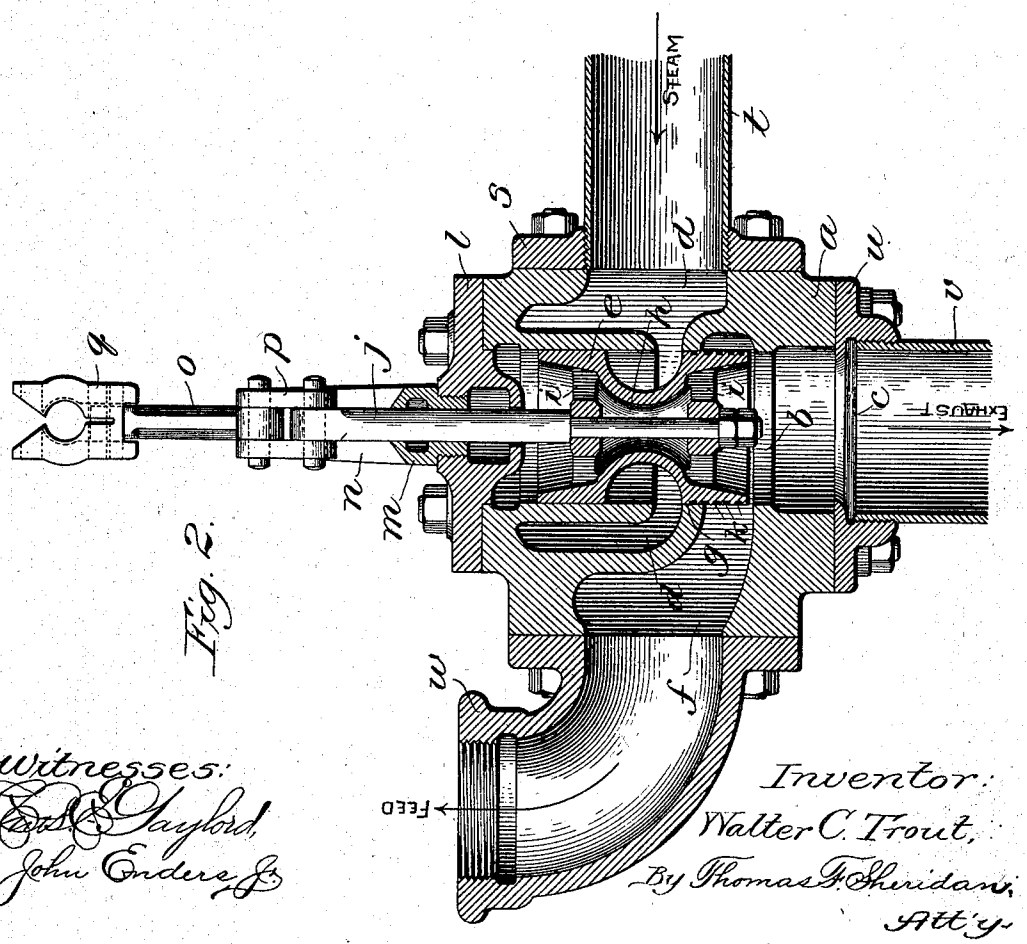


Fig. 2.

Witnesses:
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No. 731,633. Patented June 23, 1903.

UNITED STATES PATENT OFFICE.

WALTER C. TROUT, OF MILWAUKEE, WISCONSIN.

STEAM-FEED VALVE.

SPECIFICATION forming part of Letters Patent No. 731,633, dated June 23, 1903.

Application filed December 26, 1902. Serial No. 136,601. (No model.)

To all whom it may concern:

Be it known that I, WALTER C. TROUT, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Steam-Feed Valves, of which the following is a specification.

This invention relates to that class of valves which is provided with a multiplicity of openings by which steam is admitted to certain mechanisms and exhausted therefrom, and particularly to the construction and arrangement thereof and its connection with steam-feed for saw or other mills by which certain definite objects may be attained, all of which will more fully hereinafter appear.

The principal object of this invention is to provide a simple, economical, and efficient combined steam feed and exhaust valve.

A further object of the invention is to provide a steam-feed valve and arrange it in such manner as to provide for safety in case of breakage and for the drainage of the water, oil, and condensed steam.

Further objects of the invention will appear from an examination of the drawings and the following description and claims.

The invention consists principally in a steam-feed valve in which there are combined a valve-body provided with a cylindrical valve-bore extending therethrough and vertically arranged therein, a piston-valve arranged in such valve-bore and normally snugly fitting the same, so that when the valve is not in use it will be difficult to move, but when the valve is in use the expansion of the parts will release the piston and permit easy movement thereof.

The invention consists, further, in a steam-feed valve in which there are combined a body portion provided with a cylindrical valve-bore vertically arranged therein, an exhaust-passage directly under such bore, a steam-inlet on one side of and at right angles to the exhaust, and a steam-feed outlet on the opposite side from the inlet and at right angles to the exhaust, and a piston-valve movably mounted in the cylindrical valve-bore of the body portion normally tightly fitting the stem when the parts are cold, but the body portion of which valve is expanded when in operation by the heat of the steam so that the piston-valve portion may be easily moved therein.

The invention consists, further and finally, in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a portion of a steam-feed for sawmills, showing my improvements as they appear when attached to and used in connection therewith; Fig. 2, an enlarged vertical sectional elevation of a steam-feed valve constructed in accordance with these improvements, taken on line 2 of Fig. 3, looking in the direction of the arrow; and Fig. 3, a side elevation of the mechanism shown in Fig. 2 looking at such mechanism from the right-hand side of Fig. 2.

In the art to which this invention relates it is well known that it is very desirable to have a valve so constructed and arranged that the condensed steam, water, and oil may be effectively drained out of the same, and, further, that it is desirable to have a valve so constructed and arranged that the parts will normally snugly fit when they are cold, but will expand during use of the same to permit the easy movements of the valve portion, so that should the valve or any other portion break while in use it will drop to a safe position, thereby shutting off the supply of steam and cutting off the exhaust.

The principal object, therefore, of this invention is to provide a steam-feed valve having steam inlet, feed, and exhaust passages, and to so construct and arrange the same as to obtain the advantages above set forth, all of which will more fully hereinafter appear.

In constructing a steam-feed valve in accordance with these improvements I make a body portion *a* of the desired size, shape, and strength to withstand the strains and stress incident to use and to hold the other parts in position. This body portion is provided with a cylindrical valve-bore *b*, vertically arranged therein and, extending therethrough and with an exhaust-opening *c*, arranged directly under and in line with the valve-bore. The valve-body is further provided with a steam-inlet opening *d* at right angles with the valve-bore and connecting therewith, and with a steam-

feed opening *f* also arranged at right angles with the valve-bore and substantially opposite the steam-inlet opening and at right angles to the exhaust. It will be noticed that while the exhaust-opening is immediately under the cylindrical valve-bore and the steam inlet and feed openings at right angles therewith the connection of the steam-feed opening with the valve-bore is slightly below that of the connection of the steam-inlet opening with such bore.

In order to provide means for connecting the proper openings and passages in the valve-body with each other and cutting off such communication when desired, a cylindrical piston-valve *e* is provided and movably mounted in the valve-bore. This piston-valve is provided with an annular groove or passage *g*, which, as shown in Fig. 1, is immediately adjacent to the steam-inlet opening, but when the valve is moved downwardly the lower bearing portion of such piston passes down into the exhaust-opening, cuts off the communication of the exhaust with the feed-opening, and permits its annular passage *g* to connect the steam-inlet and steam-feed openings together. This piston-valve is further provided with an axial bore *h*, across which are arranged two spiders *i*. Removably attached to these spiders is a valve-stem *j*, which extends upward and outward from the valve and is used to move the piston-valve upwardly and downwardly, as occasion requires. This piston-valve tightly fits the cylindrical valve-bore when the parts are in their normal or cold condition and requires some force to move it; but when the parts are in use—that is, when the steam is supplied to or passing through such valve—the valve-body becoming heated expands more than the piston-valve and permits such valve to be moved easier than otherwise. The lower bearing portion of the piston-valve is provided with a plurality of circumferential grooves *k*, arranged to be filled with water or moisture and form liquid or water packing.

To operate the valve-stem, and thereby the piston-valve, the valve-body is provided with a cap portion *l*, secured thereto so as to close the upper part of the valve-bore, and such cap is provided with a stuffing-box *m*, through which the valve-stem passes. It is further provided with an arm or bracket *n*, to which a bell-crank lever *o* is pivotally attached. This bell-crank lever by means of a link *p* is pivotally secured to the valve-stem, so that as it is swung in one direction or the other the valve-stem is operated upward and downward. The bell-crank lever is provided with a split clip or clamp *q*, pivotally secured thereto and adapted to be secured or clamped to a tubular operating-rod *r*, whose rectilinear motions are used to operate the bell-crank lever, and thereby the valve. The valve-body is provided with flanges *s*, to which an inlet-pipe *t* is secured, a flange *u*, to which an exhaust-pipe *v* is secured, and an elbow *w*, to which a feed-pipe *x* is secured, which is connected with the cylinder *y* of a steam-feed for sawmills, all of which flanges are bolted to the valve-body, as shown particularly in Fig. 2.

In Fig. 1 I have shown the parts as they appear when in position for use, two of these steam-feed valves being shown, one for each end of the steam-feed cylinder for sawmills. In such figure both of the steam-inlet pipes *t* are connected with a main inlet-pipe *z*, which, in turn, is connected with a source of steam-supply.

The principal advantages of a valve constructed in accordance with these improvements are that the expansion feature permits the valve to be operated very easily during its use, and the vertical arrangement of the piston-valve permits an easy drainage of moisture, condensed steam, and oil, as well as permitting such valve to drop down, should the valve-stem or part of the valve become broken, to a safe position, all of which will be understood and appreciated by those skilled in the art.

I claim—

1. In a steam-feed valve of the class described, the combination of a body portion provided with a cylindrical valve-bore vertically arranged therein, an exhaust-passage directly under such bore, a steam-inlet on one side of and at right angles to the exhaust and a steam-feed outlet on the opposite side from the inlet and at right angles to the exhaust, and a vertically-movable piston-valve movably mounted in the cylindrical valve-bore of the body portion normally tightly fitting the same when the parts are normal or cold but which in operation by the heat of the steam-supply are expanded so that the valve-piston may be moved easily, substantially as described.

2. In a steam-feed valve of the class described, the combination of a body portion provided with a cylindrical valve-bore vertically arranged therein, an exhaust-opening immediately under the cylindrical bore, a steam-inlet at one side of the body portion at an angle to the valve-bore, a steam-feed opening on the opposite side from the steam-inlet also at an angle to the valve-bore, a vertically-movable piston-valve movably mounted in the cylindrical bore of the valve-body and intercepting all of the above-named openings to open and close the same and provided with an axial passage or passages to balance the valve, and a valve-stem secured to the movable valve and extending upward and outward therefrom, such valve-piston normally tightly fitting the valve-body when the parts are cold but as the parts expand when they are in use being released so that it may be easily moved and operated, substantially as described.

3. In a steam-feed valve of the class described, the combination of a valve-body provided with a cylindrical valve-bore vertically arranged therein, an exhaust-opening directly under and in line with such bore, a steam-inlet

opening at right angles to such bore and opening into the same, a steam-feed opening also at right angles to such bore and opening into the same, a piston-valve normally tightly fitting and movably mounted in such bore and arranged when the parts are in use and by the expansion of the valve-body to be easily moved therein and provided with an axial opening extending therethrough having spider portions extending across such opening, a valve-stem extending upwardly and outwardly from the piston-valve, a valve-cap on the valve-body provided with a stuffing-box through which the valve-stem is passed and a bracket portion thereon, and a bell-crank lever pivotally secured in the bracket and with the valve-stem to operate the latter, substantially as described.

4. In a steam-feed valve of the class described, the combination of a valve-body portion provided with a cylindrical valve-bore vertically arranged therein and extending therethrough, an exhaust-opening directly under in line with and connected with the bore, a steam-inlet opening at right angles and connected with the valve-bore, a steam-feed opening at right angles to and connected with such bore, a piston-valve normally snugly fitting such bore when the parts are cool but eased when the parts are heated during use and provided with a circumferential groove between its ends to provide a connecting-passage between the steam-inlet and steam-feed, the lower part of such valve-piston arranged to open and close the openings between the steam feed and exhaust passages, a valve-stem connected with such piston-valve and extending upwardly and outwardly therefrom, and a bell-crank lever for operating such valve-stem, substantially as described.

5. In a steam-feed valve of the class described, the combination of a valve-body provided with a cylindrical valve-bore vertically arranged therein and extending therethough, an exhaust-opening directly under in line with and connected with the bore, a steam-inlet opening at right angles to and connected with the valve-bore, a steam-feed opening at right angles to and connected with such bore, a piston-valve normally snugly fitting such bore when the parts are cool but eased when the parts are heated during use and provided with a circumferential groove substantially midway between the ends of the valve to provide a connecting passage between the steam-inlet and steam-feed, the lower part of such valve-piston arranged to open and close the passage between the steam feed and exhaust openings, such valve-piston having an axial opening therethrough and provided with two spider portions extending across the same, a valve-stem detachably secured to such spider portions extending upward and outward from the valve, a valve-cap provided with a stuffing-box through which such valve-stem is passed, an arm or bracket portion on such valve-cap, and a bell-crank lever pivotally secured in such bracket portion and with the valve-stem for operating the latter, substantially as described.

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