(No Model.)

E. W. LUCE.

THROTTLE VALVE.

No. 382,993. Patented May 15, 1888.

Fig. 1

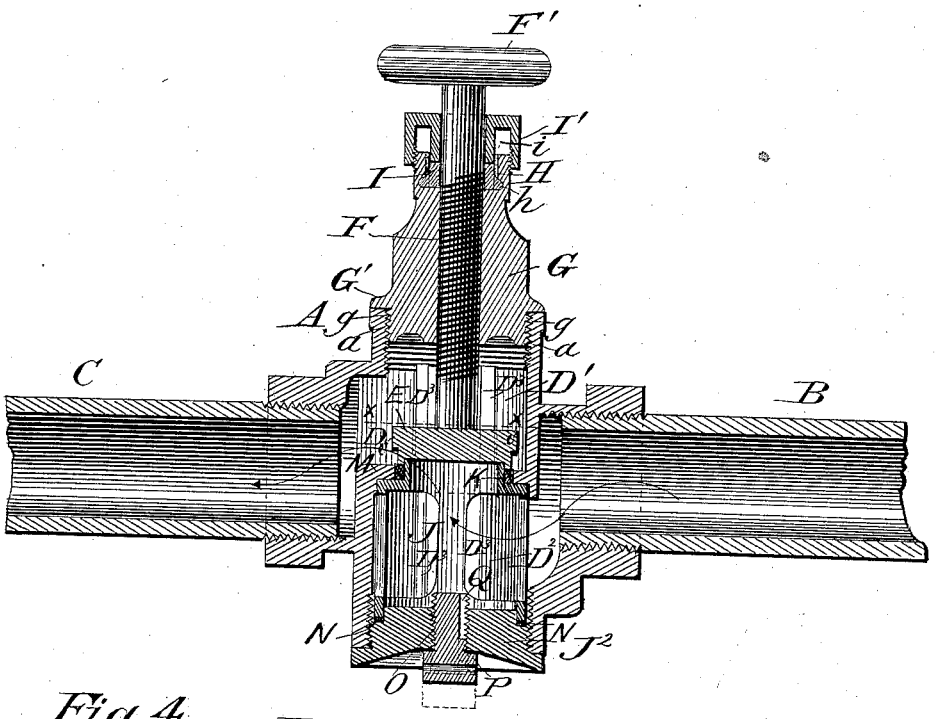


Fig. 4.

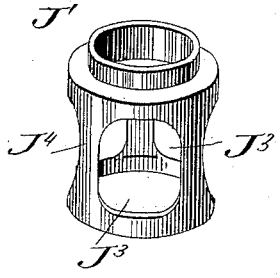


Fig. 2.

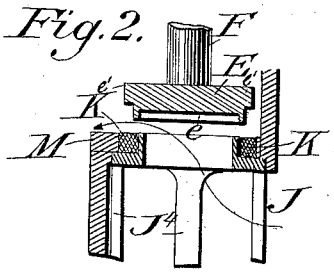


Fig. 5.

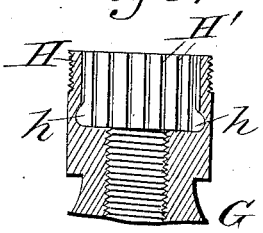
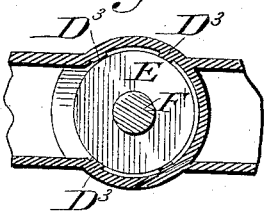


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

EDWIN W. LUCE, OF BOLIVAR, NEW YORK.

THROTTLE-VALVE.

SPECIFICATION forming part of Letters Patent No. 382,993, dated May 15, 1888.

Application filed December 16, 1887. Serial No. 258,069. (No model.)

To all whom it may concern:

Be it known that I, EDWIN W. LUCE, a citizen of the United States of America, residing at Bolivar, in the county of Allegany and State of New York, have invented certain new and useful Improvements in Throttle-Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in that class of devices technically known as "throttle-valves;" and it consists of certain peculiarities in the construction, arrangement, and combination of parts, substantially as hereinafter described, and particularly pointed out in the subjoined claim.

In the accompanying drawings, illustrating my invention, and in which like letters of reference designate the same parts, Figure 1 is a sectional side elevation of my improved throttle-valve. Fig. 2 is a similar view of a portion of the same, showing the valve elevated from its seat. Fig. 3 is a transverse section on *x x* of Fig. 1, showing most clearly the ribs formed on the interior of the valve-body, which serve as a guide for the valve and prevent the possibility of the stem of the same becoming broken by the pressure of the fluid. Fig. 4 is a detail representation in perspective of a plug, the upper extremity of which forms the seat for the valve. Fig. 5 is a detail sectional representation of the stuffing-box, showing the grooves formed on its interior and the flaring or bell-shaped bottom.

The primary object of my invention is to increase the efficiency of operation and durability of throttle-valves, and at the same time to lessen their cost of manufacture.

Another object of my invention is to construct a valve of the character set forth, in which, in the event of the primary seat for the valve being worn away by friction or otherwise, the valve will be provided with a secondary seat, thus providing a means for constant use, whether the valve is under pressure or not, and permitting the removal of the plug in order to substitute another seat in the event of the pressure entering the upper port first.

The object, further, of my invention is to provide a means for drainage of valves, which can be readily and easily operated without the necessity for removing the plug closing the lower portion of the raceway of the valve-body.

Still another object of my invention is to construct a means by which the valve will always be caused to center the same, and which will prevent the possibility of the valve-stem becoming bent by any pressure.

The object, further, of my invention is to construct a throttle-valve which will permit ready and easy access to any of its parts for the purpose of the removal of the gaskets or packing and the other portions of the device, in order to substitute others, or for any other purpose, and to construct one which, by reason of its many advantages, will readily recommend itself to those persons using such inventions.

Referring to the drawings, A represents the valve-body, which may be made of any suitable size, shape, or material, and which is provided with suitable inlet and outlet pipes, B and C, respectively, extending at right angles to a raceway, D, which raceway extends the entire length of the valve-body and comprises an upper chamber, D′, and a lower chamber, D^2. Within the upper chamber, D′, of this raceway D is situated the valve E, which is by preference formed with a recess, *e*, on its lower face, and an annular flange, *e′*, on its upper edge, and has its seat upon a gasket, K, situated upon the upper portion of a plug, J, to be hereinafter described, and provided with a stem, F, having a hand-wheel, F′, or other suitable operating device. This stem F passes through a stuffing-box, G, to which it is connected by means of screw-threads, the lowermost extremity of the stuffing-box also being formed with a series of screw-threads, *g*, engaging with a corresponding series of screw-threads, *a*, formed on the interior of the valve-body A in such a manner that these parts will be secured together; and in order to prevent the possibility of vertical accidental displacement of this stuffing-box, it is formed with an annular flange, G′, adapted to rest upon the uppermost extremity of the valve-body, as clearly shown in Fig. 1. The uppermost extremity of this stuffing-box G is formed with a recess, H, of suitable size, the bottom of which is formed flaring or bell-shaped, as shown at *h*, Figs. 1 and 5, and the sides of which are formed with a series of grooves or

mortises, H′, as shown in Fig. 5. This recess H is adapted to receive and accommodate a gasket or packing, I, which gasket is preferably formed of soft metal, and is forced into position upon the bottom of the recess by means of a screw-cap, I′, which is adapted to encircle the valve-stem F, and is formed with an annular groove, *i*, for the reception of the upper end of the stuffing-box G. It will be observed that the ridges formed on the interior of the recess H by the grooves or mortises H′ will tend to always keep the screw-cap I′ in position by preventing its becoming loosened and displaced by turning, which was a disadvantage commonly experienced in other devices of a like character. It will be observed, further, that by forming the bottom of the recess flaring or bell-shaped, as shown, and situating the gasket or packing I therein, the gasket or packing may be replenished while the device is under pressure simply by removing the screw-cap, the packing obviously remaining in the bell portion of the recess until removed by the hand. These are both features of prime importance in my invention, and their advantages will be readily recognized and appreciated by those persons familiar with this class of invention.

The interior of the raceway D is formed with a series of ribs or flanges, D^3 D^3, (shown best in Fig. 3,) which extend the entire length of the same, those in the upper chamber, D′, being adapted to serve the double purpose of a guide for the valve, causing it to center the same at all times, and as a protector for the valve-stem, preventing its being broken by the pressure of the fluid or steam within the valve-body, while those in the lower chamber, D^2, serve as guides for the upper portion of the plug J.

The plug J is formed in two parts, the upper of which, J′, is shown in detail in Fig. 4. It will be seen that this portion of the plug is made somewhat in the form of a skeleton frame, having a series of holes, J^3, communicating with the inlet and outlet pipes B and C of the valve-body, and which holes are made of such a size as to leave comparatively small supports J^4 between them; but it will be quite obvious that these supports J^4 will be of sufficient strength and size to perform the functions for which they are designed, while at the same time they will not form obstructions to the free passage of the steam or water. The upper extremity of this portion J′ is formed with an annular groove or recess adapted to seat a gasket, K, preferably formed of soft metal, and which, as before stated, serves as the seat for the valve E. The interior of the valve-body A is formed at this point with a flange, M, the outermost extremity of which rests against the said gasket K, which flange M serves as what might be termed a "secondary seat" for the valve, it being adapted to come into use when the primary seat K is worn or being worn down, as obviously the larger diameter, *e*′, of the cup-shaped valve E will then come into contact with this seat M. This is a feature of prime importance, inasmuch as it provides a means permitting the constant use of the valve, whether under pressure or not, and it facilitates the ready and easy removal of the plug in order to substitute another seat. The lower portion, J^2, of this plug J is adapted to be screwed to the interior of the raceway D, and closes its lower end, and it is formed with an annular recess to receive a gasket, N, upon which the upper portion, J′, rests, which obviously forms a tight joint, effectually preventing the escape of any of the water or steam around the screw-threads of the plug by leaking, which would otherwise occur.

The portion J^2 of the plug J is formed with a screw-threaded perforation, O, extending entirely through it, which is normally kept closed by means of a headed screw-threaded bolt, P, which is formed with a longitudinal recess, Q, made of a suitable width and extending from the upper edge to a point near the head of the same. It will be quite obvious that this arrangement will obviate the necessity of removing the plug in order to drain the valve-body, as it can be done simply by unscrewing the bolt, and the recess Q in the bolt will obviate the necessity of entirely removing the bolt in order to accomplish the above result when it is not desired that the water shall flow out with great rapidity; but the rapidity with which the water shall flow from the chamber through this drainage-opening can be regulated by the amount of opening left—that is to say, if it is desired to cause but a small amount of water within the valve-body to flow out, the bolt is only partially unscrewed to leave but a small opening, and for a larger quantity it is unscrewed more, in proportion to the quantity of water desired to be removed, while if it should be desired to entirely drain the valve-body the passage is entirely uncovered by removing the bolt.

From the foregoing the operation of my device will be readily comprehended. The steam or water enters the inlet-pipe B and flows down into the chamber D′, within which it is held when the valve is in its closed position. (Shown in Fig. 1.) When the valve is removed from its seat, as shown in Fig. 2, the water or steam will take the course shown by the arrows in Figs. 1 and 2, and will flow out of the chamber D′ through the outlet-pipe C.

It will doubtless be found in the practical construction of my invention that many of the details might be advantageously varied, and I therefore do not wish to be understood as limiting myself to the precise construction and arrangement of parts herein shown and described, but reserve the liberty of varying these details without departing from the general spirit of the invention.

Having thus described the objects, advantages, and construction of my invention, what I believe to be new, and desire to secure by Letters Patent, and what I therefore claim, is—

In a valve, the combination, with the main

body having inlet and outlet pipes, of a two-part plug fitting therein, the upper of which parts is formed with lateral holes opening communication between the said pipes and the interior of the plug, and also with a recess at its top to form a seat for the valve, and the lower of which parts closes the lowermost extremity of the valve-body, is formed at its top with an annular recess, forming a water and steam tight joint between it and the upper portion, and is also formed with a screw-threaded perforation and a screw-threaded drainage-plug normally closing the said perforation, and having a recess in its side extending but partially to its head, substantially as and for the purposes herein set forth.

In testimony whereof I affix my signature in presence of two witnesses.

EDWIN W. LUCE.

Witnesses:

NEWELL PHILLIPS,

CHAS. H. BROWN.