L. W. EGGLESTON.

VALVE.

APPLICATION FILED DEC. 1, 1909.

963,215.

Patented July 5, 1910.

2 SHEETS—SHEET 1.

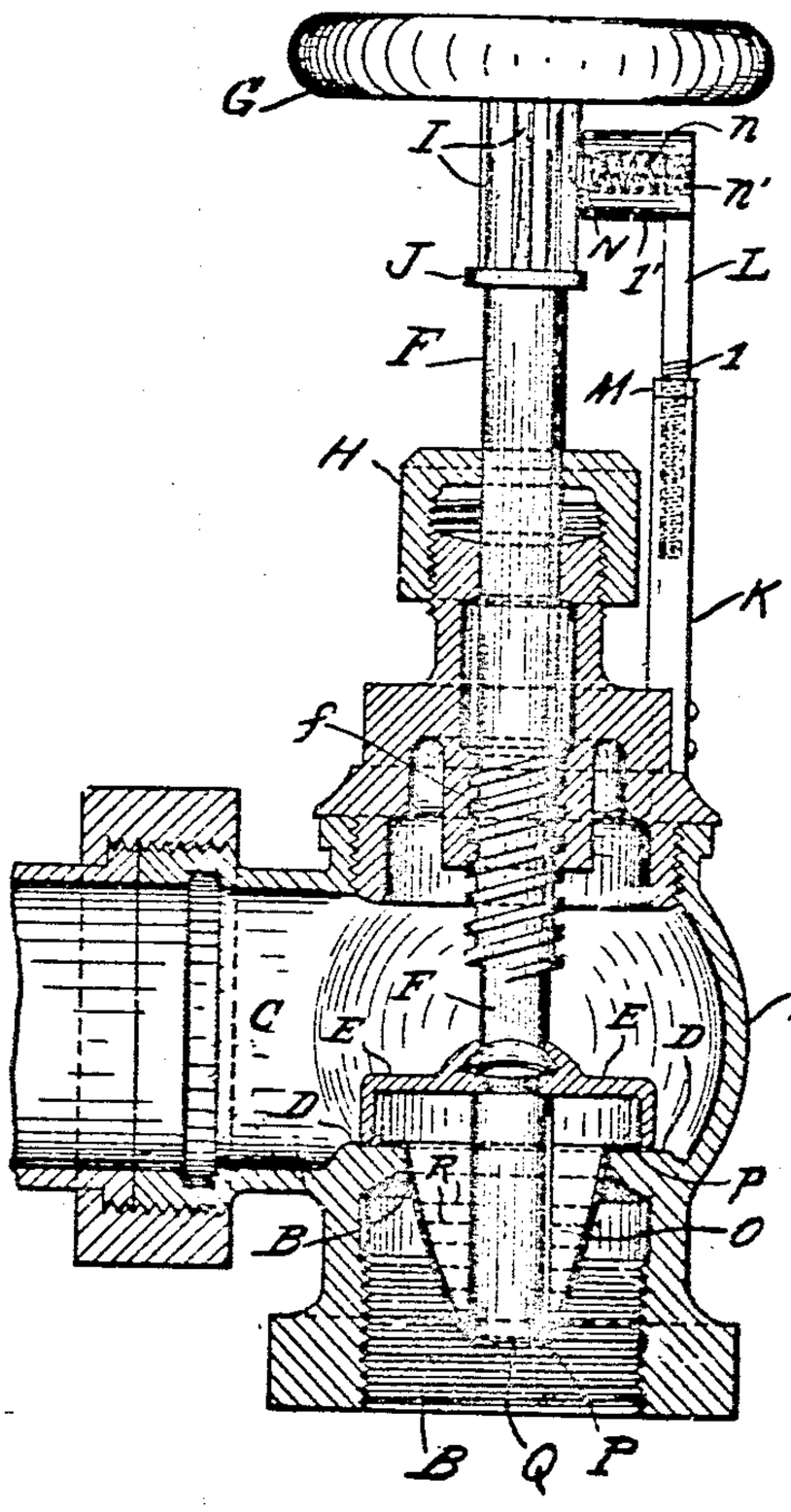

Fig. 1.

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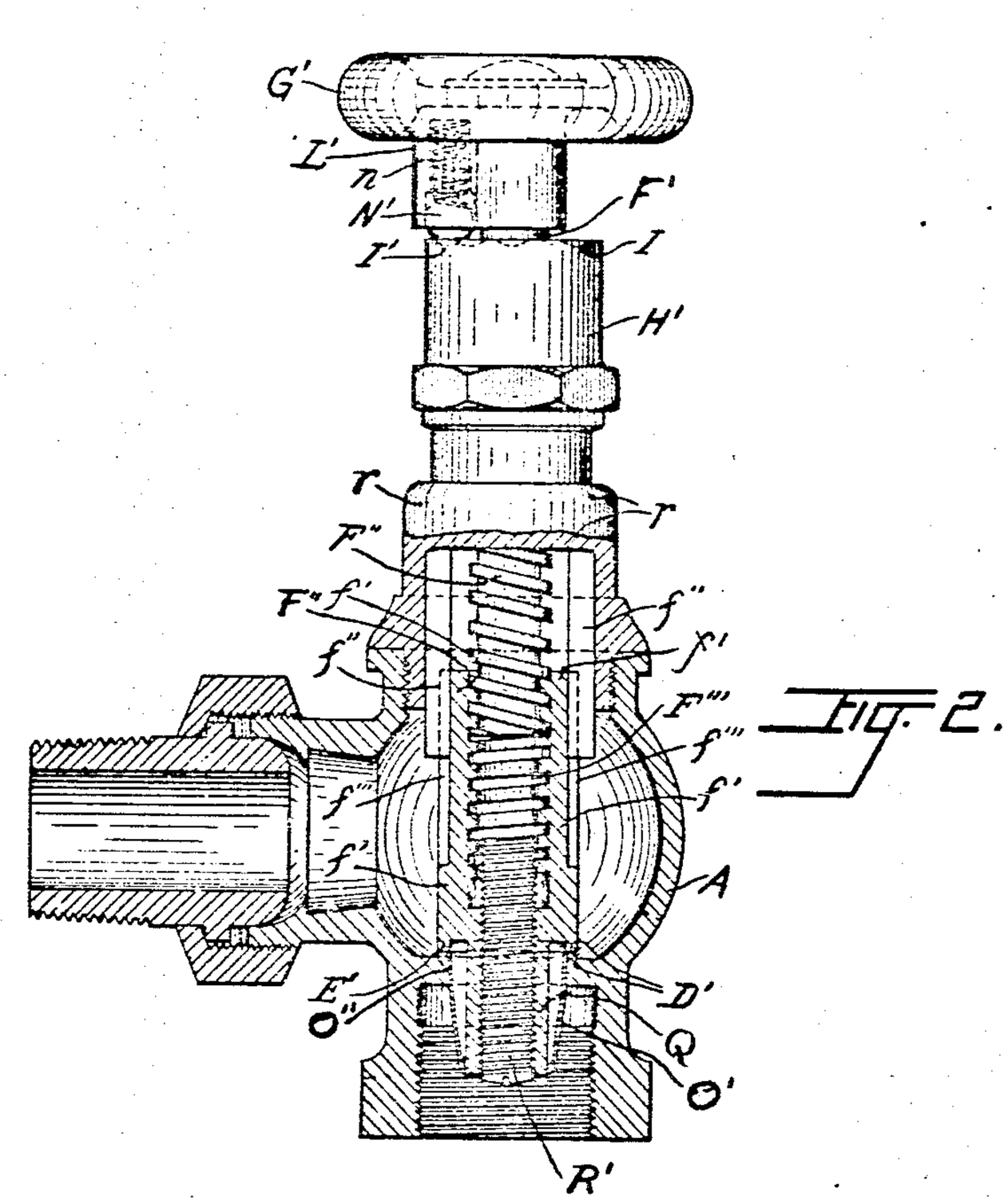

Fig. 2.

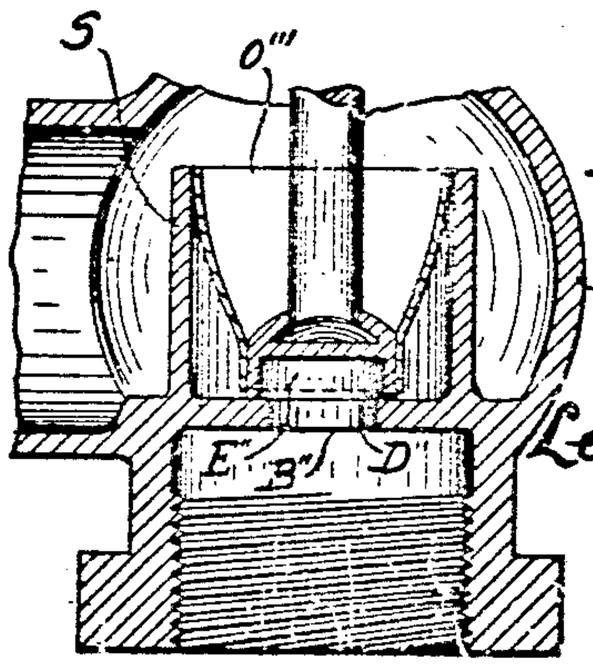

Fig. 3.

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UNITED STATES PATENT OFFICE.

LEWIS WATSON EGGLESTON, OF CHICAGO, ILLINOIS.

VALVE.

963,215. Specification of Letters Patent. Patented July 5, 1910.

Application filed December 1, 1909. Serial No. 530,767.

To all whom it may concern:

Be it known that I, LEWIS WATSON EGGLESTON, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valves, of which the following, when taken in connection with the drawings accompanying and forming a part hereof, is a full and complete description, sufficient to enable those skilled in the art to which it pertains to understand, make, and use the same.

This invention relates to valves applied to steam supply pipes, and branches from said pipes, to control the flow of steam therethrough.

The object of this invention is to obtain a valve through which a determined quantity of steam at a given pressure will in a given time flow therethrough.

A further object of this invention is to obtain a valve of the kind named which may be adjusted to deliver a desired quantity of steam flowing therethrough.

A further object of the invention is to obtain a valve provided with means to enable the operator or user to know the quantity of steam the device is set for, that is the quantity of steam which at a given pressure will, in a given time flow therethrough.

A further object of the invention is to obtain a device which when the means for opening the same are moved a given distance the quantity of steam flowing therethrough in a given time will be correspondingly increased, and which can be set to determine the greatest possible quantity of steam which will in a given time, at a given pressure, flow therethrough.

A further object of the invention is to obtain a device in which the means for determining the quantity of steam flowing therethrough will not be subject to wear, thus obviating any change by the use of the device, of the adjustment thereof.

In the drawings referred to Figure 1 is a vertical sectional view of an angle valve provided with a rotatable and longitudinally movable valve stem embodying my invention. Fig. 2 is an elevation of an angle-valve, provided with a rotatable stem not longitudinally movable, and with the shell broken away to expose to view a modification of the construction embodying my invention, and Fig. 3 is a vertical section of an additional modification.

A reference letter applied to designate a given part is used to indicate such part throughout the several figures of the drawings wherever the same appears.

Referring to Fig. 1, A is the shell of the device, B the inlet, C the outlet, D is a valve seat, E a valve co-acting with said valve seat D, F is a valve stem provided with screw threads *f*, connected at its lower end to valve E, and at its upper end provided with hand wheel G. H is a stuffing box to stem F. I, I, are longitudinally extending recesses in stem F. J is a shoulder on said stem F. K is a post rigidly secured to shell A. L is an adjustable member provided with screw threads 1 at one end thereof and with the head 1′, at the other end thereof. The screw threads 1 fit into corresponding screw threads in post K, as indicated by broken lines in Fig. 1. M is a lock nut. The head 1′ may be raised or lowered by turning the member L in the proper direction and may be secured in an adjustable position by lock nut M. N is a ball in head 1′ and *n* is a spring arranged to yieldingly hold ball N in one of the recesses on stem F. Spring *n* is held in place by screw *n*′.

As the hand wheel G is turned in the construction illustrated in Fig. 1 the ball N will "click" in moving from one of the recesses I, I, to the next one thereof, and at the same time the valve stem F, shoulder J on said valve stem and valve E are raised, and when the shoulder J is raised so as to come into contact with the under face of head 1′ the valve cannot be further opened. The member L is therefore adjusted so that when the valve is opened to permit the flow therethrough of a sufficient quantity of steam for the capacity of the radiator to which the valve is attached, the shoulder J will be raised into contact with the head 1′, and the valve cannot be opened farther.

O is a cup provided with an aperture P at its lower end and with flange *p* at its upper end. The cup O is forced into the passageway of the valve seat so that the flange *p* thereof rests on the annular table forming the valve seat D. Q is a post secured in valve E to extend downward into the aperture P and is of substantially the same diameter.

R, R, are broken lines used in Fig. 1 of the drawings simply to indicate the rise of the valve E, with post Q as the hand wheel G is turned, so that the ball N enters the next

adjacent recess I. These lines do not appear in the device.

The cup O, Fig. 1, forms a well so shaped that when the hand wheel G is turned one step, as measured by one click of ball N in a recess I the aperture P is opened to permit the flow of a quantity of steam at a given pressure in a given time through said aperture P, between said cup O and the post, and when said hand wheel is turned an additional step an additional quantity of steam at a given pressure can flow through said aperture P in said given time, and so on until the valve is entirely open. To accomplish this result the area of the plane on a line R is increased at each turn of the hand wheel as measured by a "click."

The diameter of the valve seat D in Fig. 1 is so great that, as the valve E is raised there is at all times capacity for a greater delivery of steam between the valve and the valve seat than can flow through the cup O between the depending post Q, and the cup, so that whatever steam flows through the aperture P it will flow without resistance, over the valve seat into a radiator or other steam consuming devices.

In the construction illustrated in Fig. 2 the flange on the upper end of cup O' forms the valve seat, and part O'' is made of suitable diameter to fit tightly into the inlet to maintain said cup in place. The valve E' is of no greater diameter than the portion *f'* of the stem of said valve. *f''*, *f''*, are guides fitting loosely in grooves *f'''*, in portion *f'* of the stem, and said stem is movable longitudinally while held non-rotatably thereby. F' is the portion of the valve stem in the construction illustrated in Fig. 2, to which the hand wheel is attached. G' is a hand wheel. The lower end of the part F' of the stem is provided with external screw threads F'' which fit into the internal screw threads F''' in portion *f* of the stem. As the hand wheel G' is turned, in this construction a "click" is heard, the same as in the construction illustrated in Fig. 1, so that the operator is made aware of the change made by him in the adjustment of the valve. I', I', are radial grooves on the upper end of the cap H' and N' is a ball in the extension L' of the hub of hand wheel G'. *n* is a spring yieldingly holding the ball N' in grooves I'. A screw threaded hole extends through the depending post Q and into the aperture provided with the screw threads F''' and R' is a screw in said screw threaded hole. To limit the longitudinal movement of the valve E', when the device is placed on a radiator having less capacity for the consumption of steam than has the device for the supply of steam screw R' is turned so that the upper end thereof strikes the lower end of screw threaded stem F' when the desired openings of the valve are reached. In this construction, as the valve E' is raised by the turning of the hand wheel G' the portion of a turn which is measured and signaled by the "click" of ball N' from one of the radial grooves I' into the adjacent one, a measured quantity of steam is admitted in a given time at a given pressure to flow through the annular space between the valve E' and cup O', the same as in the construction illustrated in Fig. 1.

In the modification illustrated in Fig. 3, B'' is the inlet, D'' the valve seat, E'' the valve, S is a cylindrical body open at its upper end. O''' is a cup shaped member open at both ends, the lower end being of suitable size to be forced over the valve E'' and to be held firmly thereon. The outside surface of the cup O''' is of suitable shape so that as said valve and cup are raised the annular space between said cup and the cylindrical body S. at the upper edge of said body, determines the quantity of steam which may flow through the device. And said cup is so shaped that on the turn of the hand wheel through a measured angle a measured quantity of steam in a given time will flow therethrough. It will be observed that in this construction the cup is movable with the valve and the measurement of steam is obtained by the shape of the outside of said cup instead of the shape of the inside, as in the construction illustrated in Figs. 1 and 2, and hence said cup may in this construction be filled or solid. The cup is by me preferably stamped from flat sheet metal as in this manner the exactness required in the form of the cup is easily maintained in the manufacture of a large number thereof.

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

1. A casing provided with an inlet and an outlet, a valve seat and a valve arranged to co-act with said seat and means to seat and un-seat said valve, in combination with auxiliary means to vary the area of the inlet correspondingly with the variation of longitudinal movement of said valve, and adjustable means within said casing for determining the maximum movement of said valve.

2. A casing provided with an inlet and an outlet, a valve seat, a valve arranged to co-act with said seat and means to seat and unseat said valve, in combination with auxiliary means to vary the area of said inlet correspondingly with the variation of longitudinal movement of said valve, means to indicate the movement given to said valve, and adjustable means within said casing to determine the maximum movement of said valve.

3. The combination of a valve and valve seat, means to move the valve, a well and a plunger in said well, said plunger connected

to the valve to move longitudinally therewith and arranged so that when said plunger is moved given distances the annular space between the nearest adjacent faces of said plunger and said well is increased by given areas.

4. A valve seat, a valve arranged to coact therewith, a plunger, a body having a substantially conical shaped passage therethrough so that the areas of the circular planes within said passage and at right angles to the axis of said body increase in proportion to the distance of said areas from the smaller end of said passage, and means to move the valve and change the relative position of the plunger and said body.

LEWIS WATSON EGGLESTON.

In the presence of—

CHARLES TURNER BROWN,

CORA A. ADAMS.