H. J. ALLEN.

RADIATOR VALVE.

APPLICATION FILED FEB. 24, 1915.

1,183,790. Patented May 16, 1916.

Fig. 1

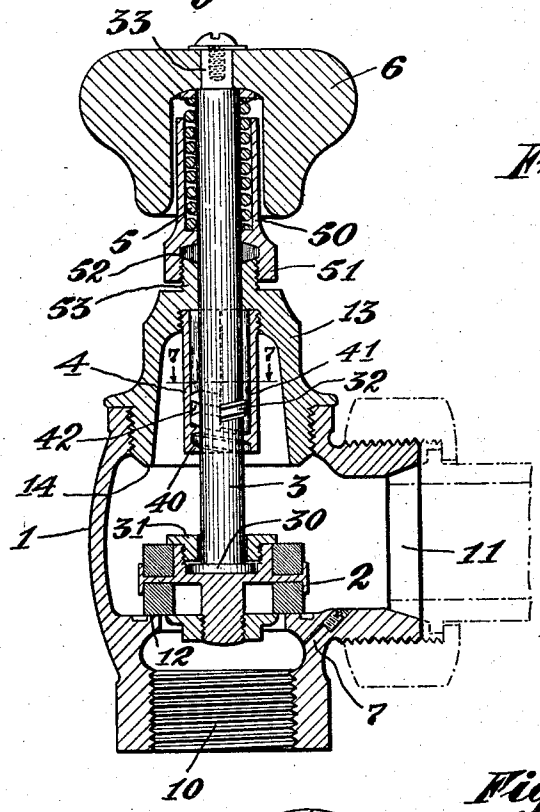


Fig. 2

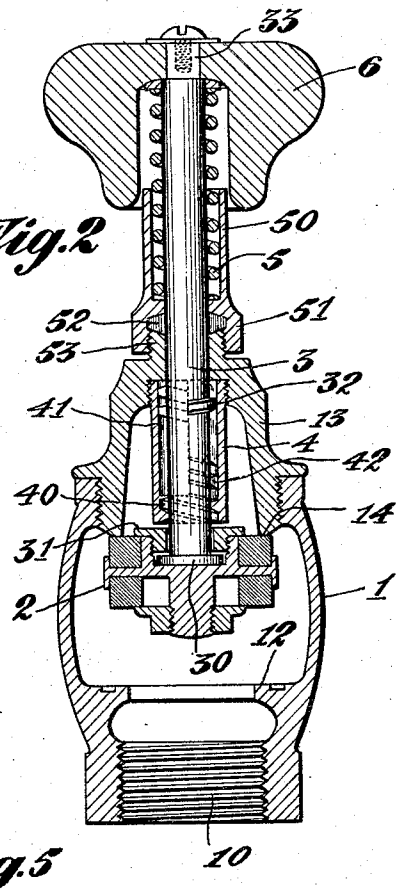


Fig. 5

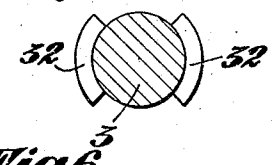


Fig. 7

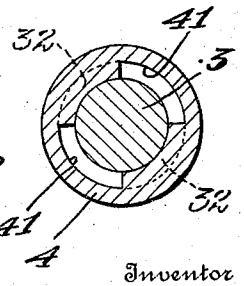


Fig. 3

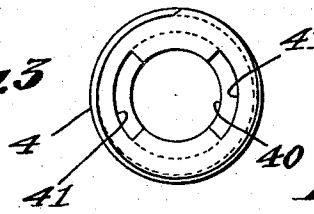


Fig. 6

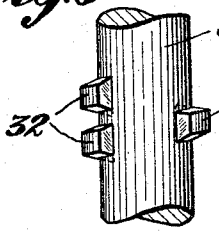
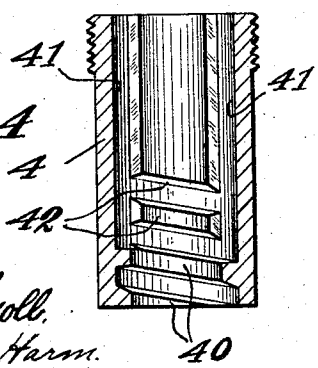


Fig. 4



Witnesses

James E. Sproll.

Clara A. Harm.

Inventor

Harry J. Allen.

By Adams & Reynolds.

Attorneys.

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HARRY JONES ALLEN, OF SEATTLE, WASHINGTON.

RADIATOR-VALVE.

1,183,790. Specification of Letters Patent. Patented May 16, 1916.

Application filed February 24, 1915. Serial No. 10,347.

To all whom it may concern:

Be it known that I, HARRY J. ALLEN, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Radiator-Valves, of which the following is a specification.

My invention relates to valves and comprises certain novel constructions in a valve which is primarily intended for use upon radiators, but which may be adapted for many other uses.

The object of my invention is to provide a valve which may be closed tightly and yet, when opened, will automatically open itself to its full extent, thus avoiding the possibility of the valve being open just enough to permit steam to enter, and yet not enough to prevent the radiator filling with water.

The novel features of my invention will be pointed out in the specification and particularly defined by the claims. In the accompanying drawings I have shown the form of construction which is preferred.

Figure 1 is a sectional elevation of my valve showing both the inlet and outlet openings. Fig. 2 is a sectional elevation taken on a plane at right angles to that of Fig. 1. Figs. 3 and 4 are respective end view and longitudinal section of the sleeve surrounding the valve stem, which coöperates therewith to tightly close the valve. Figs. 5 and 6 are respective cross section and fragmentary side view of that portion of the valve stem which carries the locking means, and Fig. 7 is a cross section upon the line 7—7 of Fig. 1.

The valve casing 1 is provided with an inlet 10 and an outlet 11, which are threaded, or otherwise constructed for the connection of the valve to the supply pipe and the radiator, the form of this construction being variable to suit the conditions of different cases. The casing is provided with a seat 12, with which the valve engages when the supply of steam to the radiator is to be cut off. The valve 2 may be of any construction found adaptable to the purpose.

The construction of the valve shown is not essential in my invention, except that the valve head should, preferably, be so connected with the stem 3, that there may be free rotative movement between the two. To secure this result, I have provided the stem with a head 30, which fits within a recess in the body of the valve head and is secured therein by a washer or threaded plug 31, which is sufficiently loose in its engagement with the valve stem, to permit of rotative movement.

Upon the valve stem, at a distance from the head which should equal or slightly exceed the distance through which the valve travels in opening, are placed one part of interlocking mechanisms by which the valve may be tightly forced upon its seat. Surrounding the valve stem, extending from just below the point indicated away from the valve, is a sleeve 4, which carries the complemental parts of the valve locking mechanism.

This valve locking mechanism consists, in the type of construction shown herein, of complemental interrupted threads, having such segmental extent as will permit reciprocative axial movement of the parts, when placed in proper relation. I have shown these interrupted threads as consisting of two parts, placed on opposite sides of the valve stem and of its inclosing sleeve. They are therefore made to extend through not more than 90°. Upon the stem I have shown two threads 32 upon one side and one upon the other, this being sufficient for the desired purpose.

The sleeve 4 is shown as screw threaded into the cap member 13 of the valve. Its length is sufficient to permit the upward movement of the valve stem which will fully open the valve. The lower inner part of the cap member 13, is preferably provided with a seat 14, against which the upper surface of the valve contacts when it is in open position. The sleeve 4 has interior threads formed in its lower end, which are complemental to the segmental or interrupted threads 32 of the stem. One or more of these threads 40, next to the valve, are made to extend through those portions of the periphery which, higher up, are cut away to form the longitudinally extending grooves 41, these grooves extending upwardly to the upper end of the sleeve, and are complemental and form a guide for, the segmental threads 32 of the stem, when the valve is moved from its seat. The upper portion of the threads 40, as shown at 42 are likewise interrupted for the passage of the segments 32 of the stem.

While I have referred to these interlocking members as being threads, it is to be understood that in their action they are in the nature of cams, or inclined surfaces, and are made threads for the reason that the thread is the simplest and most practical type of cam surface to construct.

The valve should preferably be provided with means whereby, when the interlocking members by which the valve is forced upon its seat, are released, the valve will, at once and automatically, be opened to its maximum extent. The simplest and surest method of doing this is to apply a spring which will be continuously active upon the valve to open it. I have therefore provided a spring 5, which is located outside of the valve casing. This spring is shown as located within a sleeve 50 and surrounding the stem 3. The sleeve 50 is a continuation of a nut 51, which is used as the adjustable member of a packing gland 52, and is screw threaded upon a boss 53, through which the valve stem passes. The valve is opened through a handle, which is secured upon a square or otherwise non-circular section 33, of the valve stem.

Should it be desired to use this valve upon hot water radiators, or to permit the radiator to fill with water, this may be done as follows: At the point 7 a small hole is provided, within the casing and outside of the valve seat, which connects an inlet and outlet opening of the valve casing. This may be stopped when desired, by means of a plug or small screw. By having this opening, the velocity of the entering steam will prevent back-flow of water until the radiator has become filled. It will thus be possible to use the radiator as a hot water radiator, if desired.

In the locked or closed position of the valve, as shown in Fig. 1, the segmental thread sections 32 of the stem, are in engagement with the segmental sections 42 of the sleeve 4, and the valve is held firmly upon its seat. To open the valve, it is turned through a small arc, sufficient to bring the segments 32 into registry with the axially extending grooves, or channels, 41 of the sleeve, in which position the valve may be moved in an axial direction off of its seat. In fact, the action of the spring 5 will be sufficient to cause this reciprocative movement, without necessity for applying any force for this purpose. The valve will be held by the spring in its fully opened position.

When it is desired to close the valve, it is pushed downward until the segments 32 contact with the thread 40 which extends across the end of the guide-way 41. The valve is then turned to engage its segments 32 with the segments 42 of the sleeve. The engaged inclined surfaces act to force the valve firmly upon its seat. The extent of these surfaces and the angle of inclination, may easily be formed such that the valve may be securely seated and without having to turn through any very great arc, or they may be of such extent that the stem may be given one or more full turns, as may be necessary, due to wearing down of the valve seating members. The value of threads 40, which extend across the guide-way 41, is merely to serve as a stop for the segments 32, when the latter have reached the point for entering the spaces between the threads 42. Such stop may be provided with another form of construction. The extension of the guide-way 41 throughout the distance of upward travel of segments 32, holds the valve stem in proper position for the passage of these segments through the spaces between the segments 42 of the sleeve.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States of America, is:—

1. The combination with a valve stem having interrupted threads upon a short section thereof and a sleeve surrounding said stem and having longitudinally extending grooves accommodating the threads of the stem to permit a reciprocatory movement therebetween, said sleeve having complementary interrupted threads in position to engage with those of the stem only when the stem is in valve-seating position.

2. The combination with a valve stem having interrupted threads upon a short section thereof and a sleeve surrounding said stem and having longitudinally extending grooves accommodating the threads of the stem to permit a reciprocatory movement therebetween, said sleeve having complementary interrupted threads in position to engage with those of the stem only when the stem is in valve-seating position, and a spring surrounding the valve stem and acting to move the stem into valve-open position.

3. In a valve, in combination, a valve stem having thereon interrupted threads, a sleeve inclosing the stem and having grooves therein forming guides for the passage of said threads of the stem in an axial direction and having threads complemental to those on the stem and located to coöperate therewith in securing the valve on its seat.

4. The combination with a valve and its seat, of a valve stem having interrupted threads thereon, a sleeve inclosing the stem and having threads thereon complemental to those of the stem, and adapted to engage the threads on the stem only when the stem is in valve-seating position, the threads of the sleeve farthest removed from the seat being interrupted to permit reciprocative movement of the interrupted threads on the stem therebetween and a thread nearer the valve being continued into the path of the

threads of the stem to form a stop for the reciprocation thereof.

5. The combination with a valve and its seat, of a valve stem having interrupted threads thereon, a sleeve inclosing the stem and having threads thereon complemental to those of the stem, and adapted to engage the threads on the stem only when the stem is in valve-seating position, the threads of the sleeve farthest removed from the seat being interrupted to permit reciprocative movement of the interrupted threads on the stem therebetween and a thread nearer the valve being continued into the path of the threads of the stem to form a stop for the reciprocation thereof, a handle member secured upon the outer end of the valve stem and a spring between said handle member and the casing acting to draw the valve off its seat.

6. The combination with a valve stem and an inclosing sleeve provided with means permitting free axial reciprocation and preventing rotation in opening and closing, and thread members engaging the two together at the end of the closing movement, permitting rotation to thereby securely seat the valve.

7. The combination with a valve and its seat, of a valve stem having interrupted threads thereon, a sleeve inclosing the stem and having threads thereon complemental to those of the stem, and adapted to engage the threads on the stem only when the stem is in normal valve-seating position, the threads of the sleeve farthest removed from the seat being interrupted to permit reciprocative movement of the interrupted threads of the stem therebetween, and a thread nearer the valve being continued into the path of the threads of the stem to form a stop for the reciprocation thereof, said thread being continued uninterruptedly in the direction of the valve to permit rotation of the stem to securely seat the valve.

Signed at Seattle, Washington, this 17th day of February, 1915.

HARRY JONES ALLEN.

Witnesses:

HENRY L. REYNOLDS,

JAMES E. SPROLL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."