July 25, 1939. C. W. ABERCROMBIE 2,167,321

ADJUSTABLE VENTING CONTROL FOR AIR VALVES

Filed June 18, 1937

Fig. 1.

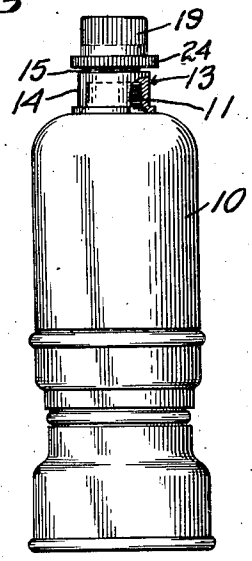


Fig. 2.

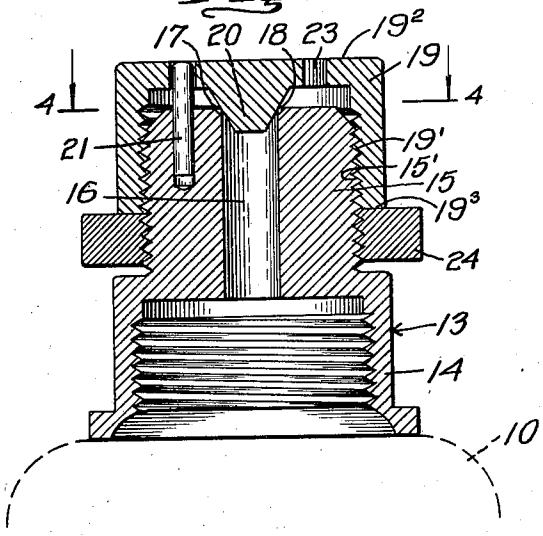


Fig. 3.

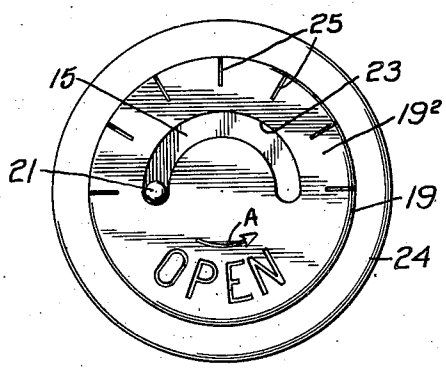
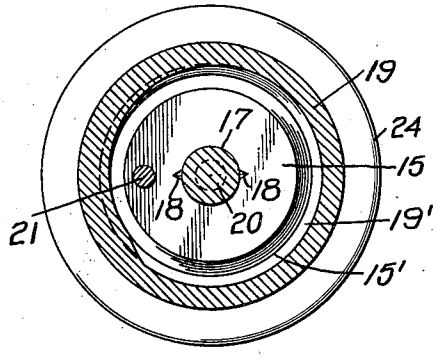


Fig. 4.



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ADJUSTABLE VENTING CONTROL FOR AIR VALVES

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9 Claims. (Cl. 251—8)

This invention relates to air valves, and more particularly to improvements in venting control for air valves for radiators or the like.

In order to heat radiators uniformly in a heating system and to have them reach uniform temperature at the same time, particularly where these radiators are located at various distances from the central source of heat, it is necessary to have an adjustable means for allowing the air to escape from the radiators when forced out by the advancing steam or hot vapors from the boiler.

By this adjustable means the venting of air from the radiator which tends to heat first, is choked off, or reduced to a minimum, and the radiator which tends to heat last is vented wide open, while venting of intermediate radiators is correspondingly controlled, thus causing all the radiators to heat up simultaneously.

The venting control apparatus according to my invention takes the form of an adjustable device adapted to be mounted on a radiator valve of any well known construction or type and it is a particular object of the present invention to provide a device which is capable of being set to allow for any venting control within the range of the radiator valve to which it is applied.

A further object is to provide such constructions which cannot be disassembled while making adjustments.

Still another object is to provide means for securely locking the device in any adjusted position.

Yet another object is to provide suitable indicating means which will indicate all the relative positions of adjustment of the venting control.

A further object is to provide an adjustable venting device having a minimum number of parts without impairment of function and with resultant reduction in manufacturing costs.

With these and other objects in view, my invention comprises the novel construction, combination and arrangement of elements to be hereinafter more fully described, shown and defined in the appended claims.

In the drawing in which similar reference characters denote corresponding parts:—

Figure 1 is a side elevation of a radiator valve provided with an adjustable venting device, according to my invention;

Figure 2 is an enlarged vertical section of my adjustable venting device;

Figure 3 is a top plan view of the device shown in Figure 2; and

Figure 4 is a section taken along line 4—4 of Figure 2 viewed in the direction of the arrows.

Referring to the drawing, 10 denotes an air valve casing for radiators or the like, and the internal air valve construction thereof may be of any well known type, for example, that providing for automatic cut off to prevent escape of steam or water from the radiator. The casing has an air outlet nipple 11 at its upper end over which the adjustable venting means constituting the subject-matter of my invention is adapted to be mounted.

The adjustable venting means comprises a lower cap body or base member 13 having an internally threaded hollow wide bottom portion 14, which is adapted to be threaded on the outlet nipple 11 of the casing 10, and an upper shank portion 15 of reduced diameter which is externally threaded as at 15'. The upper or shank portion 15 is provided with a central air passage 16 whose upper edge 17 serves as a valve seat. The upper edge 17 may be punched off at one or more points to form recesses or notches 18 for a purpose to be hereinafter specified. Cooperating with the base member 13, is an upper hollow cap member 19 internally threaded as at 19', which is adapted to thread on the upper shank portion 15. This cap member is provided with an inwardly projecting valve, tooth-like member or tenon 20 which preferably is tapered and which serves as a valve plug member. This valve or tenon is adapted to be moved toward and away from said valve seat 17 by rotation of the cap member 19 on the shank portion 15, to allow for any venting control of air from said valve 10 through the said passage 16 within the range of the radiator valve to which my venting means is applied. The recesses or notches 18 prevent complete cut off when the tapered valve or tenon rests upon the seat 17. The same may be made, for example, by lightly striking the edge of valve seat with a punch or the like to produce one or more fine recesses at this seating edge.

To prevent the cap member 19 from being removed completely while making adjustments, suitable means for limiting rotation of this member are provided. This means, in the modification shown, comprises a stop pin 21 suitably positioned in the shank 15 after the cap member has been positioned thereon and projecting into a slot 23 provided in the member 19. This slot serves the additional function of permitting air to escape from the cap member 19 above the valve seat 17. In this modification the pin member 21 is preferably so admeasured in length that when the cap member 19 is in closed position,

with the valve or tenon 20 resting on the valve seat, the upper end of the said pin member will lie flush with the top 19^2 of the said cap member 19.

To lock the cap member 19 in any desired position of rotation a suitable locking member or nut 24 is provided. This nut is threaded on the shank 15 below the cap member and by screwing the nut 24 tightly against the bottom edge of the cap member 19, after any adjustment of the cap has been made, the latter is locked against accidental rotation.

Suitable indicator means are provided which will indicate the open and closed positions of the valve with respect to its seat and also intermediate adjustment positions. In this modification these means comprise graduations or markings 25 on the top 19^2 of the cap member, which in conjunction with the stop pin 21 serve to indicate the relative position of the valve or tenon with respect to the valve set. Other indicating means, of course, may be employed. The arrow A and the word "Open" or the like indicate the manner of operation of the venting control. The circumferential walls of both the cap member 19 and the lock nut 24 may be knurled or the like to facilitate manipulation.

Operation of my adjustable venting means is as follows:—

The base member 13 is securely fastened to the radiator valve casing 10 by mounting its threaded lower portion 14 on the nipple 11 and, preferably, is cemented in position.

The locking nut 24 is rotated out of engagement with the cap member 19 to loosen the latter for adjustment. Turning the cap member to the right, for example, causes the valve or tenon 20 to approach the valve seat, thus reducing this venting passage, and turning to the left causes the valve or tenon to recede from the valve seat, increasing the venting passage. The cap member is limited in its closing movement by contact of the tapered valve or tenon with its seat and the opening movement is limited by the stop pin 21 and the end of the slot 23 in the cap.

After turning the cap member 19 to the proper passage opening for venting, the lock nut 24 is turned to bring it into tight contact with the bottom edge 19^3 of the cap member, thus locking the latter in adjusted position and securely against unintentional change. To change the degree of venting, the nut is rotated away from the cap member, the cap adjusted and the nut retightened against the said bottom edge of said cap member.

Various other modifications may be made in the construction and shape of my device without departing from the spirit of my invention as defined in the appended claims.

What I claim is:

1. In a device of the character described, the combination of a base member having an air passage and a valve seat at its upper end, a cap member rotatably associated with said base member and having a limited opening therein and a valve thereon adapted to cooperate with said valve seat for adjustable restriction of air venting through said passage, a fixed member positioned in said base member and projecting into said limited opening for limiting rotation of said cap member and simultaneously preventing disassembly of the combination, and a locking member associated with said base member for locking said cap member in any adjusted position, said locking member being mounted below said cap member whereby the former may not be removed after said device has been assembled.

2. In a device of the character described, the combination of a base member having an internally-threaded hollow portion, an externally-threaded portion above said hollow portion, and an air passage in said second named portion provided with a valve seat at its upper end, a cap member rotatably borne on said externally threaded portion and having a valve adapted to cooperate with said valve seat for adjustable restriction of air venting through said passage, said cap member having a slot for the escape of air above said valve seat, a stop pin positioned in said base member and projecting into said slot to restrict rotation of said cap member and to prevent removal of the latter after assembly of said device, and a locking member threadedly borne on said base member below said cap member for locking the latter in any adjusted position of rotation.

3. In a device of the character described, the combination of a base member having an air passage and a valve seat at the upper end thereof, a cap member rotatably associated with said base member and having a valve thereon adapted to be moved toward and away from said valve seat for adjustable restriction of air venting through said passage, said cap member also having a limited opening in its top, a locking member mounted on said base member below said cap member for locking said cap member in any adjusted position and a fixed member positioned on said base member and projecting into said limited opening for indicating the relative position of said valve with respect to said valve seat, for simultaneously limiting rotation of said cap member, and for simultaneously preventing removal of said cap member after said device has been assembled.

4. In an air valve, the combination of a casing enclosing the valve having an air outlet, and an adjustable venting means for restricting the escape of air from said casing, said means including a base member having an air passage adapted to be mounted over said outlet, a rotatable member having an opening of limited size and a valve movable toward and away from said passage to vary the venting therethrough, a fixed member positioned in said base member and projecting into said opening in said rotatable member for indicating the relative position of said valve with respect to said valve seat and for simultaneously limiting the rotation of said rotatable member and preventing removal thereof, and means for locking said rotatable member in any adjusted position of rotation.

5. In an air valve, the combination of a casing enclosing the valve having an air outlet, and adjustable venting means for restricting the escape of air from said casing, said means including a base member having an air passage adapted to be mounted over said outlet, a rotatabe cap member having an opening and a tapered tooth-like member mounted on said base member, said tooth-like member being movable toward and away from said passage to vary the venting therethrough upon rotation of said cap member, means positioned on said base member projecting into said opening for indicating the relative position of said tooth-like member with respect to said valve seat, for simultaneously limiting the rotation of said cap member and simultaneously preventing removal thereof after said venting means has been assembled, and means mounted on said base member for locking said rotatable member in any adjusted position of rotation.

6. In an air valve, the combination of a casing enclosing the valve and having an air outlet, and adjustable venting means for restricting the escape of air from said casing, said means including a base member having an air passage with a valve seat at its upper end and adapted to be mounted over said outlet, a rotatable cap member having an inwardly projecting tapered valve movable toward and away from said valve seat by rotation of said cap, a stop member for limiting rotation of said cap member, said cap member having an arcuate slot concentrically disposed about the center of said cap member into which said stop member projects, said stop member being so admeasured as to lie flush with the top of said cap member when said tapered valve rests on said valve seat, locking means threadedly mounted on said base member to lock said cap member in any adjusted position of rotation, and means to indicate the relative position of said tapered valve with respect to said valve seat.

7. In an air valve, the combination of a casing enclosing the valve having an air outlet, and adjustable venting means for restricting the escape of air from said casing, said venting means including a base member having an air passage with a valve seat at its upper end adapted to be mounted over said outlet, a rotatable cap member threadedly mounted on said base member and having a curved slot and an inwardly-projecting tapered valve movable toward and away from said valve seat upon rotation of said cap, a stop pin mounted in said base member and projecting into and movable in said slot for limiting rotation of said cap member, a lock nut threadedly mounted on said base for locking said cap member in any adjusted position of rotation, means to indicate the relative position of said tapered valve with respect to said valve seat, and means to prevent complete cut off of venting through said air passage.

8. In an air valve, the combination of a casing enclosing the valve and having an air outlet, and adjustable venting means for restricting the escape of air from said casing, said means including a base member having an air passage with a valve seat at its upper end and adapted to be mounted over said outlet, a rotatable cap member having an inwardly projecting valve movable toward and away from said valve seat by rotation of said cap, a stop member positioned on said base member for limiting rotation of said cap member, said cap member having a curved slot into which said stop member projects, and means on said cap member adjacent said opening serving with said stop member to indicate the relative position of said valve with respect to said valve seat.

9. In a device of the character described, the combination of a base member having a hollow portion, an externally threaded portion above said hollow portion, and an air passage in said second named portion provided with a valve seat at its upper end, a cap member rotatably borne on said externally threaded portion and having a vlave adapted to co-operate with said valve seat for adjustable restriction of air venting through said passage, said cap member having an air escape passageway, a stop member positioned in said base member and projecting into said air escape passageway to restrict rotation of said cap member and to prevent removal of the latter after assembly of said device, and a locking member threadedly borne on said base member below said cap member for locking the latter in any adjusted position of rotation.

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