

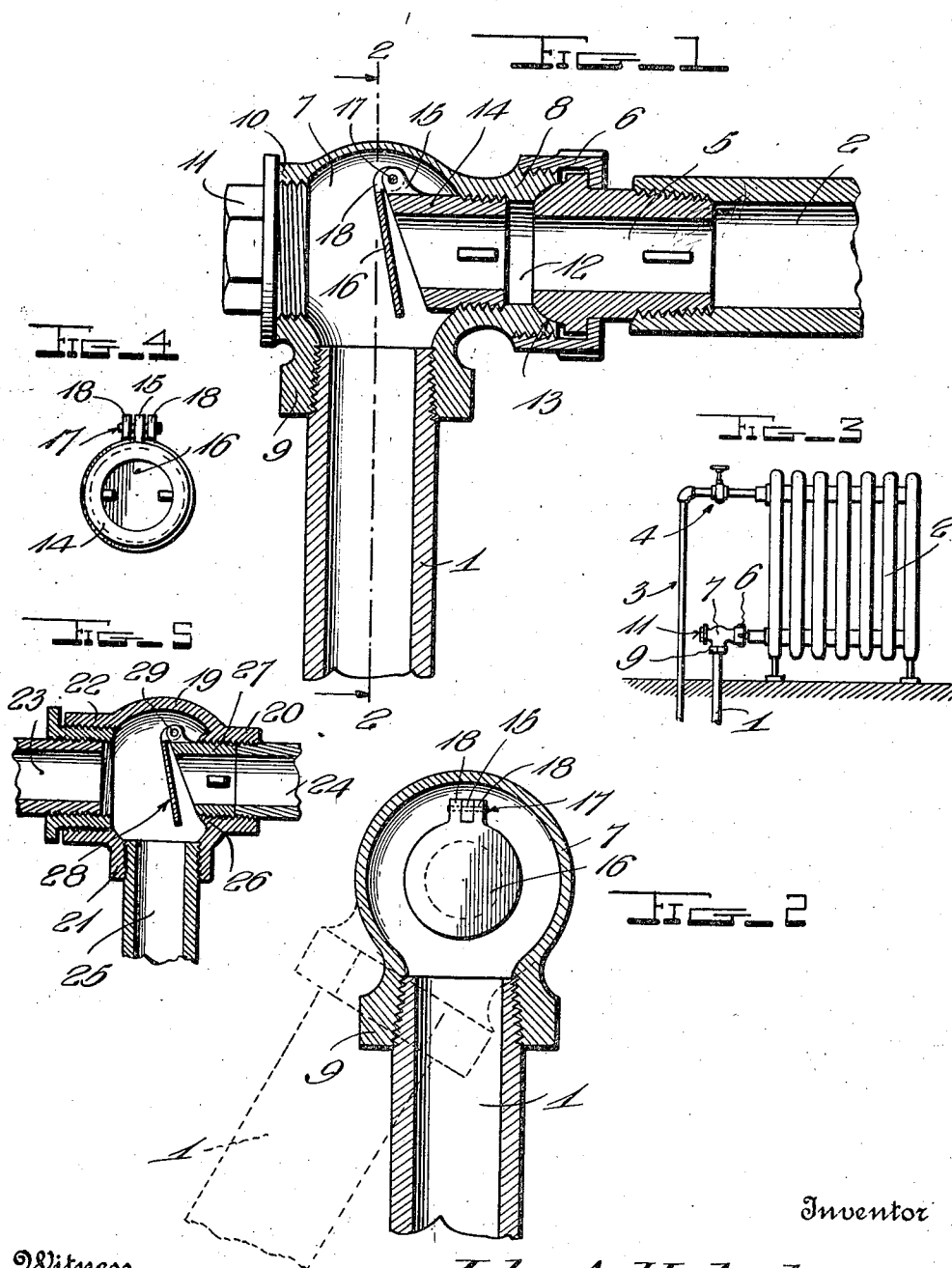
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CHECK VALVE

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UNITED STATES PATENT OFFICE.

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CHECK VALVE.

Application filed May 23, 1921. Serial No. 471,753.

To all whom it may concern:

Be it known that I, JOHN A. HOLMBERG, a citizen of the United States, residing at Lindsborg, in the county of McPherson and State of Kansas, have invented certain new and useful Improvements in Check Valves; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved check or valve for use in connection with steam and vacuum vapor heating systems and for use in connection with the circulating pipes of hot water supplies, and one object of the invention is to provide a check or valve so constructed that it may be mounted in operative relation between the outlet of a radiator and the return pipe of a steam and vacuum heating system so that suction through the return pipe back into the radiator may be prevented when the valve of the steam pipe is shut off and a vacuum created in the radiator by steam condensing in the same.

Another object of the invention is to so construct this valve that the valve may normally remain in an open position and only be moved to the closed position when the back pressure is created.

Another object of the invention is to so construct this valve that it may be gravity actuated and normally hang in a substantially vertical position out of closing engagement with its valve seat, the valve seat being cut to recede from the check valve element and thus permit the valve element to hang in an open position and be returned to an open position by gravity.

Another object of the invention is to so construct this improved valve that with a modified construction of housing or body portion, it may be used in connection with the circulating pipe of a hot water supply to prevent back flow of water and further connect the circulating pipe with a sediment blow-out.

Another object of the invention is to so construct this valve that the valve seat may be passed into the body or housing through one end thereof and then screwed into the inlet end portion of the housing thus positioning the valve seat entirely within the housing and further permitting the housing to be connected with a radiator by means

of a gland permitting the housing to be positioned at a desired angle and the valve seat adjusted axially to suspend the valve element pivotally carried thereby in a substantially vertical position.

Another object of the invention is to so construct this valve that the valve seat may be put in place or removed and cleaned or repaired and replaced without it being necessary to disconnect the valve housing or body.

This invention is illustrated in the accompanying drawings, wherein:

Figure 1 is an enlarged view showing the improved valve portions of the heating system in section.

Figure 2 is a sectional view taken along the line 2-2 of Fig. 1.

Figure 3 is a view showing the improved device in operative relation to a radiator.

Figure 4 is a view showing the valve seat in end elevation and looking at the outer end thereof.

Figure 5 is a sectional view showing the invention applied to a valve for use in connection with the circulating pipe in a hot water supply.

This improved valve is used in connection with a heating system of the steam and vacuum vapor type and will be connected with the air and water return pipe 1 through which air and water will pass from the radiator 2. This radiator is of a conventional construction and is provided with an inlet with which communicates a steam supply pipe 3 provided with a control valve 4 so that the flow of steam into the radiator may be controlled. The usual nipple 5 is provided for connecting the valve with the radiator and carries a gland 6 so that the spherical outer end portion of the nipple may be connected with the valve.

This valve is provided with a body 7 having an inlet neck 8 and an outlet neck 9, the inlet neck being disposed opposite a neck 10 having a threaded opening formed therein to receive the closure plug 11 which normally closes the openings in the neck 10. The inlet neck is provided with the usual passage 12 which has its inner end portion threaded and has its outer end portion enlarged to provide a seat 13 to receive the spherical end of the nipple 5 when the valve is brought into engagement with the nipple and the gland 6 screwed upon the neck 8. It will thus be seen that this valve may be

connected with the nipple 5 with the outlet neck which extends at right angles to the inlet neck extending at a desired angle to permit the return pipe 1 to be screwed into the outlet neck 9. It is of course understood that when this device is installed, it may first be screwed upon the pipe 1 and then brought into engagement with the nipple 5 and secured in place by the gland 6.

10 In order to control the flow of air and water through the valve, there has been provided a tubular valve seat 14 at one end of which is provided a hinge ear 15 so that a check valve 16 of the disk type may be pivotally mounted by means of a pivot pin 17 which passes through the hinge ears 18 of the valve and through the hinge ear 15 of the tubular valve seat. This tubular valve seat has its outer end portion threaded so that the valve seat may be screwed into the internally threaded inner end portion of the passage 12. It should be noted that the inner end portion of this tubular valve seat is cut at an incline so that when the valve 16 is suspended in a substantially vertical position as shown in Fig. 1, the face of the valve seat which is to be engaged by the valve will recede downwardly or in other words normally extend downwardly in diverging relation to the valve and thus cause the valve to be normally suspended out of closing engagement with the seat in an open position. This valve seat and the valve carried thereby are of such size that when the closure or threaded plug 11 is removed, they may be passed into the body of the valve through the opening of the neck 10 and the valve seat screwed into the threaded inner end portion of the passage 12. This tubular seat will be gripped by a spud wrench passed into the interior of the seat with the valve 16 swung away from the seat and with the valve body in place, the tubular seat can be screwed into the inner end portion of the passage and brought to a stop with the valve hanging in a vertical position. The plug 11 can then be put back in place and tightened to prevent leakage. When it is desired to remove the seat, the plug will be removed and the wrench again inserted and brought into engagement with the valve seat to remove the seat.

When this device is in use in connection with a steam or vacuum vapor heating system, it will be mounted as shown and when the valve 4 is open, the steam will pass into the radiator and after filling the radiator will pass out through the outlet of the radiator and through the valve into the return pipe. When the valve 4 is closed and steam in the radiator starts to condense a vacuum will be formed therein and would tend to cause back pressure in the pipe 1. The suction caused by the vacuum will however draw the valve 16 to a closed position thus

preventing the back pressure. When the pressure in the radiator and pipe 1 are at an even point, the valve will again drop to an open position and air and water can pass out of the radiator into the pipe 1. It will thus be seen that there has been provided a valve which will be normally in an open position so that air and water can pass out of the radiator into the return pipe but which is so constructed that any tendency toward back pressure through the pipe 1 into the radiator will cause the valve to be immediately closed. It will be further noted that the valve seat can be adjusted to the proper position without respect to the angle of the outlet neck 9 and further that this valve seat can be removed and repaired and cleaned and put back in place without it being necessary to disconnect the valve from the nipple 5 or pipe 1.

In Fig. 5, there has been shown a valve which is intended for use in connection with the circulating pipe of a hot water supply but which is so constructed that it could be used in place of the valve shown in Figs. 1 and 2 in a steam and vacuum vapor heating system. This valve is provided with a body 19 corresponding to the body 7 and is provided with an inlet neck 20 and an outlet neck 21 which correspond to the inlet and outlet necks of the valve shown in Fig. 1. This valve body is further provided with a neck 22 which corresponds to the neck 10 and is adapted to receive a pipe section 23 so that water returning to a boiler through the pipe or main 24 may pass through the valve and through the pipe 23 to the boiler. In doing so, the water of course passes through the body of the valve and sediment will pass through the neck 21 into the pipe 25, this sediment passing into a sediment tank or to any other convenient point of disposal. The neck 20 is extended inwardly as shown at 26 and is internally threaded so that the valve may have threaded engagement with the pipe 24 and also have threaded engagement with the tubular valve seat 27 which corresponds to the valve seat 14. This tubular valve seat is inserted through the passage of the neck 22 and screwed into the threaded passage of the neck 20 and carries a check valve 28 which is hingedly connected with the tubular valve seat as shown at 29. The inner end of the valve seat is also cut at an incline after the manner of the valve seat 14 so that under normal conditions the valve 28 will hang in a substantially vertical position out of closing contact with the valve seat.

In a water supply of the type mentioned, the water passes from the upper end of the boiler through the water main from which lead the pipes having the usual faucets connected therewith and the water is returned to the lower end of the boiler through the

mains 24 and 23 between which the valve is positioned. When a spigot is turned on, it is desired to have the water pass from the upper end of the boiler through the branch
5 pipe carrying the spigot and prevent the water from being drawn from the lower end of the boiler through the pipes 23 and 24. In other words, it is desired to prevent a back draught of relatively cool or cold water
10 when a spigot is turned on and this will be prevented due to the fact that any back draught through the pipe or main 24 will cause the valve 28 to swing to a closed position. In addition to preventing cool water
15 from the lower end of the boiler from passing through the pipe 24 to the spigot, this valve prevents water and sediment from being sucked up through the pipe 25 and thereby insures at all times a supply of
20 clean hot water when a spigot is turned on. It will thus be seen that there has been provided a valve for use in connection with a steam and vacuum vapor heating system and also a valve which may be constructed
25 for use in connection with the circulating pipe of a hot water supply.

I claim:

A coupling comprising a body having an inlet passage and an opening opposite thereto, and intermediate its length provided with 30 a side opening, a removable closure for the opening opposite the inlet, the inlet passage being internally threaded from its inner end to a point intermediate its length, a tubular valve seat inserted into the body through 35 the opening opposite the inlet, and a check valve pivotally connected with the inner end of said seat, the valve seat having its other end portion threaded and screwed into the inner end portion of the inlet passage 40 and mounting the valve seat for axial adjustment whereby when the coupling is in use, the valve seat may be adjusted to position the pivot of the valve uppermost with 45 the valve hanging in a substantially vertical position and by gravity normally held out of closing engagement with the valve seat.

In testimony whereof I have hereunto set my hand.

JOHN AUGUST HOLMBERG.

Witnesses:

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