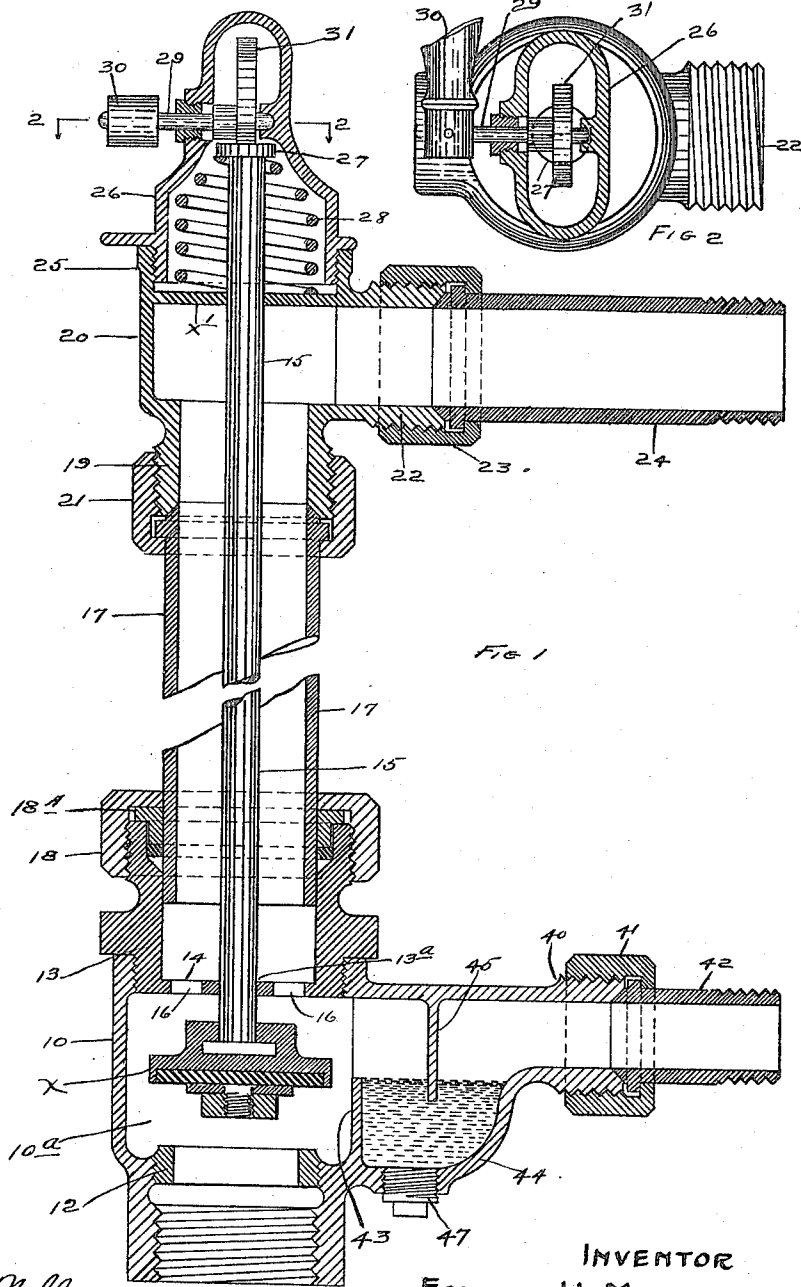


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 STEAM VALVE AND FITTING FOR HEATING SYSTEMS.
 APPLICATION FILED OCT. 31, 1914.

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2 SHEETS—SHEET 1.



WITNESSES

M. H. Mc-Nelly.
Wm. H. C. C. C.

INVENTOR
 EDWARD H. MURPHY.

By Benjamin, Roschauer & Lundy
Attys.

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Fig 4

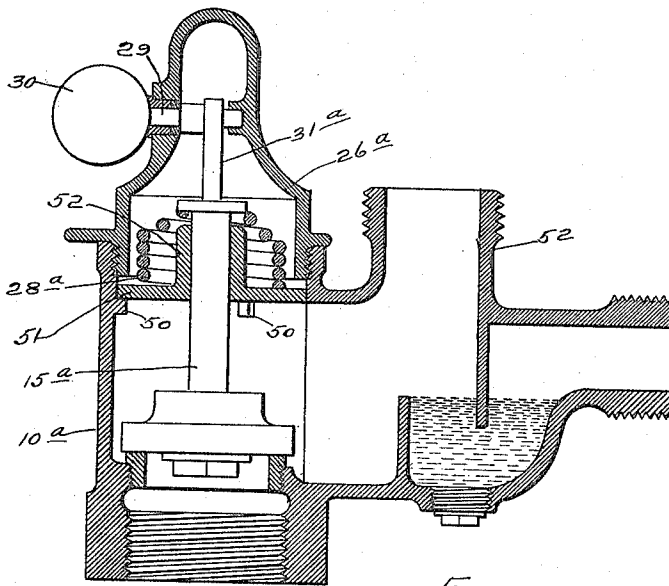
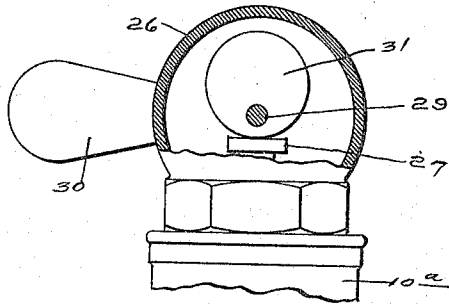


Fig 3

WITNESSES

M. H. McNeilly.
Wm. H. Eichelbauer

INVENTOR
 EDWARD H. MURPHY.

By Benjamin, Roseluce & Lundy
Attys.

UNITED STATES PATENT OFFICE.

EDWARD H. MURPHY, OF CHICAGO, ILLINOIS.

STEAM VALVE AND FITTING FOR HEATING SYSTEMS.

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Specification of Letters Patent. Patented Feb. 20, 1917.

Application filed October 31, 1914. Serial No. 869,537.

To all whom it may concern:

Be it known that I, EDWARD H. MURPHY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam Valves and Fittings for Heating Systems, of which the following is a full, clear, and exact specification.

10 My invention relates to valves and fittings for controlling or regulating the inlet and discharge of the heating agent to and from a radiator in a single pipe gravity return heating system.

15 The principal object of my invention is the provision in a steam valve of mechanism whereby the same may be rapidly and fully seated or unseated by a single operation such as the throwing over of a lever or handle. Another object is to construct a valve of this type that is incapable of being stopped or halted between the ends of its seating or unseating movements in order to prevent its being partially opened or closed.

20 A further object is to provide a suitable water-seal in conjunction with said valve, the same being a fitting either integral with the casing of the valve or separate therefrom as desired. Still another object is to construct a fitting in a manner so that the pressure of the heating element both entering and leaving the radiator will be exerted upon both sides of the bridge or web extending into the element forming the seal and thereby balance and assist in maintaining the sealing element therein in equilibrium. Other objects of my invention are the construction of a valve that is simple in construction and easy to operate, also embodying a minimum number of parts and therefore a consequent reduction in the cost of manufacture, and also effective and positive in its operation.

40 These and other objects I prefer to accomplish by the means and in the manner hereinafter fully described and as more particularly pointed out in the claims, reference being had to the accompanying drawings forming a part of this specification, in which,

50 Figure 1 is a central vertical section of a preferred form of my invention, illustrating one manner of combining my valve with my improved water-seal fitting.

55 Fig. 2 is a horizontal transverse section thereof taken on line 2—2, Fig. 1, looking in the direction indicated by the arrows.

Fig. 3 is a central vertical section of a slightly modified construction of my valve also combined with a water-seal fitting.

Fig. 4 is a fragmentary view of the upper or operating end of the valve having a portion of the casing or hood broken away to disclose the construction and relative location of the parts therein.

Referring to the drawings similar reference characters indicate the same parts. In said drawings, and more particularly Figs. 1 and 2 thereof, 10 represents a valve casing that may be of any desired shape suitable to accommodate the structure hereinafter described. This casing is preferably provided with a centrally disposed valve chamber 10^a and axially below said chamber is a relatively short internally threaded stub 11 adapted to be screwed onto the supply or feed pipe of a steam heating system. The lower portion of the wall of the valve chamber is preferably flared inwardly to reduce the diameter thereof and said reduced portion is screw-threaded to receive an annular valve seat 12, upon the upper edge or rim of which a suitable disk valve *x* is adapted to be seated.

The upper open end of the valve casing is preferably internally threaded into which is tapped a guide bushing that comprises a relatively short cup-shaped shell 13 the lower transverse wall or web 14 of which is provided with a central guide opening or bearing 13^a for a longitudinally elongated valve-stem or rod 15 that passes through and up to a point adjacent the horizontal plane of the top of the steam radiator coils. Wall or web 14 is further provided with a plurality of ports 16, 16, through which the steam from the valve is adapted to pass. The upper end of shell 13 is externally threaded and has a tube or pipe 17 fitted interiorly therein, which latter is held in place by a coupling nut 18 that cooperates with a suitable packing gland 18^a for the purpose of providing a "slip-joint" between said tube and the bushing 13 to take care of expansion and any variation in height between the supply and return openings in the radiator. This tube 17 is adapted to surround the valve stem 15 as well as form a conduit or riser that transmits the steam to the top of the radiator.

At its upper end pipe 17 is secured to the lower vertical stub 19 of an angular casing 20 inclosing the valve control mechanism by

means of a union connection nut 21. The horizontal or lateral stub 22 of this casing is similarly connected by a union connection 23 to a lateral pipe 24 that leads to and communicates with the top or upper portion of the adjacent radiator coil (not shown).

Directly above and so disposed that its axis aligns with the axis of the vertical stub 19 of the casing the latter is provided with an upwardly extended annular flange or short stub 25 that is internally threaded to receive the lower threaded portion of a cap or housing 26 that incloses and surrounds the upper end of valve stem 15 and the mechanism with which I prefer to operate said element. This housing is substantially dome-shaped in side elevation as shown in Figs. 1, 3 and 4 of the drawings and the valve stem extends up inside the same about one-half its height where said stem is provided with an adjustable disk 27. Pressing up against the underside of this disk, and preferably with its lower portion seated upon the upper face of a transverse valve stem guiding web w' of the casing 20 is a coiled expansion spring 28 which surrounds said valve stem 15 and exerts its pressure to keep the valve normally in a raised position. Mounted in suitable lateral bearings a slight distance above the upper end of the valve stem is a transversely disposed horizontal shaft 29 that is provided upon its outer extended end with an operating handle 30 while inside the housing and intermediate its bearings said shaft has an eccentrically disposed substantially circular disk or cam 31 rigidly secured thereto. The periphery of cam 31 is constantly in contact with the upper surface of disk 27 so that any rotation of said cam is adapted to move or actuate the valve stem upwardly or downwardly to seat or unseat the valve v . Said cam is so mounted on its shaft that when it is upon either dead center through its shortest or longest radius the valve cannot be opened or closed by the spring, but when said cam is rotated past its dead centers in either direction the energy exerted by the expansion of said spring will force said valve stem upwardly.

From the foregoing description it will be apparent that the disk will only hold the valve stem when it is on dead center or when its longest or shortest radius aligns with said valve stem and thus avoid the same being partially opened or closed at any intermediate points.

Cast preferably integrally with the valve casing 10 is a lateral extension in which is provided a suitable enlargement that forms a receptacle to receive the water of condensation for the purpose of forming a water seal which is a part of my present invention. This extension comprises an elongated lateral stub 40 that has its upper segment in substantially the same horizontal

plane as the lower transverse web 13^a of the cup shaped shell previously referred to herein and which has its outer end coupled by a nut 41 to the lateral drain or return pipe 42 connecting with the lower portion of the radiator. Adjacent the casing 10 and forming a portion of the dividing wall thereof is a weir 43 arising to a plane slightly below the horizontal plane of the lower segment of stub 40 as shown and intermediate said weir and the threaded end of stub 40 said extension is provided with a relatively deep chamber 44 that forms the receptacle or reservoir into which the water derived from the condensation in the radiator or return pipe is adapted to rise until it overflows said weir 43. A transverse web or bridge plate 45 depends from the upper wall of the fitting so that its lower horizontal edge will be immersed in the water in said receptacle thus forming a seal and preventing the live steam arising through the valve from entering the return pipe and interfering with the free flow of the water of condensation to said seal. It will also be observed that the seal will always be maintained at a constant level and always in balance owing to the fact that an equal pressure of steam is constantly being exerted upon the surface of the fluid on both sides of the web or bridge plate 45. For the purpose of cleaning the seal I prefer to tap a small opening 46 in the lowermost portion of the reservoir and close the same with a suitable plug 47 that may readily be removed by the use of a wrench or other suitable tool.

In Fig. 3 of the drawings I have illustrated a modified construction of my valve and operating mechanism wherein the tube or pipe 17 of the preferred form is dispensed with and the valve stem correspondingly shortened. In this modified construction the casing 10^a is constructed similar to that previously described excepting that short lateral lugs 50 are formed upon the interior thereof adjacent the upper end. Upon these lugs rests a removable transverse plate 51 corresponding with the web w' in the upper casing member 20 of Fig. 1 excepting that its central opening is surrounded with an elongated vertical sleeve or bushing 52 of sufficient length to afford a guide or bearing for the shortened valve stem or rod 15^a. The cap or top 26^a screws down into the upper stub portion of the casing and has the operating cam 31^a and spring 28^a inclosed therein as described above. Alongside said upper stub end and preferably cast integral with the casing or housing 10^a is a vertically disposed stub 53 to which is attached a suitable feed pipe (not shown) that leads to either the top or the bottom of the radiator in substantially the same manner as tube 17 connects the valve chamber 10 with said radiator. Below said stub 53 and alongside

the valve is a water seal also of the same construction as that illustrated in Fig. 1 of the drawings and which need not be described in detail in this connection.

5 The water seal which has been illustrated in Figs. 1 and 3 of the drawings as made integral with the valve casing is well applicable to various types of separate and independent fittings for steam heating systems
10 such as T's, angle and elbow fittings.

While I have herein illustrated and described a preferred form or forms of my invention, it of course will be obvious to others, skilled in the art to which it pertains,
15 that various modifications thereof are possible without materially departing from the spirit of my invention. I therefore desire it understood that all such changes and modifications, or refinements thereof are
20 contemplated within the scope of my invention as set forth in the appended claims.

What I claim as new is:—

1. An integral fitting formed with a passageway for the supply of steam to a radiator,
25 and a passageway through which the water of condensation is returned to the steam supply pipe, the second named passageway being provided with a water seal, and a valve in the fitting for governing the

flow of steam and water of condensation therethrough. 30

2. An integral fitting formed with a longitudinal passageway for the supply of steam to the radiator, and a lateral passageway through which the water of condensation is returned to the steam supply pipe,
35 the lateral passageway being provided with a water seal, and a valve in the fitting for governing the flow of steam and water of condensation therethrough.

3. An integral fitting formed with a longitudinal passageway for the supply of steam to a radiator, and a lateral passageway through which the water of condensation is returned to the steam supply pipe,
40 the lateral passageway being provided with a water seal, a valve seat in said fitting at the steam entrance thereto, and a valve in said fitting adapted to seat on said seat for governing the flow of steam and water of
45 condensation therethrough. 50

In testimony whereof I have hereunto set my hand and seal this 28th day of October, 1914.

EDWARD H. MURPHY. [L. s.]

Witnesses:

E. K. LUNDY, Jr.,

WM. HARVEY EICHELMAN.

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