June 19, 1934. J. E. SHEAFFER 1,963,872

CONTROL VALVE

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Fig. 1.

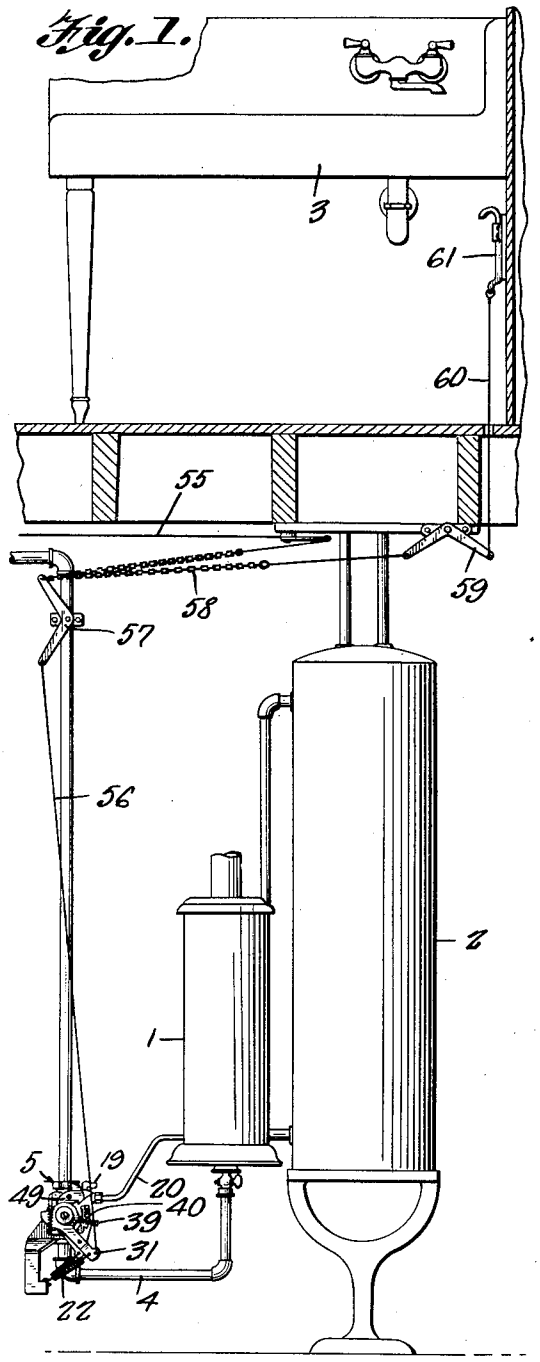


Fig. 7.

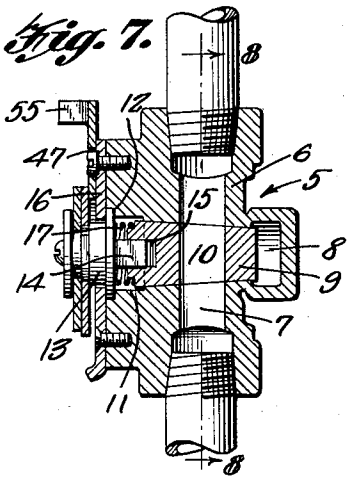


Fig. 8.

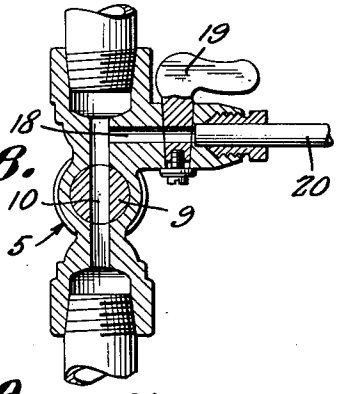


Fig. 9.

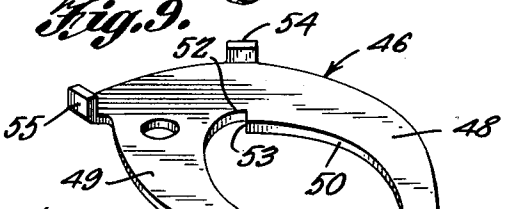
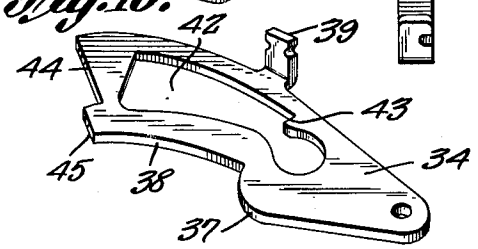


Fig. 10.



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Fig. 2.

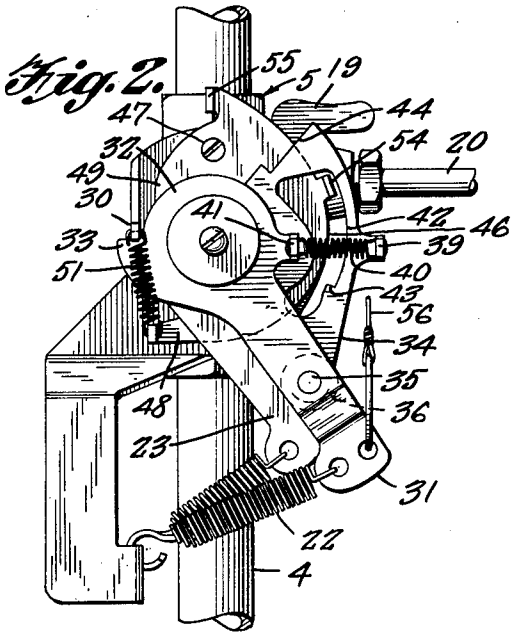


Fig. 3.

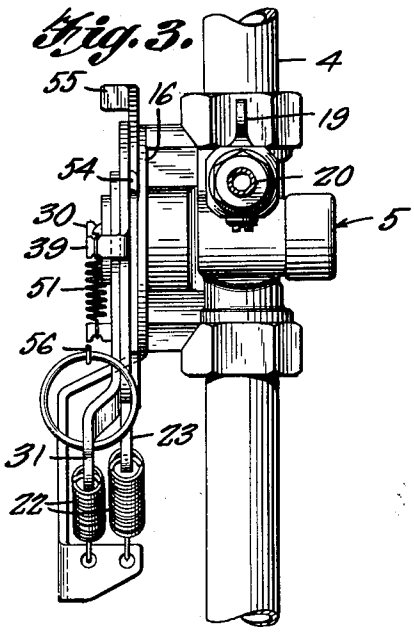


Fig. 4.

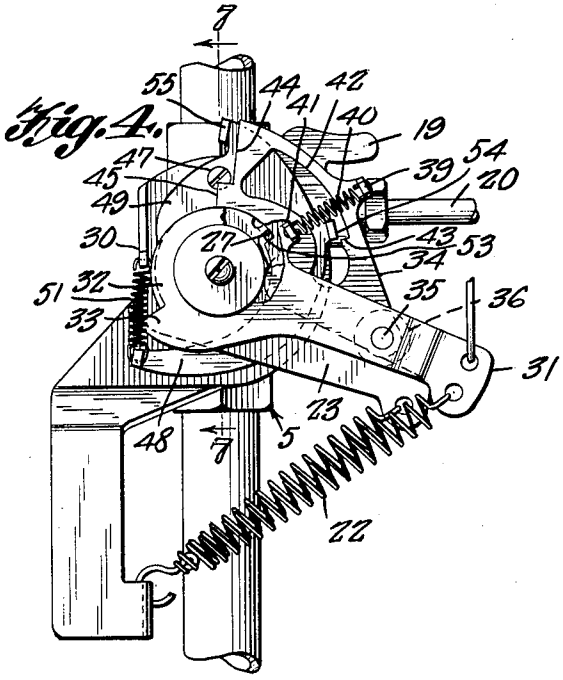


Fig. 5.

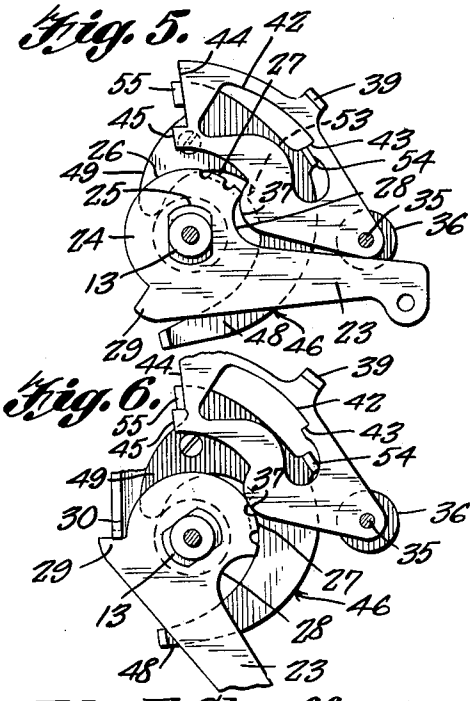


Fig. 6.

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Patented June 19, 1934 1,963,872

UNITED STATES PATENT OFFICE

1,963,872

CONTROL VALVE

John Elmer Sheaffer, Louisville, Ky., assignor to
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Application February 26, 1932, Serial No. 595,405

2 Claims. (Cl. 137—139)

This invention relates to improvements in valves of the character set forth in my United States Letters Patent #1,581,028, and has for the primary object, the provision of an improved valve construction which will be self-seating and fool-proof in operation.

Another object of this invention is the provision of a positive stop means for the operating means when the latter moves the valve into an opened position and said stop means automatically locking the valve in said opened position until the operating means is again actuated whence said stop means automatically releases the valve and permits the latter to assume a closed position.

With these and other objects in view, this invention consists in certain novel features of construction, combination and arrangement of parts to be hereinafter more fully described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawings, in which

Figure 1 is a sectional diagrammatical view illustrating a valve and remote control means therefor and showing said valve associated with a hot water heater of a water system of a building.

Figure 2 is a side elevation illustrating the valve and operating means therefor with the valve in an off or closed position.

Figure 3 is an edge elevation illustrating the same.

Figure 4 is a view similar to Figure 2 showing the operating means and valve in an opened position.

Figure 5 is a detail view showing the positive stop means in the act of releasing the valve from an opened position.

Figure 6 is a similar view showing the stop means after releasing the valve from an opened position and with the operating means of the valve returned to a normal or off position.

Figure 7 is a sectional view taken on the line 7—7 of Figure 4.

Figure 8 is a sectional view taken on the line 8—8 of Figure 7.

Figure 9 is a perspective view illustrating a locking plate.

Figure 10 is a perspective view illustrating an actuating plate.

Referring in detail to the drawings, the numeral 1 indicates a conventional type of hand lighted gas burner for heating the water in the tank 2 of a hot water system of a building. The heater and tank being shown in the basement of a building with the outlet for the water arranged in conjunction with a sink or basin 3 located in the building above the basement. The burner of the gas heater 1 having the usual gas supply pipe 4 connected thereto and in which is located a valve 5 constructed in accordance with my invention.

The valve 5 comprises a body 6 having a passage 7 therethrough to which the gas supply pipe 4 is connected and the passage is intersected by a tapering bore 8 forming a valve seat engaged by a plug valve 9 of tapered formation and which is provided with a port 10 adapted to be moved into and out of registration with the passage 7 for controlling the gas to the burner of the heater 1. The bore 8 at one end is enlarged to form a chamber 11 in which is formed an annular bearing 12 adapted to rotatably support a valve operating head 13. The head 13 is provided with a squared shank 14 fitting within a squared socket 15 of the valve element 9 for the purpose of providing a slidable driving connection between the head and the valve element. The head 13 is held in seated engagement with the annular bearing 12 by a stationary plate 16 secured to the body 6 and interposed between the head 13 and the valve element 9 is an expansion spring 17 normally urging the valve element into engagement with the walls of the bore 8 to establish a leak-proof connection to prevent the escape of gas from the valve during the use of the device.

The body 6 is provided with a passage 18 in communication with the passage 7 and is controlled by a valve 19. The passage 18 has a pipe 20 in communication therewith and which is connected to the ordinary pilot of the burner 1 and with the valve 19 in an opened position, gas flows to the pilot regardless of the position of the valve element 9.

A valve lever 23 has formed at one end a hub portion 24 provided with an elongated opening 25 to receive a correspondingly shaped portion on the head 13 for the purpose of establishing a driving connection between the lever and said head. The hub portion 24 provides a curved bearing surface 26 on which is formed a tongue or an extension 27 which extends laterally of the hub 24 into an arcuate shaped slot formed in the plate 16. The hub 24 between the tongue or extension 27 and the lever 23 is provided with a recess 28. The free end of the lever 23 is connected to one of the coiled springs 22 for normally urging said lever in a direction to close the valve 5. A stop 29 is carried by the hub 24 to engage with a stop 30 on the plate 16 for limiting the movement of the lever 23 beyond a valve closing

position under the action of its respective spring 22.

An operating lever 31 is provided with a hub 32 journalled to the head 13 and said hub 32 is provided with a stop 33 adapted to engage the stop 30 for limiting the movement of the operating lever 31 in one direction. The operating lever 31 has the coiled spring 22 attached thereto for urging said operating lever in the stated direction or into its normal position when the valve 5 is in a closed position.

A substantially segmental shaped actuating plate 34 is pivoted to the operating lever 31 as shown at 35 and the pivot 35 carries a circular head 36 riding on one edge of the valve lever 23. The actuating plate 34 upon its inner edge is formed with a rounded shoulder 37 adapted to fit within the recess 28 for the purpose of establishing a driving connection between the operating lever 31 and the valve lever 23. The inner edge of the actuating plate 34 between the free end of the latter and the shoulder 37 is curved as shown at 38 to conform to the contour of the hub 24 of the valve lever 23 and bears thereagainst. An ear 39 is formed on the outer edge of the actuating plate 34 and has connected thereto a coiled spring 40 which is in turn connected to an ear 41 formed on the hub of the operating lever 31 for the purpose of normally urging the inner edge of the actuating plate into engagement with the hub of the valve lever to position the shoulder 37 in the recess 28. The actuating plate 34 is provided with a slot 42 and one wall of the same has formed thereon a stop or shoulder 43. The free end of the actuating plate 34 is shaped to form an abutting face 44 and also a stop or shoulder 45.

A latch plate 46 is pivoted to the stationary plate 16 as shown at 47 and includes arcuate shaped curved portions 48 and 49 extending in opposite directions from the pivot 47. The latch plate 46 is located between the stationary plate 16 and the hub 24 of the valve lever 23 with a major portion of the latch plate extending outwardly from under the hub 24. The inner edge of the arcuate shaped portion 48 of the latch plate forms a cam face 50 which rides on the tongue or extension 27. The free end of the arcuate shaped portion 48 of the latch plate is connected to a coiled spring 51 which is in turn secured to the stop 30 for normally urging the latch plate in a direction to bring the cam face 50 against the tongue or extension 27. The latch plate is provided with a recess 52 at its inner edge and at one end of the cam face 50. The highest part of the cam face 50 communicates with the recess 52 and thereby forms a latching shoulder 53 adapted to engage one side of the extension or tongue 27 when the latter enters the recess 52. The arcuate shaped portion 49 of the latch plate forms a stop for limiting the pivotal movement of the latch plate in one direction by engaging the hub 24 of the valve lever 23. An ear 54 is formed on the outer edge of the latch plate and operates within the slot 42 of the actuating plate 34. An extension or ear 55 is formed on the latch plate 46 to be engaged by the working face 44 and also the extension or stop 45 of the actuating plate 34 during the operation of the device and which will be hereinafter more fully described.

The normal position of the various parts heretofore described are as shown in Figure 2 with the valve 5 in a closed position. A movement of the operating lever 31 in the direction indicated by the arrow in Figure 2 to a position as shown in Figure 4 causes an opening of the valve 5. When the lever 31 moves from the position shown in Figure 2, it simultaneously moves the valve lever 23 in a corresponding direction due to the actuating plate 34 or the shoulder 37 thereof fitting within the recess 28 of the valve lever 23. As the operating lever 31 reaches the position shown in Figure 4, the shoulder 43 of the actuating plate engages the ear 54 of the latch plate and limits the movement of the operating lever beyond the position shown in Figure 4. During the described movement of the operating lever 31, the tongue or extension 27 rides against the cam face 50 and as the operating lever 31 and also the valve lever 23 reach the position shown in Figure 4 to open the valve, the tongue or extension 27 passes the end of the cam face 50 allowing a pivotal movement of the latch plate inwardly bringing the tongue or extension 27 into engagement with the latch shoulder 53 locking the valve lever 23 in the position shown in Figure 4 for maintaining the valve in an opened position. The movement of the operating lever into the position shown in Figure 4 brings the working face 44 of the actuating plate 34 into engagement with the stop 55 of the latch plate, so that on further movement of the operating lever 31 in the same direction causes a pivotal movement of the actuating plate 34 outwardly from the hub of the valve lever disengaging the shoulder 37 from the recess 28 interrupting the driving connection between the operating lever and the valve lever. The working face exerting pressure on the stop 55 causes a pivotal movement of the latch plate against the tension of the spring 51 disengaging the latch shoulder 53 from the tongue or extension 27 of the valve lever. The valve lever 23 is then freed from a locked position and returns to its initial position by the influence of one of the springs 22 moving the valve 5 into a closed position. The operating lever when released from the last stated position returns to its initial position by the influence of the other spring 22 positioning the various parts ready to open the valve when the operating lever is again actuated.

From the foregoing description it will be seen that the valve is both opened and closed by a movement of the operating lever 31 in one direction and to permit actuation of the operating lever from remote places within the building, an operating cable 56 is attached to the operating lever 31 and to one end of a bell crank lever 57 suitably supported for pivotal movement and the other end of the bell crank lever has chains 58 connected thereto leading to various places and where bell crank levers 59 are pivotally located. The chains provide compensating mediums to take care of slack that may occur in the controls during the operation thereof. The bell crank levers 59 have connected thereto cables 60 which extend through the ceiling of the basement into other parts of the building and have connection with operating finger pieces 61, one of which is located adjacent the basin 3 and slidably mounted so that on an upward pull thereon the operating lever 31 will be moved in the direction indicated by the arrow in Figure 2 for opening the valve and as the valve moves into an opened position or the operating lever assumes the position shown in Figure 4, the pull on the finger piece 61 is stopped and when released permits the latch plate to lock the valve lever in the position shown in Figure 4 maintaining the

valve in an opened position, so that on a second upward pull on the finger piece 61 the operating lever 31 is moved from the position shown in Figure 4 to a position which brings about the operation of the latch plate to free the valve lever and permit the valve to automatically move into a closed position as shown in Figure 6. When the pull on the finger piece is again released the operating lever 31 returns to its initial position as shown in Figure 2.

The controls described permit the operation of the valve to be carried out for the purpose of stopping and starting the hot water heater from remote places within the building from where the hot water burner is located.

While I have shown and described the preferred embodiment of my invention, it will be understood that minor changes in construction, combination and arrangement of parts may be made without departing from the spirit and scope of my invention, as claimed.

Having thus described my invention, what I claim is:

1. A valve operating device comprising operating and valve levers, said operating lever journaled to a valve and the valve lever fixed to said valve for opening and closing the latter and having a recess, a fixed plate, spring means connected to the levers and to the plate, a latch plate pivoted adjacent one end to the fixed plate and having a notch and a cam face, spring means between the other end of the latch plate and the fixed plate, an actuating plate slidably engaging the valve lever and pivoted to said operating lever, spring means between the actuating plate and the operating lever, a shoulder on the actuating plate and normally fitting in the recess of the valve lever, an extension on the valve lever to engage the cam face and to engage in the notch after a given movement of said levers to hold the valve lever against retroactive movement, and means between the actuating plate and the latch plate to cause pivotal movement of the latter during a further movement of the operating lever for disengaging the extension from the notch and permitting retroactive movement of the valve lever to close the valve.

2. A valve operating device comprising operating and valve levers, said operating lever journaled to a valve and the valve lever fixed to said valve for opening and closing the latter and having a recess, a fixed plate, spring means connected to the levers and to the plate, a latch plate pivoted adjacent one end to the fixed plate and having a notch and a cam face, spring means between the other end of the latch plate and the fixed plate, an actuating plate slidably engaging the valve lever and pivoted to said operating lever, spring means between the actuating plate and the operating lever, a shoulder on the actuating plate and normally fitting in the recess of the valve lever, an extension on the valve lever to engage the cam face and to engage in the notch after a given movement of said levers to hold the valve lever against retroactive movement, and a lug on the latch plate to be engaged by the actuating plate during further movement of the operating lever to cause pivoting of said latch plate to disengage the notch thereof from the extension to permit retroactive movement of the valve lever for closing the valve.

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