

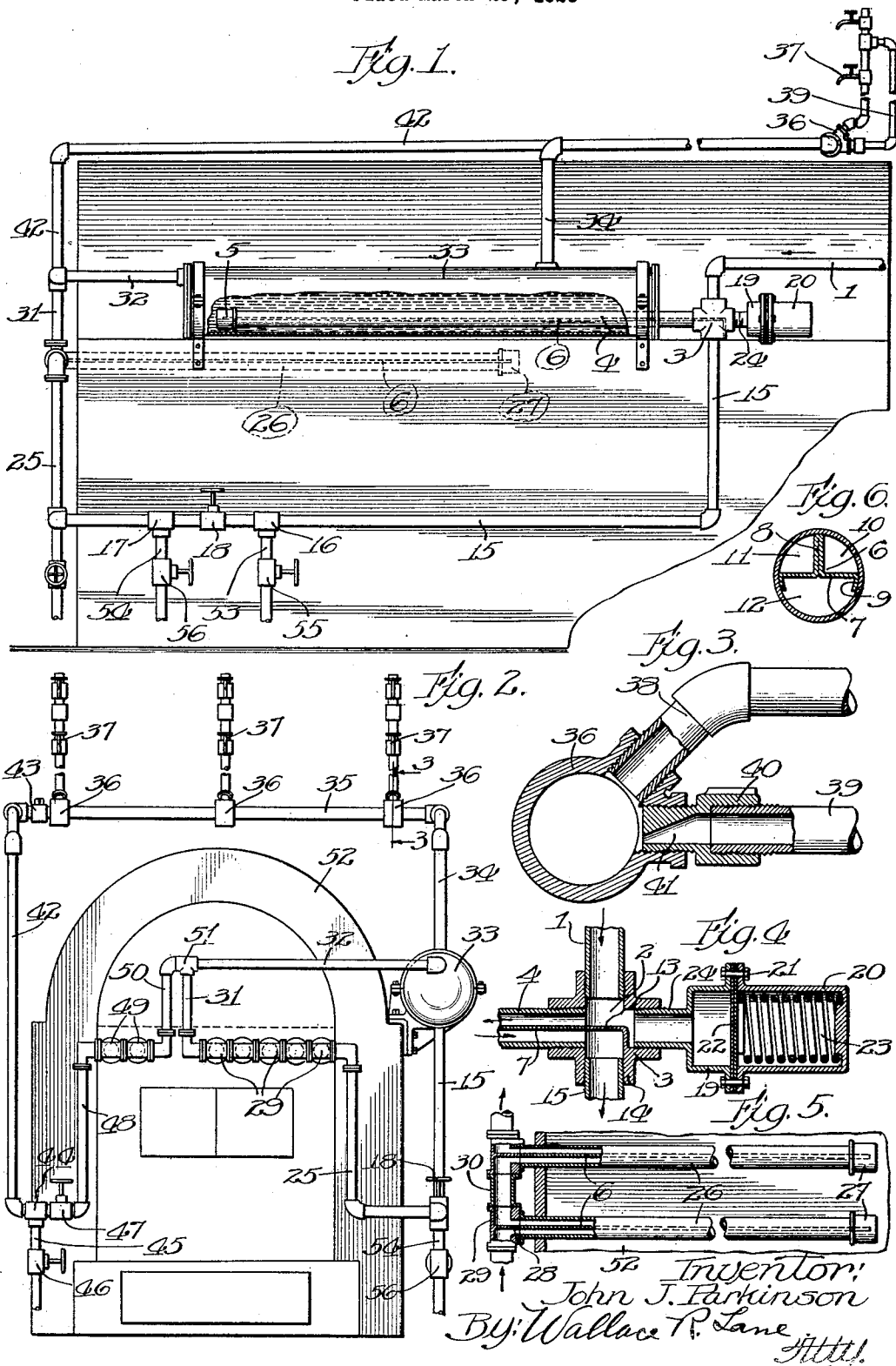
May 3, 1932.

J. J. PARKINSON

1,856,504

HOT WATER SUPPLY DEVICE

Filed March 29, 1926



UNITED STATES PATENT OFFICE

JOHN J. PARKINSON, OF CHICAGO, ILLINOIS

HOT WATER SUPPLY DEVICE

Application filed March 29, 1926. Serial No. 98,163.

The present invention relates to hot water systems or supply devices and parts thereof.

Among the objects of the invention is to provide a novel supply system or device capable of maintaining a circulation of the water irrespective of the demand that might be made upon the supply and to always supply hot water for instant use at the taps or faucets irrespective of such demand.

Another object of the invention, whether or not maintaining the demand but preferably in aid of maintaining said demand, is to provide means for tempering or preheating the incoming or replenishing water supply, such as the water being supplied from a city main or the like. The tempering or preheating in a specific form of the invention, is preferably effected by passing the incoming water through a passage submerged in the hot water passing from the heating means.

The invention also comprehends, as another feature, means for cushioning or absorbing fluctuations in the fluid pressure in the system, such means being preferably connected to the supply line ahead of the preheating means, as between the city supply and the preheater.

As another feature of the invention, the latter also includes the idea of passing the water to be heated, through passages of the return-flow type, which are submerged in the liquid of a heater, whether it be a hot water heater or a steam or vapor boiler. By submerging the heating coils or legs having the return flow passages, in the liquid, as within a short distance below the normal water level of the same, the temperature of the water in the supply passage can never rise above the boiling point and there is no danger of steam arriving at the taps, faucets or spigots and burning the user.

The invention also comprehends the provision of a single supply duct or conduit for any number of tap-off branches or risers and also the provision of novel means for tapping

off for and returning from each of such riser or branch, the latter having any desired number of faucets or the like. Preferably such means is arranged to take the water from the upper part of the supply duct where the water is at a higher temperature than that at the lower part of the duct, and supplying this water to the faucets, the rising pipe then leading to a return pipe connected to the lower part of the duct for returning the water of lower temperature into the duct where the water is at lower temperature than that in the upper part of the duct. For the purpose of aiding in directing this return into the lower part of the duct, the invention comprehends a novel fitting preferably having a tapered passage, nozzle or orifice for directing the returning stream of water downwardly into the lower space of the supply or circulating duct or conduit. Such a fitting is preferably provided in each return branch.

The invention also comprehends the provision of a return pipe or duct leading back to the heater for connection with the supply duct, preferably at a point after the water has passed through the submerged heating coils, although it might be ahead of that, if desired. This is for the purpose of recirculation of the water and whereby a free and rapid circulation may be effected. The returning water may have dropped in temperature, and the return pipe is therefore preferably connected to one or more heating coils of the return-flow type submerged a short distance below the normal water level of the liquid in the heater, whereby the water may receive heat before recirculating in the supply duct.

The present invention offers the advantage of the use of smaller pipes than heretofore required and the elimination of an extra return pipe and also the elimination of a circulation pump. It also comprehends the provision of means for readily flushing out or cleaning the system within a very short period

of time and without the shutting off of the water supply through the building, this being preferably effected by connecting drain connections to the supply pipe, such as between the preheater and the heating coils, and also in the return pipe to the recirculating connection. The pipes may also and preferably are provided with means for regulating the rate of supply or of return or of both for maintaining the proper heating and flow.

Other objects, capabilities, advantages and features are comprehended by the invention as will later appear and are inherently possessed by the invention.

Referring to the drawings, Fig. 1 is a side view in elevation, with parts broken away, of a system constructed in accordance with the invention.

Fig. 2 is a front vertical view thereof.

Fig. 3 is a fragmentary sectional and part side view taken in a plane represented by line 3—3 in Fig. 2 of the drawings.

Fig. 4 is a vertical sectional view taken through the cushioning and preheating connecting parts of the device.

Fig. 5 is a fragmentary part sectional and part top plan view of some of the heating coils for the system.

Fig. 6 is a transverse sectional view of one of the heating coils.

Referring now more in detail to the drawings, the embodiment selected to illustrate the invention is shown as comprising a conduit or duct 1 leading from any suitable source of supply such as from a city water main, this conduit being connected to an inlet passage 2 of a cross fitting 3 for delivery of water thereto. The cross 3 has a lateral opening in which is secured a coil 4 of tubular form and having at its other end a closure or cap 5. Within the tube 4 is longitudinally disposed partition means 6 of the general cross sectional form shown in Fig. 6 of the drawings, this partition means having a horizontal wall portion 7 and a vertical wall portion 8, the horizontal wall portion 7 having curved flanges 9 for engaging with and resting upon the lower half of the tubes 4. In this way the partition means provides for passages 10 and 11 above the partition 7 and passage 12 below the partition 7. The inner end of the partition means terminates at a substantial distance from the end of the cap 5 so as to provide communication from the passages 10 and 11 to the passage 12, the other end of the partition means terminating at the end of the tube 4 which is connected to the fitting 3. Within the fitting 3 is provided a partition 13 extending upwardly from one side of an outlet 14 of this fitting member 3 and extending laterally with the end of the partition in registry with the end of the partition 7 in the tube 4. To the outlet 14 is connected a pipe or conduit 15 leading to T-fittings 16 and 17 and a valve 18 adapted to control the

flow through the pipe. It will be apparent from the above that the flow of the fluid is through the pipe 1 into the upper space of the fitting 3 and above the partition 13 and thence into the passages 10 and 11. The fluid then passes around the end of the partition means near the cap 5 and then beneath the partition portion 7 through the passage 12 to the lower space of the fitting 3 and thence through the pipe 15.

At the opposite side of the fitting 3 from that where the tube 4 is connected, is provided a cushioning means adapted to absorb shocks or fluctuations in pressure in the pipe system, such as water hammers and the like, the cushioning device comprising flanged chambers 19 and 20 connected together by bolts or the like 21 and separated by a diaphragm 22 against which acts a coil spring 23, the latter reacting against the outer end of the chamber 20. The chamber 19 is connected by a nipple 24 to the upper space of the fitting 3.

The pipe 15 then continues through a pipe 25 leading to one or more heating legs 26 of tubular form and of the return flow type, the same as tube 4. The tube 26 has a cap 27 and has disposed therein a partition means 6 with the inner end of the same registering with a partition 28 formed in a T fitting 29 to which the pipe 25 is connected. It will be seen that the flow of the fluid is into one side of the T fitting 29 and thence into the spaces 10 and 11 at one side of the tube 26 and around the end of the same near the cap 27 and then through the space 12 to the other side of the partition 28 in the T fitting 29. The T fitting 29 may be connected with a succeeding like fitting by a short connecting pipe 30. The succeeding heating coils are of the same structure.

After passing through the heating coils, the fluid then passes through a duct or pipe 31 to a pipe 32 and into a chamber 33 of any desirable form, such as of cylindrical form as shown. It is within this chamber that the tube 4 extends and is submerged in the liquid passing into the chamber 33 whereby the fluid passing through the passages 10, 11 and 12 will absorb heat from the heated liquid passing through the chamber 33. The liquid will then pass from the chamber 33 through a duct or pipe 34 to a circulating pipe 35. The circulating pipe may be given a slight pitch or rise as desired and extend through the building to the points where the hot water is to be used and drawn off through taps or faucets. At intervals along this conduit or duct 35 are connected fittings 36 to each of which is connected the riser or branch leading to the faucets and also returning therefrom.

Each branch or riser may have one or more faucets 37 and the pipe leading thereto comprises a connecting pipe 38 secured at an

angle of 45 degrees with the fitting 36 so as to receive communication from the upper space within the fitting 36, as clearly shown in Fig. 3 of the drawings. From the riser is connected a return pipe 39 leading back through a fitting 40 connected with the side of the fitting 36 and adapted to direct the returning fluid into the lower space or part of the fitting 36. The fitting 40 is preferably provided with a tapered passage 41 or nozzle adapted to downwardly direct the returning stream of fluid into the lower space of the fitting 36, as clearly shown in Fig. 3 of the drawings. As the water is flowing through the conduit 35 and the fittings 36, the water of higher temperature will be in the upper part of the conduit and fittings and water of lower temperature will be in the lower part thereof. Therefore the hot water will pass upwardly through the pipe 38 and the riser to the faucets, and circulation may be effected by return of the cooler water to the pipe 39 and fitting 40 to the nozzle 41 for returning into the lower space of the fitting 36. There is just enough difference in temperatures between the upper and lower parts of the conduit 35 and fittings 36 to cause this circulation.

The conduit 35 proceeds through the building and is connected to a return pipe 42 which may have a check valve 43 as shown in Fig. 2 of the drawings. The return pipe may then be connected to a fitting 44 to which may be connected a drain pipe 45 controlled by a valve 46. The return may then proceed through a control valve 47 and a pipe 48 to one or more heating coils 49 of the return-flow type and of the same identical structure as that described above in connection with Fig. 5 of the drawings. The liquid thus heated by these return-flow pipes or coils will then proceed through a pipe 50 connected by a T-fitting 51 with the pipe 32, preferably at a point beyond the heating coils of the pipe 24, for the recirculation of the returned water with the water passing into the pipe 32 to supply the demand in the circulating pipe 35.

In this way it will be apparent that water may first flow to a preheating return-flow coil 4 in the preheating chamber 33 and be tempered or be given a preliminary heat before passing to the heating coils in the furnace or heater, and then passing through the heating coils in the heater. The heater 52 may be of any desired form for heating the liquid, such as a hot water heater or a steam or vapor boiler, and it is part of this invention to submerge the heating coils 26 a short distance below the normal level of the liquid in the boiler. In this way the liquid passing there-through will never rise in temperature above the boiling point; thus the maximum temperature thereof is controlled. The rate of flow of the liquid through these parts and to

the pipe 32 into the chamber 33 and conduit 35 is controlled by the valve 18 and the return flow valve 47 in the return flow conduit 42. Whatever amount of water is used at the faucets will be replenished by the water flowing into pipe 1 from the city main, and the amount not used will return through the return pipe 42 and recirculate with the replenished liquid in the pipe 32, the returning water, in the meanwhile, being heated through the coils 49. In this way a continuous circulation of the water may be effected irrespective of the amount of demand made at the faucets.

If it be desired to flush out or clean the system, the same may be drained through drain pipes 53 and 54 connected to fittings 16 and 17 and controlled by valves 55 and 56. Likewise draining may be effected through the drain pipe 45 controlled by the valve 46 in the return conduit 42.

While I have herein described and upon the drawings shown an illustrative embodiment of the invention, it is to be understood that the latter is not limited thereto but comprehends other features, constructions, arrangements of parts and details without departing from the spirit thereof.

Having thus disclosed the invention, I claim:

1. In a hot water heating system comprising a boiler, a preheater chamber, a preheater coil in said chamber, heating coils in said boiler, said preheater coil being connected to a water supply and in series with a heating coil in said boiler, said chamber, a tap-off pipe, another of said heating coils and a connection between said heating coils and said chamber.

2. In a hot water heating system comprising a boiler, a hot water circuit comprising a preheating chamber, a tap-off, a connection between said preheating chamber and said tap-off, a heating coil in said boiler, a connection between said heating coil and said tap-off, a connection from the other side of said heating coil to said chamber, a second heating coil in said boiler, a connection between said second heating coil and said connection between said preheating chamber and said first mentioned heating coil, a preheating coil in said preheating chamber and connected to a water supply and to the other side of said second heating coil.

3. In a hot water heating system comprising a boiler, first and second heating coils in said boiler, a preheating chamber, a connection between said heating coils and leading to said chamber, a conduit leading from said chamber to a tap-off and to said second heating coil, a preheating coil in said chamber and connected to a water supply, and a connection from the other side of said preheating coil to said first heating coil.

4. In a hot water heating system compris-

ing a boiler, a hot water circuit, said circuit including a heating coil in said boiler, a preheating chamber outside said boiler, and a tap-off beyond said preheating chamber, and a supply line connected to said circuit between said heating coil and said preheating chamber, said supply line including a preheating coil in said preheating chamber and a heating coil in said boiler.

10 In witness whereof, I hereunto subscribe my name to this specification.

JOHN J. PARKINSON.

15

20

25

30

35

40

45

50

55

60

65