

A. HORWITZ.
GAS WATER HEATER.
APPLICATION FILED OCT. 2, 1911.

1,044,456.

Patented Nov. 12, 1912.
2 SHEETS—SHEET 1.

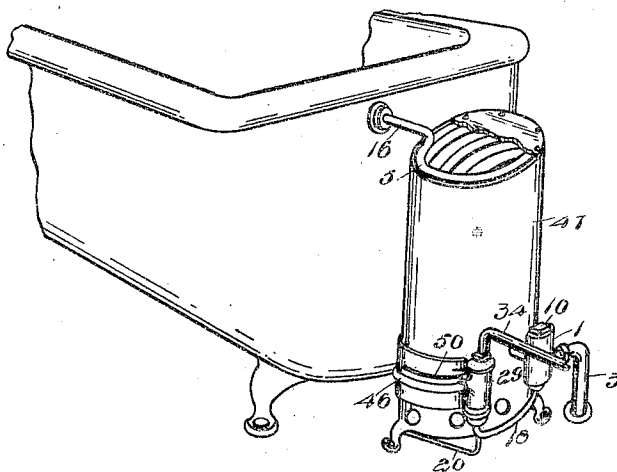


Fig. 1.

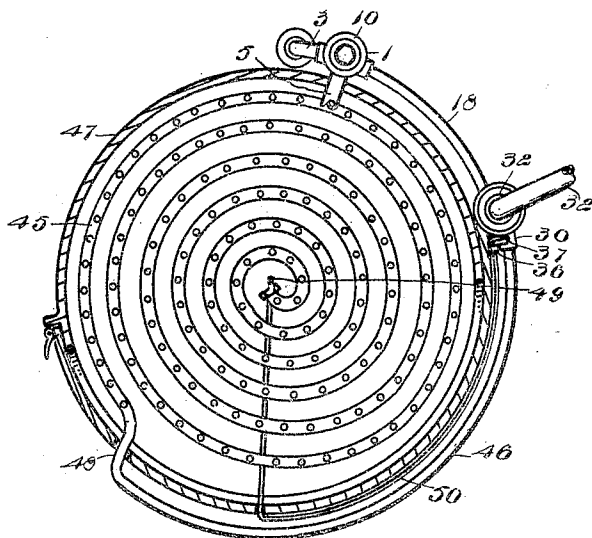


Fig. 2.

Witnesses

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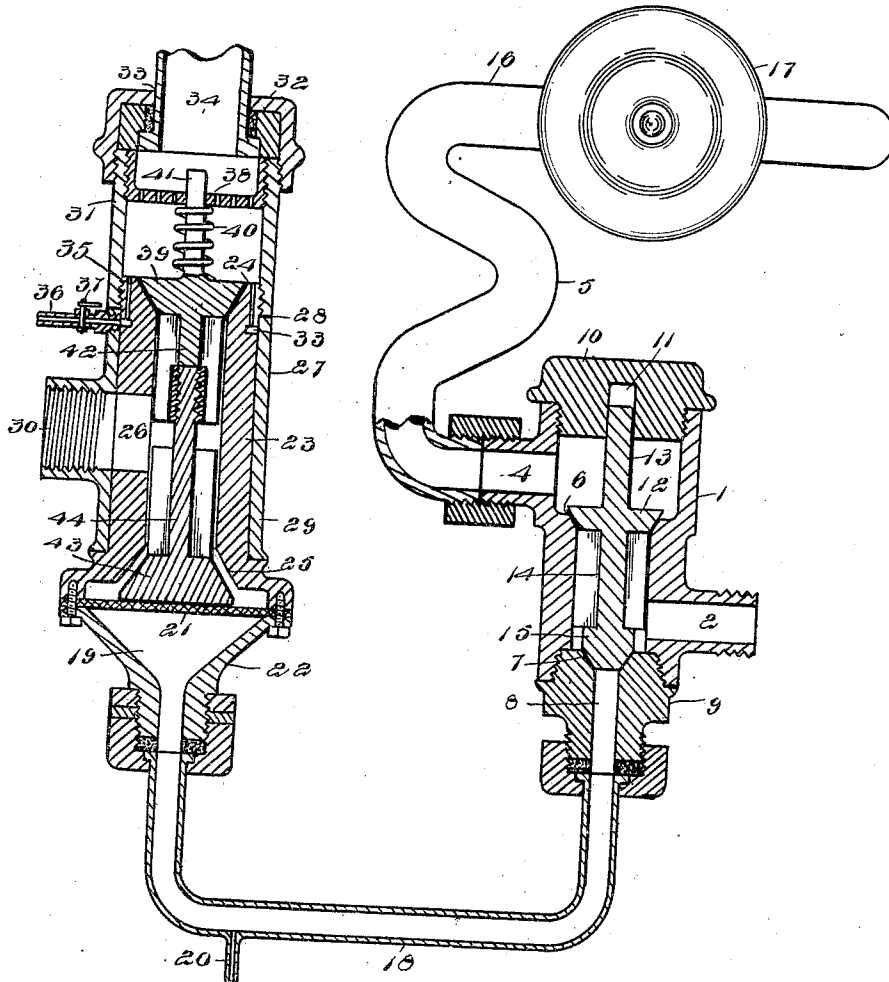


Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

ADOLPHE HORWITZ, OF MONTREAL, QUEBEC, CANADA.

GAS WATER-HEATER.

1,044,456.

Specification of Letters Patent.

Patented Nov. 12, 1912.

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To all whom it may concern:

Be it known that I, ADOLPHE HORWITZ, resident of 711 Berri street, in the city and district of Montreal, in the Province of Quebec, in the Dominion of Canada, a subject of the King of Great Britain, have invented certain new and useful Improvements in Gas Water-Heaters; and I do hereby declare that the following is a full, clear, and exact description of the same.

The invention relates to improvements in gas water heaters, as described in the present specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially in the novel means employed for cutting in and cutting out the supply of gas to the heater.

The objects of the invention are to devise a very efficient and simple device which may be attached to a bath or other convenient place for instantaneously heating the water as it flows from the main inlet to the faucet from which it is being used, to economize in the consumption of gas, and generally to construct a machine of simple, safe and durable form.

In the drawings, Figure 1 is a perspective view of the heater, showing the top partly broken away and a portion of the bathtub. Fig. 2 is a cross section through the heater and valve, showing the preferable arrangement of burner. Fig. 3 is a diagrammatic view of the arrangement of the valves.

Like numerals of reference indicate corresponding parts in each figure.

Referring to the drawings, 1 is the inlet valve casing having the inlet 2, toward the lower end, connected to the supply main 3, and the outlet 4, toward the upper end, connected with the coil 5, said casing in the interior having the valve seat 6 immediately below the outlet opening 4 and the valve seat 7 immediately below the inlet 2, the latter seat surrounding the entrance to the water passage 8, emptying at the bottom of the casing 1, said water passage being contained within the lower head 9 of said casing, said head preferably screwing into the bottom portion of the casing 1.

10 is the upper head of the casing screwing into the top portion thereof above the outlet 4 and having a central stem hole 11 extending thereinto from the inner side.

12 is a valve normally resting on the

seat 6 and having the stem 13 projecting upwardly therefrom into the stem hole 11, and the stem 14 projecting downwardly therefrom and rigid at its lower end with the valve 15, said valve 15 resting on the seat 7 and coincidentally closing the opening to the water passage 8, when the valve 12 is in its closed position.

16 is a pipe from the outlet end of the coil 5. 17 is a faucet at the delivery end of said pipe 16.

It will be noticed that the valve 15 is of much smaller diameter than the valve 12, further the chamber above the valve 12 is of greater area than the chamber above the valve 15.

The water from the supply main 3 entering the inlet 2 lifts the valve 12 and fills the coil 5 and may be carried right through that coil on the opening of the faucet, but after the coil is filled and while the faucet is closed, the valve falls back to its seated position under the influence of gravity and consequently the valve 15, but on the release of the water in the coil by opening the faucet 17, the water flows from the chamber above the valve 12, releasing said valve, therefore, the water from the supply main 3 will lift the valve 12 and pass on through the coil at the same time the valve 15 is raised, which allows some of the water from the main to flow into the water passage 8 and empty therefrom.

It will now be understood from the foregoing description of the water inlet and outlets, that there is a comparatively unobstructed passage from the main water inlet to the faucet, the only obstacle being the simple check valve 12, which valve offers no bar whatsoever to the passage of water on opening the said faucet 17.

18 is a bent tube suitably secured to the outlet from the water passage 8 at one end and at the other end to the inlet to the diaphragm chamber 19 and having the drain 20 intermediate of the length thereof leading to any waste pipe. The diaphragm chamber 19 is closed at the upper end by the diaphragm 21, the walls 22 of said chamber flaring outwardly and supporting at the outer side thereof, the inner valve casing 23, said inner valve casing having at the upper end the seat 24 and at the lower end the seat 25 and intermediate of the height thereof the gas outlet port 26.

27 is the outer valve casing, split at 28,

the lower portion 29 having the flanged port 30 registering with the port 26 in its open position, said lower half 29 encircling the inner valve casing 23 and adapted to turn thereon, so as to cut off the registration of the port 30 with the port 26.

31 is the upper half of the valve casing 27 and is rigidly secured, preferably being screwed on to the outer side of the inner valve casing 23 at the upper end thereof, said upper half 31 being closed in at the top end by the cap 32 screwed thereon, the cap 32 having the inlet gas passage 33 connected to the gas main by the pipe 34.

35 is an annular recess in the wall of the inner valve casing 23, forming a by-pass to the pilot-light pipe 36, controlled by the gas cock 37.

38 is a perforated plate rigidly secured in the upper end of the outer valve casing 27 and having a central stem hole therethrough.

39 is a valve spring-held to the seat 24 by the spring 40 encircling the stem 41, said stem extending upwardly through the central stem hole in the perforated plate 38.

42 is a stem extending centrally and downwardly from the valve 39.

43 is a valve adapted to engage the seat 25 and when the gas is cut off, resting on the diaphragm 21 and having the stem 44 secured to the stem 42, thereby connecting the two valves 39 and 43.

It will be thus seen that the diaphragm 21, which may be of flexible material, such as rubber or very light sheet metal, ordinarily will permit the gas to be cut off through the pressure of the spring 40, but with the emptying of the water from the water passage 8 on the opening of the faucet 17, as already explained, the tube 18 is filled and overflows and empties into the diaphragm chamber 19, continuing to pour into said chamber until the diaphragm is forced upwardly and in this upper position the valve 43 engages the seat 25 and thus cuts off any further leakage of the water in that direction, but the valve 39 being connected with the valve 43 is lifted from its seat and the gas flowing through the perforated plate 38, continues past said valve into the inner valve casing 23 and out through the ports 26 and 30, when said ports are registering one with the other.

45 is a burner, here shown in convolute form, though it may be in any suitable arrangement, the solid outside pipe 46 extending to and secured in the flanged port 30, thus providing a hinge for said burner 45 formed of the lower half 29 of the outer valve casing. The burner 45 swings on its hinge into the coil casing 47 through the slot 48 carrying with it the pilot-light 49 connected by the tube 50 with the pilot-light pipe 36.

In more particularly pointing out the op-

eration, it may be explained that the coils 5 are, of course, constantly filled with water and when the faucet is turned off, the inlet is automatically cut off, so that no fresh water flows into the inlet casing 1, but on opening the faucet, the water continues to flow through the coil or coils, as the case may be, and the bent tube 18 fills and opens the gas valve so that the burner is supplied through the port 26 and immediately the gas is supplied to the burner, the said burner lights, as the pilot 49 is constantly going. If it is desired to continue the cold water instead of the warm through the coils, then the said burner may be swung outwardly, which has the effect of closing the port 26, and thus the gas is cut off and no gas is consumed during the period the cold water is flowing.

The simplicity of the invention is one of its several advantages, for the valves are all of most ordinary form, though their arrangement is particularly efficacious, especially is this emphasized in the absence of pistons and piston rods and the operation, it being accomplished by a column of water diverted from the main stream.

The function of the valve 43 is to shut off any counter pressure of gas on the upper surface of the diaphragm which may tend to overcome the pressure by water in the pipe 18 when only a little water is being drawn from the faucet, the said valve preventing the gas reaching the diaphragm. However the valve 43 is not a necessity and may in some cases be dispensed with.

What I claim as my invention is:

1. In a gas water heater, a water container having an inlet at the lower end and an outlet at the upper end, a cock attached to said outlet and a water valve casing secured to said inlet, said casing having an inlet at the lower end and a coil inlet at the upper end, a valve within said casing between said inlet and the coil inlet adapted to be lifted from its seat by the flow of water into the casing, a gas heater and a gas valve for regulating the flow of gas thereto, a pipe connecting the water valve casing and said gas valve and means for operating said gas valve through the medium of a column of water in said pipe which is subjected to increased pressure as the water valve rises.

2. In a gas water heater, a valve casing having an inlet and outlets, valves arranged between said inlets and outlets and operating coincidentally, a coil connected at one end to an out-flow tap and at the other end to the outlet of said valve casing, a tube connected to the other outlet opening of said valve casing and adapted to divert a column of water from said main water inlet, a valve casing having at the lower end thereof a diaphragm chamber and a diaphragm closing in said chamber, said diaphragm chamber being

connected with said tube, a valve at the lower end of said casing operated by said diaphragm, and a gas valve at the upper end of said casing operatively connected with said lower valve, and a burner suitably connected and communicating with said valve casing.

3. In a gas water heater, a valve casing having an inlet and outlets, check valves arranged between said inlet and outlets, a coil connected at one end with an outflow tap and at the other end with one outlet of said valve casing, a valve casing having at the lower end thereof a diaphragm chamber, a diaphragm closing in said chamber, inner walls supported from said diaphragm chamber forming seats at the top and bottom thereof and an intermediate port and outer walls encircling said inner walls and having a corresponding port, valves adapted to rest on said upper and lower seats and connected together, a tube connecting the other outlet of the first mentioned casing with the inlet of said diaphragm chamber and a burner suitably connected and communicating with the last mentioned casing.

4. A gas water heater, comprising an inner casing forming upper and lower seats and having a port intermediate of the height thereof, an outer casing having a portion thereof turning on said inner casing and a port adapted to register with the aforesaid port, a burner attached to said rotating part of the outer casing, a valve resting on the upper seat and spring-held thereto, a valve connected with the aforesaid valve and adapted to engage the lower seat, a diaphragm engaging said lower valve, a diaphragm chamber at the lower end of said casing containing said diaphragm, a coil connected at one end to an out-flow tap and at the other end through a valve mechanism to the main water supply, and a tube connecting said water valve mechanism with said diaphragm chamber.

5. A gas water heater, comprising a valve casing connected to the gas supply having its top portion rigidly secured to an inner casing and the lower part thereof turning on said inner casing, said inner and outer casings having ports therethrough respectively adapted to register, said inner casing having upper and lower seats, a burner secured to the outlet gas port of said outer casing, a valve spring-held to the upper seat of said inner casing, a valve connected with the

aforesaid valve and adapted to engage the lower seat, a diaphragm operatively connected with said lower valve, a diaphragm chamber supporting said valve casings and closing said diaphragm, a coil casing having a suitable slot into which said burner swings, a coil in said casing connected at one end with an out-flow tap, a water valve mechanism connected with the other end of said coil and to the main inlet, and a tube connecting said diaphragm chamber with said water valve mechanism having a drain pipe opening intermediate of the length thereof.

6. A gas water heater, comprising an outer casing split intermediate of the length thereof and an inner casing fast with the top portion of said outer casing having the lower portion of said outer casing turning thereon, said inner casing having a port in the side thereof registering with the port in the turning portion of the outer casing, valve seats, and an annular recess forming a gas by-pass, a pilot-light pipe in said turning portion of the outer casing registering with said annular recess, a burner secured to said outlet port in the outer casing, a gas pipe connecting said outer casing with the main supply, a perforated plate rigidly secured in the upper portion of said outer casing having a central stem hole therethrough, a valve having a stem extending through said stem-hole, a spring encircling said stem between said valve and said plate, a valve at the lower end of said inner casing connected with the upper valve, a diaphragm under said lower valve adapted to lift it to its seat, a diaphragm chamber inclosing said diaphragm and supporting said valve casing and having a suitable inlet thereto, a coil connected with an out-flow tap at one end, a casing inclosing said coil and having a burner slot below said coil, a pilot-light secured in said burner and connected with said pilot-light pipe, a water valve mechanism connected with the other end of said coil and with said main water supply, and a tube connecting said water valve mechanism with said diaphragm chamber.

Signed in the city and district of Montreal, Quebec, Canada, this twenty-first day of September, 1911.

ADOLPHE HORWITZ.

Witnesses:

G. H. TRESIDDER,
NEIL F. PIGEON.