J. MARTENS.

SYSTEM FOR SUPPLYING DRINKING WATER.

APPLICATION FILED NOV. 26, 1915.

**1,284,406.**

Patented Nov. 12, 1918.

2 SHEETS—SHEET 1.

Fig. 1

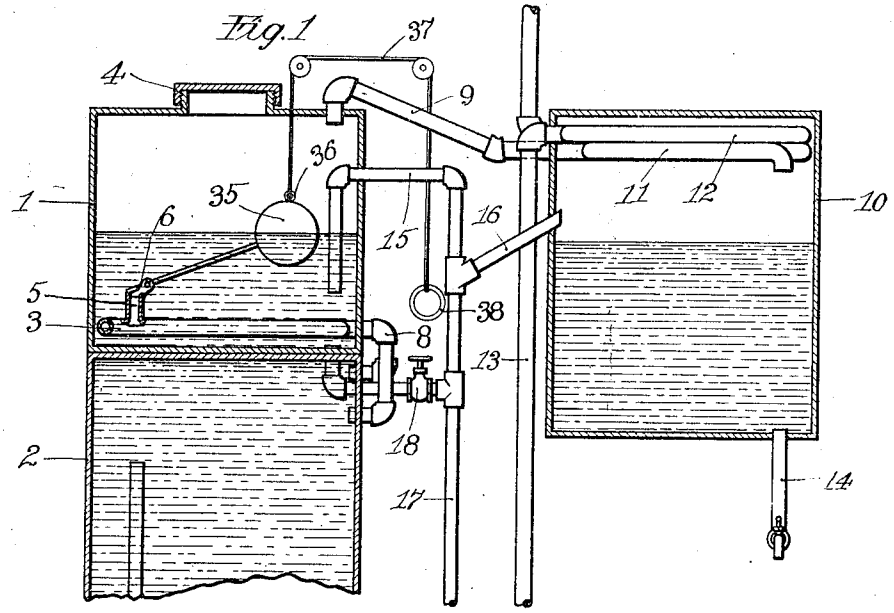



Fig. 6

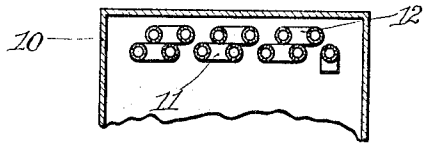



Fig. 2

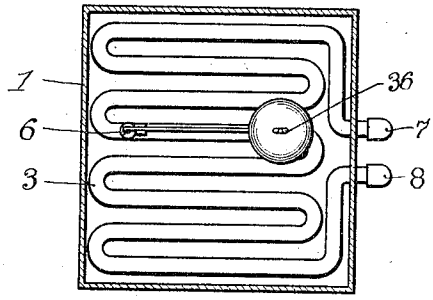
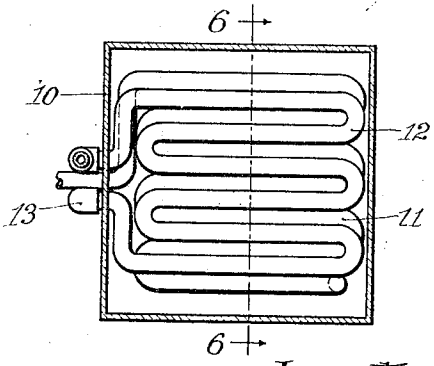



Fig. 3




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2 SHEETS—SHEET 2.

Fig. 5

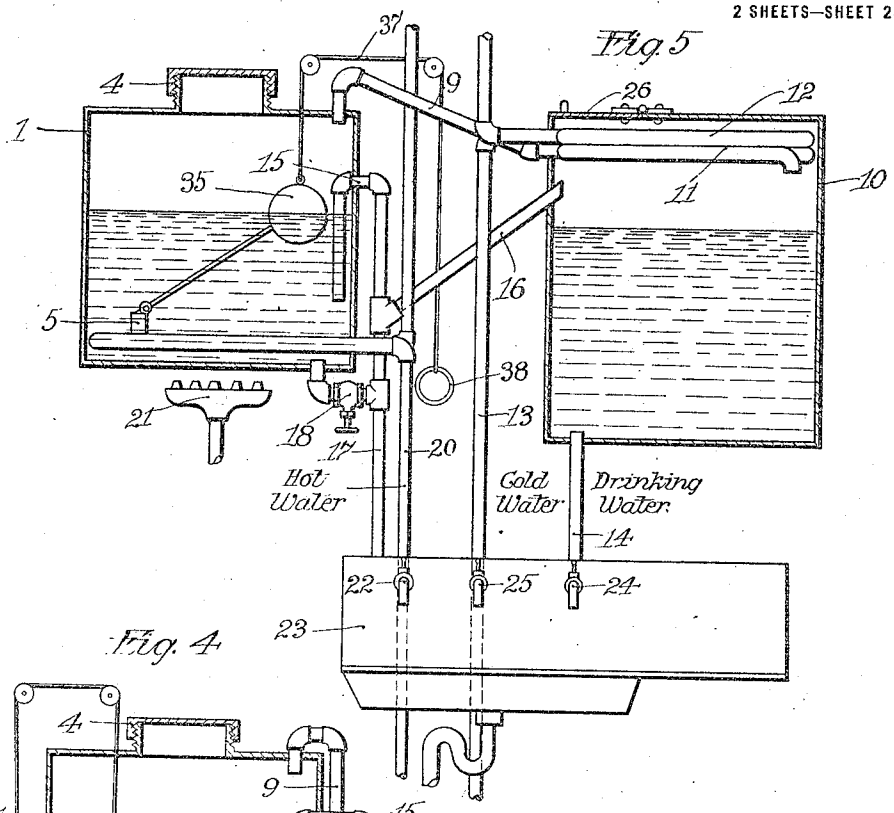
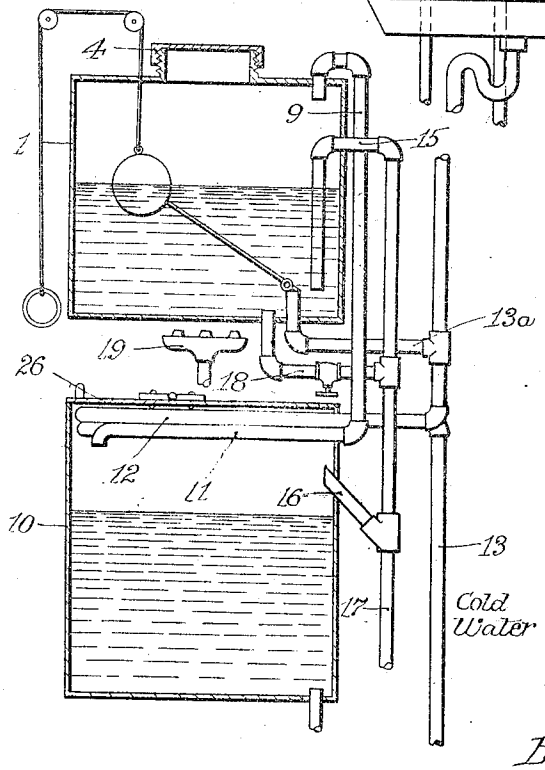



Fig. 4




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# UNITED STATES PATENT OFFICE.

JOHN MARTENS, OF CHICAGO, ILLINOIS.

## SYSTEM FOR SUPPLYING DRINKING-WATER.

1,284,406. Specification of Letters Patent. Patented Nov. 12, 1918.

Application filed November 26, 1915. Serial No. 63,443.

*To all whom it may concern:*

Be it known that I, JOHN MARTENS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Systems for Supplying Drinking-Water, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The present invention relates to a system for supplying potable water for houses, apartments and the like. The object of the invention is to provide an improved still apparatus applicable to modern conditions for supplying potable water for houses, apartments, hotels and the like.

In the accompanying drawings, which form a part of the present specification, I have illustrated a manner in which my invention may be practised.

Figure 1 shows, in section, a drinking water still connection with a water heater of the class described in my prior Patent No. 1,199,805, October 3, 1916.

Fig. 2 illustrates in plan view the heating coil for vaporizing the water;

Fig. 3 illustrates in plan view the vapor coils and the cooling coils for condensing the vapor;

Fig. 4 illustrates a modification in which an independent burner is employed for vaporizing the water;

Fig. 5 illustrates a system in which hot water from a steam pipe, or hot water pipe, is employed to vaporize the water, either alone or in conjunction with an independent gas burner;

Fig. 6 is a section taken on line 6—6 of Fig. 3.

A vaporizing tank 1 is mounted on top of the heater 2 in such position that the bottom of the vaporizer will be subjected to the heat of the water in the tank 2 to bring the water in the vaporizer 1 to the proper temperature for distilling the same. In addition a coil of pipe 3, shown in plan in Fig. 2, is disposed in the bottom of the vaporizer 1 so that the water which may be heated in the heater 2 will aid further in imparting heat to the body of water in the vaporizer 1. The heater 2 has the usual inlet and outlet pipes and also has an inlet pipe adjacent its upper end for receiving preheated water from an auxiliary heating source such as a water back in a stove or the outlet of the cooling coil of the condenser. These pipes in turn are connected to the city water mains and are subject to the pressure therein. The top of the vaporizer is closed by a screw-cap 4 which permits of access to the interior of the vaporizer for cleaning and the like. Water is supplied from the heater 2 to the vaporizer through a short section of pipe 5 connected to coil 3 which is controlled by the float control valve 6 to govern the admission of water to the vaporizer. This is to keep a constant level in the vaporizer and to preserve a free steaming surface. It is to be noted that the coil 3 is connected to the heater 2 by means of short pipe connections 7 and 8. The water in the vaporizer 1 will slowly be vaporized and will pass out of the vaporizer through the pipe 9 into the condensed water receiver 10, first passing through a coil 11, which discharges into the condensed water receiver. The coil 11 is juxtaposed with a cooling coil 12 so that the vapor will be condensed and will drip into the tank 10. The cooling coil 12 is supplied with cooling water from the regular water main 13. The bottom of the tank 10 is provided with a pipe 14 which allows the drinking water to be drawn off. Both the tanks 1 and 10 are provided with overflow connections to prevent the liquid in each one from rising above a certain point. The U-shaped siphon tube 15 prevents the water from rising to a point where water might be discharged into the storage tank 10 through 9. The siphon tube 15 is particularly advantageous in that the end of the tube is normally sealed against the escape of vapor, but the same always presents an effective outlet for the water when the level rises above a given point. The tank 10 is provided with a pipe 16 which is introduced into the tank at a point adjacent the top, this pipe presenting an open outlet for the overflow of the liquid into the discharge or drain pipe 17. It is to be noted that the vaporizer 1 has a draw-off or blow-off connection 18 for emptying the vaporizer when it is desired to clean the same. This draw-off connection connects the bottom of the vaporizer with the discharge tube 17.

It is to be noted that the coils 11 and 12 in the storage tank 10 are brought into as inti-

mate relationship as possible in order to effect a transfer of heat from the vapor tube 11 to the cold water tube 12.

The system shown in Fig. 4 is substantially the same as that shown in Fig. 1 except that the heating means employed in the system shown in Fig. 4 is a gas burner 19 for heating the water in the vaporizer 1. It is also to be noted in this form that the water for supplying the tank 1 is drawn from the cold water supply main 13 by a connection $13^a$ instead of from a hot water heater.

In Fig. 5 I have illustrated a similar system and a manner in which the potable or drinking water may be led to a sink or the like and how the hot water supply pipe 20 may serve to vaporize the water in the tank 1, and, if the same be insufficient, an auxiliary gas burner 21 may be employed. The hot water main 20 is provided with the hot water tap 22 at the sink 23. The distilled water main 14 is provided with a tap 24 and the cold water pipe 13 is provided with a tap 25.

The drinking water tank 10, as shown in Figs. 4 and 5 is preferably provided with a hinged cover 26 to permit access to the inte-rior of the tank for cleaning or repairs.

It can be seen that according to my system, the heat from the hot water plant is utilized to as great an extent as possible in vaporizing the drinking water and such heat as is required to supplement this is supplied externally.

It is to be understood that the water in the heater 2 is under pressure, varying in different municipalities from 30 to 100 pounds per square inch. The boiling temperature of water at 30 pounds pressure (2 atmospheres) is approximately 250° F. It will be apparent that where the water pressure in the heater 2 is sufficient ample heat for boiling the water in the vaporizer 1 can be obtained even though the water in the heater 2 be considerably below the boiling temperature. Where conditions such as low water pressure or low hot water temperatures obtain I find it advisable to supplement the heat supplied to the vaporizer by the gas burner 19.

By the above described system it is possible to have water for drinking and cooking purposes at the disposal of the housewife at all times. The above described arrangement of a siphon for preventing flooding of the vaporizer is particularly useful in that it allows of a fairly wide variation in level without operating, but after it once operates the level is reduced to a definite point and the siphon ceases to operate, as the capacity of the siphon and its point below the water level is so proportioned that it will be broken shortly after setting the level control valve into operation, due to the restricted outlet of this level control valve which can not feed water fast enough to maintain the unbalanced condition necessary for the continued action of the siphon. The level control valve is operated so that there is a tendency to clean the seat of the valve and to cause it to close properly or to remove the cause of flooding. The siphon is also particularly useful in preventing a leakage of steam such as would be the case if an open overflow pipe were employed.

What I claim is:

1. In combination, a hot-water heater comprising a main supply conduit, a vaporizing tank, a coil therein communicating with the conduit, a float valve on the end of the coil to control admission of liquid under pressure to the vaporizer, a siphon co-operating with the float valve and arranged in said vaporizing tank to regulate the level of the liquid in said vaporizer, and a conduit communicating with said tank to conduct the vapor therefrom to a condenser.

2. In combination a hot water heater, having means to discharge hot water into the top thereof, said water being under pressure, a superposed vaporizing chamber having connection with said heater, and coöperating float valve and siphon means for maintaining a free steaming surface in said vaporizer.

3. In combination a hot water heater comprising a tank for containing hot water, and means to discharge hot water into the top of said tank, said tank being being normally under pressure, a superposed vaporizing chamber having connection with said heater tank, a float controlled valve governing said connection, said valve having a restricted outlet, and a siphon adapted to discharge at a higher rate than said valve.

4. In combination a vaporizing chamber, a float-controlled valve governing the admission of liquid thereto, a discharge tube for conveying the vapor generated in said vaporizer and a siphon tube having its one limb extending below the normal level of the liquid in said vaporizer for maintaining the liquid level within predetermined limits.

5. In combination a vaporizing tank, a heating coil disposed in said tank, a float-controlled valve for controlling the admission of liquid to said tank, a siphon having one limb disposed in said tank and projecting below the normal level of the liquid therein, said siphon having a greater discharge capacity than said valve.

6. In combination a vaporizing tank, a float-controlled valve for governing the admission of liquid to said tank, means to heat said vaporizing tank and the liquid therein, a condenser communicating with said tank, said condenser comprising a tank, a worm in said tank, one end of said worm discharging into said tank and the other end of said worm being connected to said vaporizer and a cold water worm disposed in intimate relation to said first worm.

7. In combination a vaporizer comprising a rectangular tank, a heating coil disposed adjacent the bottom of said tank, inlet and outlet pipes for supplying said heating coil with heating fluid, a vapor delivery pipe, said inlet and outlet and vapor pipes being disposed through the top of said tank contiguously, transverse of said tank, a drain pipe entering through the bottom of said tank, a siphon entering the bottom of said tank and a man-hole opening in the top of said tank adjacent one end thereof.

8. In combination, a hot-water heater, a vaporizer arranged in communication with the heater to receive preheated liquid therefrom, a receptacle, a conduit affording communication between the vaporizer and said receptacle, vapor condensing means in said receptacle communicating with the conduit, a float valve within the vaporizer to control admission of liquid thereto, and a siphon overflow conduit communicating with the vaporizer and coöperating with the float valve to maintain a constant liquid level in the vaporizer, and normally preventing escape of vapor from the vaporizer.

9. In combination, a hot-water heater, a vaporizer in communication with said heater to receive preheated liquid therefrom, a receptacle and a conduit affording connection between the vaporizer and the receptacle, a float valve in the vaporizer to control the admission of preheated liquid thereto, and a siphon having its inner end disposed beneath the normal liquid level maintained by the valve, whereby when said level arises above a predetermined point the contents of the vaporizer are drained by the siphon so as to open the valve and flush the same, said siphon preventing the escape of vapor from the vaporizer.

In witness whereof, I hereunto subscribe my name this 24th day of November, A. D. 1915.

JOHN MARTENS.

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