No. 803,178. PATENTED OCT. 31, 1905.

S. G. LEYSON.

# COMBINED WATER HEATER, FILTER, AND COOLER.

APPLICATION FILED JULY 18, 1905.

Fig. 1.

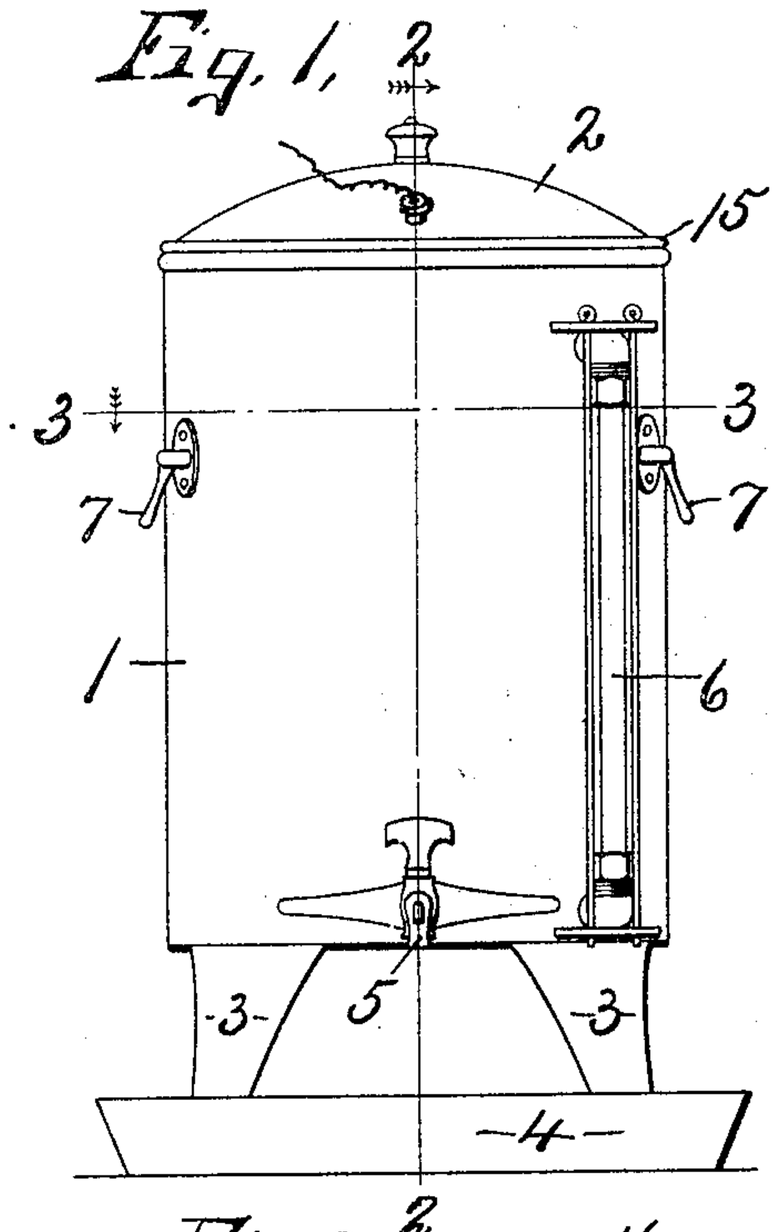



Fig. 2.

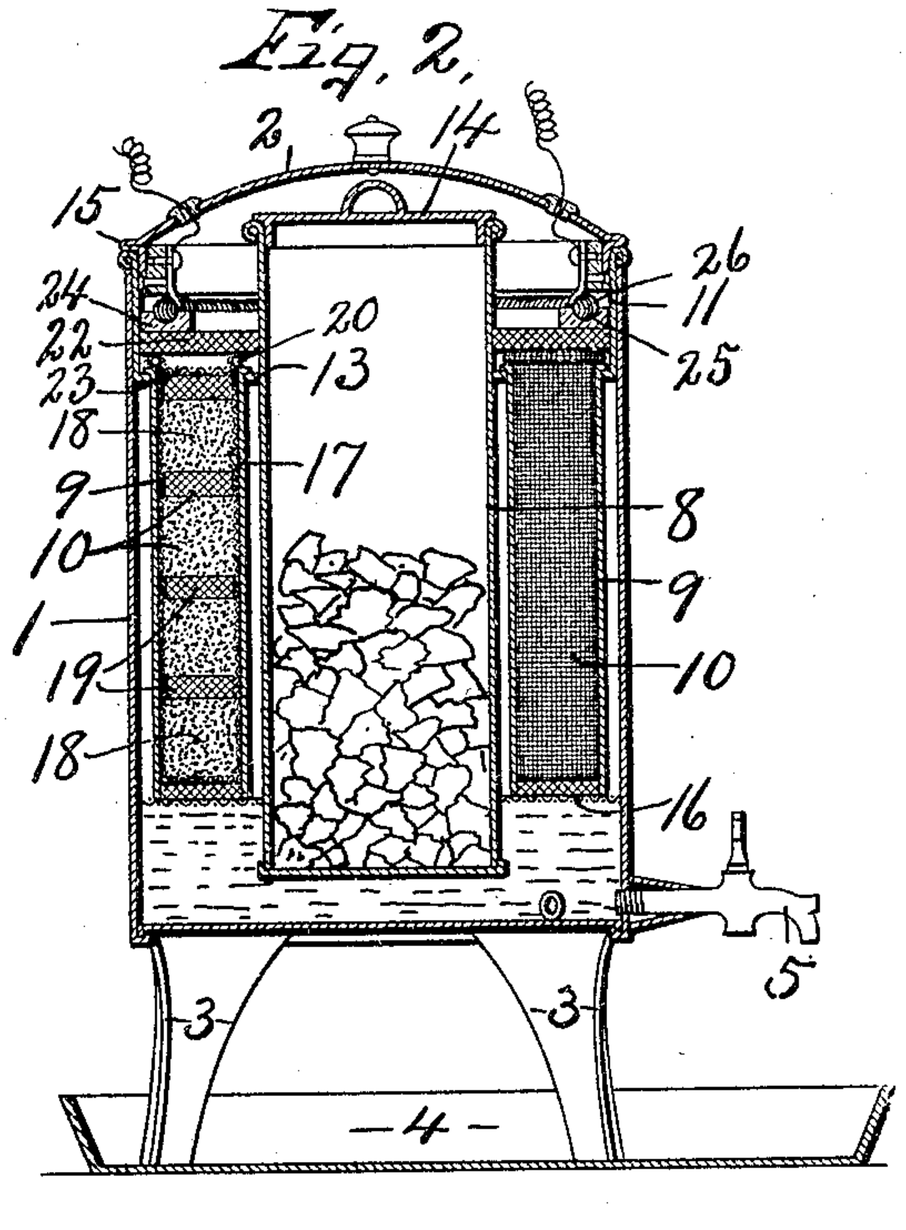



Fig. 3.

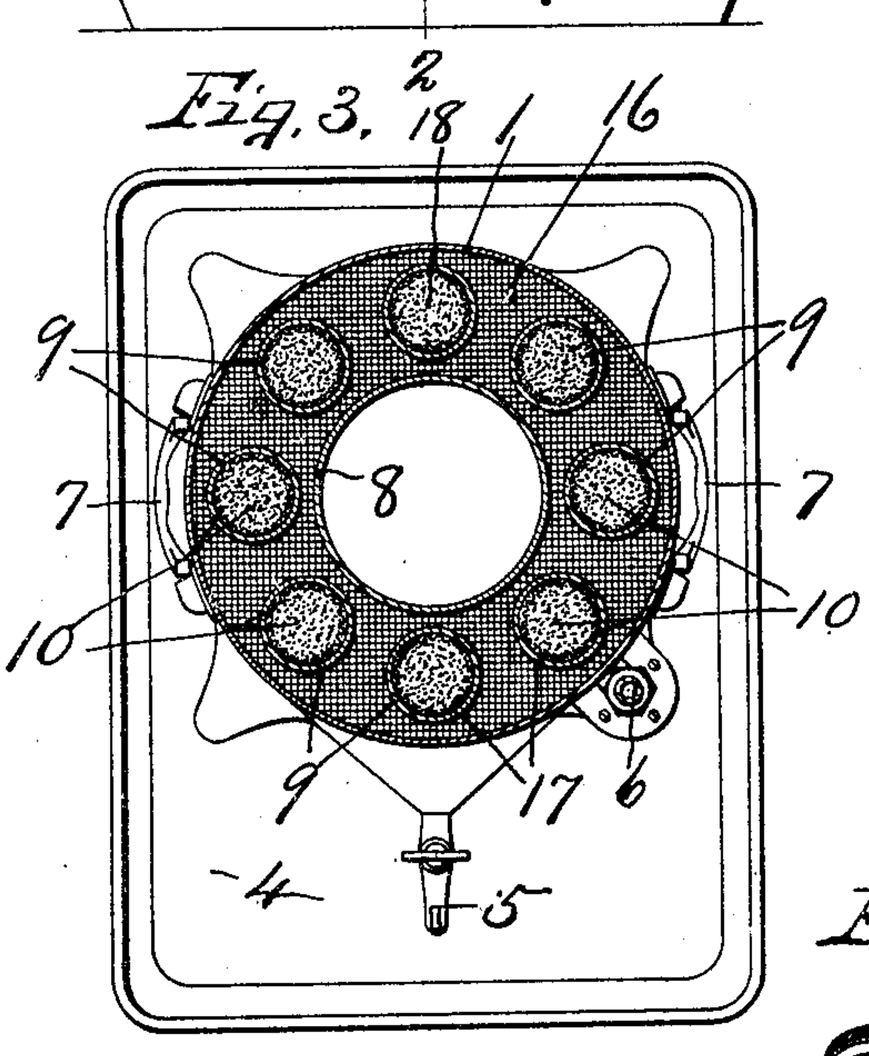



Fig. 4.

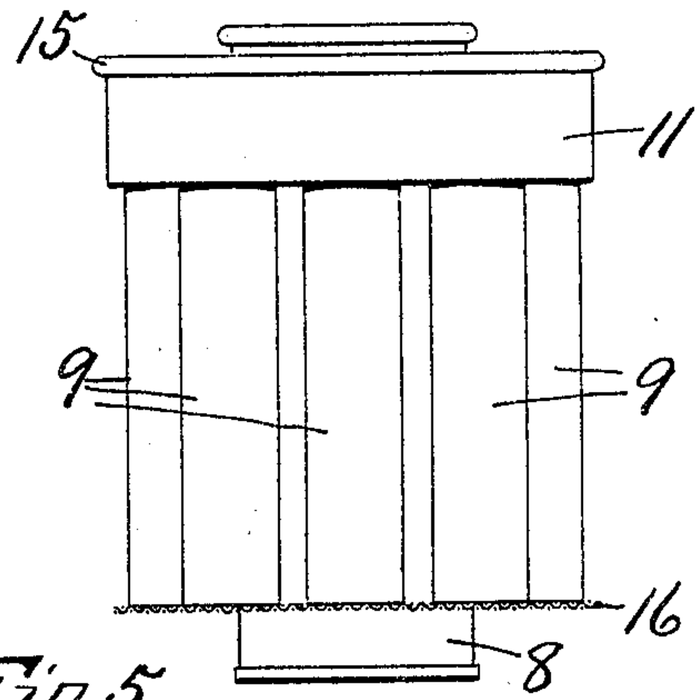
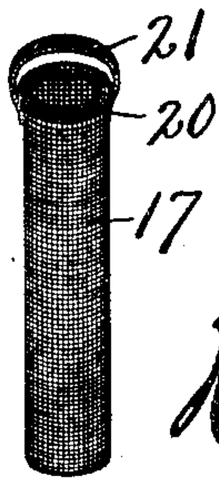



Fig. 5.

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# UNITED STATES PATENT OFFICE.

SACKVILLE G. LEYSON, OF SYRACUSE, NEW YORK.

## COMBINED WATER HEATER, FILTER, AND COOLER.

No. 803,178. Specification of Letters Patent. Patented Oct. 31, 1905.

Application filed July 18, 1905. Serial No. 270,234.

*To all whom it may concern:*

Be it known that I, SACKVILLE G. LEYSON, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in a Combined Water Heater, Filter, and Cooler, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in reservoirs for drinking-water, and refers more particularly to a combined filter, cooler, and water-heating apparatus, which may be of any desired form or size adapted to be used in private or public houses for dispensing sanitary drinking-water, although it is evident that it may be employed for cooling and filtering other liquids.

My object is not only to provide means for sterilizing, filtering, and cooling the water, but also to construct the apparatus in such manner that its several parts may be easily and quickly taken apart and thoroughly cleaned inside and outside when necessary.

Another object is to provide a series of filtration-sacks, which will hereinafter be termed "cartridges" and which are composed of a comparatively inexpensive material confined within a similarly inexpensive screen or sack, so that when clogged or filled with the residue in the water after filtration they may be destroyed without very much loss and replaced by new ones, it being understood that these cartridges are made up in large quantities of a definite size to be readily inserted into or removed from their respective pockets with which the apparatus is provided.

Other objects relating to the specific construction and arrangement of the several parts of my improved filtering and cooling apparatus will be brought out in the following description.

In the drawings, Figure 1 is a front elevation of a drinking fountain or receptacle embodying the various features of my invention. Fig. 2 is a sectional view taken on line 2 2, Fig. 1. Fig. 3 is a sectional view taken on line 3 3, Fig. 1, to disclose the relative arrangement of the filtering-cartridges concentrically around the cooling-tank. Fig. 4 is an elevation of the detached cartridge-holder and inclosed cooler-tank. Fig. 5 is a perspective view of one of the filtering-cartridges.

In carrying out the objects stated I provide a suitable receptacle 1, which in this instance is formed of sheet metal and consists of an upright cylindrical shell closed at the bottom and open at the top, except as closed by a suitable lid or cap 2. This water-receptacle is mounted upon suitable legs 3, which rest in an underlying tray 4 of sufficient area to receive any ordinary drip from a faucet 5 with which the tank 1 is provided, said tray being also adapted to support one or more drinking-glasses. (Not shown.) The faucet 5 is tapped into the tank near its bottom for drawing off the filtered water when desired, and I also provide the tank with a glass vertical sight-tube 6, which communicates with the lower and upper ends of the tank to enable the user to readily see or determine the amount of water in the tank.

When this apparatus is adapted for house use or portable, it is usually provided with suitable handles 7, by which it may be carried from place to place.

Centrally within the receptacle 1 is a second upright cylindrical reservoir 8, which is considerably smaller in diameter than the inner diameter of the receptacle 1 and is also of less height than the distance between the bottom and lid of said receptacle, said reservoir being suspended in a manner hereinafter described centrally within the outer shell 1 and clear from its bottom, sides, and top. The object of this is to leave a clear water-space at the bottom and sides of the central cooling-chamber 8 and also to leave ample space for the reception of a circular row of cartridge-receiving tubes 9, each of which receives and incloses a filtering-cartridge 10, presently described.

The upper end of the cooling-reservoir 8 is surrounded by a water-pan 11, which is also cylindrical and fits snugly into the upper end of the outer receptacle 1, the bottom of said pan being provided with a series of circular openings in which the upper ends of the tubes 9 are secured by soldering or by other fastening means, whereby the tubes 9 become a unitary part of and are removable with the pan 11.

The cooling-reservoir 8 is snugly fitted in a central aperturre 13 in the bottom of the water-pan 11 and is rigidly secured to said bottom by soldering or other fastening means, whereby the reservoir 8 also becomes a unitary part of and is removable with the pan 11, the upper end of said reservoir extending some distance above the upper edge of the pan 11 to prevent any possibility of

the unfiltered water overflowing into the reservoir 8, and as a further protection against the entrance of water into the reservoir 8 the latter is provided with a removable cap or lid 14. The greater portion of this reservoir 8 extends below the bottom of the pan 11, and its lower extremity is closed and terminates some distance below the lower ends of the tubes 9, but above the bottom of the outer receptacle 1, thereby permitting a free passage of the water under and around the bottom and sides of the reservoir 8 in a manner hereinafter described.

The upper edge of the pan 11 is provided with an outwardly-projecting annular shoulder 15, which normally rests upon the upper edge of the outer receptacle 1, and thereby supports the pan 11, cooling-reservoir 8, and tubes 9 in operative position, as previously described.

The lower ends of the tubes 9 are capped by a transverse screen partition or disk 16, which is soldered or otherwise secured to the lower ends of the tubes 9 and also to the sides of the central cooling-reservoir 8, so that each tube 9 is provided with a screen-bottom, and the intervening annular space between the sides of the reservoir 8 and receptacle 1 is also divided transversely by the screen 16 a short distance above the bottom of the reservoir 8. It now appears that the tubes 9, which are all of substantially the same length and diameter, surround but are somewhat shorter than the reservoir 8—that is, their upper ends terminate below the top of said reservoir and are open, while the lower ends terminate above the bottom of the reservoir and are capped by the screen 16.

The filtering-cartridges 10 are all of substantially the same size as and fit snugly within their respective tubes 9, and each consists of an outer screen-sack 17, of coarse fabric or other suitable porous material, closed at the bottom and containing alternate layers 18 and 19 of different filtering materials, such as pulverized charcoal and felt, resting one upon the other, with a layer of felt in the bottom of the sack to prevent the charcoal from filtering through the sack. The upper end of each sack 18 is in this instance secured to a metal ring 20 of greater diameter than the interior diameter of the tube 9, so that when the cartridge is inserted into its tube the ring 20 engages the upper end of the tube, and thereby limits the downward movement of the cartridge, each of which is provided with a suitable bail or handle 21, by which the cartridge may be removed when desired. It is now clear that water placed in the pan 11 can only escape through the filtering-cartridges 10, through which such water filters and precipitates into the bottom of the receptacle 1, where it rises around the sides of the cooling-reservoir 8 and tubes 9, said reservoir 8 being adapted to contain ice or other freezing or cooling agent to cool the water in the tank or receptacle 1, such cooled and filtered water being drawn off when desired through faucet 5. As a further means of filtering the water which may be placed in a pan 11 I place above the bottom of and within the pan 11 a disk 22 of comparatively thick felt or equivalent porous material, which lies directly over the upper ends of the tubes 9 and cartridges 10, and I also provide the upper end of each cartridge with a metal screen 23, which is pressed within and just below the ring 20 to hold the filtering sections from endwise movement or displacement and at the same time allowing the water to pass readily into the filters.

It is sometimes desirable to heat the water in the pan 11 before filtration, and in order to accomplish this heating successfully without materially altering the general structure of the apparatus I support upon the filtering-disk 22 a ring 24 of insulating material, such as porcelain, having an annular groove 25, in which is placed an electric heater, as a resistance-coil 26 of German silver or other material having a high degree of electrical resistance, such coil being connected in any well-known manner (not necessary to herein illustrate or describe) to a suitable source of electric energy. (Not shown.)

In the operation of my invention the lids 2 and 14 of the receptacles 1 and 8, respectively, are first removed, after which a suitable quantity of water is placed in the pan 11 and a cooling agent, as ice, is placed within the central tube or reservoir 8, after which the lids 2 and 14 are replaced, the water in the tank or pan 11 being heated by the electric heater 26 and then filtering through the cartridges 10 and screen 16 into the bottom of the outer receptacle 1, where it is cooled by contact with the cooling-reservoir 8 and may be drawn off in desired quantities through the faucet 5.

When it is desired to clean the interior of the receptacle 1, the pan 11 may be readily lifted upwardly through the open end of said receptacle and placed one side while the interior of the tank or receptacle 1 is being thoroughly cleansed, it being understood that the interior of such receptacle is practically smooth and of the same interior diameter from end to end, which of course facilitates its thorough cleansing or sterilizing. In like manner the reservoir 8 and tubes 9, both of which are smooth and substantially the same diameter from end to end, may be thoroughly cleaned or sterilized by simply removing the cap 14 from the reservoir 8 and also removing the cartridges 10 from the tubes 9. These cartridges, as previously stated, consist of a sack of comparatively inexpensive coarse fabric filled with pulverized charcoal and coarse felt or similar cheap material, which

may be thrown away after being in use for a reasonable period of time. The water which is placed in the pan 11 comes in contact with the electric heater 26 and may be brought to the boiling-point before being allowed to filter through the cartridges 10 and, being supported upon the insulating-ring within the pan, may be readily removed when necessary by removing the lid 2, and in like manner the felt disk 22, which is more or less flexible, may be withdrawn from the upper end of the reservoir 8, so that all parts of the various mechanisms are readily accessible and may be maintained in a thoroughly sanitary condition.

What I claim is—

1. In an apparatus of the class described, an outer receptacle having a valve-outlet near its bottom, in combination with a water pan fitted in the open upper end of the receptacle and provided with a series of tubes depending from the bottom of the pan into the receptacle, and a series of filtering-cartridges, each removably inserted in one of the tubes.

2. In an apparatus of the class described, an outer receptacle having a valved outlet, a water-pan in the upper end of the receptacle having a series of openings in its bottom, upright tubes leading downwardly from said opening, and filtering-cartridges, each consisting of a screen-sack removably inserted in one of the tubes and confining therein a filtering substance.

3. In an apparatus of the class described, an upright receptacle closed at the bottom and open at the top, a water-pan having a central opening, a cooler-tank, or reservoir fitted in said opening and depending into the receptacle, a series of tubes surrounding the cooling-tank, and a series of filtering-cartridges, each removably inserted in one of the tubes.

4. In an apparatus of the class described, the combination of an outer upright receptacle and an inner cooling-reservoir centrally arranged in the outer receptacle leaving an annular space between it and the outer receptacle, a transverse partition between the inner and outer receptacles, a series of tubes secured in the transverse partition and extending downwardly therefrom, and a series of sacks or screen-cylinders, each inserted in one of the tubes and containing a filtering material.

5. In an apparatus of the class described, an upright cylindrical receptacle, a cooler-reservoir supported centrally within the receptacle, a series of upright tubes arranged concentrically around the reservoir, means for securing the tubes to the reservoir, whereby the tubes and reservoir may be removed together from the receptacle, and filtering-cartridges removably inserted in the tubes.

6. In an apparatus of the class described, an upright receptacle in combination with a water-pan and a series of tubes depending therefrom and in communication therewith, filtering-cartridges in the tubes, and an electric heater in the water-pan above the upper end of the tubes for heating the water before passing through the filtering-cartridges.

7. In an apparatus of the class described, an upright receptacle in combination with a water-pan loosely fitted in the upper end of the receptacle and removable therefrom, upright tubes depending from and communicating with the water-pan, a cooler-reservoir supported by the bottom of the pan and inclosed by said tube, and filtering-cartridges, each removably inserted in one of the tubes, said tubes, reservoir and pan being united and removable together from the upper end of the receptacle.

8. In an apparatus of the class described, the combination with an upright cylindrical receptacle having a valved outlet, a water-pan loosely fitted in the upper end of the receptacle and removable therefrom, a cooler-reservoir supported by the pan, a series of tubes also supported by the pan, and each having a screen-bottom, a series of cartridges each removably inserted in one of the tubes and containing a filtering substance, a filtering-disk covering the upper ends of the cartridges, and means in the pan above the disk for heating the water before entering the filtering-cartridges.

In witness whereof I have hereunto set my hand this 12th day of July, 1905.

SACKVILLE G. LEYSON.

Witnesses:
H. E. CHASE,
MILDRED M. NOTT.