

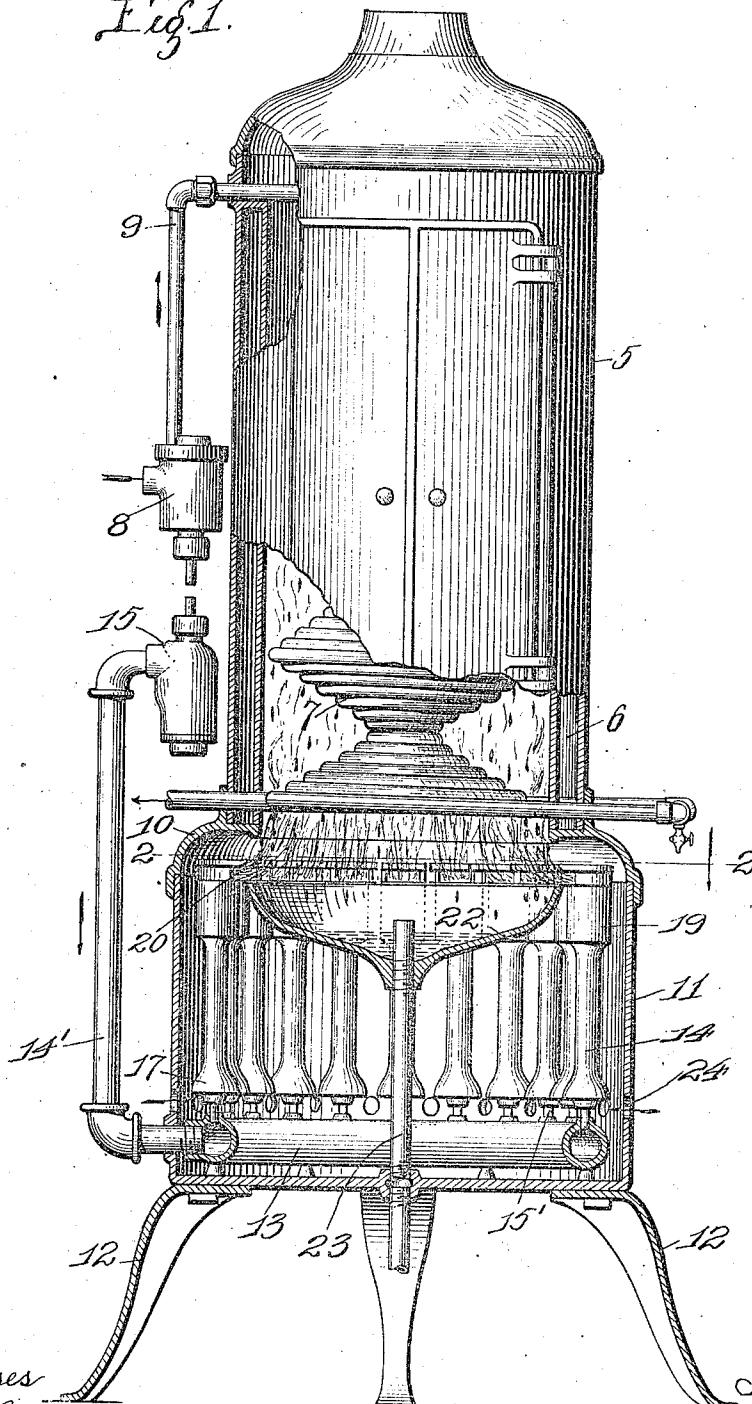
W. F. STEWART.
INSTANTANEOUS WATER HEATER.
APPLICATION FILED MAR. 23, 1911.

1,028,146.

Patented June 4, 1912.

2 SHEETS-SHEET 1.

Fig. 1.



Witnesses
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2 SHEETS-SHEET 2.

Fig. 2

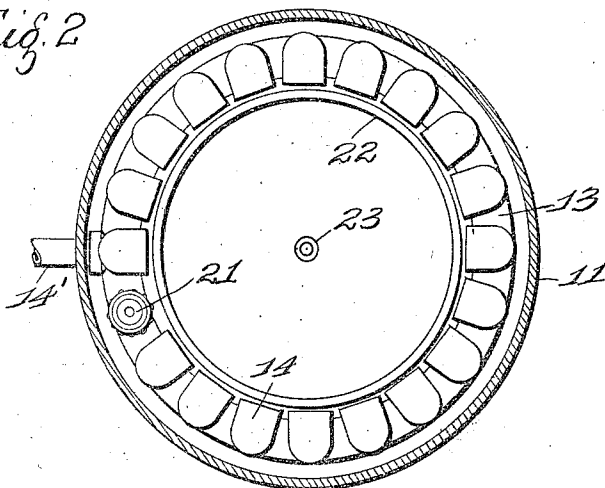
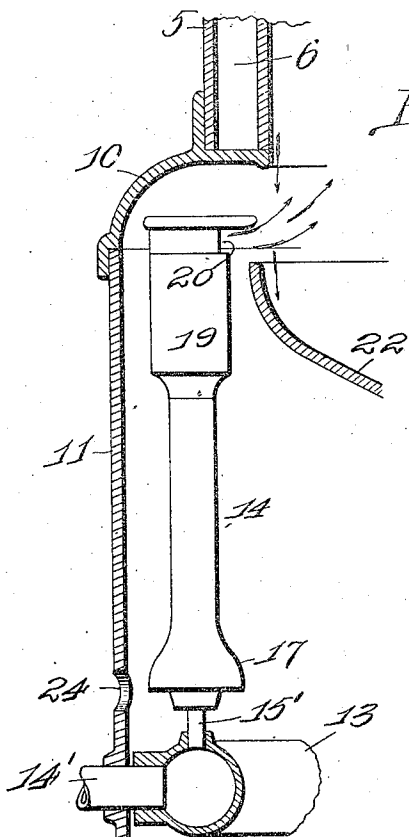
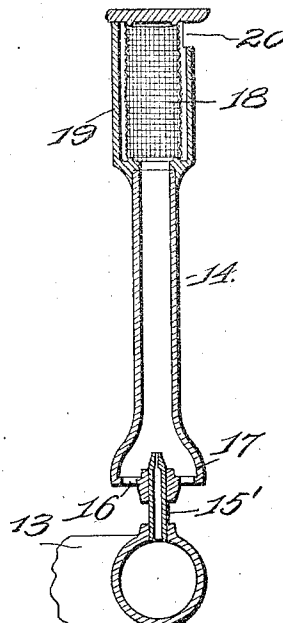


Fig. 3.



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Fig. 4.



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UNITED STATES PATENT OFFICE

WILLIAM FRASER STEWART, OF ST. LOUIS, MISSOURI.

INSTANTANEOUS WATER-HEATER.

1,028,146.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed March 23, 1911. Serial No. 616,400.

To all whom it may concern:

Be it known that I, WILLIAM FRASER STEWART, a citizen of the United States, and resident of St. Louis, Missouri, have invented certain new and useful Improvements in Instantaneous Water-Heaters, of which the following is a specification.

This invention relates to improvements in instantaneous water heaters, and has for its object a heat generator located beneath a liquid coil or water container in such a manner that the heating efficiency and the life of the generator is not impaired by the water and residue occasioned by the sweating of the coil or water container.

A further object of my invention is to construct an instantaneous water heater preferably of the water coil type having a plurality of burners located beneath the coil, but out of alinement with the coil's periphery, and an evaporating pan located beneath the coil to catch such condensation and residue as escapes from the coil without in any manner interfering with the operation of the burners.

A further object of my invention is to construct an instantaneous water heater with a housing having a canopy base in which is mounted a ring of burners with a discharge opening or ignition point so arranged as to project the flame in approximately a horizontal direction concentrating toward the center and resulting in a column of flame influencing the entire heating surface of a coil located in the housing above the canopy base, the said burners being out of vertical alinement with the periphery of said coil, and an evaporating pan located centrally between the ring of burners to catch and dispose of all condensation derived from the heated coil and prevent such condensation from coming in contact with the burners.

Figure 1 is a combination side and sectional view of an instantaneous automatic water heater showing my invention embodied therein. Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1. Fig. 3 is an enlarged detail sectional view of a portion of the canopy base and housing showing the relative position of the burner therewith. Fig. 4 is a detail sectional view of one of the burners.

Referring to the drawings in detail, 5 indicates a cylindrical housing provided with

a lining forming an air jacket 6 of the ordinary construction, the same acting as an air insulator. In this housing is mounted a coil 7, which is preferably constructed of copper tubing and the water is admitted into the coil by way of the water inlet valve casing 8 of the ordinary construction through the pipe 9. The hot water from the coil is directed to any suitable source of supply from the bottom of the coil through the pipe 9'. The housing 6 is mounted upon a flared cap or canopy 10; this cap in turn is supported upon a shell or base 11 forming a combustion chamber, and this base in turn is supported upon suitable standards 12. In the shell or base 11 is located a tabular ring 13 in which gas to the plurality of burners 14 is supplied by the supply pipe 14', the admission of said gas to the burners being regulated by the valve 15, which is of the ordinary construction now used in automatic water heaters. On the ring 13 is supported the burners 14 and the gas is admitted therein through the nozzles or jets 15'. The gas escaping into the burners through the nozzle intermingles or mixes with the air passing through the opening 16 formed in the base 17 of each of the burners 14, and the properly mixed gases are directed upwardly into the cylindrical screen 18 formed in the head 19 of the burners and is directed outwardly through the opening 20 toward the center of the circle of burners, the flame generating from each of the burners concentrating into a solid column of flame and directed beneath the coil located in the housing. In proper relation with the ring of burners is a pilot light 21 which instantaneously ignites the burners when the gas is admitted into the same by the operation of the valve 15.

The burners in the shell or base are located beneath the canopy so as to bring the same out of vertical alinement with the periphery of the coil. The object of this is to prevent the condensation derived from the heated coil from coming in contact with the burners and extinguishing or impairing the flame, and in order to prevent such condensation from lodging in the base and contacting with the lower portion of the burners I provide an evaporating pan 22 mounted upon a pipe 23, which is supported in the base and through this pipe the condensation is permitted to pass out. In this

manner the base and the entire internal mechanism protected from corrosion.

The base is provided with a plurality of openings 24 acting as air inlets, so as to supply the burners with proper oxygen. In addition to this a sufficient amount of air is admitted through the pipe 23 so as to intermingle with the column of flame to aid in proper combustion, and to assist in carrying the flame up through the coil. This pipe 23 as will be observed in Fig. 1 projects into the pan slightly above the bottom so as to provide an overflow from the pan should the water of condensation accumulate faster than it can be evaporated.

The essential feature of my invention is the location of the burners and pilot light beneath a hood or canopy ring so as to be fully protected against any water of condensation derived from the coils and both the burners and pilot light so constructed as to obtain the greatest possible efficiency. The evaporating pan being placed immediately beneath the coils and in the center of the ring of burners with a pipe extending through the bottom so that the water of condensation is carried away without reaching or effecting the burners or any other part of the heater, thereby avoiding corrosion and the extinguishing of the burners.

Heretofore the heating efficiency of all water heaters of this character has been greatly and rapidly impaired, as the result of the burners or generator being located directly beneath the coil, the sweating of the coil causes water to accumulate and drip in considerable quantity over the burners and supply pipes. This water finds its way to the ignition point of the burner and into the burner itself, carrying residue with it, which chokes the burner gauze and causes a yellow flame, which produces carbon on the heating surfaces of the water container and also in the burner with the result that the heating efficiency of the burner or generator, and the conductivity of the coil or water container are both materially impaired and reduced. This sweating or condensation at times (depending largely on the temperature of the water) is so great as to extinguish a burner and extinguish the pilot light, which gives the burner ignition.

The objectionable features in all water heaters heretofore have been overcome by placing the burners or heat generators and pilot light outside of the zone effected by the sweating or water of condensation and supplying a collection pan by which the water of condensation may be disposed of without reaching the burners.

Having thus fully described my invention, what I claim as new and desire to have

secured to me by the grant of Letters Patent, is:

1. A water heater comprising a plurality of burners arranged in a horizontal ring with their jet openings directed substantially horizontally toward the axis of the ring, and a housing containing a water coil located above and in substantial axial alignment with said ring, but within the inner periphery thereof, said housing being free of obstructions to the products of combustion other than the water coil.

2. A water heater comprising a plurality of burners arranged in a horizontal ring with their jet openings directed substantially horizontally toward the center of the ring, and a housing containing a water coil located above said ring and substantially concentric with said ring and of smaller diameter than the inner periphery thereof, and a drip pan below and of larger diameter than said coil, said housing being free of obstructions to the products of combustion other than the water coil.

3. A water heater comprising a hollow base, a ring of burners inside of said base, a housing mounted on said base, and a water coil inside of said housing, the margin of the opening between the hollow base and said housing being above but within the inner periphery of said ring of burners and said opening being wider than said water coil.

4. A water heater comprising a ring of burners with their jet openings directed toward the axis of the ring, a drip pan inside of said ring of burners and with its outer margin close to the inner periphery of said ring, and a water coil above and of smaller diameter than said drip pan, the jets from the burners being arranged to issue above the drip pan and below the water coil substantially as described.

5. A water heater comprising a ring of burners with their jet openings directed toward the axis of the ring of burners, a drip pan inside of said ring of burners and with its outer margin close to the inner periphery of said ring of burners, and a water coil above and of smaller diameter than said drip pan, the jets from the burners being arranged to issue above the drip pan and below the water coil substantially as described, and an outlet pipe communicating with said drip pan.

In testimony whereof, I have signed my name to this specification, in presence of two subscribing witnesses.

WILLIAM FRASER STEWART.

Witnesses:

ALFRED A. EICKS,
WALTER C. STEIN.