BOILER FOR STEAM COokers OR THE LIKE

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BOILER FOR STEAM COOKERS OR THE LIKE

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This invention relates to improvements in boilers for steam cookers or like units where it is necessary to supply steam rapidly and economically.

Although the unit has been particularly designed for use on field kitchens it can be applied to domestic or other purposes where a relatively small steam unit is required.

The object of the invention is to provide a unit in which the gaseous combustion of the water and steam is obtained and in which there will be high heat transfer between the gases of combustion and the water, simplicity of manufacture and maintenance being a feature of the invention as well as quick and easy cleaning of the parts subject to the formation of scale.

According to our invention a water drum has beneath it a series of inclined tubes opening at each end into headers which are in communication with the water drum and are provided with removable covers to give access to the tubes for cleaning. The gases of combustion passing around the tubes pass also around the drum to cause superheating of the steam therein and to generally increase the efficiency of the unit, the drum having an internal division the space beneath which serves as the water space and the space above which serves as the steam space.

In order however that the invention may be more clearly understood an embodiment of same will now be described with reference to the accompanying drawing in which—

Fig. 1 is a longitudinal section of a drum, water tube and headers, and portion of the surrounding casing, and

Fig. 2 is a cross section as on line 2—2 of Fig. 1.

The water drum 3 has near each end a pair of depending tubes, the tubes at the one end being designated 4 and those at the other end 8.

The main heating tubes 6 which are inclined as shown open into headers 8 and 8, the header 8 communicating with the water drum 3 through the connecting tubes 4, and the header 9 communicating with the drum through the connecting tubes 5.

Each header has an inclined face 11 through which the tubes 6 open and is provided with a cover plate 12 held in place by means of screwed studs 12.

The main tubes 6 are straight and are so disposed that by removing the cover plates 10 the inside of the tubes can be cleaned and any scale removed therefrom which has built upon the walls of the tubes. The number of tubes may be varied, but it is convenient to use superimposed layers of tubes, the tubes in the adjacent layers being staggered so that the gases of combustion follow a zig-zag path in their upward flow.

The drum 3 has within it a perforated baffle 14 which serves to divide the lower water space from the steam space and serves to control the flow of the steam within the drum.

The casing 15 which encloses the water tubes 6 extends up and over the water drum 3, thus guiding the gases of combustion around the drum and so affecting a degree of superheating of the steam within the drum. The casing communicates with a flue at 16. A grate or other firing means is located beneath the water tubes 6, but this is not shown in the drawing as it may take any usual or approved form. The baffles 17 and 18 deflect the gases to the path indicated by the arrows in the drawing, but it is to be understood that the actual path followed by the gases may be varied to suit particular requirements.

The connecting tubes 4 and 5 open into the drum through walls 18 and 20 respectively.

The steam outlet pipe is marked 22, while 23 represents a blow-off tube, both of which tubes may be coupled to any convenient form of control.

The tubes 24 serve to take stop and safety valves and a pressure gauge.

Circulation of the water will take place from the water drum 3 through the connecting tubes 5 to the lower header 9 the water being heated in and rising through the inclined main tubes 6 into the header 8 and returning through the connecting tubes 4 to the water drum, in this way maintaining continuous circulation through the drum with the result that rapid heating of the entire body of water takes place.

What we claim as our invention is:

1. In a steam cooker or the like an improved boiler comprising a tubular water drum, a series of inclined straight tubes beneath the drum, heaters disposed beneath the drum one near each end thereof in which the tubes open, a removable cover plate upon each header serving to give access to the tubes throughout the length thereof in either direction for cleaning, a plurality of tubes connecting each header with the water drum, said tubes opening into the drum near the ends thereof, a casing enclosing the water drum in common with the tubes and headers to direct the gases of combustion around the water drum, and a perforated partition fixed within the water drum to divide the water space from the steam space.

2. In a steam cooker or the like, an improved boiler, comprising a cylindrical water drum hav-
ing a steam outlet port, a series of inclined straight tubes beneath the drum, a header disposed beneath one end of the drum into which the tubes open at one end, a removable cover plate on said header serving to give access to all the tubes from said end, a second header disposed beneath the other end of said drum into which the other ends of said tubes open, a second removable cover on said second header serving to give access to all of the tubes from said other end, a plurality of distinct tubes connecting each header with aforesaid water drum and opening into the latter near the ends thereof, a casing enclosing the water drum together with the tubes and headers so as to direct the gases of combustion around said water drum, and a perforated partition within the water drum near the top thereof dividing the water space therein from the steam space.

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