Dec. 31, 1929. L. EHMANN 1,741,982

WATER REPLENISHER AND LEVEL MAINTAINER

Filed March 23, 1928

Fig. 1

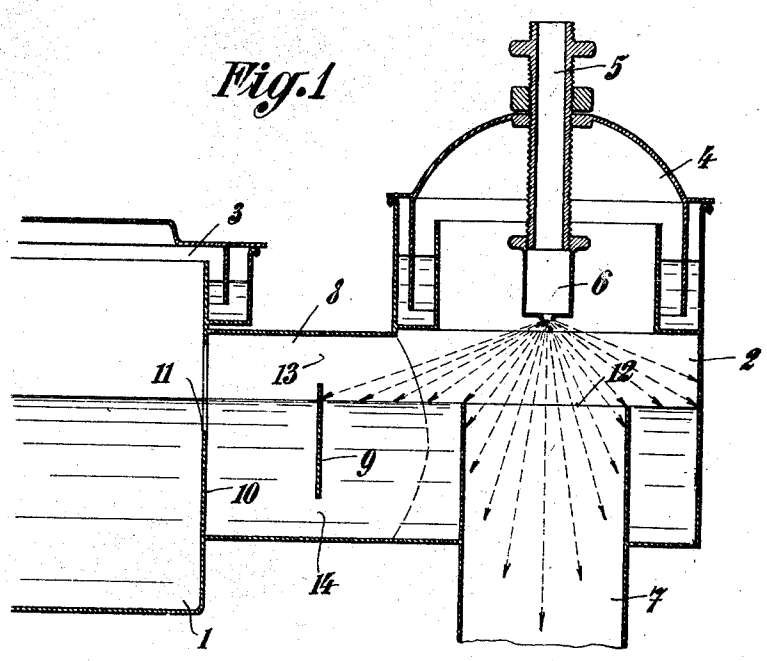
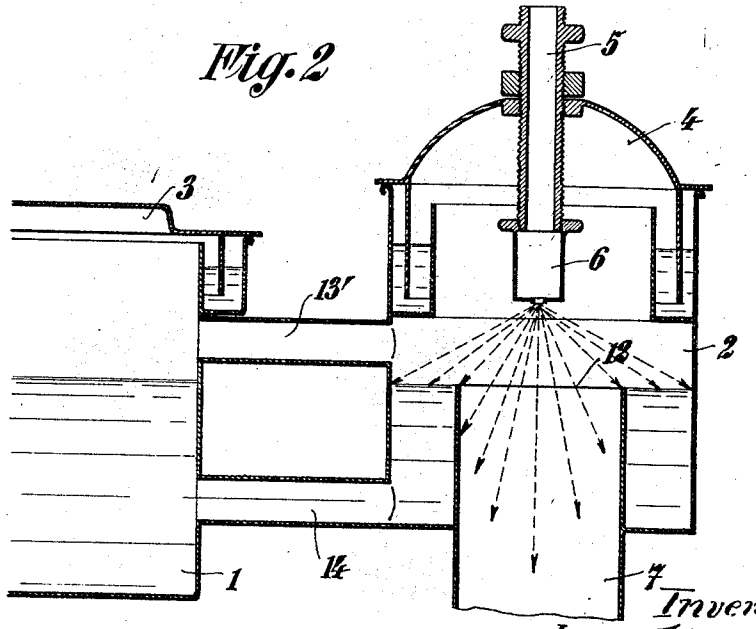


Fig. 2



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WATER REPLENISHER AND LEVEL MAINTAINER

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This invention relates to a water replenisher and level maintainer for cooling and sterilizing boilers or vessels, and particularly to means which, while maintaining a proper level of the water, will heat the fresh water being supplied and condense the steam so as to prevent the escape of the latter into the room in which the boiler is being used.

The present invention has for its object to preheat the feed water by making use of the heat of the exhaust steam from the boiler, and to effect the condensation of the steam by the feed water, whereby the operation of this kind of apparatus is rendered very economical, allowing expensive features, such as separate exhaust steam pipes, etc., to be dispensed with.

Two modes of carrying out the present invention are illustrated by way of example and in sectional elevation in the accompanying drawings, in which:

Fig. 1 is a vertical section through a boiler and one form of water level maintainer embodying my invention.

Fig. 2 is a similar view showing a modified form of level maintainer.

The level maintainer comprises a receptacle 2 attached to the boiler 1 by means of a pipe 8. Lids or covers 3 and 4, dipping into small water-seal compartments, prevent the escape of steam from the boiler and receptacle 2 into the room in which the boiler is in use. A cold water supply pipe 5 is secured to the cover 4 and provided with a sprayer nozzle 6, which is vertically adjustable on the pipe 5 and is arranged centrally above a water overflow pipe 7. The communication pipe 8 is divided into inner and outer compartments by a partition 9 (Fig. 1) in such a manner, that the partition terminates above the top edge 12 of the overflow pipe 7 and leaves clear a passage 13 for the discharge of steam above the compartments, but does not extend down to the bottom of the pipe 8, so that a passage 14 connecting the bottoms of the compartments is formed. The side wall of the boiler extends into the cross-sectional area of the pipe 8 and thus constitutes a partition 10 in which is an opening 11, the bottom wall 11' of which terminates below the water level governed and maintained by the top edge 12 of the overflow pipe 7.

In case of the supply of an excess amount of feed water, only the colder feed water will flow off by way of the overflow pipe 7, because the same cannot mix with the hot water of the boiler 1 and hence loss of hot water will be prevented. By way of the passage 13 the steam, escaping from the boiler 1, passes into the vicinity of the spraying nozzle 6. The passage 14 provides a means whereby water may flow from the inner compartment of pipe 8 to the outer compartment thereof and the receptacle 2 to maintain therein and in the boiler 1 the same water level.

The same working operation is attained in the modification shown in Fig. 2 by employing in lieu of partition 9 two pipes or passages 13' and 14' between the boiler 1 and the level maintainer receptacle 2.

The operations of feeding and pre-heating the feed water, and drawing off and condensing the steam are caused by the spraying nozzle 6. The same is arranged in such a manner, that the axis of the conical spray head ejected therefrom coincides with that of the overflow pipe but the spray head is of greater diameter than the overflow pipe 7 and thus is divided. The part of the atomization cone projected into the overflow pipe 7 effects a suction in the level maintainer and thus sucks steam from the boiler. Thereby the steam passes through the part of the atomization cone of water lying above and projecting marginally beyond the pipe and a large proportion of the steam is condensed thereby. The remainder of the steam then passes under the suction pull into the overflow pipe and is completely and quickly condensed therein, owing to its complete saturation by the small drops of cold water from the center of the atomization cone, without the necessity of using special pipes or other means for the purpose.

Having thus described my invention, what I claim is:

1. In liquid replenishing and level maintaining means for cooking and sterilizing vessels, a level maintaining device, a boiler, means establishing communication between the lat-

ter and the said level maintaining device, a water discharge pipe and a feed nozzle secured to the said supply pipe, the said nozzle being arranged to discharge a stream of feed water into the path of steam flowing from the boiler so that the steam will preheat the feed water and be partly or wholly condensed by exchange of heat between the same and the feed water.

2. In a liquid replenishing and level maintaining means for cooling and sterilizing vessels, a level maintaining device, a boiler, means establishing communication between the latter and the said level maintaining device, a water discharge pipe and a feed water supply pipe arranged in the latter, and a spraying nozzle secured to the said supply pipe opposite the mouth of the said discharge pipe, the said nozzle being arranged to discharge a stream of feed water axially toward said discharge pipe and in the path of steam flowing from the boiler so that the steam will preheat the feed water and be wholly or partly condensed by exchange of heat between the same and the feed water.

3. Means for maintaining the fluid level of cooking vessels, particularly receptacles for boiling instruments, comprising a level maintaining device, a boiler, passages establishing communication between the latter and the said level maintaining device, a water discharge pipe and a feed water supply pipe arranged in the latter, and a spraying nozzle secured to the said supply pipe, said nozzle being constructed and arranged to discharge a conical spray of feed water of larger diameter than the discharge pipe axially toward said pipe and in the path of the steam flowing from the boiler, whereby the feed water will be preheated by the steam and portions of the steam will be condensed in the receptacle and in the discharge pipe.

In testimony whereof I affix my signature.

LEO EHMANN.