Electric Water Heaters in Milking Sheds

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BY virtue of the ease of operation of electric water heaters they are preferred to any other type by the great majority of dairy farmers. However, if they are to fulfil their function of providing boiling water for the cleaning and sterilising of milking machines and equipment, they must receive adequate attention and be correctly used.

WHERE electric reticulation of farming districts has been carried out dairy farmers have, as a matter of course, installed electric water heaters in their milking sheds until today it is unusual to see any other type in areas where electric power is available. Since electric water heaters are in such numbers, it is most important that they should be used correctly to safeguard the quality of milk or cream produced on the farms. Only by knowledge of their construction, care, and operation can this be achieved.

The dairy electric water heater consists of a copper cylinder, lagged with mill wool, the whole, except for necessary connections, being enclosed by a casing constructed from flat galvanised-iron sheeting. Unlike its counterpart the domestic water heater, the dairy type does not fill automatically from a supply tank and is not under pressure. Filling is in most cases done through a funnel on the top or side of the heater and water is drawn off by gravitation through a tap set near the bottom but above the element. The reason for this is that were the heater to fill automatically the ingoing cold water would soon cool the boiling water in the cylinder as it was being drawn off. But by non-automatic filling, the last gallon drawn off the heater will be of at least as high a temperature as the first and the benefits of this will be obvious.

The sizes of cylinders and elements to be installed are governed by a schedule in the Dairy Produce Regulations 1938, and are based on the size of the milking machine used. For bigger sheds slightly larger sizes of both are required where whole milk is produced for factory supply. The purpose of the regulations and the schedule it contains is to ensure that sizes of cylinders and elements will be sufficient for the boiling of water in sufficient quantity for the cleaning of the milking machine and dairy equipment at the times required. Before the gazetting of this regulation a number of cylinders of 12- or 15-gallons capacity were installed and were quite unsuitable for use in milking-machine sheds.

TABLE A: CREAM SUPPLY

Capacity of milking machine	Capacity of cylinder (gallons)	Rating of heating element: Continuous supply of electricity (watts)	Rating of heating element: Non-continuous supply of electricity (watts)
2-cow plant	20	600	700
3- or 4-cow plant	25	750	900
5- or 6-cow plant	30	1,000	1,200

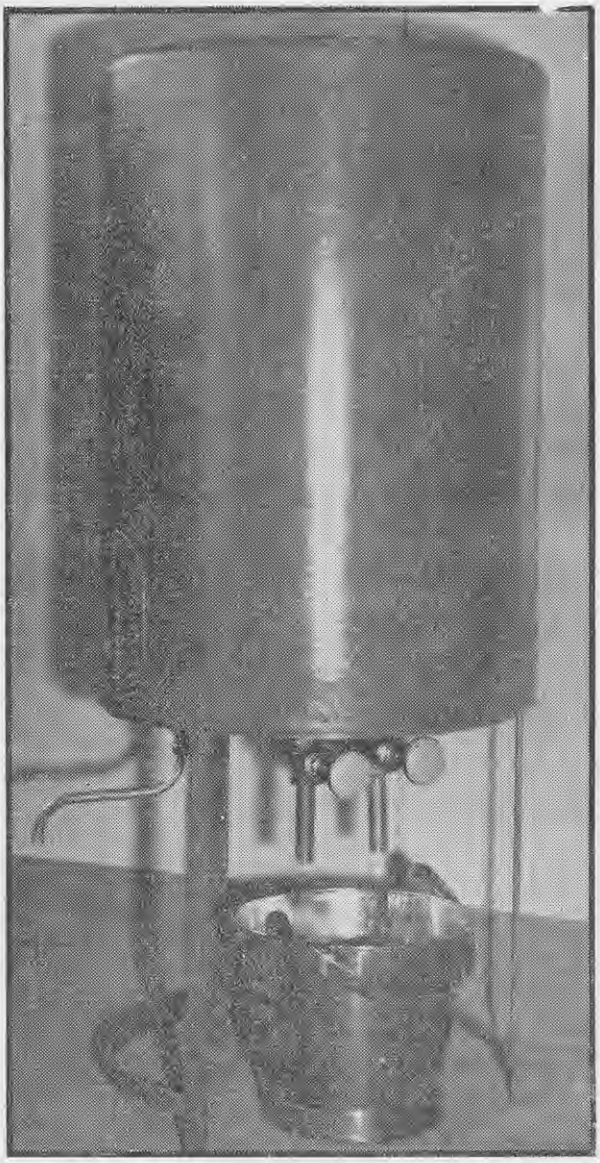
TABLE B: MILK SUPPLY

Capacity of milking machine	Capacity of cylinder (gallons)	Rating of heating element: Continuous supply of electricity (watts)	Rating of heating element: Non-continuous supply of electricity (watts)
2-cow plant	20	500	600
3- or 4-cow plant	25	750	900
5- or 6-cow plant	40	1,100	1,400

The schedule provides for the use of two sizes of elements to suit the provision of "continuous" or "non-continuous" supply of electric energy to the heater. In the non-continuous supply of current the heater is disconnected as soon as the milking-machine motor operates and this type of supply is usual in dairying districts. In a few areas the power boards give a continuous supply in which the electric cylinder is connected during the time of milking operations. Both systems are satisfactory if the cylinder is carefully used and the heated water conserved.

In 1939, as a measure to assist in the conservation of power, distributing boards were given authority to require the fitting of thermostats to dairy electric heaters and most did so. A condition of these installations was that the thermostat was so adjusted that the supply of current was cut off at a temperature of not less than 206 degrees F. and was renewed at a temperature of not less than 196 degrees F. While the installation of thermostats may not have saved a great deal of power in summer when farmers were making full use of the water in their heaters, they were very effective in doing this in winter. Contrary to a belief among some dairy farmers the installation of thermostats did not affect the heating capacity of the element until the temperature of the water in the heater reached at least 206 degrees.

The efficiency of an electric heater, judged on its capacity to provide boiling water at the times required, depends upon two factors—correct installation and judicious use in the shed.



Modern type of dairy water heater in which the cylinder is lagged with ½in. asbestos sheeting. Two draw-off pipes and the overflow discharge are under the cylinder. Power is cut off by thermostat control only when the water boils, and loss of heat between milkings is negligible.