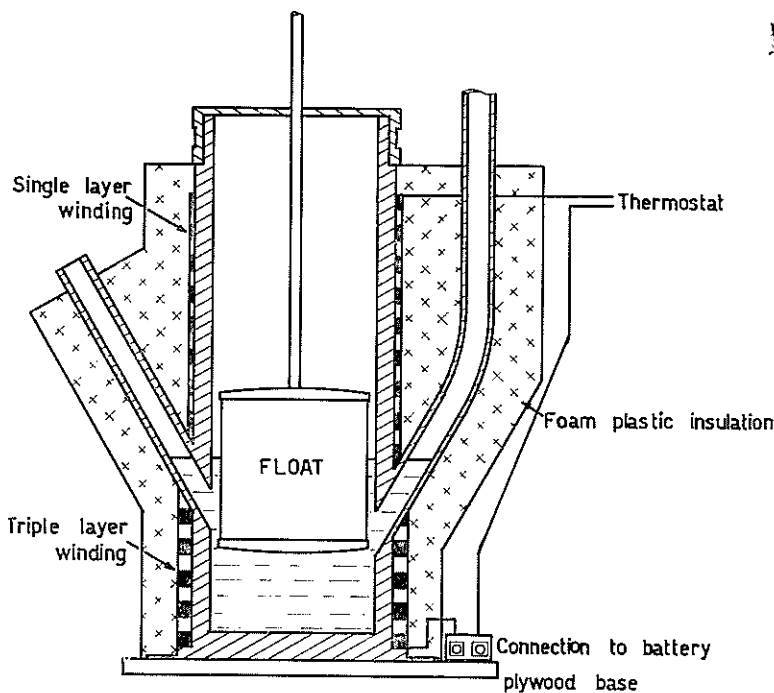


NOTE ON
BATTERY POWERED HEATING OF
LAMBRECHT RAINGAUGES

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The Marlborough Catchment Board has two 32-day Lambrecht raingauges installed at altitudes of 2,350 ft and 2,600 ft. During the first winter the floats in both gauges were crushed as a result of freezing. After considering kerosene, propane and electricity it was decided to try a system of heating by battery power. As stated by Chandler (1965) the only part of the gauge that requires heating is the float chamber.



SECTION THROUGH FLOAT CHAMBER

LAMBRECHT RAINGAUGE FLOAT CHAMBER showing modifications for heating.

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The float chamber was removed from the gauge and wound with about 150 to 200 yards of 38-gauge enamelled copper wire, giving a resistance of 100 to 120 ohms. Each layer of wire was wrapped with plastic insulation tape. Wrappings of wire were concentrated over the lower part of the float chamber (Fig. 1). The float chamber was mounted on plywood to reduce heat loss.

A fish-tank thermostat was used as a cut-in switch. Because most of these thermostats operate in the range 50°-70°F it was necessary to bend the bimetal strip slightly so that it closed at approximately 35°F. The thermostat was connected into the circuit and strapped to the inlet pipe.

For insulation the float chamber was wrapped in a sheet of $\frac{3}{4}$ in. foam plastic (see Fig.). A 12-volt, 9-plate wet cell battery with a capacity of over 80 amp/hrs was used. This battery is capable of running for a month should the thermostat jam. The battery was protected from freezing and leads were run from it to the two contacts on the float chamber.

Experiments were carried out in a deep-freeze chest and it was found that when the equipment was drawing 100 mA the water in the float chamber maintained a temperature of 49°F compared with 24°F air temperature.

The modified float chambers were installed in July 1964. During the winter of 1965 snow lay around these gauges for periods of up to one week. The maximum frost recorded at Blenheim for 1965 was 14.1° which could have been exceeded at the two raingauges. No damage occurred to either gauge, and no evidence of freezing of water in the float chamber was indicated on the charts.

REFERENCE

- Chandler, A. 1965: Installation and Frost Protection of Lambrecht Rain-gauges. *J. Hydrol. (N.Z.)*, 4 (1) : 34-8.