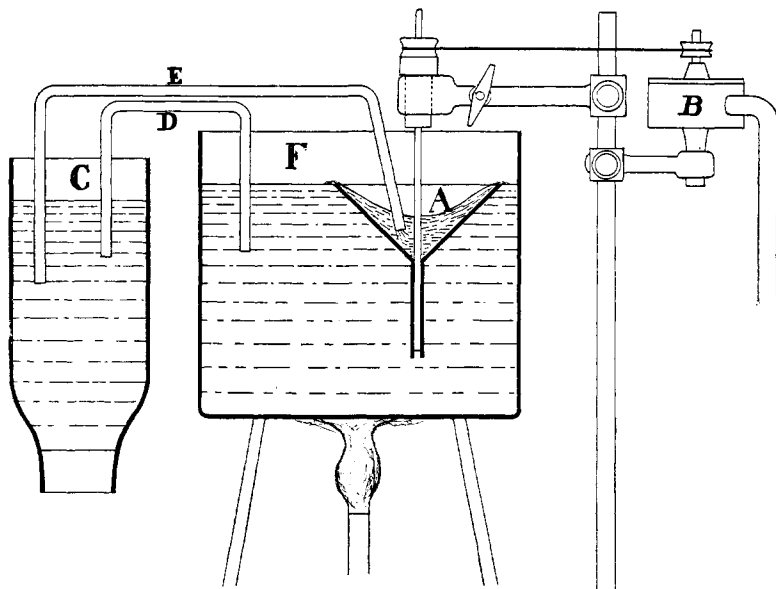


A CONSTANT TEMPERATURE DEVICE

BY HAMILTON P. CADY

It is often necessary to keep a constant temperature in an apparatus which on account of its size or for some other reason cannot be immersed in a constant temperature bath. This may be done in various ways, one of which is to circulate water having a constant temperature around the apparatus. In order to keep the water circulating, the device illustrated in the cut has been found convenient.



A is an ordinary 75 mm glass funnel mounted on a glass rod and running in the bearings of an ordinary Witt stirrer. B is a Raabe turbine. F is a large water-bath kept at the desired

temperature. C is the apparatus through which the water is to circulate. The siphon D connects C and F and consequently the water will come to the same level in both vessels. A is adjusted so that the top of the funnel comes just at the surface of the water in F. If the interior of the funnel be connected with C by the siphon E, the end of which is as near to the bottom of A as possible, water will flow from C into A until the level is the same in each. When equilibrium is reached the level of the liquid in A, F and C will be the same.

If now A be caused to rotate by the turbine, the water in A will be thrown out by the so-called centrifugal force and the level of the liquid in A will be lower than that in C. This will cause water to flow from C into A, thereby lowering the level of the water in C below that in F and causing water to flow from F into C. This will of course set up a circulation of water through C that will continue as long as A is rotated. If the siphons are made of moderately large tubing the amount of water that can be caused to circulate is surprising. The temperature in C can be maintained as constant as that in F, although of course slightly lower.

The rotating funnel has the advantage of not only keeping the water circulating through C but of thoroughly stirring that in F, for the water is drawn up from the bottom along the outside of the funnel and thrown off in a sort of a wave which is fully a centimeter in height when the apparatus is running at full speed. If the top of the funnel be placed at or near the surface of the water there will be no spattering. If however it be raised considerably higher, the water will be thrown off in small drops.

Water may be caused to circulate through a condenser by filling the condenser completely with water and placing one connecting tube in the funnel and the other in the bath. The condenser may of course be placed in any position either above or below the bath, provided it is not more than thirty feet above the latter.

It would seem that with this device a circulating liquid might be advantageously used instead of a vapor jacket in vapor

density determinations when a series of measurements are to be made at different temperatures, for it would do away with the necessity of having a number of very pure substances, the temperature would be independent of barometric changes, and any desired change of temperature could be easily made without change in the apparatus. If temperatures above 100° are required, some other liquid such as high boiling paraffin or cottonseed oil may be substituted for water.

Cornell University