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The Moulding Action of Surface Tension on a Free Sheet of Water

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placed gives the most satisfactory sodium flame, although a five-eighths inch Bunsen will answer if properly supplied with salt. A convenient grating for this purpose is a Wallace replica having about 15000 lines to the inch. Gratings with no more than 3000 lines per inch will show the dark-line image but not very certainly, except with greater care. The image is sharp and fine, its width being determined by the actual thickness of the filament of the lamp and is much smaller than the apparent width of the filament which is affected by irradiation. A high temperature filament gives best results but is objectionable because of the intensity of the light which falls directly into the eye. When such a filament is used the eye may be protected by pasting a narrow strip of paper across the grating. By varying the voltage applied to the lamp the temperature of the filament may be changed and the effect of the relative temperatures of filament and flame may be observed.

A NEW TYPE OF ELECTROMAGNETIC WAVE METER

WINFIELD SALISBURY

(ABSTRACT)

A high degree of accuracy and sensitivity are obtained by using a combination of a two element vacuum tube and direct current galvenometer, which measures the voltage across the condenser in the resonant circuit instead of the current in the inductance as is the common practice. The small amount of energy necessary to operate this indicator makes possible a very sharp resonance peak. Its sensitivity allows it to be operated far enough from the source of the waves that it does not effect their length.

A new method of locating nodes on Lecher's wires makes possible whatever accuracy can be obtained in measurement of a length. The wavemeter is calibrated, with the aid of these wires, for wavelengths between three and one hundred meters.

THE MOULDING ACTION OF SURFACE TENSION ON A FREE SHEET OF WATER

L. B. SPINNEY

(ABSTRACT)

A smooth stream of water falling vertically is allowed to strike the center of a small circular plate placed horizontally. The water

under these circumstances spreads laterally over the edge of the plate in a thin stream. Under the action of gravity and surface tension this thin bubble-like stream assumes various forms determined by the velocity of the stream impinging upon the plate and the dimensions of the various parts of the apparatus.

The bubble may be made to assume a more or less nearly spherical form or, by joining a free water surface below, to shape itself into the form of a bell. The smooth unbroken forms assumed by this film-stream are very striking, affording a beautiful illustration of surface tension effects and give promise of a convenient means of studying certain surface tension phenomena.

A MODIFICATION OF LEES' METHOD FOR THE DETERMINATION OF THE HEAT CONDUCTIVITY OF A POOR HEAT CONDUCTOR

PAUL C. OVERSHEET

Lees' Method is described at length in the Phil. Trons. A 1898, vol. 191, also in a general way in Poynting and Thompson's "Heat" and Watson's "Textbook of Physics." The modified method is described in detail in "The Measurement of the Heat Conductivity of Sulfur and a Sulfur-Coke Mixture," Physics Thesis by Paul C. Overstreet, State University of Iowa, 1925. This method consists of the measuring of the temperatures of a hot copper disk, U, on one side of a poor heat conducting disk, S, and that of a cooler disk, M, on the other side of S, after the system has come to a steady state — heat being furnished to U as described in Lees' Experiment. The exposed end and edges of the disks are coated with a substance whose emisivity for various temperatures has been separately determined. The heat radiated from M is then calculated. That radiated from the edge of S is then calculated on the assumption that for a thin disk the temperature drop will be a linear function of the distance from the hot disk, U. Using the same assumption and a linear relation for the radiation, an equation is found in λ, the fractional part of the thickness of S the heat will travel on the average before it is radiated.

$$\lambda^3 - 3\frac{h - \frac{1}{2}a}{b(U_u - U_m)}\lambda^2 + 3\frac{h_u U_u}{b(U_u - U_m)^2}\lambda - \frac{1}{2}$$

$$\frac{h_m U_m + h_u U_u + h_m U_u - \frac{1}{2}a(U_u - U_m)}{b(U_u - U_m)^2} = 0$$

$$k = h_m U_m t_s \frac{1 + {}_r{}^2 t_m}{U_u - U_m} + \frac{2t_s^2}{3r(U_u - U_m)}$$

$$\cdot\lambda\cdot (h_m U_m + h_u U_u + h_m U_u - \tfrac{1}{2}a(U_u U_m)$$