

Precision Balance 9

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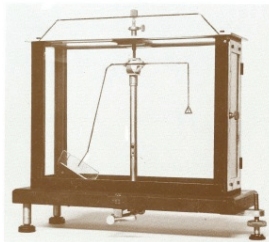


FIG 1.

The design of this micro-balance, Fig 1, is attributed to Walther H. Nernst (1864-1941), but it was made by Spindler & Hoyer in Göttingen, c1905. The balance was for weighing very small loads and was based on the principle of torsion combined with inclination of the beam. When the quartz beam was loaded, the glass rod twisted (a form of torsion spring) and the reading was indicated by the displacement of the long pointer against a graduated scale visible on the left side.

The beam, which is made of quartz, is only 1mm in diameter and has a length of 125mm (4.9"). On the left side, the beam is bent down to an angle of about 75 degrees and continues as the pointer 165mm long (6.5"). On the right, a thin wire suspends the pan from a little loop in the end of the beam. The pan diameter is only 10mm (0.4"). The beam is fixed, by shellac, to the middle of a thin glass rod 35mm in length (1.4"). This rod, which is the torsion element of the balance, is stretched between the arms of a fork at the top of the column, Fig 2.

When not in use, the beam is held by an unusual double arrestment gear, fixing from above as well as from below, Fig 2. When required for weighing, the upper arrestment is first removed using the device above the case. The locking screw is released, the vertical rod is pulled up by the knob on top, then the screw is re-locked. This raises the clamping fork clear of the beam, Fig 3.

750

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Abstract

Remarks