DEPARTMENT OF

TRADE AND COMMERCE
CANADA

SD-GA.42

STANDARDS DIVISION

OTTAWA, September 18, 1953.

TYPE APPROVAL

BAILEY TYPE "CG" FLOW MECHANISM

The apparatus specified and illustrated herein has been duly approved by the Standards Division under the provisions of the Gas Inspection Act, Chapter 82, R.S. 1927, as amended, and may be admitted to verification in Canada.

Apparatus Approved: Type "CG" Flow Mechanism, manufactured by the Bailey Meter Company Limited, Montreal, P. Q.

Application: Measurement of fluids in conjunction with standard orifice plates and approved pressure gauges.

Rating of Apparatus:
Differential ranges ..... 0-2" water gauge; 0-4" water gauge
Working pressure ..... up to 50 p.s.i.

Description: The type "CG" Flow Mechanism is designed for very low differentials and the manufacturer uses this basic element in a variety of flow meters. This approval covers its use with any approved static pressure element, integrator or other auxiliary device. As in the case of other Bailey flow meters, the number suffixes on the type designation denote certain features of the particular meter. Also, if temperature and pressure elements are mounted in the same case with the flow mechanism, this is indicated by a "class" designation following the type designation. For example, a "Type CG-35 Class 38" Flow Meter would describe a rectangular-case flow meter, without integrator (see Circular SD-GA.27) having a type "CG" differential mechanism and containing a class 3 pressure element and a class 8 pressure element.

The type "CG" Flow Mechanism consists essentially of a large-capacity bell enclosed in a casing which is partly filled with oil. Attached to the top inside of the bell is a specially-shaped 'displacer' which is immersed in its own independent mercury reservoir. The high side of the differential pressure is applied to the inside of the bell, the low side of the differential to the outside of the bell within the bell casing. At zero differential the weight of the mercury displaced by the 'displacer' plus the weight of the oil displaced by the bell (very small) is equal to the total weight of the bell; thus the bell is in equilibrium. When a differential is applied the bell emerges from the oil and the displacer from the mercury. The net downward force of the bell increases until the increased differential is balanced out and equilibrium is restored. The displacer is so shaped that the bell moves under a differential a distance proportional to the square root of the differential. The motion of the bell is transmitted by a forked lever to the recording element through pressure-tight bearings and the record made is proportional to the $\sqrt{h}$. It is apparent that the weight of the bell and the amount of mercury in the mercury reservoir are factors in the original factory calibration. In the field, small changes in the weight of the bell or in the amount of mercury in the reservoir should bring the instrument into calibration except in case where mercury has been lost from the reservoir.

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