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A Recording Weight-Meter

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SUMMARY

An electro-mechanical device is described which can be added to a conventional platform weighing machine so as to give a voltage proportional to the difference between the load on the platform and the setting on the steelyard arm. The range of the instrument is 30 lb., and the sensitivity is that of the weighing machine itself, namely about 2 oz. for a total load of up to 5 cwt. A circuit is included which gives aural or visual warning when the platform load falls to a pre-arranged value.

Introduction

In the testing of domestic appliances the measurement of rate of consumption of the fuel, or burning rate, is a fundamental necessity, since all efficiencies are calculated by measuring the appropriate heat outputs and expressing them as a percentage of the heat released by the burning fuel. In earlier work the average rate of fuel consumption was determined by filling the appliance to a given level at each refuelling, and weighing the fuel added; this method can, however, give only an average burning rate over the whole period between two consecutive refuellings and when bituminous coal is used may lead to large errors owing to inequalities in the rate of release of volatiles and superimposed effects arising from the swelling and caking of the coal. A better method is to mount the appliance to be tested on a suitable weighing machine, when the change in weight due to burning of the fuel can be measured accurately over any desired period. Use of this method in the Domestic Appliance Laboratories led to a request for some device for recording the weight continuously, and the instrument to be described was subsequently developed.

Description

If, on a platform weighing machine, the adjustable weights on the steelyard arm are set at a value different from the load on the platform, there will be a force on the arm proportional to this difference. The arm can be re-balanced by applying to it an equal and opposite force, and this is done in the present instrument by attaching to the arm a current-carrying coil which is suspended in a magnetic field; the current is automatically adjusted to the value required.