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AN INDUCTION TYPE WIND VANE

A simple wind vane is described which works on principle of mutual induction between two coils. If the shielded area between the coils is varied linearly the induced voltage in the secondary coil also will vary linearly. Fig. 1 shows the mechanical arrangement of the coils and the shielding material coupled to the vane. The disc used for shielding purpose has a shape shown in Fig. 2. The shape of the cam was geometrically designed knowing the length of the coils, minimum and maximum of shielding required. From the centre to its periphery its radial distance increases linearly. The centre of the disc is connected to the central shaft of the vane which is supported by two miniature ball bearings.

2. Complete circuitry is housed along with the coil plate. A phase shift oscillator generates a frequency of 8 kHz with an amplitude of 7 volts. This voltage is fed to the primary coil through an

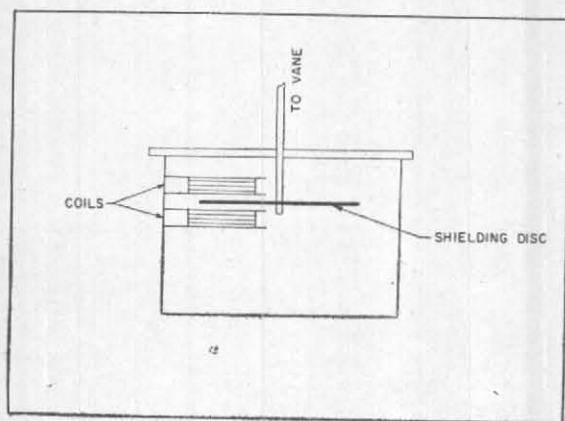


Fig. 1

emitter follower. The output of the secondary coil is rectified and fed to an operational amplifier RCA741. An output of 1.4 volts is obtained which is sufficient to drive a 0-1 mA stripchart recorder. Fig. 3 shows the calibration in terms of output in volts against angle of rotation. From the calibration curve it can be seen that the linearity is from 0°-330°. Thus non-linearity is found between 330° and 360°. This cannot be avoided be-

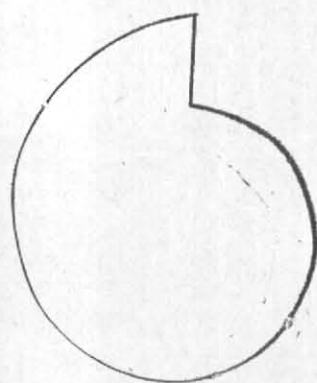


Fig. 2

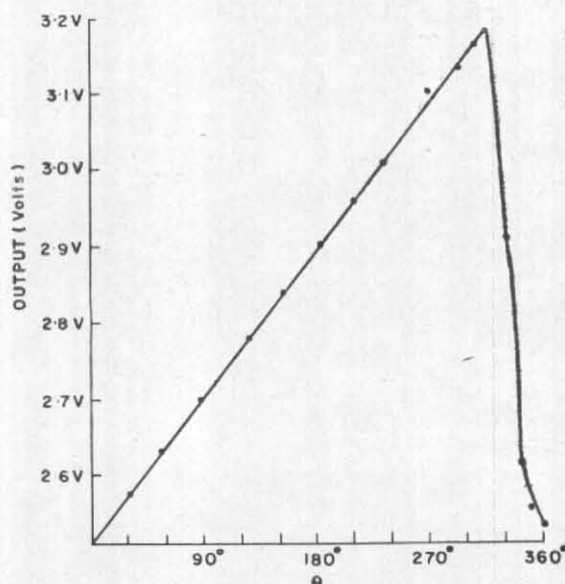


Fig. 3

cause of hysteresis effects. Thus the vane can be adjusted in the prevailing wind direction and the perturbations can be recorded which are essential for micrometeorological studies. The vane is made out of thermocole which is very light in weight. A thin coating of aluminium paint is supplied over it so that weather effects are reduced. It is 20 cm long and has a maximum width of 7 cm. Thus it has an aspect ratio 0.35.

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