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AN AUTOMATIC SIGNALLING ANEMOMETER

Dual-purpose anemometers, which would indicate windspeeds and issue warnings, by either visual or acoustical means, whenever windspeeds exceed certain critical values, are required for various purposes; particularly by Railway Traffic Control Units for issuing cautionary signals to trains approaching long, exposed bridges. Signalling pressure tube anemographs, in which the rising float makes an electrical contact whenever the windspeed exceeds 40 miles per hour, have been in operation on Pamban and Godavari bridges of the Southern Railway for many years. This equipment is, however, both complex and unwieldy apart from requiring frequent repairs and calibration. It is also not automatic, since the instrument lights up a warning lamp whenever the windspeeds exceed 40 mph and needs a pointsman to operate the traffic signals. A simple, automatic, inexpensive electrical anemometer that would both measure and indicate windspeeds at a distance and control auxiliary equipment at pre-selected windspeeds seemed to be the ideal answer. The present note describes such a signalling anemometer designed and constructed at the request of the Southern Railway, in the Instruments Division of Meteorological Office, Poona.

The signalling anemometer consists of a standard IMD electrical cup generator anemometer and a windspeed indicator and signalling unit (Fig. 1). The generator unit of the anemometer consists of a small 6-pole permanent magnet rotated by the cup wheel in a stator consisting of six coils wound on a laminated core. The alternating current produced in the stator windings is fed to the indicator incorporating a rectifier (Fig. 2). The magnitude of the current which flows in the indicator depends on the rate of rotation of the cup wheel and the indicator is, therefore, graduated directly in knots. The permanent magnet dynamo generates an e.m.f. of 1·84 volts at 20 knots and 7·6 volts at 80 knots, providing adequate power for operating a small sensitive relay, in the voltage range 2—8 volts. The relay is connected to the output terminals of the rectifier, through a variable resistance R, which controls the operation of the relay. Since the voltage produced by the generator is proportional to the windspeed, the relay can be

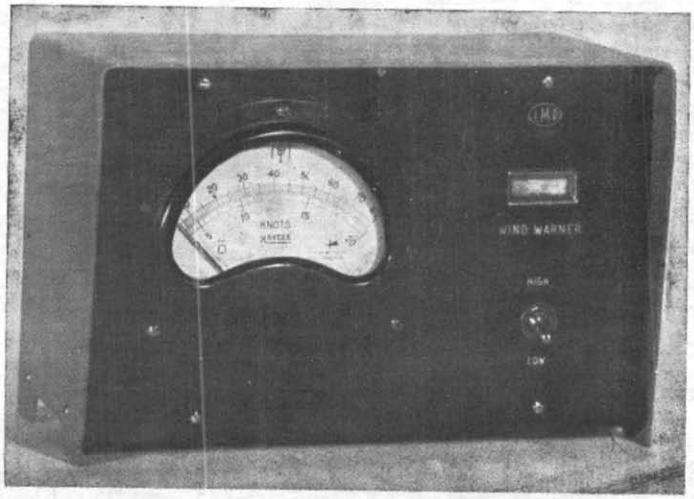

Fig. 1

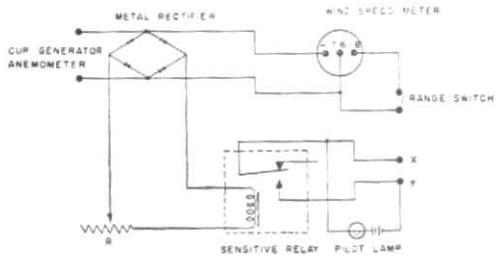

Fig. 2. Circuit diagram of wind warner panel

made to operate at any preselected windspeed by suitable adjustment of the resistance R. The calibration of the windspeed indicator being carried out under full load, no correction to the indicated windspeed value is required when the relay is in operation.

The terminals X, Y are connected to an electrical relay circuit, to operate either a siren or mechnical or electrical traffic signals. As long as the windspeed exceeds the preselected value, the relay will be "on", switching on the pilot lamp and alarm signal and will cut off the signal, only when the windspeed falls below the danger level.

The instrument has the added advantage of being remote indicating and operating. The wind measuring and transmitting unit can be installed at the site representative of conditions to be measured. The indicating and signalling unit can be installed at any distance from the trasmitter, provided suitable twin core cables are used between the transmitter and receiver or the signals are suitably amplified.

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