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Simple Low Power Electronic Relay

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THE recent note of Linnel and Haendler[1] describing a simple thermostat relay in which an *FG* 57 thyratron controlled several hundred watts prompts us to describe a similar inexpensive low power circuit (Fig. 1), which we have used for about a year with a precision manostat.[2] This relay used a 2050 thyratron.

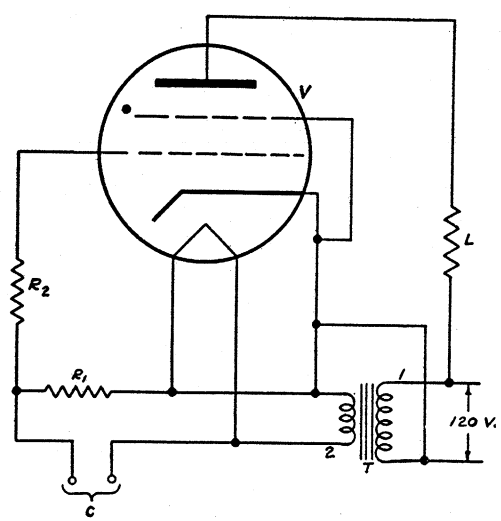

FIG. 1. Low power relay. $T=6.3$ volt a.c. 1 amp. $R_1-R_2=1$ megohm, 1 watt. $V=2050$ thyratron. $L=750$–800 ohm solenoid. C=connection to regulator.

In order that the signal grid shall remain in control when the anode is positive, terminal (2) of the secondary must be 180° out of phase with terminal (1) of the primary. This is conveniently determined by trial after the relay has been assembled. If the tube fires continuously, the leads from the secondary should be reversed.

The relay has satisfactorily operated the air inlet valve of the manostat; L is the 750-ohm solenoid of the valve. When an increase in pressure closes the regulator contacts, the filament voltage is applied across R_1 and is thus impressed on the signal grid out of phase with the anode voltage. The tube does not fire, and the air inlet closes. When the pressure falls and opens the contacts, the signal grid is no longer biased to cut-off and loses control. The tube fires and energizes the solenoid, thus opening the air inlet, and the cycle repeats. R_2 limits grid current.

Although suitable for controlling only low power (10 watts or less), the relay has replaced a commercial unit costing five times as much.

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* One of the Laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, United States Department of Agriculture.

[1] R. H. Linnel and H. M. Haendler, Rev. Sci. Inst. 20, 364 (1949).

[2] W. P. Ratchford and M. L. Fein (to be published).