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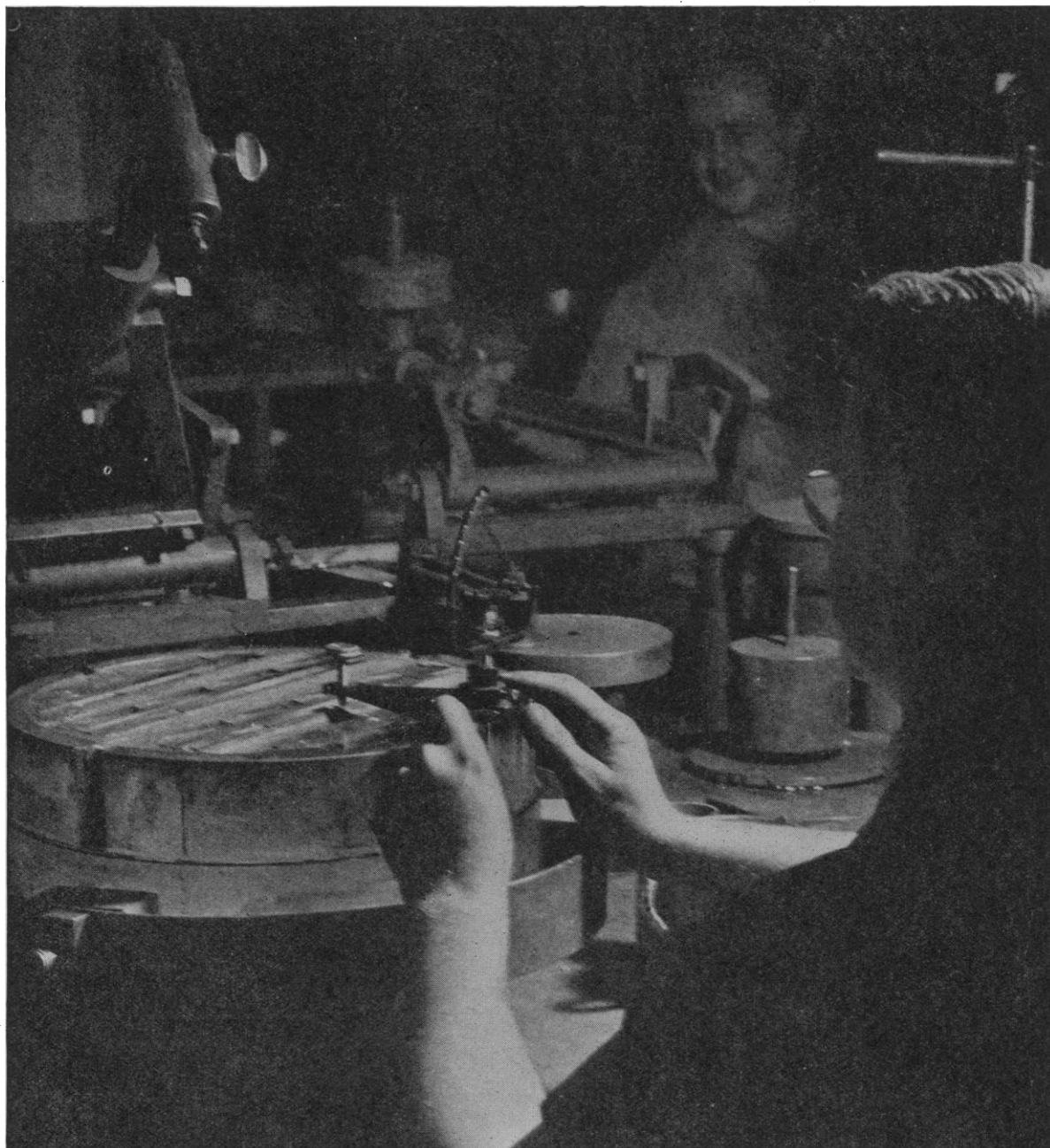
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EARTHQUAKE RISK AND ITS ABATEMENT IN CALIFORNIA

By HARRY O. WOOD

RESEARCH ASSOCIATE OF THE CARNEGIE INSTITUTION OF WASHINGTON

LONG experience has made it certain that the occurrence of earthquakes in and near California, and the attendant risk that there is from this cause, are matters not well understood by a vast majority of people both inside the state and beyond its borders. For the most part non-residents overestimate and residents underestimate the risk here from earth shocks. In both respects so general a want of understanding is disadvantageous to the region. From every point of view the situation calls for clarification.

Manifestly there is some risk—of death, injury and loss of property—in every actively seismic region where very small earthquakes are frequent, somewhat

larger ones numerous, with the occurrence of shocks of small destructiveness every year or two on the average, and moderate, large and great earthquakes at longer and longer intervals. California is such a region.¹ How great is this risk, and how is it spread? What can be done to abate it?

Although the following discussion necessarily deals specifically with California and the immediately neighboring region, the general conclusions reached apply also to seismic regions elsewhere, including some other districts in the United States.

¹ See "Destructive and Near-destructive Earthquakes in California and Western Nevada," U. S. Coast and Geodetic Survey, Special Publication No. 191.

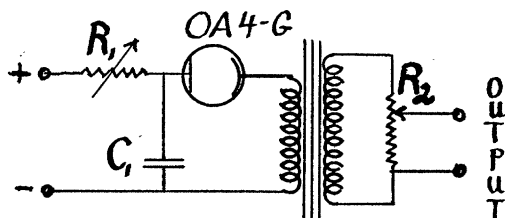


FIG. 1

diagrammed here provides frequency of stimulating impulses adjustable between the range of 2 to 60 impulses per second. Voltage and frequency are independently controlled by dials, single stimuli are obtained by operation of a push-button and a signal magnet is operated simultaneously with stimuli.

Fig. 1 is the schematic diagram of the stimulating voltage circuit. Variable resistor R_1 controls the frequency of the discharge of condenser C_1 through the primary of the transformer T_2 . Stimulating voltage

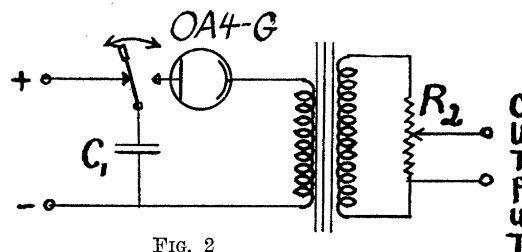


FIG. 2

T_1, T_2 : 35-40 watt power transformer, 650 v, 6.3, and 5 volt secondaries

Tubes : 5W4 rectifier; OA4-G gas-filled tube

R_1 : 2 meg variable resistor

SW_1 : SPDT switch

R_2 : 20,000 ohm wire wound potentiometer

SW_2 : SPST switch (mounted on R_2)

R_3 : 30,000 ohm $\frac{1}{2}$ W. R_4 : 5,000 ohm 2W

R_5, R_6 : 100,000 ohm 1 W

C_1 : 0.1 mfd., 1,000 v condenser

C_2 : 8 mfd., 450 working volts electrolytic condenser

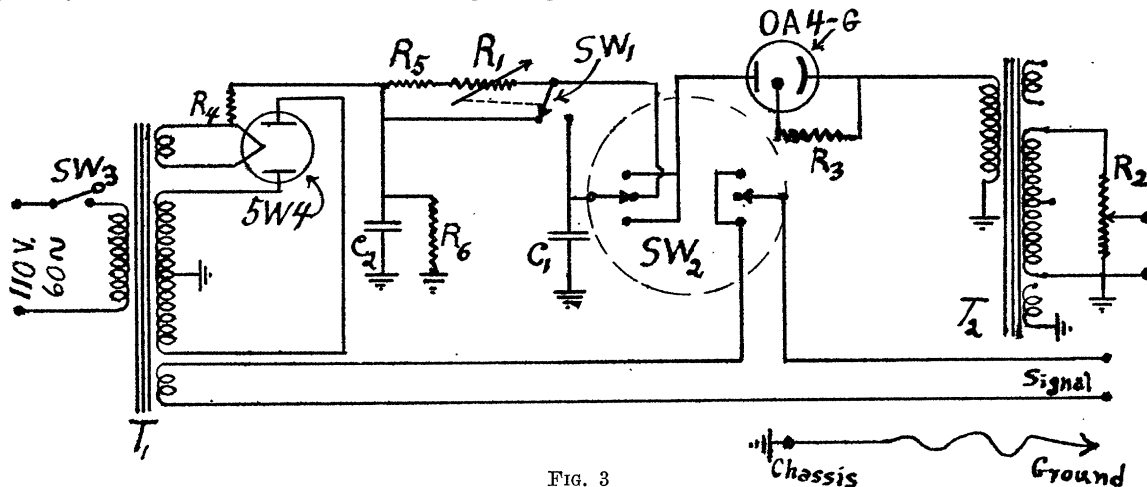


FIG. 3

is controlled by adjusting R_2 . It is apparent that there is no interaction of controls R_1 and R_2 . In Fig. 2 the schematic diagram for obtaining single stimuli is shown, and Fig. 3 is the actual circuit diagram of the entire apparatus.

In Fig. 3, switch SW_2 is a CRL type 1467, which functions in one position as a push-button, or key, and in the other position as a toggle switch. SW_1 , which mounts on the frequency control, R_1 , changes the circuit from that of Fig. 1 to that of Fig. 2. A ground wire for the chassis of the instrument is provided to prevent stray contractions caused by stray charges in the instrument.

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