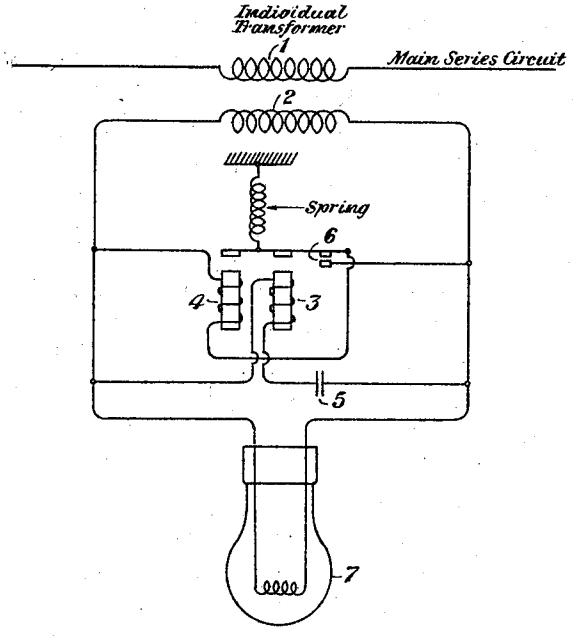
July 17, 1928. 1,677,193

R. G. McCURDY

SHORT CIRCUITING SWITCH

Filed Sept. 2, 1927



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UNITED STATES PATENT OFFICE.

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SHORT-CIRCUITING SWITCH.

Application filed September 2, 1927. Serial No. 217,279.

This invention relates to series street lighting circuits, and more particularly to the individual transformers which are associated one with each lamp lighted from the circuit.

If a lamp in a lighting system of the type indicated above fails (or burns out), the secondary of the individual transformer associated with that lamp is opened, and distortion is caused thereby in the alternating current waves in the system. This distortion may cause objectionable noise in telephone or other transmission circuits which are exposed to induction from the lighting circuit.

The object of this invention is to prevent such distortion and the interference with transmission circuits consequent thereupon.

With this object in view, I provide a novel switching arrangement for automatically short-circuiting the secondary winding of an individual transformer when the associated lamp fails, as will be more fully described below.

The invention will be more clearly understood when the following detailed description is read with reference to the accompanying drawing, which shows diagrammatically an individual transformer, a lamp connected therewith and my novel switching arrangement.

With reference to the details of the drawing the individual transformer has its primary winding 1 in the main series circuit of the lighting system and its secondary winding 2 in series with the filament of the incandescent lamp 7. An alternating current relay has an operating winding 3 and a holding winding 4. The operating coil 3 is connected across the lamp circuit in series with a condenser 5, as shown. The combination of the coil 3 and the condenser 5 is tuned to one of the odd harmonics of the fundamental lighting current frequency; for instance, if 60 cycle current is involved, the combination may be tuned to the ninth harmonic, or 540 cycles. When the relay operates, the normally open contact 6 is closed. The closing of this contact places a short-circuit across the secondary winding 2 of the transformer through the holding coil 4 of the alternating current relay.

With a lamp, such as 7, in service under normal conditions, harmonic voltages across the secondary of the individual transformer are very small. Accordingly, under such conditions, in the arrangement shown in the drawing, the relay contact 6 will remain open. If, however, the lamp 7 fails, fairly large harmonic voltages are set up across the secondary of the transformer, and the odd harmonic to which the combination 3—5 is tuned will energize the operating coil 3 of the relay and cause the closing of contact 6. This operation places a short-circuit across the secondary winding 2 of the transformer and prevents the harmonic voltage from being impressed across the operating coil 3 of the relay. The 60-cycle current (assuming that fundamental frequency) will, however, flow through the holding coil 4 and serve to keep the contact 6 closed.

When the main series circuit of the lighting system is de-energized, the relay contact will open, and if the defective lamp is replaced during the period of de-energization, the relay circuit will be in condition for suitable operation when the lighting circuit is next energized.

What is claimed is:

In association with a transformer having its primary winding included in a series lighting circuit carrying alternating current of a given frequency and a lamp having its filament in series with the secondary winding of said transformer, an alternating current relay having an operating coil bridged across said secondary winding and a holding coil, a condenser in series with said operating coil in the bridge, said condenser and said operating coil being tuned to one odd harmonic of the lighting current frequency, and a contact adapted to close when said operating coil is energized and to place a short-circuit around the secondary winding of the transformer through said holding coil.

In testimony whereof, I have signed my name to this specification this 31st day of August, 1927.

RALPH G. McCURDY.