

April 21, 1931.

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1,801,302

RELAY CIRCUIT METER CONTROL DEVICE

Original Filed Feb. 4, 1927

Fig. 1

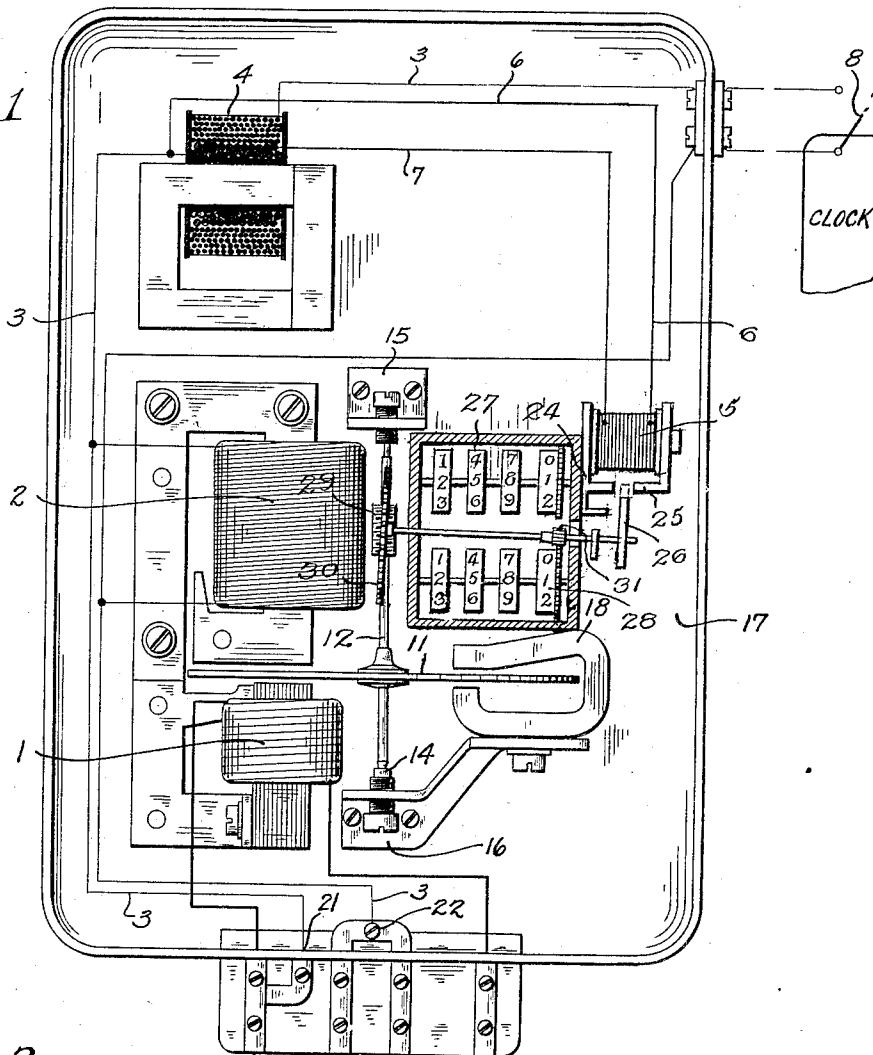
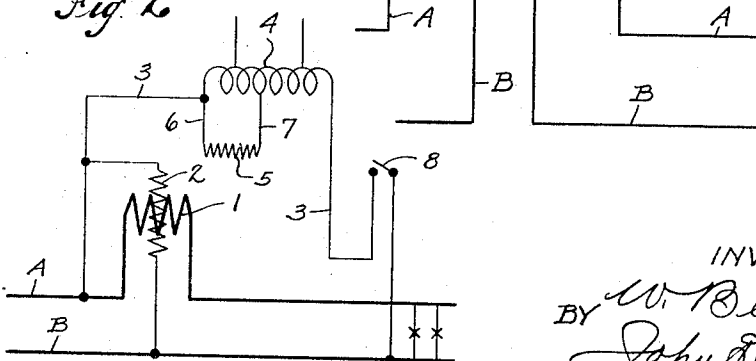


Fig. 2



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RELAY-CIRCUIT METER CONTROL DEVICE

Application filed February 4, 1927, Serial No. 165,816, and in Switzerland February 5, 1926. Renewed June 25, 1930.

The invention relates to relay circuit current control devices, and more particularly to such devices employed in induction meters and especially in such meters for the higher commercial voltages, or other relatively high voltages.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The accompanying drawing, illustrates diagrammatically certain parts of the coils of an induction meter, of the relay circuit, and the control therefor, and in connection with the description serves to illustrate the principles of the invention and to explain the operation thereof.

Fig. 1 is an elevation, partly diagrammatic, of a meter embodying the invention; and

Fig. 2 is a diagrammatic representation of the invention.

In many alternating current devices, and especially in induction meters for the higher commercial voltages, relays are employed for controlling registering devices, or other devices, which relays cannot be practicably wound for the rated voltage of the meter or other device. One example of such use of relays is in multiple tariff meters, wherein the relay is utilized to switch the meter gear train from one registering mechanism to another. In the construction of such devices, it is customary to provide series resistances in the relay circuit to avoid the use of impracticably fine wire.

Such an arrangement however, necessitates a larger watt consumption without any advantageous effect on the circuit except the resultant cutting down of the voltage to within the limits for practical relay construction. On the other hand, the increased watt consumption increases the heat in the relay coil, and this exerts an unfavorable effect upon the meter, or other device mounted in the same casing.

The present invention eliminates the dis-

advantages described, together with others later to be described or which will be obvious to those skilled in the art, and also realizes certain advantages which are hereinafter likewise set forth in part. By my invention, there is provided in the relay circuit of the induction meter or other device using such high-voltage current, an autotransformer adjacent to and preferably within the same casing as the meter coils, and the terminals of the relay coil are connected to a part, that is, to one end and some intermediate point of the autotransformer, while the line voltage is connected to the entire winding, that is, to both terminals of the autotransformer.

By my invention, embodied as described or in an equivalent construction, a great reduction is effected in the transformation of electrical energy into heat in the relay circuit, and this is especially the case with the higher commercial voltages. An important advantage lies in the fact that the relay coil can be wound for the proportionately lower voltage. It is possible consequently to use a heavier wire and thereby secure a stronger and better construction of the relay coil. The winding space about the coil can likewise be used to better advantage, as the heavier wire is better adapted or suited for filling the winding space.

It will be understood that the foregoing general description and the following detailed description are exemplary and explanatory of the invention but are not restrictive thereof. Referring now in detail to the diagrammatic showing of the accompanying drawing, the current coil of an induction meter is indicated by 1, and the pressure coil thereof by 2. It will be understood that the meter disc and its shaft and the driving connections therefrom to a registering or other device, may be of any standard and suitable form.

The relay circuit is indicated by 3, and an auto-transformer 4 is in series in the circuit. The coil 5 represents a relay used to control an energy-registering mechanism, or other suitable device in any standard or desired form or manner. One terminal 6 of the relay coil 5 is preferably connected at one end

to the autotransformer, and the other terminal 7 of the relay coil is connected to the autotransformer at some intermediate point, which will effect the proportional reduction of voltage required for the relay coil over that of the relay circuit 3. The auto-transformer is preferably positioned within the meter casing where any heating of the autotransformer would result in a corresponding heating of the meter coils and parts, seriously impairing the accuracy of the meter.

A suitable circuit-controlling device is provided for the relay circuit and it is indicated by reference numeral 8. This device may be of any suitable form and have any desired manner of operation, as for instance it might be merely a hand switch, or it might be an automatic time control or any other suitable device.

In Fig. 1 of the drawing my invention is shown embodied in a known type of induction meter, having a meter disc 11 mounted on a spindle 12, journaled at its ends in bearings 13 and 14, respectively, which bearings are mounted in brackets 15 and 16, fixed to the meter casing 17. A suitable brake magnet 18 operates on the meter disc 11 in the usual manner. The relay controlling switch 8 is shown in this figure as being time-controlled. The connections of the power circuit with the meter are indicated as A and B, and the circuit for the auto-transformer is shown connected across the power circuit at terminals 21 and 22. The connections of the relay circuit 6, 7 to the auto-transformer circuit and windings are shown in this figure. The relay poles are indicated by 24 and 25, and the switch for connecting and disconnecting alternatively the register mechanisms is indicated by 26. The registering mechanism is shown as a conventional two-rate register of the general type shown in the British patent to Landis and Gyr, No. 1056 of 1911, and includes the two counting trains 27, 28 adapted to be alternatively driven by means of worm 29, worm gear 30 and pinion 31.

The relay coil may, by way of example, constitute part of a driving connection, or the control therefor, for a multiple-tariff registering device, a multiple-rate register, a maximum-demand register, a brake or stop mechanism, or any other suitable device. The operation of the relay, as indicated, may be either manual and at will, or may be automatic, time-controlled, periodic or otherwise, as may be found desirable or convenient.

It will be understood that changes may be made from the disclosed exemplary form of the invention, without departing from the principles or sacrificing its chief advantages.

What I claim is:—

1. In an induction meter in combination metering mechanism, a power circuit, a circuit connection across the power circuit, an

auto-transformer so positioned that heating of the auto-transformer would result in heating of the metering mechanism in said circuit, a relay for controlling registering mechanism and a relay circuit connected to the autotransformer to receive a reduced voltage current.

2. An alternating current-operated device including in combination an induction meter in an alternating current power circuit, a relay for controlling the registering action of the meter, a relay circuit across the power circuit, and an auto-transformer adjacent to the coils of the meter in the relay circuit to supply reduced voltage to the relay winding for avoiding appreciable heating of the meter elements by the relay.

In testimony whereof, I have signed my name to this specification.

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