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ART OF ELECTRICAL DISTRIBUTION.

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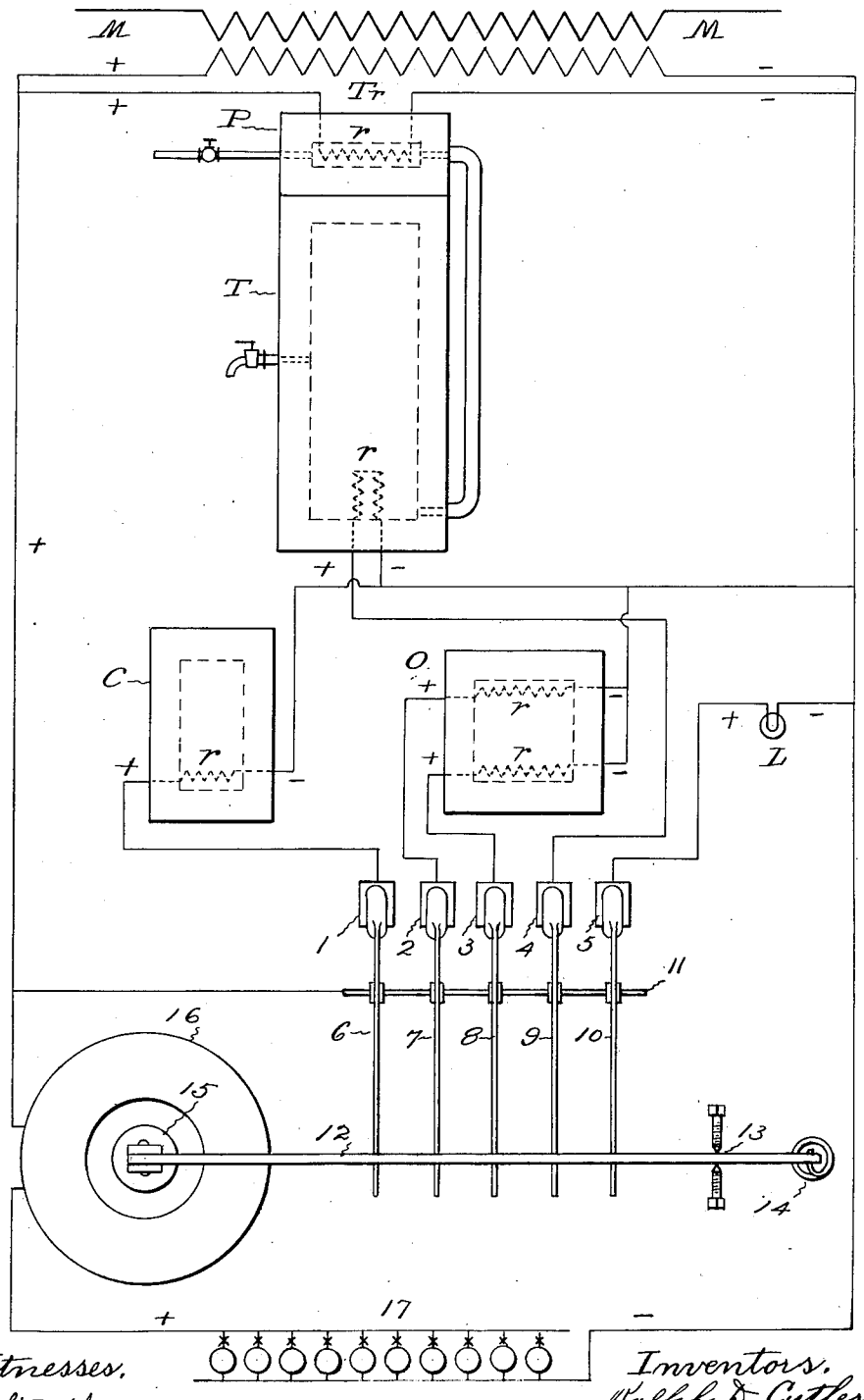
1,014,049. Patented Jan. 9, 1912.



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UNITED STATES PATENT OFFICE.

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ART OF ELECTRICAL DISTRIBUTION.

1,014,049. Specification of Letters Patent. Patented Jan. 9, 1912.

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To all whom it may concern:

Be it known that we, RALPH D. CUTLER and MICHAEL F. OWENS, citizens of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in the Art of Electrical Distribution, of which the following is a specification.

This invention relates to a method of distributing, on the premises of a consumer, electrical energy furnished by a public service corporation. A consumer, who is provided with various electrical translating apparatus, such as lamps, water heaters, roasting and baking ovens, boiling and stewing cookers, pressing irons, and motors, the aggregate capacity of which is large, but which are not all utilized at the same time, can by this method be supplied from a central station continuously with a definite uniform amount of electrical energy that is less than the aggregate capacity of all the apparatus, but sufficient to efficiently operate such apparatus as the consumer desires to utilize at any one time.

The object of this invention is to arrange such a system of distribution on the premises of the consumer that, while he may be provided with various kinds of electrical translating apparatus which in the aggregate require more current, he will at any one time only use the predetermined fixed amount of current that he has contracted for. This is attained by supplying the customer continuously with a uniform fixed maximum amount of current at a flat rate or controlled meter, which he can use practically all the time for specific purposes, and providing means which automatically divert part of that current from the specific purposes, to other uses when desired, so that the company will only be called upon to furnish a current of fixed wattage and the customer only required to pay a fixed definite amount, regardless of the particular uses to which the current is put. With this method of distribution the consumer draws from the line for 24 hours a day continuously a predetermined fixed number of watts of electrical energy for use in connection with certain translating apparatus. If he wishes to use other apparatus, the system is so designed that the simple act of starting that apparatus automatically diverts sufficient current for the purpose from its original circuit, so that the consumer can use such apparatus as he pleases, but cannot draw any more than the specific amount of current.

The invention is illustrated diagrammatically in the accompanying drawings as arranged for supplying a consumer continuously with a fixed definite amount of current for operating a water heater, a baking and roasting oven, a boiling and stewing cooker and some lamps, and at the same time permitting, without drawing any more current from the mains, the turning on of the lights.

In the system illustrated, C indicates a cooker of the fireless type having the usual heat non-conducting walls and provided with an electrical heating resistance r of, for example, 45 watts capacity. If this apparatus is supplied with substantially this amount of current at a fixed voltage, say 60 volts, for practically the entire 24 hours, its internal temperature will keep at about 250° F., which has been found sufficient for boiling and stewing food. O indicates an oven, also of the fireless type, having the usual heat non-conducting walls and provided with two electrical heating resistances r, for example, of 30 watts capacity each. With these energized by this amount of 60-volt current for practically 24 hours, the oven temperature will be about 350° F., which has been found to be a good baking and roasting temperature. The water heater which is indicated may have a percolator P provided with a heating resistance r, of say 100 watts capacity, for heating a stream of water, and a tank T provided with a heating resistance r of say 30 watts capacity for keeping hot the water heated by the percolator. It has been demonstrated that such a heating apparatus, if supplied continuously for practically 24 hours with 130 watts of 60-volt current, will heat and keep hot 10 to 15 gallons of water per day. L indicates a 15-watt incandescent lamp of common variety. The wires — of the resistances of these pieces of apparatus are connected with the wire — of the inductive transformer coil T^r of 250 watts capacity, 250 watts being the aggregate capacity of the translating apparatus mentioned for

illustration. In the system illustrated as showing the method of applying this invention, the wire + of the percolator resistance is connected directly with the wire + of the transformer coil; the wire + of the cooker resistance is connected with a terminal 1; the wire + of the upper oven resistance is connected with the terminal 2; the wire + of the lower oven resistance is connected with the terminal 3; the wire + of the tank resistance is connected with the terminal 4; and the wire + of the lamp L is connected with the terminal 5. Adapted to normally make contact with the terminal 1 is the end of a conducting lever 6; adapted to normally make contact with the terminal 2 is the end of a conducting lever 7; adapted to normally make contact with the terminal 3 is the end of a conducting lever 8; adapted to normally make contact with the terminal 4 is the end of a conducting lever 9; and adapted to normally make contact with the terminal 5 is the end of a conducting lever 10. These levers are indicated as pivoted on a bar 11 which is connected with the wire + of the transformer coil. Under normal conditions the ends of these levers are engaged with the several terminals.

When the system above described is in use, the transformer takes 250 watts of current continuously from the main line M. This is distributed through the circuits mentioned for practically 24 hours a day, and as the demand is uniform and continuous, this small wattage of current can be supplied from the central station at a low flat rate for a given term.

In the apparatus indicated by the drawing and used as an illustration of an embodiment of the invention, there is a lever 12 pivoted at 13 so as to extend adjacent to the ends of the conducting levers. This lever is normally held away from the conducting levers by means of a spring 14. The free end of this lever is connected with an electro-magnet armature. In the form shown this armature is the core 15 of the solenoid 16. One end of the solenoid coil is connected with the transformer coil, and the other end of the solenoid coil is connected with the wire + of the lamps 17. The lamp wire — is connected with the wire — of the transformer. Ten 15-watt lamps are indicated for the purpose of illustration.

Practically all of the 250 watts of current, which is supplied continuously for 24 hours, goes through the water heater, cooker, oven, and one lamp. If the consumer desires one light at any particular locality, when he switches it on, 15 watts of the current flows through the solenoid coil. This draws in the core and causes the solenoid lever 12 to engage the conductor lever 10 so as to lift its end from the terminal 5 and open the circuit of lamp L. If two more lamps are turned on, enough current passes through the solenoid to draw the core farther in and cause its lever to engage the conductor lever 9 and open the cirucit at terminal 4. This cuts out the heater coil in the water tank. As more lamps are turned on more of the heating coils are cut out. If all of the lamps should be turned on at the same time, which is not often the case, sufficient current would flow through the solenoid to draw in the core and cause the lever 12 to engage all the conductor levers and open all the circuits containing the heating coils of the cooker, oven, and water tank. As the lighted lamps are switched off, the amount of current flowing through the solenoid is reduced so as to relieve the pull on the solenoid core and allow the spring 14 to move the lever 12 out of engagement with the several conductor levers, permitting these conductor levers to again close the circuits containing the coils of the various apparatus. The position of the lever 12 with relation to the conducting levers depends upon the amount of current flowing through the solenoid, consequently, the amount of current that is diverted from the cooker, oven and water tank depends upon the number of lamps that are switched in. When all of the lamps are turned off, all the current is redirected to the cooking and heating apparatus.

It is of course understood that this invention is not limited to the particular varieties of apparatus mentioned, nor to apparatus which uses the specified quantities of current, nor is it limited to a system utilizing alternating current. The types of apparatus and current figures given are merely illustrative and apply to an embodiment of the invention which has proved practical in the case of such a customer as has been mentioned as an example.

The invention claimed is:

1. The improvement in the art of distributing electrical energy to various electrical translating apparatus which consists in continuously supplying a current of uniform voltage and fixed wattage of less amount than the aggregate capacity of the translating apparatus but of sufficient amount to cause certain of the electrical translating apparatus to perform their normal functions, automatically diverting from said translating apparatus a sufficient quantity of current for temporarily energizing other translating apparatus when the latter apparatus are switched in, and automatically re-directing the diverted current to the former apparatus when the latter apparatus are switched out, whereby the amount of current used never varies.

2. The improvement in the art of heating and lighting, which consists in continuously supplying an electric current of uniform voltage and fixed wattage of less

amount than the aggregate capacity of the heating apparatus and lighting apparatus but of sufficient amount to cause the electrical heating apparatus to perform their normal functions, automatically diverting from said heating apparatus sufficient quantity of current for temporarily energizing lamps, when the lamps are switched in, and automatically re-directing the diverted current to the heating apparatus when the lamps are switched out, whereby the amount of current used never varies.

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