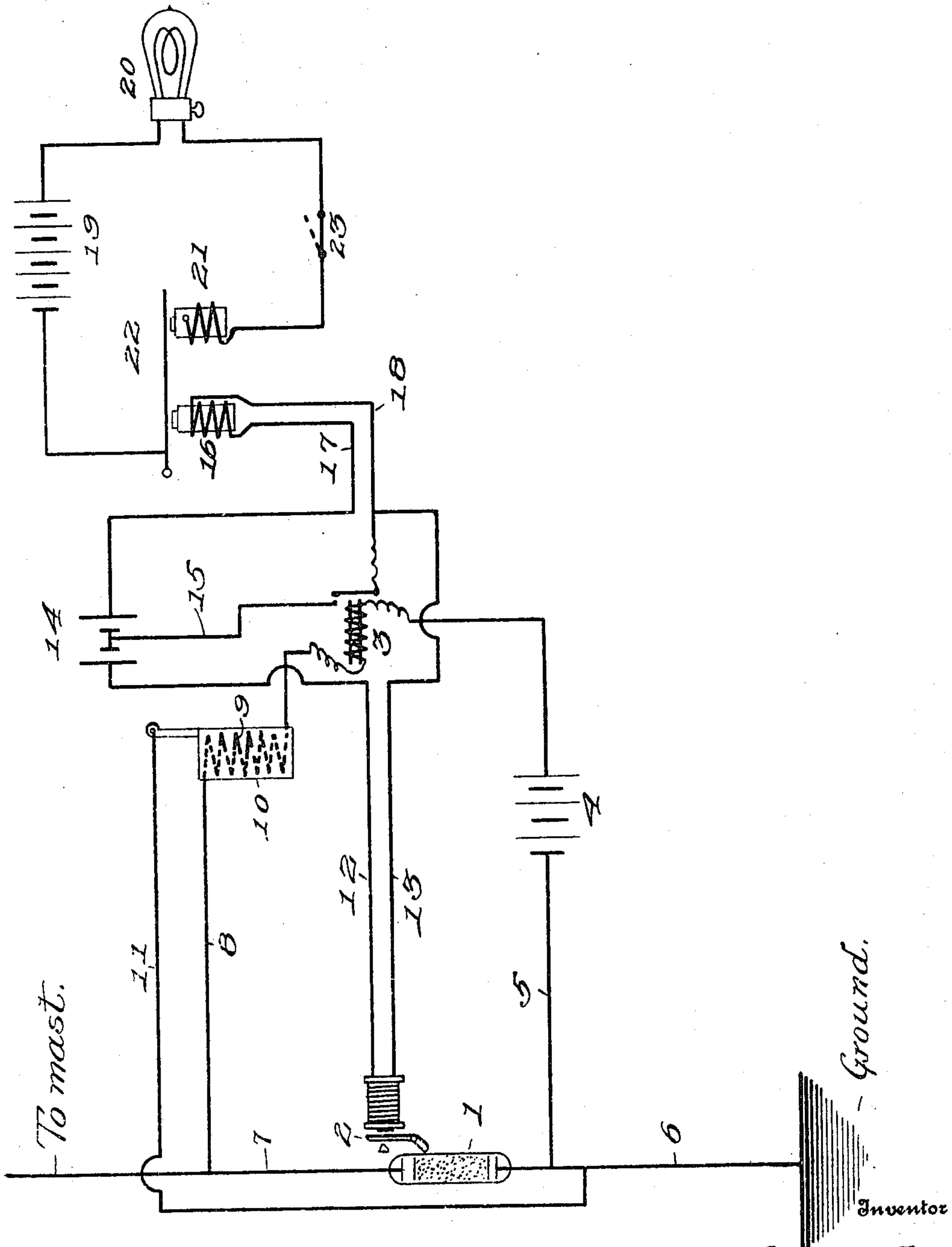


E. B. TUSTIN, JR.
WIRELESS LIGHTING SYSTEM.
APPLICATION FILED APR. 1, 1908.

Patented June 21, 1910.

961,914.



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UNITED STATES PATENT OFFICE.

EDWARD B. TUSTIN, JR., OF BLOOMSBURG, PENNSYLVANIA.

WIRELESS LIGHTING SYSTEM.

961,914.

Specification of Letters Patent. Patented June 21, 1910.

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To all whom it may concern:

Be it known that I, EDWARD B. TUSTIN, Jr., citizen of the United States, residing at Bloomsburg, in the county of Columbia and State of Pennsylvania, have invented certain new and useful Improvements in Wireless Lighting Systems, of which the following is a specification.

The present invention provides novel means for lighting a series of lamps at about the same time without requiring them to be in the same circuit, or electrically connected by wire.

The invention is of especial advantage in rural districts, or sparsely settled sections, or wherever a number of widely separated lights are required to be lighted at or nearly the same instant and it is not feasible, or practicable, to include them in one circuit.

The purpose of the invention is to devise novel means for using Hertzian waves as the means for effecting the results aforesaid, said waves being sent out from a given station, and each lighting system including means capable of being affected by such electro-motive waves to effect illumination of the lamps forming a part thereof.

The invention consists of the novel system and arrangement of parts substantially as shown in the accompanying drawing, which is a diagrammatic view.

The antenna circuit includes the coherer 1 and a tapper 2 is arranged to coöperate with said coherer to loosen the particles after the surges produced by the Hertzian waves. A relay 3 included in a local circuit, is energized when the coherer is affected by the electro-motive waves striking the antenna so as to close a local circuit and produce the desired effect. The relay 3 is located in a local circuit containing battery 4, a wire 5 connecting one pole of said battery to the ground wire 6 of the antenna circuit, the other pole of the battery having connection with the antenna 7 by means of wire 8, which latter also includes an inductance 9 to prevent the surges affecting the relay 3. A capacity sleeve 10 is fitted around the inductance 9 and is connected by wire 11 to the ground wire 6 of the antenna circuit, and supplements the action of the inductance in preventing the surges set up in the antenna circuit from affecting the relay 3 and interfering with the functions normally performed thereby in the system.

The tapper circuit includes wires 12 and

13 and elements of a battery 14, and this circuit is closed by the relay 3 when energized by the action of the Hertzian or electro-motive waves upon the antenna circuit. The wire 12 has direct connection with one pole of the battery 14, whereas the wire 13 has connection with the other pole of an element of the battery by means of a wire 15 and the circuit closing contact and armature of the relay 3.

A local circuit closer for the lamp circuit includes an electro-magnet 16 and wires 17 and 18, the wire 17 running to one pole of the battery 14 and the wire 18 having connection with the other pole of an element of the battery 14 by means of the wire 15 and the circuit closing contact and armature of the relay. As clearly indicated in the drawing, like elements of the battery 14 are electrically connected to one another and to the wire 15, whereas the opposite elements have electrical connection with, respectively, the tapper and circuit closing circuits. This results in producing in effect two independent circuits, the electro-motive force of one being balanced by the electro-motive force of the other so that the current of the battery 14 is divided and sent through the tapper and circuit closing electro-magnets to energize the same each time the relay 3 is vitalized.

The reason for using what is practically two independent circuits with the opposed elements of the battery connected in separate circuits, is that the magnet which operates switch 22 is wound with heavier wire than the magnet which is used in the tapper or de-coherer, therefore the magnet which is wound with the heavier wire consumes more current than those which are wound with a finer wire. Two sets of batteries are used because of the difference of resistance of the two magnets.

The lamp circuit includes a current generator 19, one or more lamps 20 and a circuit closer, the latter comprising an electro-magnet 21 and armature 22. A switch 23 is provided in the lamp circuit to break the same when required. An armature 22 is included in the lamp circuit and is adapted to be attracted by the electro-magnet 16 when vitalized so as to close the lamp circuit, the latter being maintained in closed relation by the attraction of the electro-magnet 21 after the lamp circuit has been initially closed. One wire of the electro-magnet 21 is elec-

trically connected with the core forming a part of said electro-magnet, whereas the opposite end of the wire is connected with a lead of the lamp circuit.

5 It is presumed that in rural districts and sparsely settled sections, or widely separated stations equipped with electric light plants, each place or station so provided with an electric light system also has an antenna circuit and appliances as herein set forth so
10 that Hertzian or electro-motive waves sent out from a given station will produce surges or electrical impulses in the several antenna circuits, with the result that the lamps are
15 lighted. When the coherer of the antenna circuit is affected, an impulse is produced in the relay 3 sufficient to energize the same and close the circuit through the tapper and through the electro-magnet 16. When the
20 electro-magnet 16 is energized, it attracts the armature 22 and closes the lamp circuit provided the switch 23 has been previously closed. The current of the lamp circuit passing through the electro-magnet 21 keeps
25 the same vitalized and attracts the armature 22 and holds the circuit closed until interrupted by the switch 23.

It is to be understood that the several parts are situated or so placed as not to be
30 tampered with, hence when the switches of the several lamp circuits are closed, the lamps are lighted at a given time by the sending out of Hertzian waves in the manner well understood, said waves producing
35 electrical impulses or surges in the antenna circuits, with the results hereinbefore set forth.

Having thus described the invention, what is claimed as new is:

40 1. In combination, a lighting circuit, lamps therein, and an electrical circuit closer for the lighting circuit included therein, an electro-magnet in said lighting circuit co-

operating with said circuit closer to hold the same closed while current is passing in the lighting circuit, an antenna circuit, a local circuit including a relay and having electrical connection with the antenna circuit upon opposite sides of the coherer, a tapper circuit, and a circuit closing circuit having
45 a battery and a closer common to each, said closer adapted to be operated by the relay, and the circuit closing circuit including an electro-magnet for closing the working circuit, the battery common to the tapper and
50 circuit closing circuits having like elements electrically connected with each and having the opposite elements electrically connected with the opposite ends through the circuit closing contact and armature of the afore-
60 said relay.

2. The combination with an electric lighting circuit, electric lamps therein, and a circuit closer therein, of an antenna circuit, a coherer therein, a local circuit including a
65 relay and having an electric connection with the antenna circuit on opposite sides of the coherer, a tapper circuit, an electro-magnet arranged to close the circuit closer of the lamp circuit, a circuit having therein a
70 source of power and connected to said electro-magnet, a circuit closer in the last named circuit, actuated by said relay magnet, an electro-magnet in the lamp circuit adapted to hold the circuit closer of the lamp circuit
75 closed after it has been initially operated, and means for cutting off current through the lamp circuit, thereby demagnetizing said circuit and releasing the circuit closer.

In testimony whereof I affix my signature 80 in presence of two witnesses.

EDWARD B. TUSTIN, JR. [L.S.]

Witnesses:

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