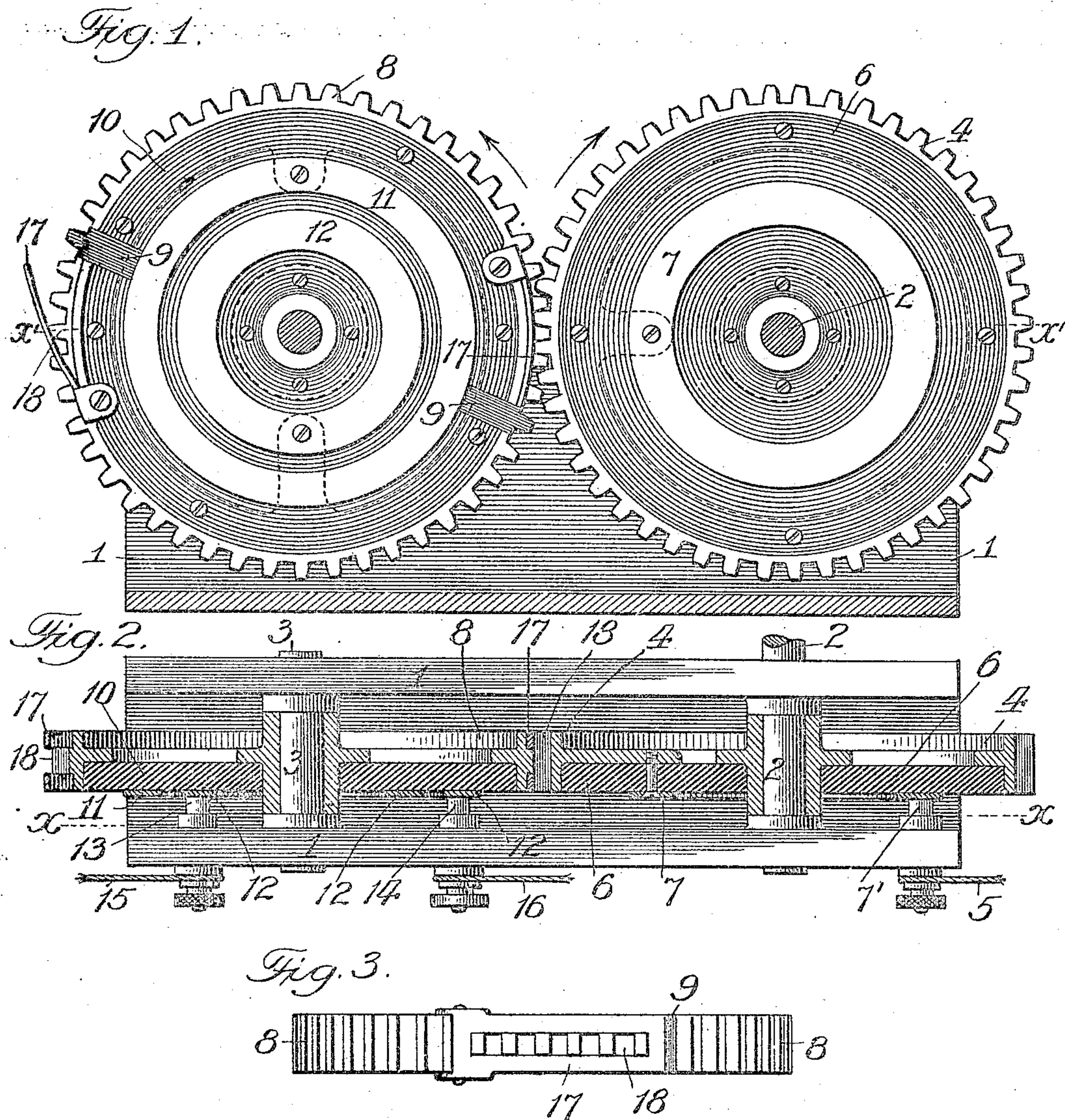


P. J. DOYLE.  
CIRCUIT CHANGER.  
APPLICATION FILED APR. 7, 1909.

951,601.

Patented Mar. 8, 1910.



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# UNITED STATES PATENT OFFICE.

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## CIRCUIT-CHANGER.

951,601.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed April 7, 1909. Serial No. 488,428.

*To all whom it may concern:*

Be it known that I, PATRICK J. DOYLE, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Circuit-Changers, of which the following is a specification.

This invention relates to the intermittent or "flasher" type of electric signs, and has for its object to provide a simple, durable and efficient circuit changing mechanism adapted to alternately shift the electric current from one portion of the sign to another, all as will hereinafter more fully appear.

In the accompanying drawings illustrative of the present invention: Figure 1, is a vertical sectional elevation on line  $x-x$ , Fig. 2. Fig. 2, is a horizontal section on line  $x'-x'$ , Fig. 1. Fig. 3, is a face view of the driven member or gear wheel.

Similar numerals of reference indicate like parts in the different views.

Referring to drawings, 1 represents a supporting frame having bearings in which are journaled the driving and driven shafts 2 and 3 of the present mechanism.

4 is a gear wheel carried by the driving shaft 2 and having a continuous toothed rim of conducting material electrically connected with a supply line or wire 5 of the electric circuit by which the sign lamps are supplied. In the preferred construction shown, said rim is carried by a web 6 of insulating material and is electrically connected with a conducting ring 7 carried by said web in concentric relation to the axis of rotation of the gear wheel 4. Said ring 7, is adapted for contact with the contact brush 7' carried by the frame 1 and attached to the line wire 5 aforesaid.

8 is a gear wheel carried by the driven shaft 3 and meshing with and receiving rotation from the gear wheel aforesaid. In the preferred construction shown, the toothed rim of the gear wheel 8 is formed in sections which are separated by sectors 9 of insulating material and formed with a gear tooth as shown. The rim sections aforesaid, are attached to a web 10 of insulating material and individually connected with conducting rings 11 and 12 carried by said web in separated relation to each other and in concentric relation to the

axis of rotation of said gear wheel 8. The rings 11 and 12 are in turn adapted for individual contact with stationary contact brushes 13 and 14, carried on the frame 1 and individually connected by line wires 15 and 16 with different groups of lamps in the sign. Where there are two groups of lamps, the rim of the wheel 8 is divided into two insulated sections, as shown, and individually to the two groups of lamps, and with a greater number of groups a corresponding number of said sections will be formed in the aforesaid rim of the gear wheel 8.

With the described construction, as the two gear wheels rotate in unison, the insulated rim sections of the gear wheel 8 are alternately brought into extended surface and electrical contact with the gear wheel 4 to alternately complete the electric circuit to the two groups of lamps, and so that one group will be active while the other group is dormant, and vice versa.

17 are spring tongues attached at one end to the periphery of the gear wheel 8, and preferably near the base of the gear teeth thereof, and with their free ends immediately adjacent to the sector 9 of insulating material before described. In the construction shown the tongues 17 are of the same width as the face of the wheel 8 and are formed with central elongated slots 18 for the passage of portions of the gear teeth next to said tongues, and to such end said portions of the gear teeth are cut away at their sides to fit the aforesaid elongated slots 18, and project therethrough and mesh with and be driven by the teeth of the gear wheel 4 in the continued operation of the mechanism, and as illustrated in Figs. 2 and 3. The purpose of the tongues 17 is to provide a quick break of the circuit as the rim sections which carry the same move out of mesh with the driving gear 4, in that the free ends of said tongues will maintain electric contact until the last moment, and then rapidly move out of contact, due to their restrained resiliency, and which restraint is due in turn, to the teeth of the driving gear holding said tongues against the periphery of their carrying gear 8 while passing through the meshing zone of the pair of gear wheels.

Having thus fully described my said in-



vention what I claim as new and desire to secure by Letters Patent, is:—

1. In a circuit changer, the combination of a driving gear wheel, and a driven gear wheel, the driving gear wheel being adapted for connection to the source of electric supply, and the driven gear wheel having its toothed rim formed into a series of insulated sections, individual terminals connected to said insulated sections, and spring tongues attached to said insulated sections and adapted to afford final contact with the driving gear, substantially as set forth.

2. In a circuit changer, the combination of a driving gear wheel, and a driven gear wheel, the driving gear wheel being adapted for connection to the source of electric supply, and the driven gear wheel having its toothed rim formed into a series of insulated sections, individual terminals connected to said insulated sections, and spring tongues attached to said insulated sections and adapted to afford final contact with the driving gear, said tongues having elongated slots through which project portions of the teeth of each insulated section narrowed to fit said slots, substantially as set forth.

3. In a circuit changer, the combination of a driving gear wheel having an annular toothed rim and a web of insulating material, a conducting ring attached to said web and electrically connected to said rim, a contact brush bearing on said ring, a driven gear wheel having a web of insulating material and an annular toothed rim formed into insulated sections, individual conducting rings attached to said web and electrically connected to said insulated rim sections, and individual contact brushes bearing on said rings, substantially as set forth.

4. In a circuit changer, the combination

of a driving gear wheel having an annular toothed rim and a web of insulating material, a conducting ring attached to said web and electrically connected to said rim, a contact brush bearing on said ring, a driven gear wheel having a web of insulating material and an annular toothed rim formed into insulated sections, individual conducting rings attached to said web and electrically connected to said insulated rim sections, individual contact brushes bearing on said rings, and spring tongues attached to the insulated rim sections and adapted to afford final contact with the driving gear, substantially as set forth.

5. In a circuit changer, the combination of a driving gear wheel having an annular toothed rim and a web of insulating material, a conducting ring attached to said web and electrically connected to said rim, a contact brush bearing on said ring, a driven gear wheel having a web of insulating material and an annular toothed rim formed into insulated sections, individual conducting rings attached to said web and electrically connected to said insulated rim sections, individual contact brushes bearing on said rings, and spring tongues attached to the insulated rim sections and adapted to afford final contact with the driving gear, said tongues having elongated slots through which project portions of the teeth of each insulated section narrowed to fit said slots, substantially as set forth.

Signed at Chicago, Illinois, this 6th day of April 1909.

PATRICK J. DOYLE.

Witnesses:

ROBERT BURNS,  
HENRY MOE.