

(No Model.)

H. W. LEONARD.
ELECTRIC LIGHTING SYSTEM.

No. 405,896.

Patented June 25, 1889.

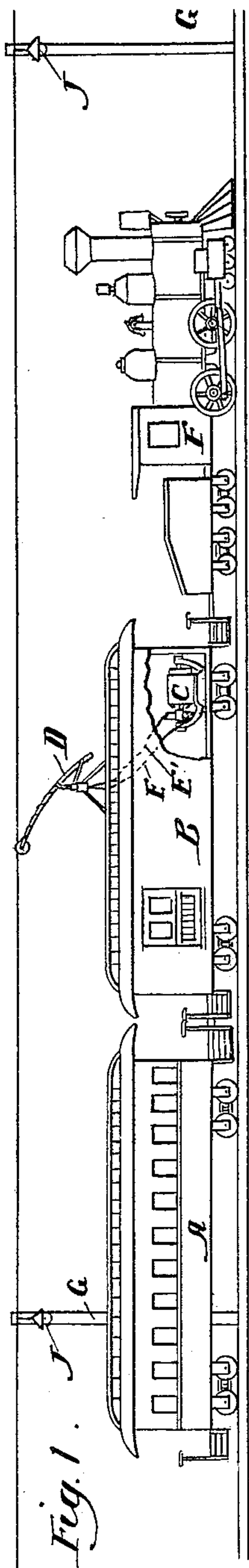


Fig. 1.

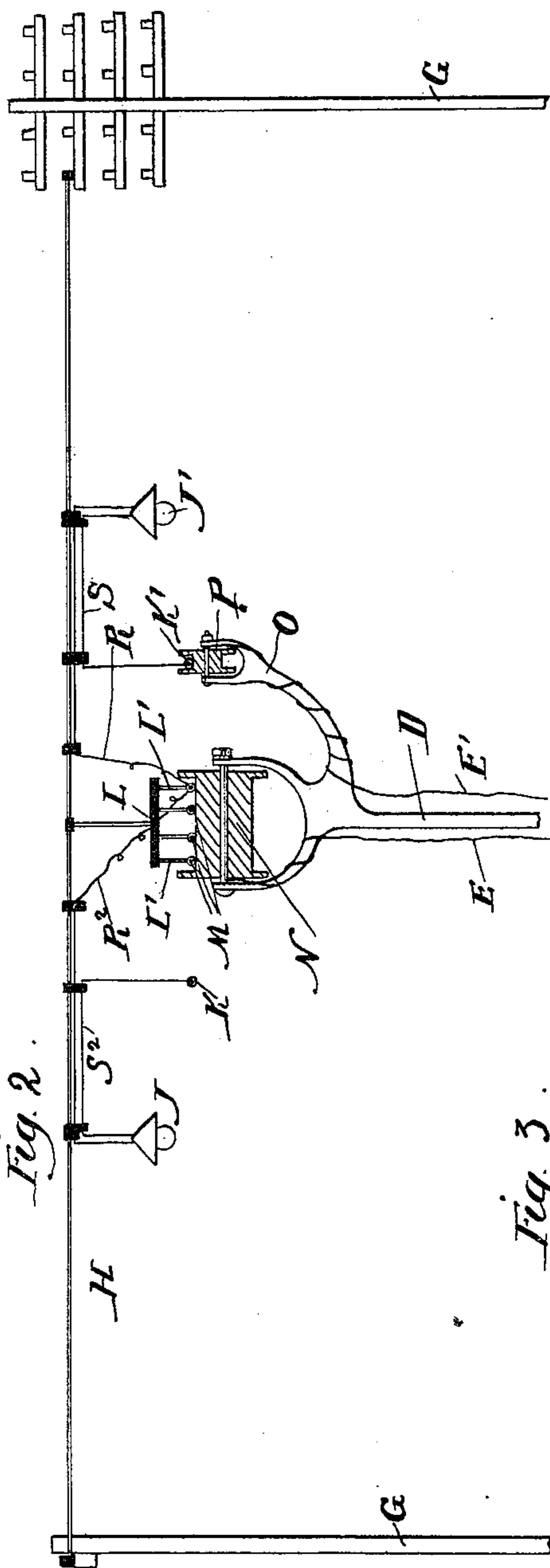


Fig. 2.

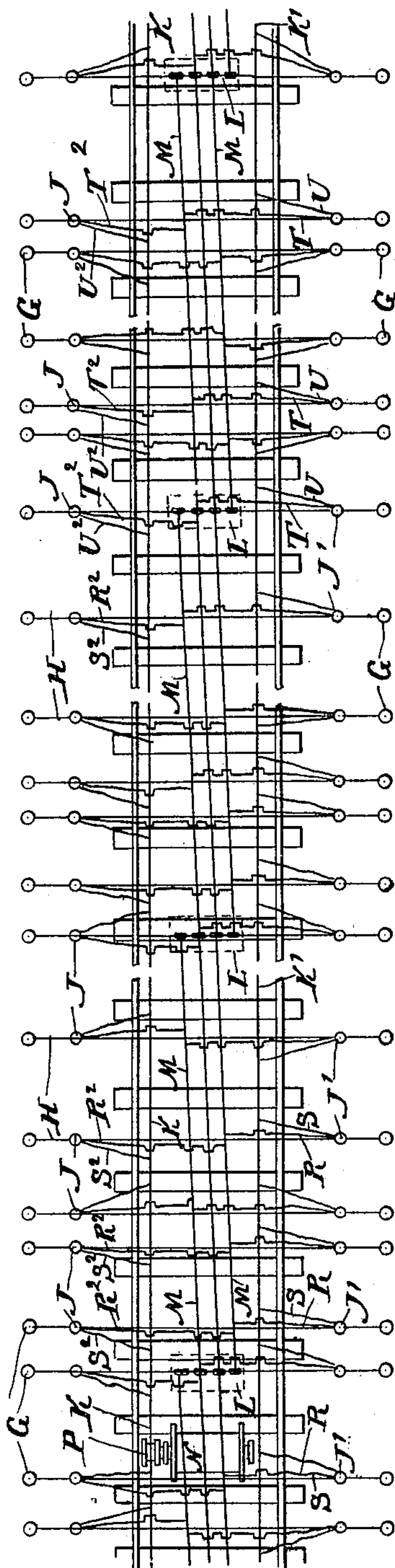


Fig. 3.

Witnesses:

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HARRY WARD LEONARD, OF CHICAGO, ILLINOIS.

ELECTRIC-LIGHTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 405,896, dated June 25, 1889.

Application filed January 19, 1889. Serial No. 296,862. (No model.)

To all whom it may concern:

Be it known that I, HARRY WARD LEONARD, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Electric Lighting and Distribution, of which the following is a specification.

My invention relates to devices for illuminating railroad-tracks and the like and for energizing translating devices from a generator in motion, and has for its object to provide convenient means therefor.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of a track equipped with my device with parts removed. Fig. 2 is a cross-section of such track, showing the parts in position. Fig. 3 is a diagrammatic view of a track and wires and lamps.

Like parts are indicated by the same letter in all the figures.

A is a car; B, the baggage-car containing the generator C and carrying the trolley-pole D, along which leads the two wires E and E' from the poles of the generator.

F is the locomotive.

G G are poles along the sides of the track.

H H are suspending-wires from such poles across the track. From these wires are suspended in suitable manner and by suitable insulators the lamps J and J', the wires K and K', and the insulating-block L. From this latter hangs the links L' L', carrying each one of the wires M M. On the trolley-pole D is pivoted the large roller N, which bears upward against the wires M M, and on the arm O from such trolley-pole is pivoted the small roller P, which bears upward against the wire K' or K, according to the direction in which the train or car carrying the trolley-pole is moving. At one end of each wire M there are connectors—as, for instance, R R—which connect such wire with the lamps J'. From these same lamps lead connectors S S to the wire K'. On the other end of each wire M are a series of connectors T T, leading, respectively, to lamps J' J' on the same side of the track as the lamps J' J' first mentioned.

From these lamps lead return-connectors U U to the wire K'. Each wire M, describing from the left-hand side of the drawings, has at one end a series of connectors R² R², leading to the lamps J J, from which run connectors S² S² to the line-wire K, and each wire M has at its other end a series of connectors T² T², leading to the lamps J J, on the same side of the track as the first-mentioned lamps J J. From these lamps lead connectors U² U² to the line-wire K. All these wires M M run diagonally to the course of the track, and each is connected in the manner above indicated, with three lamps on each side of the track at each end, said lamps being suspended, preferably, in pairs on a cross-wire H. The wires are arranged so that there will be three in any cross-section taken along the track.

Of course the arrangement, number, and connections of the lamps and wires could be greatly changed without departing from the spirit of my invention, and when applied to a double-track road, where the trains move usually in one direction, the lamps on one end of each wire M and on one side of the track could be omitted; or they could be omitted on either end or either side, as desired.

My device is shown as designed for a single-track road and to illuminate the track in both directions from the train, and on one side of the track when the train is moving in one direction and on the other when it is moving in the opposite direction.

In Fig. 2 the trolley and train are supposed to be moving away from the observer, and in Fig. 3 toward the left.

The use and operation of my invention are as follows: When a train, the baggage-car of which is equipped with a generator and trolley-pole, as described, is proceeding in one direction—say away from the observer when applied to Fig. 2 and toward the right when applied to Fig. 1, the trolley being in the latter case turned around—the trolley-roller N bears upward against and engages the bare wires M M, while the trolley-roller P bears upward against the bare wire K'. Thus a circuit is made through the generator, connector E, roller N, wires M M, connectors R

R, through lamps J' J', back through connectors S S to wire K', through pulley P and wire E' back to the generator. Thus so long as the trolley-roller N is against any one wire
 5 M this circuit is made through all lamps connected with such wire M, and with the wire K' if the trolley is moving as last-above described. If the trolley is moving toward the left, as indicated in full lines in Fig. 3, all
 10 lights will be energized which are in connection with wire K. Thus when the train is moving toward the right all lights on the right-hand side of the track are lighted with a distance of about the length of one wire M in
 15 each direction from the generator. As soon as the trolley-roller N is off of any wire M of course the lights connected with such wire are extinguished. Thus the train is illuminated, also the track, at the place of its movement,
 20 also the track for any desired distance front and rear—say one-third of a mile—and the direction of the motion of the train can be easily determined by any one having occasion to notice. The lights are so arranged
 25 along the track and on the wires that they are extinguished and lighted in groups of, say, three at the ends of the lighted path.

I have shown my invention as applied to lights and lighting tracks; but it is clearly
 30 applicable to any device or arrangement wherein it is desired to energize translating devices from a generator moving with reference thereto, and particularly where such devices are to be energized in succession or suc-
 35 cessive series.

Of course it is clear that the wires K and K' could be dispensed with and the wires E' and the wires connecting the lamps with wires K and K' be led to ground.

40 The essential feature of my invention is its applicability to the lighting of railroad-tracks from and by means of generators, particularly dynamos, on a moving train, and in so applying it it must be evident that a prac-
 45 tically continuous succession of lights in operation for a considerable distance along the track must be had. In this my invention is distinguished from all manner of signaling devices arranged along the track and oper-
 50 ated by a generator on the train, for in the case of such signals it is neither desirable nor necessary that they should be continuously in operation; nor am I aware of any form of device or arrangement of circuits whereby
 55 such signaling devices arranged along a track are kept some of them constantly energized from and by the moving generator.

I claim as new and desire to secure by Letters Patent—

60 1. The combination of a series of short wires, a series of long wires, a generator of electricity, a branched connector leading therefrom to the short wires and either one of the long wires, as the case may be, and series of
 65 lamps connected some with the short wires

and one of the long wires and others with the short wires and another of the long wires.

2. The combination of a series of short overlapping wires, two long wires, two series of lamps connected one series from one long
 70 wire, the other series from the other long wire, and both to the short wires, and a generator movable along such wires and a branched connector leading therefrom to the short wires
 75 and one of the long wires.

3. The combination of a series of fixed conductors, a series of translating devices connected therewith, a generator movable along such conductors, a movable connector nor-
 80 mally in contact with at least one of such conductors and one pole of the generator, and connectors between the other pole of the generator and some of such conductors, the circuit being thus completed through a trans-
 85 lating device, so as to successively energize such translating devices from the moving generator and normally to keep some of them constantly energized.

4. The combination of a series of fixed conductors, a series of electric lamps connected
 90 therewith, a generator movable along such conductors, a movable connector normally in contact with at least one of such conductors and one pole of the generator, and connectors
 95 between the other pole of the generator and some of such conductors, the circuit being thus completed through a translating device, so as to successively energize such electric
 100 lamps from the moving generator and normally to keep some of them constantly ener- gized.

5. The combination of a series of fixed overlapping conductors, a series of translating devices connected therewith, a generator mov-
 105 able along such conductors, a movable connector normally in contact with at least one of such conductors and one pole of the generator, and connectors between the other pole of the generator and some of such conductors, the circuit being thus completed through a
 110 translating device, so as to successively energize such translating devices from the moving generator and normally to keep some of them constantly energized.

6. The combination of a series of fixed con-
 115 ductors along a railroad-track, a series of translating devices connected therewith, a movable generator adapted to be carried along the track, a movable connector from one pole of the generator and normally in contact with
 120 at least one of such conductors, and connections from the other pole of the generator to some of such conductors, the circuit being thus completed through a translating device, so that the translating devices are successively
 125 energized from the generator moving on the track and some of them always energized when in operation.

7. The combination of a series of fixed con-
 130 ductors, a series of incandescent lamps con-

nected therewith, a generator movable along such conductors, a movable connector normally in contact with at least one of such conductors and one pole of the generator, and
5 connectors between the other pole of the generator and some of such conductors, the circuit being thus completed through a translating device, so as to successively energize

such incandescent lamps from the moving generator and normally to keep some of them constantly energized.

Dated the 16th day of January, 1889.

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