

No. 731,466.

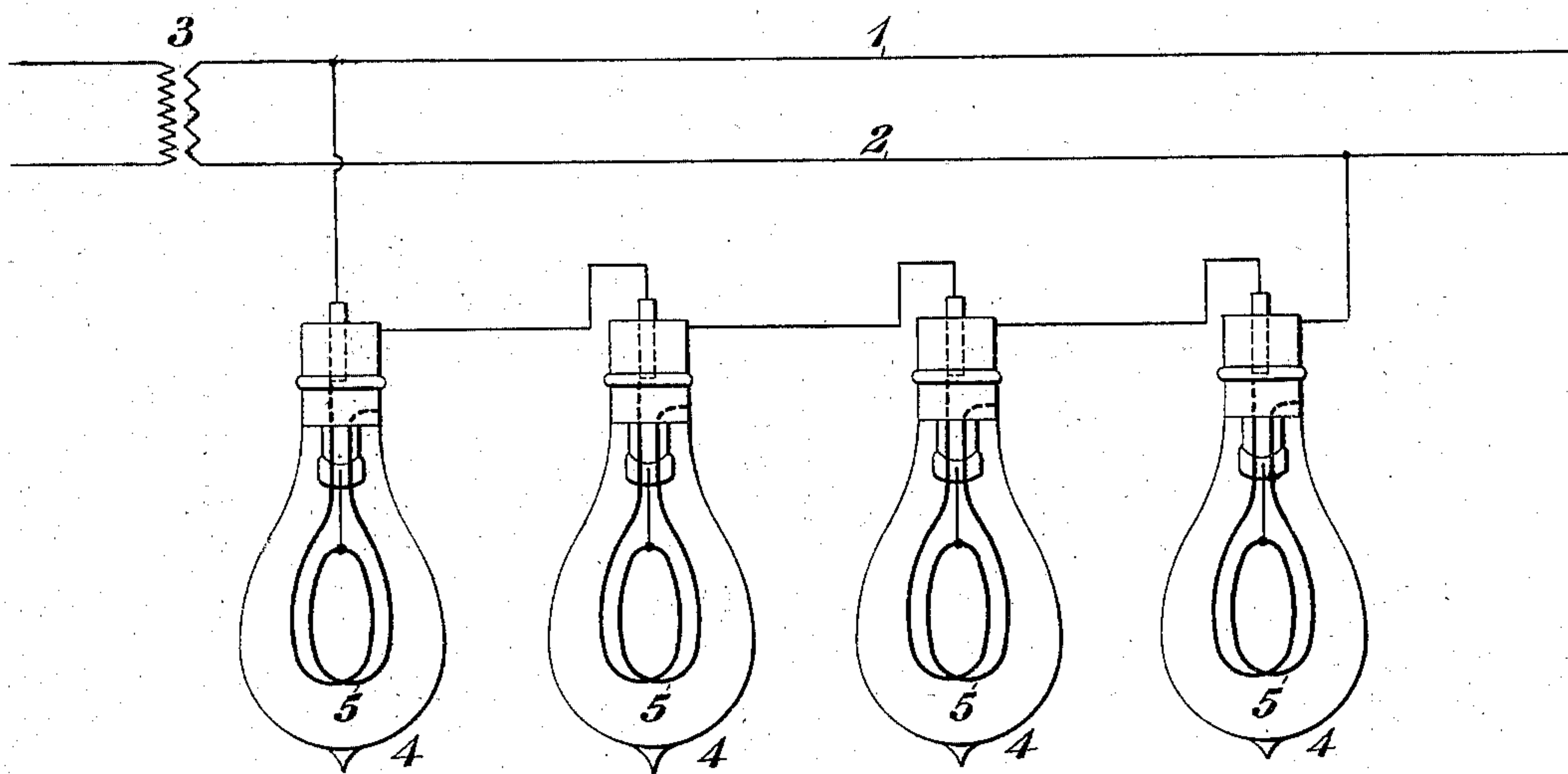
PATENTED JUNE 23, 1903.

B. G. LAMME.

LIGHTING APPARATUS FOR RAILWAY VEHICLES.

APPLICATION FILED SEPT. 29, 1902.

NO MODEL.



WITNESSES:

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UNITED STATES PATENT OFFICE.

BENJAMIN G. LAMME, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

LIGHTING APPARATUS FOR RAILWAY-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 731,466, dated June 23, 1903.

Application filed September 29, 1902. Serial No. 125,224. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN G. LAMME, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Lighting Apparatus for Railway-Vehicles, (Case No. 1,087,) of which the following is a specification.

My invention relates to means for illuminating electrically-propelled railway-vehicles; and it has for its object to provide means for this purpose which shall be adapted to alternating currents of very low frequency.

In an application for patent, Serial No. 87,316, filed by me December 26, 1901, I have set forth a system whereby single-phase alternating electric currents of very low frequency may be economically and advantageously utilized for propelling railway-vehicles, and in the practical development and application of such system it becomes necessary to provide means for efficiently lighting the vehicle so operated.

Difficulty in utilizing the energy employed for propelling the vehicles for producing the required illumination has been experienced by reason of the fact that the low rate of alternations produces objectionable fluctuations in the light emitted from incandescent lamps supplied thereby when such lamps are constructed and operated in accordance with the usual practice. I propose to meet and overcome this difficulty by providing lamps having special characteristics which will adapt them to this service.

My invention is diagrammatically illustrated in the single figure of the accompanying drawing, where I have illustrated a lamp-circuit 1 2, as supplied from the secondary of a step-down transformer 3, the primary being supplied from the trolley-circuit.

In this system the frequency of the single-phase alternating current employed is less than three thousand alternations per minute and will generally be in the neighborhood of

two thousand alternations per minute, though not necessarily restricted to this rate. This low rate renders impracticable the employment of ordinary incandescent lamps in the usual manner. I therefore propose to employ lamps the filaments of which shall have a large degree of heat inertia—that is, they shall be of such large cross-section as to be adapted to low voltage and heavy current, and therefore shall carry such amount of heat that they will not cool down sufficiently during the reversals of current to materially affect their illuminating power.

The voltage employed for the lamp-circuit will obviously depend upon the number of lamps which are connected in series; but the adjustment may be made such by means of the transformer 3 that each lamp shall be adapted to an electromotive force of from five to ten volts and to a current which may be approximately ten amperes.

I do not, of course, limit the invention to these values, but give them as illustrations to show that the voltage is extraordinarily low and the current extraordinarily large as compared with the voltage and current usually employed in commercial lighting.

The lamps 4, which are supplied from the circuit 1 2, may be of the usual construction, except that the filaments 5 are, as above indicated, of special construction and the arrangement of the lamps in circuit may be varied and adjusted to suit the requirements of any particular case.

I claim as my invention—

1. The combination with an alternating-current circuit of very low frequency, of an incandescent lamp having a filament of such large cross-sectional area that it may operate with a large current at low voltage and have such a degree of heat inertia that it will not cool sufficiently between alternations to effect visible fluctuations in the light emitted by it.

2. In a lighting system for railway-vehicles, the combination with an alternating

current circuit of very low frequency, of a plurality of incandescent lamps having filaments of such large cross-sectional area that they may utilize a very large current at low
5 voltage and have such a degree of heat inertia that reversals of the current will not effect visible fluctuations in the light emitted.

In testimony whereof I have hereunto subscribed my name this 25th day of September, 1902.

BENJ. G. LAMME.

Witnesses:

JAMES B. YOUNG,
BIRNEY HINES.