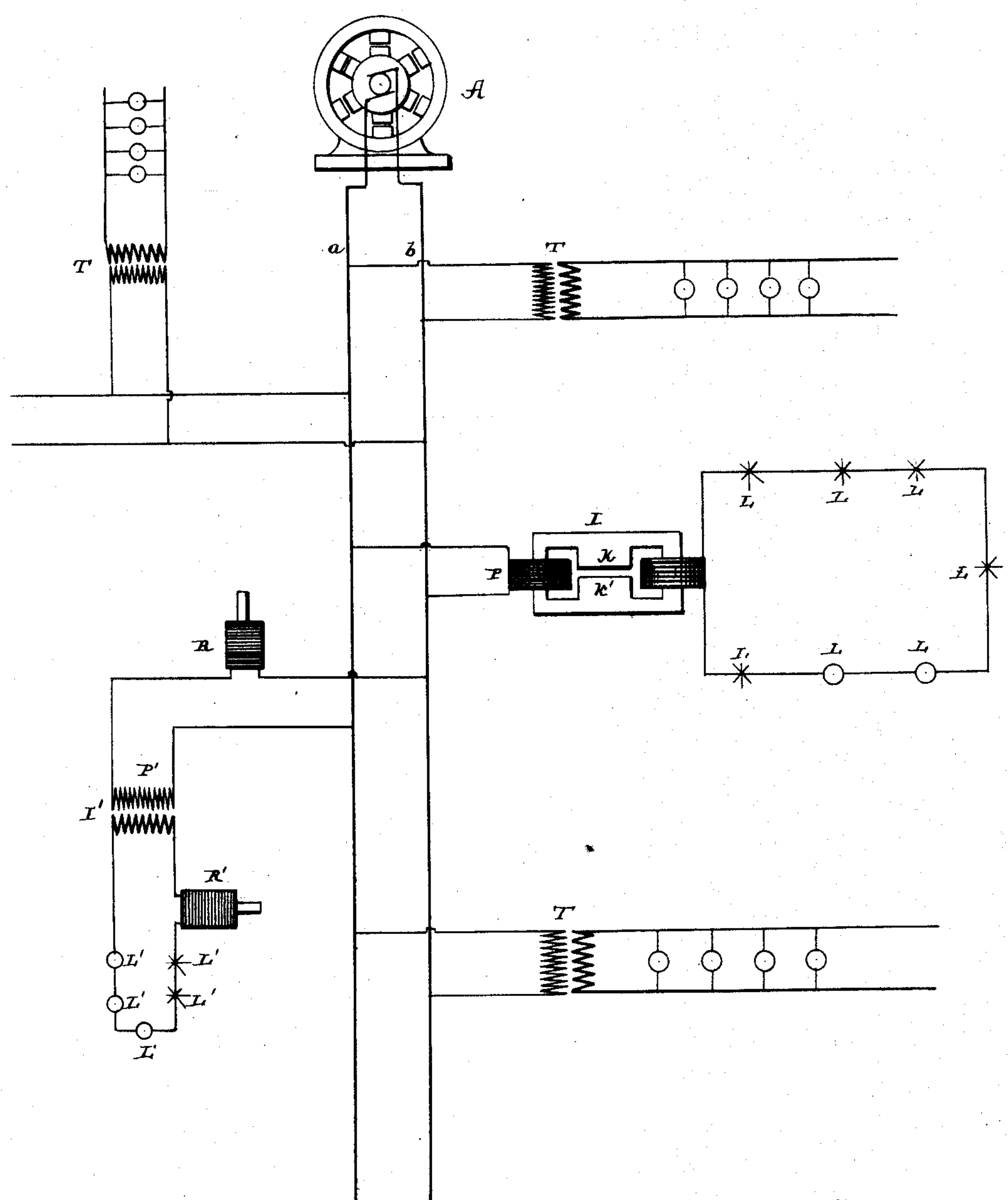
(No Model.)

E. THOMSON.

SYSTEM OF DISTRIBUTION FOR ALTERNATING CURRENTS.

No. 421,208. Patented Feb. 11, 1890.



Witnesses

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[illegible]

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UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF LYNN, MASSACHUSETTS.

SYSTEM OF DISTRIBUTION FOR ALTERNATING CURRENTS.

SPECIFICATION forming part of Letters Patent No. 421,208, dated February 11, 1890.

Application filed February 4, 1889. Serial No. 298,621. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, and a resident of Lynn, in the county of Essex and State of Massachusetts, have invented a certain new and useful System of Distribution for Alternating Currents, of which the following is a specification.

The object of my invention is to provide for the operation of electric devices in series and in multiple from the same mains or source of energy and in a simple and effective manner. The invention is designed more particularly to permit this to be done from the same set of constant potential mains, the object being to permit incandescent lamps run in parallel and arc or other lamps run in series to be operated from the same source of energy, supplying currents of constant potential to suitable mains. Instead of incandescent lamps, other translating devices of any desired description might be run in parallel, and instead of the arc or other lamps in series any other final consumers of energy—such as electric motors—might be employed.

My invention consists, essentially, in the herein-described system of distribution, comprising an alternating-current source of approximately-constant potential, a transformer or transformers having its primary supplied from said source and having its secondary connected to translating devices in multiple arc, and other transformer or transformers having a primary supplied from the same constant potential source and feeding one or more electric lamps or other final-energy consumers in series, the latter transformer or transformers being properly constructed or combined with suitable devices, whereby a current of approximately-constant strength may be delivered to the series of translating devices.

In the accompanying drawings I have illustrated my invention diagrammatically.

A indicates an alternating-current generator of any suitable kind, and *a b* mains leading therefrom and of approximately-constant potential.

T T indicate transformers of the ordinary kind, having their primary coils connected to branches run from the mains in any desired direction and placed wherever convenient. The secondaries of said transformers supply the incandescent lamps or other translating devices in parallel, as indicated. A system of distribution of this nature is well known and is capable of great extension. In connection with such system I employ other transformers, as I I′, whose primaries are in branches from the mains *a b*, and whose secondaries connect to circuits leading out to lights L L L′ L′ or other translating devices in series, thus establishing a series circuit which may be of any desired voltage, either higher or lower than that existing between the mains *a b*, or of the same potential or voltage, as desired. The current on the series circuit supplied from such secondaries should obviously remain practically unchanged, despite changes in resistance of such series circuits produced from any cause—as, for instance, by shunting out the arc or other lamps L L′. A compensation for this purpose may be secured by a proper construction of the transformer itself, or by introducing either into the primary branch, as shown in connection with converter I′, a variable reactive device R, or by introducing into the secondary line of such converter a similar variable resistance or reactive device R′ for keeping the currents at a determinate strength. A suitable construction of transformer for accomplishing this purpose is indicated at I, and forms the subject of another application for patent filed by me January 10, 1888, Serial No. 296,018. In this transformer the primary and secondary are wound on separate parts of the same core, and a partial magnetic shunt for the part of the core between them is provided by means of pieces of iron or extensions K K′ brought into close proximity. By a proper adjustment of the space between such extensions an automatic fall of potential will be produced in the secondary in case the resistance thereof diminishes.

I do not limit myself to any particular means for obtaining a constant current in the series circuit or regulating the strength of current therein.

The devices L L′ are, as before stated, either arc lights in series, incandescent lights in series, or other translating devices, as desired.

The advantage of this system is that it per-

mits the use, for district and interior lighting, of ordinary transformers supplying incandescent lamps, as usual, from their secondaries, and, in connection with the same, distributing-mains, long branch or district lines conveying currents to a considerable distance and maintaining arc lights in series for outdoor illumination, or for illumination, or, if desired, either separately or together with such arc lamps, incandescent lamps arranged in series for store-lighting or indoor work, the primary source of all the current being the alternating-current generator or generators at A, properly placed at a central or other suitably-located station.

I have described my system applied to the operation of incandescent lamps in parallel; but it will be obvious that the same arrangements are equally applicable to the supplying of other translating devices in place of those named and indicated, and I do not therefore limit myself in this respect.

While I have described the use of arc or series incandescent lamps at the points L′, it will be understood that other final-energy users may be substituted therefor.

I do not claim herein the system of distribution in which the series circuit supplied from the secondary is one containing transformers in series, so that the series current is converted before it is finally utilized in the final-energy users, such as lamps or other devices. In my invention the series circuit connected to the secondary or secondaries contains the final energy-consumers, and the current of such secondary is finally utilized without being again converted by means of the transformers or other converting devices.

What I claim as my invention is—

1. The combination, with the same constant potential source, of a transformer whose secondary supplies a constant-current circuit having electric lamps or other final-energy users in series thereon, and a transformer whose secondary supplies translating devices arranged in multiple arc, the primaries of both said transformers being supplied in multiple from the said source.

2. The herein-described system of electric distribution for lighting purposes, consisting of alternating-current mains of constant potential, incandescent lamps or other translating devices supplied in multiple from the secondaries of transformers whose primaries are supplied in multiple from said mains, and arc or other lamps placed on constant-current-series circuits connected to the secondaries of other transformers, having their primaries also connected to the same constant potential source in multiple with the primaries of the first-named transformers.

Signed at Lynn, in the county of Essex and State of Massachusetts, this 31st day of January, A. D. 1889.

ELIHU THOMSON.

Witnesses:
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