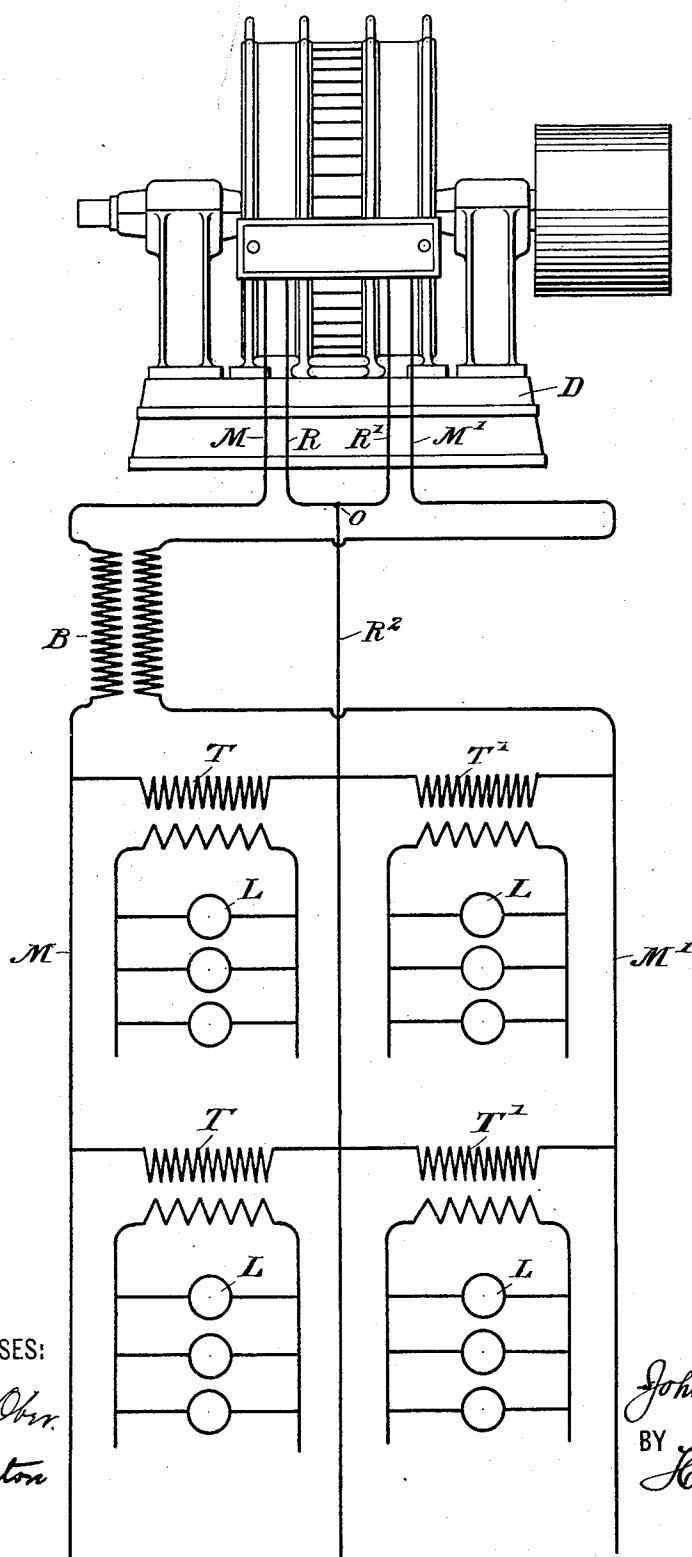


(No Model.)

J. F. KELLY.
SYSTEM OF ELECTRICAL DISTRIBUTION.

No. 559,530.

Patented May 5, 1896.



WITNESSES:

Frank S. Ober
C. B. Eaton

INVENTOR

John F. Kelly

BY

C. B. Brownell

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN F. KELLY, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO THE
STANLEY ELECTRIC MANUFACTURING COMPANY, OF SAME PLACE.

SYSTEM OF ELECTRICAL DISTRIBUTION.

SPECIFICATION forming part of Letters Patent No. 559,530, dated May 5, 1896.

Application filed November 20, 1895. Serial No. 569,502. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. KELLY, a citizen of the United States, residing at Pittsfield, in the county of Berkshire and State of Massachusetts, have invented a new and useful System of Electrical Distribution, of which the following is a specification.

My invention relates to improvements in electric systems in which alternating currents of different phase are used, and has for its object to prevent the unbalancing of the current in circuits carrying currents of different phase, which unbalancing in circuits as ordinarily arranged and constructed is due to the mutual induction between the component parts of such a circuit. This unbalancing is especially troublesome in two-phase systems where one return-wire common to both circuits is used, and as yet no satisfactory means have been invented to prevent it in such a circuit so far as I am aware. It is in connection with such a system that I shall describe my invention, referring to the accompanying drawing, which shows diagrammatically a system embodying my invention.

In the drawing, D represents a generator of two-phase currents of any ordinary type. I prefer the type having all the coils stationary; but this is in no way essential.

M and M' represent the two lines or mains with their various branches carrying the currents of different phase, for which R² is a common return-wire, branching at O into the wires R and R', which lead to the respective generating-coils of the two circuits.

T T are translating devices, here represented as transformers supplying lamps or other translating devices L L L, and B is a balancing-transformer, to be further described below.

Under ordinary circumstances the lines or mains M M' would be connected directly to the coils of the generator and not through a balancing-transformer. For such a system as that I have above described, when the lines are thus directly connected, the mutual induction between the component parts of the system is unbalanced, and is therefore such as to create an increased opposition to the flow of one current and a decreased opposition to the flow of the other. When the electromotive force of mutual induction is rela-

tively high, the results are such as to preclude the use of such a system and compel a resort to four wires. By my invention, however, I am able to preserve the cheaper system, in which a common return-wire is used for both circuits, and yet avoid the trouble due to mutual induction. In embodying my invention therein I place a balancing-transformer B with one of its coils in each circuit of the system having an otherwise normally-unbalanced mutual induction, the coils being so wound that the induction between them is in the opposite direction to that on the lines themselves. The dimensions of the transformer are at the same time so chosen that the mutual induction of its coils is equal to that of the lines, so that the unavoidable mutual induction of the lines is balanced by the intentional mutual induction at one point—*i. e.*, within the transformer-coils—and the system having a common return-wire may be advantageously used. By thus having two equal inductions of equal magnitude and opposite directions the circuits are the equivalents of circuits entirely devoid of mutual induction.

Although I have described my invention in connection with a system such as that shown in the drawing, I do not desire to be understood as confining it to use in such a system or to any particular system in which it is capable of use.

Having thus described my invention, what I claim is—

1. In a system for alternating currents of different phase having an otherwise normally-unbalanced mutual induction a balancing-transformer having its coils in series respectively with the mains carrying the currents of different phase, substantially as described.

2. In a system for alternating currents of different phase the combination of a transformer with the lines carrying the currents of different phase, the coils on the transformer being connected respectively with the mains carrying currents of different phase and having a relation of mutual induction equal and opposite to that of the lines, substantially as described.

3. In a system for two alternating currents of different phase the combination of a trans-

former having two coils, with two lines or
mains carrying the currents of different
phase, each of the coils being connected in
series with one of the lines and having a re-
5 lation of mutual induction equal and oppo-
site to that of the mains, substantially as de-
scribed.

In witness whereof I have hereunto set my
hand this 18th day of November, 1895.

JOHN F. KELLY.

Witnesses:

A. C. CLARK,
H. A. BULLARD.