(No Model.)

# C. ZIPERNOWSKY, M. DÉRI & O. T. BLÁTHY.

## ELECTRIC DISTRIBUTION BY ALTERNATING CURRENTS.

No. 392,090. Patented Oct. 30, 1888.

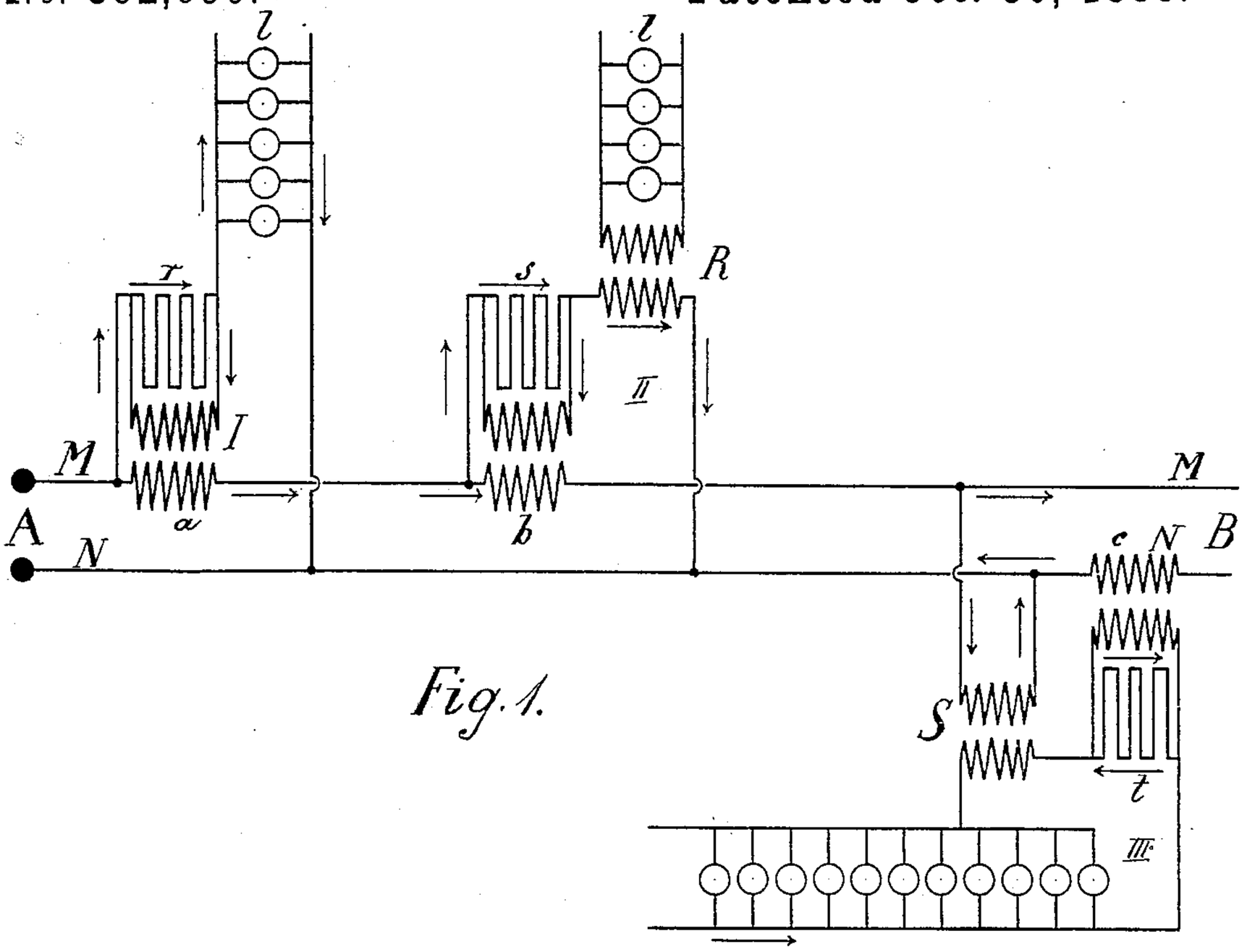


Fig. 1.

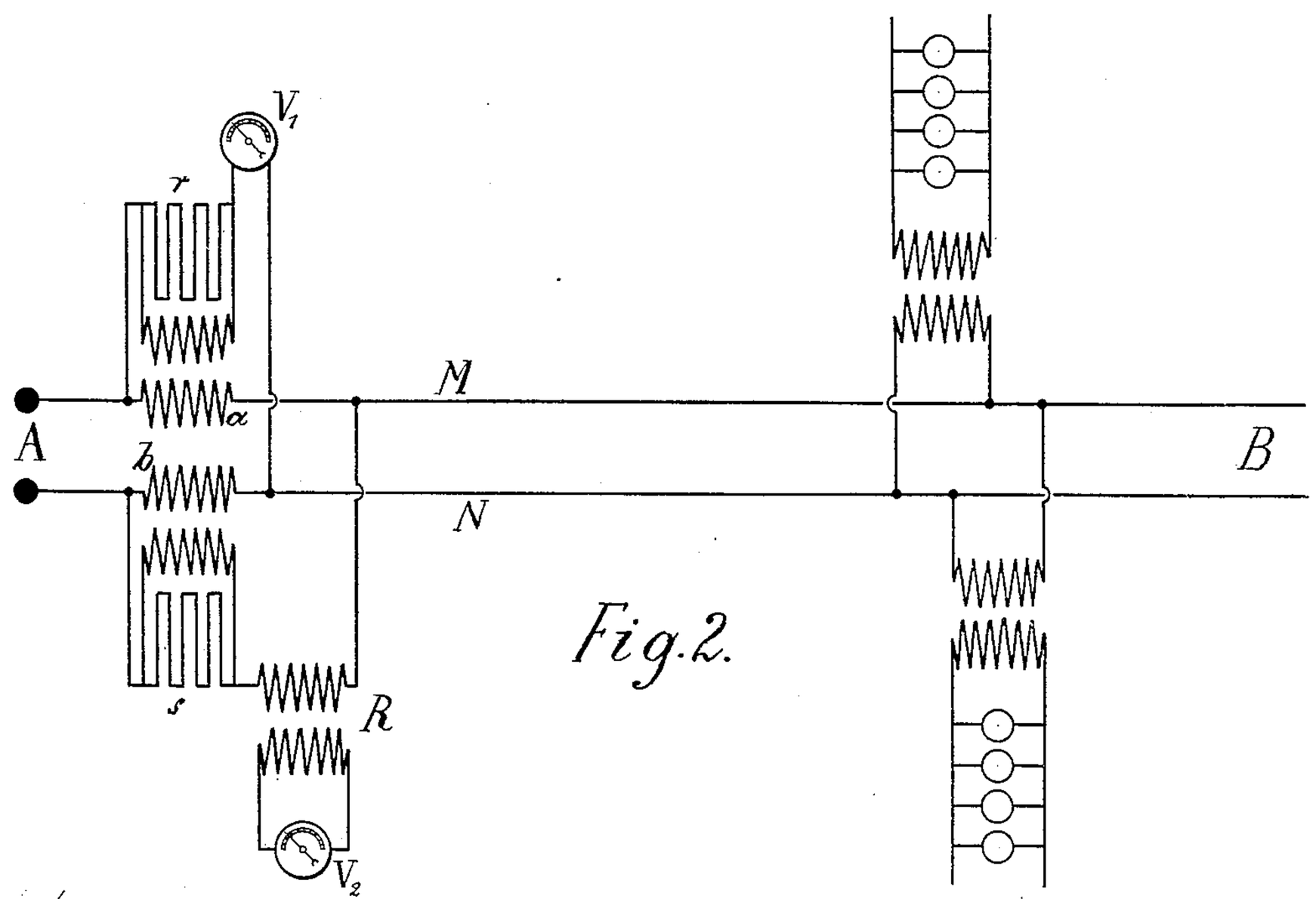


Fig. 2.

Witnesses.
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# UNITED STATES PATENT OFFICE.

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## ELECTRIC DISTRIBUTION BY ALTERNATING CURRENTS.

SPECIFICATION forming part of Letters Patent No. 392,090, dated October 30, 1888.

Application filed September 2, 1886. Serial No. 212,490. (No model.) Patented in Italy March 31, 1886, XX, 19,523, and April 13, 1886, XXXIX, 43; in Austria-Hungary May 22, 1886, XXXVI, 756, and XX, 1,264; in England June 16, 1886, No. 8,040; in Spain August 18, 1886, No. 9,117; in Germany September 18, 1886, No. 37,780, and in France October 25, 1886, No. 176,791.

*To all whom it may concern:*

Be it known that we, CARL ZIPERNOWSKY, of Buda-Pesth, Hungary, MAXIMILIAN DÉRI, of Vienna, Austria, and OTTO TITUS BLÁTHY, of Buda-Pesth, Hungary, and all three subjects of the King of Hungary, have invented new and useful Improvements in the Regulation of Alternating Electric Currents, (for which we have obtained Austrian patent, vol. 36, No. 756, dated May 22, 1886; Hungarian patent, vol. 20, No. 1,264, dated May 22, 1886; German patent, No. 37,780, dated September 18, 1886; French patent, No. 176,791, dated October 25, 1886; British patent, No. 8,040, dated June 16, 1886; Italian patent, vol. 39, No. 43, dated April 13, 1886; Spanish patent, No. 9,117, dated August 18, 1886,) of which the following is a specification.

The object of this invention is to regulate the tension of alternating electric currents by means of induction coils or transformers in cases where alternating electric currents are so distributed as to maintain, by means not pertaining to this invention, a constant difference of potential in the conductors at a determined point, which in all practical cases will be at the farthest ends of the main conductors, or very nearly there. In such cases we use transformers for compensating the variations of tension caused by the resistances of the conductors at such points of consumption, which are not so distant from the source of electricity as the points at which the tension is maintained constant *a priori*—that is, for the purpose of feeding these points also with currents of constant tension. This object is accomplished in the following manner.

Referring to the accompanying drawings, illustrating the invention, Figures 1 and 2 are diagrams showing our invention.

In Fig. 1 the source of electricity is shown at A, whence the main conductors M and N start, which main conductors supply in parallel arc the different consumption devices, as arcs and incandescent lamps, electromotors, transformers, &c. The generation of current is to be such that at the ends of the main line, at B, the tension will be constant, in consequence of which the current tension at A will increase in proportion with the intensity of the main current. At all intermediate points the tension will also increase with the current strength. In order to supply any intermediate points of consumption, notwithstanding this, with currents of constant tension, we cause the branch current on its way to the consumption device to traverse a determined resistance. Through this resistance we cause also to pass the secondary current of a compensating coil or transformer, the primary of which is traversed by the main current. The branch current for the consumption device in view must have the same direction in the resistance with the current generated by induction in the compensating coil. The difference of potential at the terminals of the said resistance is dependent upon the intensity of the secondary current induced by the main current in the compensating coil, and therefore also on the intensity of the main current itself. This difference of potential counteracts the current branching to the consumption device. By suitable coils and resistances this difference of potential at the terminals of the compensating resistance may be made equal to the rise of potential in the main conductors at the points in view necessary to overcome the resistance of the main line with the increased intensity of current.

In Fig. 1 some modes of application of the combination are shown. At I incandescent lamps *l* are derived from the main conductors M and N. Of course there may be more than one pair of main conductors running from the central station, some or all being provided with compensating devices according to the present invention. The branch current for the lamps traverses the resistance *r*, through which also passes the secondary current induced by the main current in the transformer *a*. At I I incandescent lamps *l* are supplied with the secondary current from a transformer, R, the primary current for which goes through the resistance *s*, which is likewise traversed by the compensating current induced in *b* by the main current. At I I I there are also incandescent lamps *l*, supplied by the transformer S; but in this case it is the secondary current of this which is caused to pass the resistance

*t*, which receives also the secondary current of the compensating coil *c*. These combinations are specially valuable for controlling at the source of the electric currents the tension that is acting at any moment at the consumption devices. For this purpose a voltmeter is derived directly or by the aid of a transformer from the mains near the generators of electricity, and the variations of tension due to the resistances of the conductors in consequence of variable intensities of current in the mains are compensated for by aid of the device described above. The compensating coil and resistance cause the voltmeter to indicate as if it were connected to the ends of the conductors, where it is desired to have a constant tension. In Fig. 2 this arrangement is shown, the voltmeter V′ being directly connected to the mains, while voltmeter $V^2$ is acted upon with the intermission of the transformer R. By suitable arrangement of the compensating coils *a* and *b* and of the resistances *r* and *s* the voltmeters can be made to indicate the tension acting at the lamps situated at the end of the line at B. The lamps are shown to be supplied by transformers.

What we claim is—

In a system of distribution for alternating electric currents with constant or nearly constant difference of potential in the conductors, the combination of induction-coils or transformers with the said conductors, the one bobbin of which coils is inserted in the main line of conductors and the other bobbin of which is inserted in the circuit-supplying translating devices and is closed on a suitable resistance, the current through said supply-circuit passing through the resistance and through the second bobbin of the induction-coil, substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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