(No Model.)

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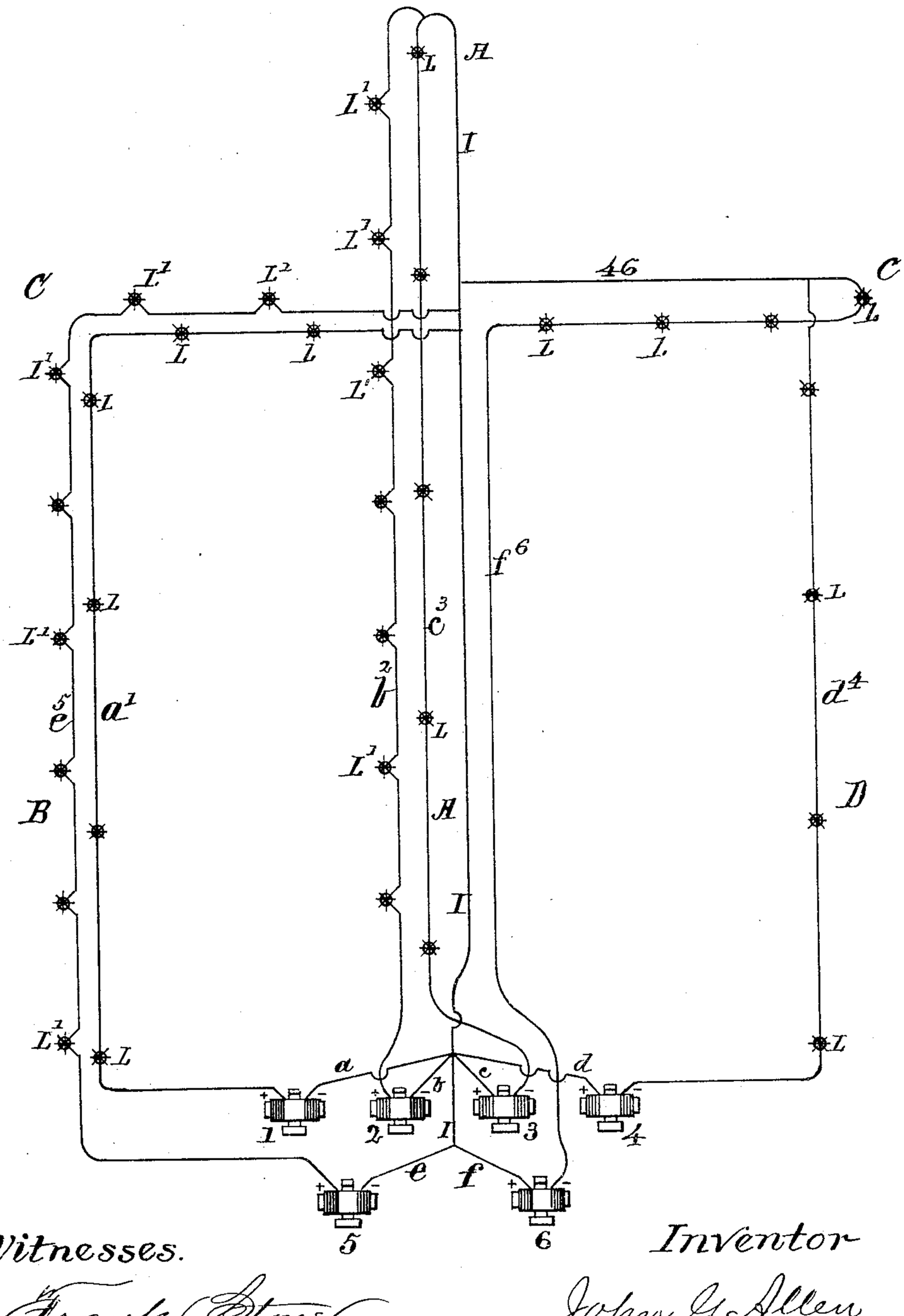
SYSTEM OF DISTRIBUTION FOR ELECTRIC LIGHTING CIRCUITS.

No. 317,960. Patented May 19, 1885.



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Frank Stone.

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SYSTEM OF DISTRIBUTION FOR ELECTRIC-LIGHTING CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 317,960, dated May 19, 1885.

Application filed January 23, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. ALLEN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in the System of Electrical Distribution for Electric-Lighting Circuits, &c.; and I declare the following to be a description of my said invention, sufficiently full, clear, and exact, to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

In the erection of wires or distributing-circuits for electrical lighting and similar purposes, it is customary in practice to run a complete line or an outgoing and incoming wire for each separate circuit-current. Parallel circuits for separate lighting on the same street are also in practice frequently employed—one circuit for the street-lights and another circuit for the lights in stores and buildings—this practice being found the more desirable and convenient, for the reason that the two sets of lights—viz., those for the buildings and those for the street—are required to be lighted and extinguished at different hours, and can thus be separately turned on and off when desired. The conformation of the town or streets also frequently requires the wires of some of the circuits to be carried long distances before reaching the district where the lights are located, thus requiring the use of large quantities of wire and the labor and expense of erecting and maintaining the same.

The object of my present invention is the arrangement of electrical distributing-circuits in a manner to economize wire without loss of energy in the transmission of currents; and my invention consists in a system of electrical distribution wherein the circuits are so arranged that the several separate or different currents are carried throughout a portion of their course by independent and separate wires, and on another portion of their course by a wire or conductor that is common to all the currents and forms a part of each of the several circuits, as hereinafter more fully explained.

My invention is herein shown and described as applied in a system of street-distribution for a series of electrical arc lights arranged for lighting streets and buildings; but it will be understood that my improved system of circuits can be employed for the distribution of electricity for other than lighting purposes, if desired, since the gist of the invention consists in running the currents, where the lines run parallel or where practical, on a single and the same wire, instead of keeping each current on a separate circuit-wire, and this I have discovered can be done without greater loss of energy than if the currents are each confined to separate wires.

The drawings illustrate the manner of arranging the circuit-wires in accordance with my invention, and the relation thereof to the current-generators and the lights.

In the drawings, Figures 1, 2, 3, 4, 5, and 6 denote a number of dynamo-machines or magneto-electric generators for producing the currents at the central station. a', b^2, c^3, d^4, e^5, and f^6 indicate wires or conductors corresponding with the several electric generating-machines and forming the independent or single portions of the circuits along which the lights L and L′ are arranged; and I indicates a wire which serves as a common carrier for all of the currents, and which wire I takes the place of a parallel line or incoming wire for each of the several circuits. Thus in the case of the main street A the line c^3, on which the street-lights L are located, is carried to the farthest desired limit and then joins the line I, which returns to the station without lights upon it. The line b^2, having the store and building lights L′, is in like manner extended as far as required for embracing the lights, and is then joined to the line I, instead of making a return back to the central station, thus requiring only three lengths of wire where the commonly-employed system would require four. If there were six circuits on the street, there would be but seven wires required, or one wire more than half the ordinary number required. In this latter case the saving of five wires would be effected by my improved system.

For the side street, B, wires can be run as at a' e^5 for the street and store lights L L′, respectively, with both or either of said wires

extending through a cross-street, as C, and joining with the common wire I of the main street; or, again, the wires of the side and cross streets, as C and D, can be extended to include the desired number of lights L, and then be connected one with the other, as the lines d^4 and f^6, and the portion of wire 46 carrying the double current may then extend to and join with the wire I, which includes the several other currents, substantially as illustrated. At the central station the wire I is connected by branch wires *a b c d e f* with the respective generators, so that each machine commands its own particular current and maintains the proper distribution through its respective circuit.

It is well known that the resistance of a wire or conductor is a constant quantity, and does not vary materially with the volume of the current, except the proportional size of the wire in relation to size of the current is so small that the wire becomes heated to an appreciable degree. This would not occur with wires exposed in the open air and of the size and kind ordinarily employed for electric lighting purposes, (say No. 6 or No. 4 copper wire,) unless subjected to a current many times greater than that required for the operation of a circuit of arc lights such as are employed for common street-lighting. Thus it will be seen that it is possible to practically combine the separate currents on one wire, and, by doubling up the currents on portions of the circuits, in the manner described herein, to obviate the necessity of using complete separate circuit-wires, and at the same time to effect equally beneficial results as with the ordinary system.

It is immaterial to the practical success of this system of distribution whether all of the currents pass in the same direction over the wire I at the same time, since the circuits will operate equally well with currents running in the same or opposite direction through said wire, there appearing to be no material difference in either case.

By this system of distribution it will be seen that a given number of circuits can be included, and a given number of lights in a district can be operated, with much less extent of wire than by the ordinary method, thus effecting a great saving in the cost and maintenance of electrical-lighting wires.

What I claim as of my invention, and desire to secure by Letters Patent, is—

In an electric-lighting system, the combination of a series of independent dynamo or magneto electric generators, each generator being located in an independent circuit having a series of electric lamps thereon, and said independent circuits having a common return-circuit from outlying points to a common point of junction at the central station, as herein set forth.

Witness my hand this 16th day of January, A. D. 1884.

JOHN G. ALLEN.

Witnesses:
CHAS. H. BURLEIGH,
FRANK STONE.