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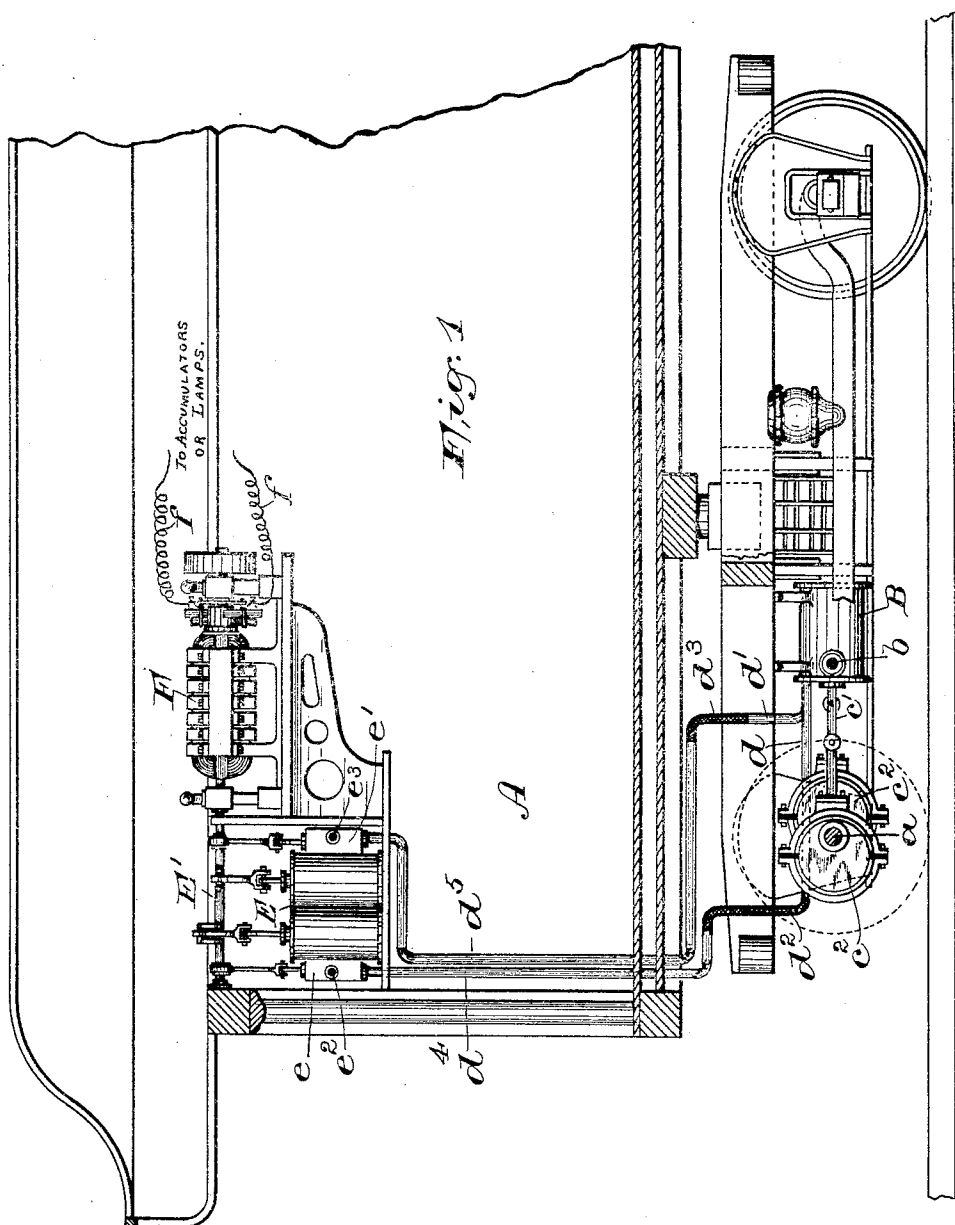
2 Sheets—Sheet 1.

S. YOUNG, M. MOSKOWITZ, L. D. ADLER &
J. LOEWENBERG.

ELECTRICAL DISTRIBUTION FOR CARS.

No. 478,182.

Patented July 5, 1892.



WITNESSES:

Wm. H. Canfield Jr.
Clarence Hartje

INVENTORS:

Samuel Young,
Moris Moskowitz,
Leon D. Adler, and
Joseph Loewenberg.
BY Fred C. Fraentzel. ATT'Y.

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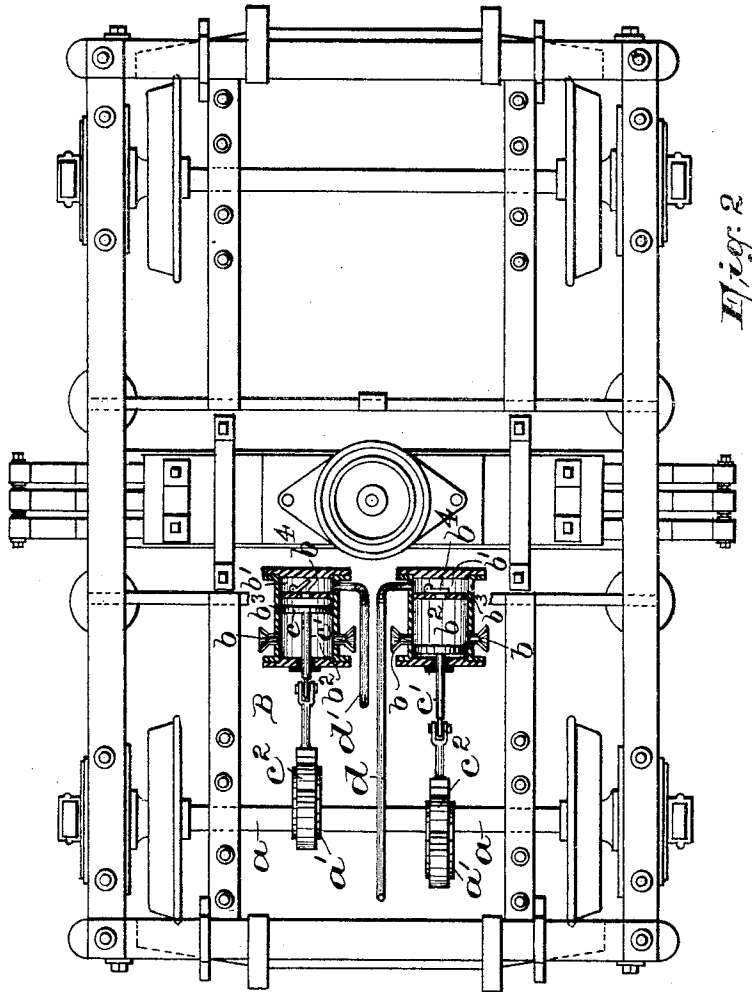


Fig. 2

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UNITED STATES PATENT OFFICE.

SAMUEL YOUNG, MORRIS MOSKOWITZ, LEON D. ADLER, AND JOSEPH LOEWENBERG, OF NEWARK, NEW JERSEY.

ELECTRICAL DISTRIBUTION FOR CARS.

SPECIFICATION forming part of Letters Patent No. 478,182, dated July 5, 1892.

Application filed October 15, 1891. Serial No. 408,767. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL YOUNG, MORRIS MOSKOWITZ, LEON D. ADLER, and JOSEPH LOEWENBERG, citizens of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Electrical Distribution for Cars and Means for Utilizing the Waste Energy from the Car-Axle for such Purpose; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The primary object of this invention is to supply steam, horse, cable, or other cars with electricity either for lighting or heating purposes.

The invention is designed to utilize the waste energy from one or more of the car-wheel axles for driving or operating an air-compressor, which is connected with and which in turn drives an air-engine, causing the latter to drive a dynamo, whereby the electricity is generated either for lighting or heating purposes.

To meet these several ends the invention therefore consists of certain arrangements and combinations of parts, as will be herein-after more fully described, and finally embodied in the clauses of the claim.

In the accompanying sheet of drawings, in which similar letters of reference are employed to indicate corresponding parts in each of the views, are illustrated the various mechanical devices employed to accomplish the object of our invention.

In said drawings, Figure 1 is a vertical section of one end of a car and its truck, illustrating in side elevation the arrangement of the air-compressor attached to the truck and driven from one of its axles and an air-engine and connected dynamo within the car for distributing the generated electricity either to an accumulator or directly to the lamps. Fig. 2 is a plan view of the truck, showing the cylinders of an air-compressor in section and the pistons thereof connected by

mechanical means to one of the axles of the truck.

In said above-described views, A indicates the car, and *a* one of the car-wheel axles.

B B are two air-compressors arranged beneath the car and preferably attached in any convenient manner to the truck. Said cylinders B are provided on their sides with the funnels or inlet-valves *b*, and at one end is an air-chamber *b'*, separated from the main portion *b²* of the cylinder by a wall *b³*, provided with a suitable valve *b⁴*. Within each cylinder is arranged a piston *c*, connected by means of a piston-rod *c'* with any suitable mechanism for deriving power from the car-axle. In the present instance we have shown said piston-rods *c'* connected to eccentrics *c²* *c³*, arranged on the eccentric-heads *a'*, secured directly on the axle. From each air-chamber *b'* in said air-compressors extend the conducting-pipes *d* and *d'*, respectively, connected by rubber tubing *d²* and *d³* to pipes *d⁴* and *d⁵*, which extend up into the car, preferably into the closet portion thereof, in which, upon a shelf, is arranged a suitable air-engine E. The air is forced through the pipes *d⁴* and *d⁵* into the valve-chest *e* and *e'* and escapes through the exhaust-pipes *e²* and *e³* into the open air outside of the car.

The operating mechanism of the engine E revolves the shaft E', which is a continuation of the shaft of the dynamo F, which, as will be evident, is of any suitable and desirable construction. The wires *f* of the dynamo extend into the car, either to accumulators (not shown in the present case) or directly to the lamps.

The valves within the valve-chest of the air-engine are placed in such a manner that no matter whether the car moves forward or backward they will always travel in the same direction, and thereby cause the dynamo to revolve in one and the same direction.

From Fig. 2 it will be noticed that the eccentrics and the piston-heads are arranged at different positions in their respective cylinders, whereby when the one piston is on the return stroke the other piston is on the forward stroke, thereby forcing the air alternately through the pipes *d* and *d'* and to their respective valve-chests in the air-engine in

the car, causing a uniform motion of the shaft F', and hence of the dynamo F.

The advantages of this system of generating electricity for cars will be evident. The energy from the axle now lost is utilized, and owing to the great number of revolutions of a car-axle enough power is generated to drive the dynamo.

In order to have a constant light, it is preferable that the electricity generated is stored in accumulators. Thus the dynamo can be run all day, if necessary, for storing up enough electricity in the accumulators, and when the lights are required the current can be turned on and the car supplied with light from the accumulators. It will also be evident that the air-engine E and the dynamo can be dispensed with, in which case the air-compressors can be used for pumping air into a car for cooling purposes, especially on cars for the transportation of meats and fruit, the power being taken from the axle of the car.

We do not wish to be understood as limiting ourselves to the exact arrangement of the present system and the construction of the several devices herein shown, for certain changes can be made without departing from the scope of our present invention.

Having thus described our invention, what we claim is—

In a system for electrically lighting cars, in combination with the pivoted truck of a car, a pair of air-compressing cylinders arranged directly upon said truck, said cylinders being provided with valves on their opposite sides, eccentrics arranged on and moving with said car-wheel axle of the truck and said eccentrics being directly connected with the piston-rods in said cylinders, pipes d and d' , leading from said cylinders, flexible tube connections d^2 and d^3 , pipes d^4 and d^5 , extending into the car-body, an air-engine provided with valve-chests with which said pipes d^4 and d^5 communicate, and a dynamo connected with said engine, all arranged substantially as and for the purposes set forth.

In testimony that we claim the invention set forth above we have hereunto set our hands this 10th day of October, 1891.

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