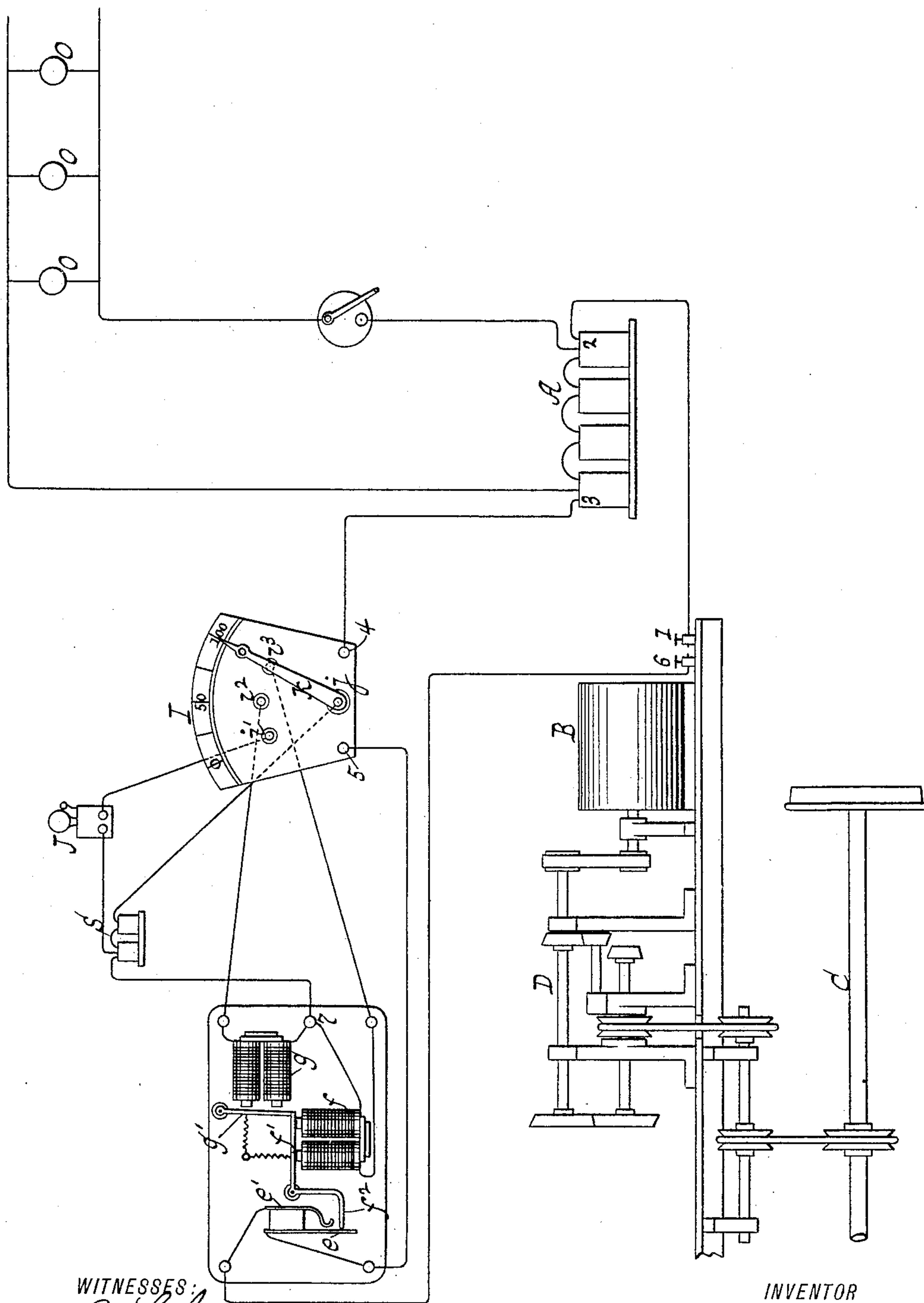


(No Model.)

J. I. CONKLIN.  
ELECTRIC LIGHTING SYSTEM.

No. 462,237.

Patented Nov. 3, 1891.



WITNESSES:

*R. L. Conklin*  
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# UNITED STATES PATENT OFFICE.

JOSEPH I. CONKLIN, OF BROOKLYN, NEW YORK.

## ELECTRIC-LIGHTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 462,237, dated November 3, 1891.

Application filed February 9, 1891. Serial No. 380,740. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH I. CONKLIN, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Electric-Lighting Systems, of which the following, taken in connection with the accompanying drawing, is a full, clear, and accurate description.

My invention is an electric-lighting system consisting of the combination of a main or charging circuit incorporating a dynamo, storage-battery, and circuit-closer, a cut-out circuit incorporating two magnets and armatures therefor and a local battery, with the armatures arranged to engage each other and one constructed to operate the circuit-closer of the main circuit, an automatic switch in the cut-out circuit, controlled by the main circuit, for alternately energizing the magnets of the cut-out circuit, and a lamp-circuit connected to the storage-battery, whereby a uniform potential is automatically maintained in the storage-battery for supplying the desired lamps.

My invention also consists of a certain novel construction of the circuit-closer in the main circuit and armatures in the cut-out circuit, and, further, of a certain novel construction of a voltmeter for adapting it to act as an automatic switch, as hereinafter more fully described.

The accompanying drawing represents a side view of parts constituting my electric-lighting system.

Referring to the drawing, the letter A indicates a storage-battery, and B a dynamo, both of which parts may be of any usual or suitable form.

When my invention is applied to a railway-car or other vehicle, the dynamo B may be operated from the axle C by a mechanical movement, as shown at D and more fully described in Letters Patent of the United States granted to me October 15, 1889, No. 412,841, the dynamo, together with said movement, being usually placed on the floor of the car under a car-seat, while the storage-battery is placed in any convenient place in or under the vehicle.

The letters *e e'* indicate two contact-springs forming a circuit-closer; *f g*, two electro-mag-

nets, each composed in this example of two coils, and *f' g'* armatures concomitant to said magnets, respectively. The armature *f'* is composed of a bell-crank lever, and its auxiliary arm *f<sup>2</sup>* is in a suitable position relatively to the contact-spring *e* that it may impinge against said spring, as shown. Each of the armatures *f' g'* has a suitable retractile spring joined thereto in the usual way.

The letter I indicates a voltmeter, which may be of any usual or suitable construction, on the face of which meter are contact pins or points *i' i<sup>2</sup> i<sup>3</sup>*, which are insulated and usually lie in a plane concentric to a pivot *j*, on which is mounted a hand *k*, forming the indicator of the meter.

The letter O indicates a series of lamps arranged in a circuit which is connected to the storage-battery A, these lamps being in practice placed at the desired points in the car or other structure where my invention may be used.

The operation of my system is to charge the storage-battery A from the dynamo B, the circuit of which is as follows: Commencing at binding-post 1, to pole of battery at 2, through battery to its opposite pole 3, thence to binding-post 4 of voltmeter and through magnets of meter to post 5 thereof, thence to contact-spring *e*, and through contact-spring *e'* to binding-post 6 of dynamo. When the storage-battery A is fully charged, the indicator *k* is at its maximum point and in contact with the pin *i<sup>3</sup>*. In this position of the indicator *k* a current is created from one pole of a local battery S to the pivot *j* through the indicator to pin *i<sup>3</sup>*, thence to magnet *f*, to a binding-post 7, and to the opposite pole of said local battery. Said current passing through and energizing the magnet *f* attracts its armature *f'*, and this armature is locked by the armature *g'* engaging therewith by the action of its retractile spring, as shown. In this position of the armature *f'* its arm *f<sup>2</sup>* bears against the contact-spring *e*, forcing it away from the spring *e'*, and the main or charging circuit from the dynamo is opened, with the effect of cutting off the supply of current from the dynamo B to the storage-battery, thereby insuring the safety of the battery.

It may be here remarked that under normal



conditions the indicator  $k$  remains within or below its said maximum point, and hence the storage-battery is not entirely cut off from the dynamo. When the potential or current of the storage-battery  $A$  is reduced to its minimum, the indicator  $k$  recedes, and in passing over the pin  $i^2$  completes a circuit from the local battery  $S$  to the pivot  $j$  through the indicator  $k$  to pin  $i^2$ , to and through magnet  $g$  to binding-post 7, and thence to battery. The current passing through the magnet  $g$  attracts its armature  $g'$  and releases the armature  $f'$ , and with it the spring  $e$ , permitting the latter to come in contact with the spring  $e'$ , thus closing the main or charging circuit from the dynamo. In case the indicator  $k$  reaches its minimum point it is brought into contact with the pin  $i'$  and completes a circuit from the local battery  $S$  to pivot  $j$  through the indicator to pin  $i'$ , to and through an alarm  $J$ , and thence to battery.

From this description it will be seen that the indicator  $k$ , together with the contact-points  $i' i^2 i^3$ , forms an automatic switch, thereby adapting the voltmeter  $I$  to be used for that purpose.

What I claim as new, and desire to secure by Letters Patent, is—

1. An electric-lighting system consisting of the combination of the main or charging cir-

cuit incorporating a dynamo, storage-battery, and circuit-closer, the cut-out circuit incorporating two magnets and armatures therefor, and a local battery, with the armatures arranged to engage each other and one constructed to operate the circuit-closer of the main circuit, an automatic switch in the cut-out circuit, controlled by the main circuit, for alternately energizing said magnets of the cut-out circuit, and a lamp-circuit connected to the storage-battery, substantially as and for the purpose described.

2. In an electric-lighting system, the main circuit incorporating a circuit-closer, which is composed of two contact-springs, one longer and more resilient than the other, in combination with a cut-out circuit composed of two sets of magnets and armatures therefor, one of which armatures is constructed as a bell-crank, the end of which presses against the resilient spring when the armature is attracted, the other armature acting as a lock, and locking or unlocking the bell-crank armature and closing or opening the circuit, as the case may be, substantially as and for the purposes described.

J. I. CONKLIN.

Witnesses:

LOUIS W. FROST,  
R. F. W. BOSKERCK.