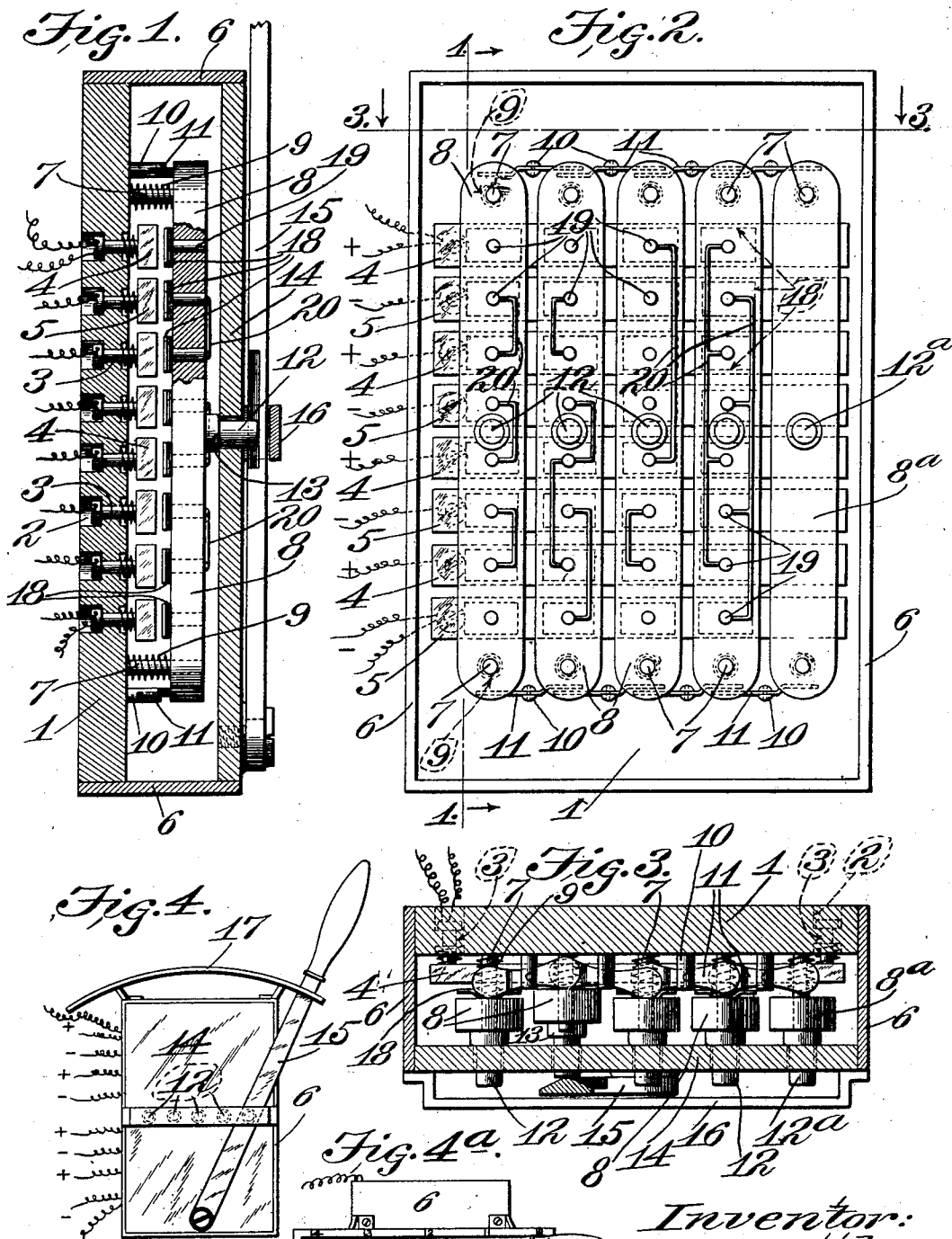


J. A. LITTLE.
ELECTRIC CONTROLLER.
APPLICATION FILED MAR. 16, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



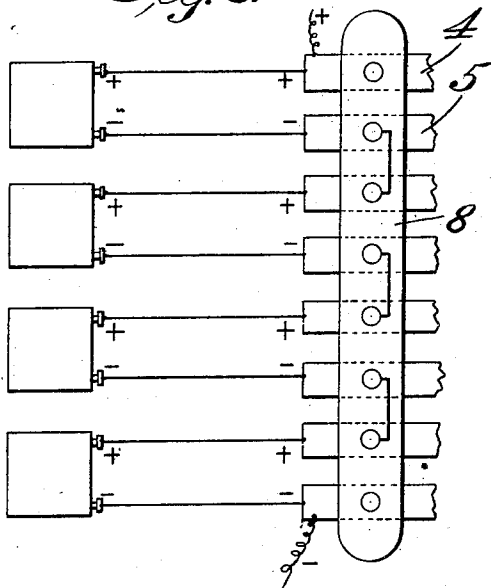
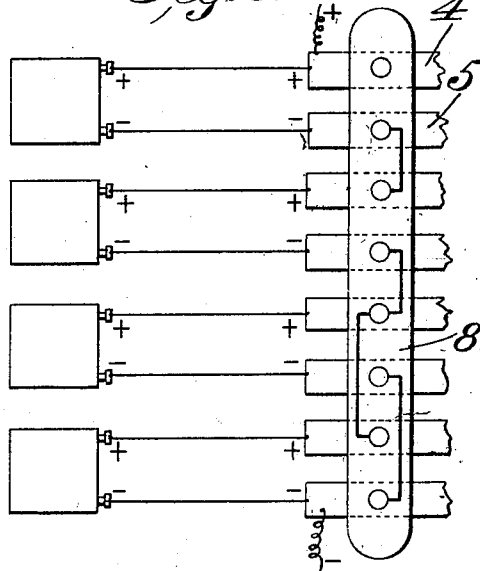
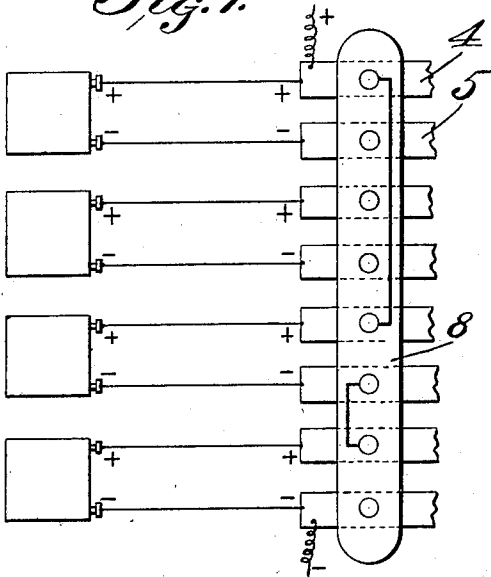
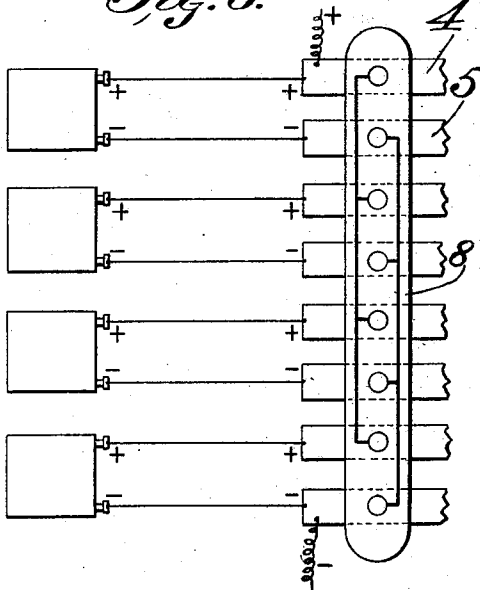
Witnesses:
G. A. Pennington
J. H. Gibbs

Inventor:
John A. Little,
by Bakewell & Cornwall
Attys.

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2 SHEETS—SHEET 2.

Fig. 5.*Fig. 6.**Fig. 7.**Fig. 8.**Witnesses:*

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UNITED STATES PATENT OFFICE.

JOHN A. LITTLE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO GLOBE ELECTRIC COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

ELECTRIC CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 732,201, dated June 30, 1903.

Application filed March 16, 1903. Serial No. 148,030. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. LITTLE, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Electric Controllers, of which the following is a full, clear, and exact description, 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, forming part of this specification, in which—

Figure 1 is a longitudinal vertical sectional view on line 1 1 of Fig. 2. Fig. 2 is a front elevational view of the device with the face-plate removed. Fig. 3 is a transverse sectional view of Fig. 2 on line 3 3 looking in the direction of the arrows. Fig. 4 is a view similar to Fig. 2, with the several parts in their operative position. Fig. 4^a is a detail view hereinafter described, and Figs. 5, 6, 7, and 8 are diagrammatic illustrations of the detail arrangement of wiring for the several contact-plates hereinafter more fully described.

The invention relates to new and useful improvements in electrical controllers for general use, though the particular application of the invention illustrated herein is representative of the apparatus designed especially for use in connection with an electrically-propelled motor-vehicle; and it consists in certain features of construction and operative combination of parts, all as hereinafter more fully described, and specifically pointed out in the claims.

Referring to the drawings, 1 is a base-plate, provided with perforations 2, in which are held reciprocatory spring-controlled binding-posts 3, provided at each side of the base-plate 1, as shown in Figs. 1 and 3, and supporting thereon the terminal-plates 4 and 5, the former, 4, comprising the positive battery-terminals and the latter, 5, the negative terminals of the same. The terminal-plates 4 and 5 extend substantially across the casing 6 from left to right and are supported at each end by posts 3, as shown in the drawings. For convenience of reference the several cooperating parts will be described in detail as herein illustrated, though it will be

apparent that any other suitable arrangement thereof which will produce the same relative coöperation of parts will be within the spirit of the invention, which is not limited to the particular arrangement herein shown and described.

Supported at each end by posts 7 are contact-carrying plates 8, held normally out of contact by means of the springs 9 on said posts 7. The contact-plates 8 are disposed at right angles to the terminal-plates 4 and 5 and extend beyond the top and bottom plates 4 and 5 at each end. In convenient proximity to the ends of plates 8 are located posts 10, preferably slotted at their ends, and pivotally supported in said slotted ends are levers 11, which levers are pivoted behind the end portions of said plates 8. Thus if any contact-plate is pressed inwardly toward the terminal-plates the levers 11 behind the same will carry outwardly the next contact-plate on either side, thereby assisting the springs 9 to insure breaking of contact as soon as any plate 8 of the series is released and the next plate is depressed.

Connected with the contact-plates at approximately the central portion thereof are posts 12, provided with shoulders 13, the free outer ends of said posts 12 projecting normally through and beyond the face-plate 14 and the shoulders 13 serving to prevent excessive thrust of said posts 12 through said plate.

Pivotally supported upon the lower portion of the face-plate 14 is a lever 15, which lever is provided with beveled rear face and is guided in operation by means of the strap 16, which strap is in substantially the plane of the projecting ends of the posts 12, and a slotted arc 17 is provided with a scale or with a scale and offset openings 17^a, designed to serve as an indicator and as engaging means for holding the said lever 15 in its several operative positions, as best shown in the detail view Fig. 4^a.

Thus far the several vertical plates, herein called "contact-plates," are substantially alike; but the plate marked 8^a is in practice a neutral plate which is not provided with contact members, and when the lever 15 is

thrown to the position shown in Fig. 4 the post 12^a will contact with said lever without acting to close the battery-circuit.

Upon the rear face of each plate 8 is a series of contacts 18, which may be of any preferred form, though for convenience of illustration they are illustrated in the form of thin metal plates interposed between the contact-plates 8 and the terminal-plates 4 and 5 and are the same in number as the number of such terminal-plates.

The terminal-plates are of metal or of other material faced with metal at the points of impingement of the contacts 18, and the body portion of the contact-plates is formed from any suitable non-conductor of electricity, through which project binding-posts 19, connected at their inner ends to said contacts 18 and connected at their outer ends in various plans of arrangement by the wires 20, so that as shown in Fig. 8 all the batteries of the series are connected in multiple, as shown in Fig. 7 the two lower batteries are in series with the two upper batteries cut out, as shown in Fig. 6 the two upper and the lower batteries are in series with the battery next the bottom in multiple with the bottom one, while in Fig. 5 all the batteries are in series, whereby the greatest service efficiency thereof is obtainable.

It will be understood that the terminals are to be properly connected to their respective storage batteries and finally to the motor of the vehicle wherein the power of such batteries is to be utilized; but as such connections are well understood they are not herein illustrated.

I am aware that many minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

Having described the invention, what is claimed as new is—

1. In an apparatus of the character described, a series of battery-terminals arranged substantially parallel, a series of movable contact-plates and a neutral plate at an angle thereto and means for simultaneously closing circuit through said movable contact-plates, and a movable member adapted to actuate each contact-plate separately; substantially as described.

2. In an apparatus of the character described, a series of disconnected battery-terminals arranged substantially parallel, a series of movable contact-plates carrying contacts arranged parallel and at an angle to said battery-terminals, binding-posts on said contact-plates connected to said contacts, current-conductors variously connecting said binding-posts on the said contact-plates to produce varied current from the same series of batteries, and a movable member cooperating with and adapted to move one or more

of said contact-plates to close the circuit there-through when in predetermined positions; substantially as described.

3. In an apparatus of the character described, a plurality of battery-terminals, a plurality of movable contact-plates arranged at an angle thereto, with contacts thereon, connected to utilize the current of all of said batteries in various circuits, and means for closing circuit upon movement of said contact-plates from minimum to maximum; substantially as described.

4. In an apparatus of the character described, a plurality of battery-terminals, a plurality of movable circuit-carrying contact-plates arranged at an angle thereto, and contacts therebetween upon a plurality of said circuit-carrying contact-plates, a neutral plate, posts projecting from said contact-plates and said neutral plate and a lever, movable on a fixed pivot, adapted to cooperate with each of said posts at predetermined points of its movement; substantially as described.

5. In an apparatus of the character described, a series of battery-terminals arranged in pairs, a movable contact-plate at an angle thereto cooperating therewith and means movable in contact with said plate for closing circuit through said contact-plate; substantially as described.

6. In an apparatus of the character described, a plurality of battery-terminals arranged in pairs, movable contact members at an angle thereto, cooperating with said terminals, current-conductors variously arranged on said movable contact members, contacts on said movable members connected with said current-conductors, and means for projecting said contact members in the direction of said terminals; substantially as described.

7. In an apparatus of the character described, a plurality of battery-terminals arranged in substantially parallel series, a series of movable cooperating contact-carrying members cooperating therewith, current-conductors variously arranged on said movable contact members, contacts on said movable members connected with said current-conductors, and means for moving said contact-carrying members into operative contact with said battery-terminals; substantially as described.

8. In an apparatus of the character described, a plurality of battery-terminals arranged in substantially parallel series, a series of movable cooperating contact-carrying members cooperating therewith, current-conductors variously arranged on said movable contact members, contacts on said movable members connected with said current-conductors, and means for moving said contact-carrying members successively into and out of operative contact; substantially as described.

9. In an apparatus of the character described, a series of terminals connected with a

plurality of batteries, a series of movable contact members at an angle thereto, current-conductors variously arranged on said movable contact members, contacts on said movable members connected with said current-conductors, and a movable member cooperating therewith, adapted to control the current from said batteries in various arrangements of such current; substantially as described.

10 10. In an apparatus of the character described, a series of battery-terminals arranged in cooperative relation, movable members cooperating therewith, current-conductors variously arranged on said movable con-

tact members, contacts on said movable members connected with said current-conductors, and means for projecting said movable members from a normal position to close the circuit successively through said movable members; substantially as described. 15 20

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 26th day of February, 1903.

JOHN A. LITTLE.

Witnesses:

FREDERICK H. GIBBS,
GEORGE BAKEWELL.