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A. C. McWILLIAMS.

METERING PANEL BOARD.

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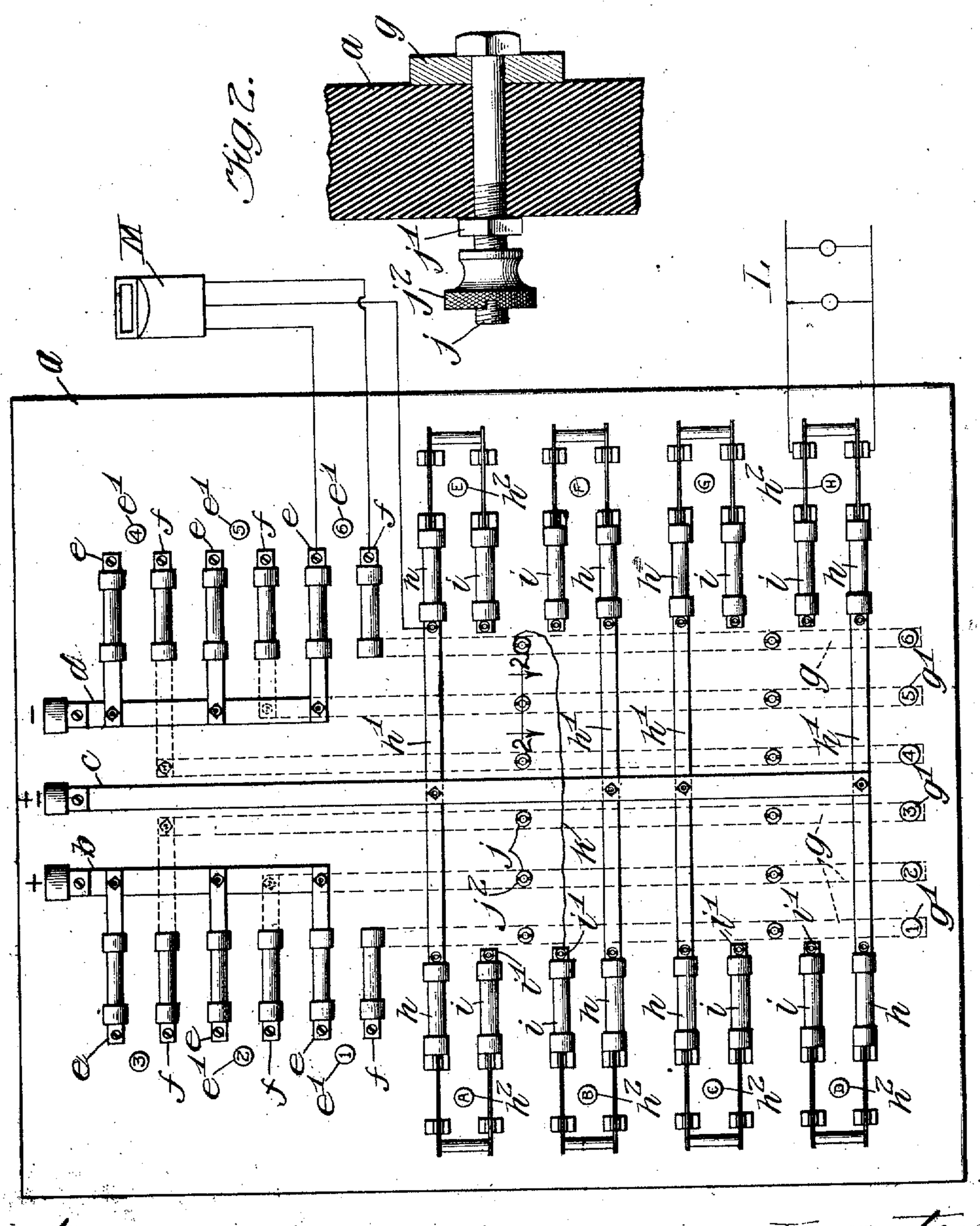

Fig. 1.

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METERING PANEL-BOARD.

No. 850,174. Specification of Letters Patent. Patented April 16, 1907.

Application filed April 19, 1906. Serial No. 312,591.

To all whom it may concern:

Be it known that I, ARTHUR C. McWILLIAMS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Metering Panel-Boards, of which the following is a specification.

My invention relates to panel-boards, more especially metering panel-boards, such as are employed in office and other buildings, where the light or power circuits of different tenants have to be separately metered and where it is frequently necessary to rearrange the grouping of load-circuits upon the different meters.

The general object of the invention is to provide a compact and easily-constructed panel-board by means of which any load-circuit or any number of load-circuits may be thrown onto any meter by the act of merely connecting a short loose wire or other removable conductor to two closely-associated contact-points on the board and to render it possible that this may be done without the necessity of having the different loose conductors cross each other. I attain this object by the apparatus shown in the accompanying drawings, in which—

Figure 1 is a front view of the board, showing the permanent connections thereon and also showing one temporary or removable conducting-wire, whereby a certain load-circuit is thrown onto a certain meter-circuit. Fig. 2 is a sectional view taken on line 2 2, Fig. 1, showing the preferred form of contact-piece or binding-stud.

Similar letters refer to similar parts throughout the several views.

The parts are mounted upon a board *a*, which consists of marble, slate, or other suitable insulating material.

In the design here shown the board is adapted for a three-wire system of electrical distribution, and three main bus-bars *b*, *c*, and *d* are permanently mounted upon the board. Permanently connected to the outside bus-bars *b* and *d* are meter-terminals *e f*, arranged in pairs, one terminal *e* of each pair being permanently connected to one of the outside bars *b* or *d*, and the other terminal *f* of each pair being permanently connected to one of the parallel conductor-bars *g*, which latter are preferably mounted on the back of the board and for convenience may be designated by number-plates *g'*, running in the present instance from "1" to "6," as shown in Fig. 1. For convenience also it is desirable to place corresponding plates *e'* adjacent to the pairs of meter-terminals *e f*.

In the present three-wire design bus-bar *c* is neutral and by preference extends along the board in a line coincident with the median line of the apparatus, so as to pass between the double row of load-terminals *h i*, arranged on either side thereof. One terminal *h* of each pair of the load-terminals is permanently connected, preferably by means of a conductor-bar *h'*, to bus-bar *c*, and the other terminal *i* has a binding-post *i'*, by means of which a removable conductor—such, for example, as a loose wire—may be detachably attached. For reasons which will hereinafter more fully appear I prefer to so arrange bars *h'* that the load-terminals will occur in groups of four pairs in a group, the terminals *h* being on the outside of the group and the terminals *i* on the inside thereof, with the binding-posts *i'* lying adjacent to each other, two on each side of the median line of the apparatus. It is desirable that each pair of load-terminals be appropriately designated by plates h^2, which in the present case are lettered from "A" to "H."

The conductor-bars *g* above mentioned, which for the sake of symmetry should be substantially parallel, extend transversely to the rows of load-terminals *h i*, so that each bar *g* will cross in front of each binding-post *i'*. Electrically connected to each bar *g* at a point between two adjacent binding-posts *i'* are secured contact-pieces *j*, the preferred construction of which is shown in Fig. 2. As there illustrated, a stud *j* is electrically connected to bar *g* on the back of the board and projects through to the front, where it is secured by a lock-nut *j'*. A screw cap or nut j^2 is provided for removably attaching a loose conductor, such as the wire *k* shown in Fig. 1. Studs of this kind are now in common use and are desirable; but any other suitable form of contact-piece may be employed which is capable of completing the electrical connection between a bar *g* and a loose or removable conductor or wire, such as the wire *k*. In this arrangement, therefore, the conductor-bars *g* lie parallel to the median line of the apparatus and parallel to the rows of load-terminals *h i*, and there is a row of contact-pieces *j* extending transverse to the median line, one contact-piece for each bar *g*. There is a contact-piece on each bar *g* for each group of

four load-terminals, and in the present instance, in which there are eight pairs of load-terminals, there will be two transverse rows of said contact-pieces.

In operation when the electrician desires to throw a given load-circuit onto any predetermined meter all he has to do is to supply a short piece of conducting material, such as loose wire *k*, and attach it at one end to a binding-post *i'* and at the other end to the proper contact-piece *j*. For example, suppose it is desired to throw load-terminals "B" onto meter-terminals "6," it is only necessary to run a short wire *k* from the "B" binding-post *i'* to the "6" contact piece or stud *j*, as shown in Fig. 1. In this illustration the worst possible case is shown, for here it is necessary to bridge from the left row of load-terminals to the extreme right end of the row of contact-pieces. If it had been desired to throw load-terminals "B" onto meter-circuit "1" only a very short piece of wire would have been required. It will be noted—and this is one of the advantageous features of my board—that any one of the group of four load-terminals—for example, "A, B, E, F"—or all of them may be connected to any meter-terminal without the necessity of having any one loose wire cross any other loose wire, and it will also be noted that the above may be accomplished by means of only a single transverse row of contact-pieces *j* for each group of four load-terminals.

In Fig. 1 there is illustrated a meter and meter-circuit M and load-circuit L, and in order to make the description of the device intelligible it has been necessary to herein refer to one set of terminals as "meter-terminals" and to the other set as "load-terminals." It is obvious, however, that there is no reason why the load-circuit could not be connected onto the terminals which I have termed "meter-terminals" and the meter-circuits upon the terminals termed "load-terminals." The compactness of construction and the universality or flexibility of the apparatus would in no degree be lessened if the so-called "meter-terminals" were located where the load-terminals now are and the so-called "load-terminals" were located where the meter-terminals now are, and I wish it to be understood that in interpreting the annexed claims the words "meter" and "load" may be transposed without departing from the spirit of my invention.

Although the present board is well adapted for a three-wire system of electrical distribution, it is equally well adapted for a two-wire system, for it is obvious that the bus-bars *b* and *d* could both be at the same potential as well as at different potentials.

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

1. In combination; a plurality of pairs of stationary meter-terminals; a plurality of pairs of stationary load-terminals; a bus-bar permanently connected to the first meter-terminal of each pair; another bus-bar of different potential permanently connected to the first load-terminal of each pair; a set of substantially parallel conductor-bars permanently connected to the second meter-terminal of each pair; removable conductors and contact-pieces connected to each one of said parallel bars, there being one of said contact-pieces adjacent to each pair of load-terminals whereby any load-circuit may be thrown onto any meter-circuit by means of a single removable conductor connected at one end to the second load-terminal of such load-circuit and at the other end to the adjacent contact-piece leading to the proper meter-circuit.

2. In combination; a plurality of pairs of stationary meter-terminals; a plurality of pairs of stationary load-terminals; a bus-bar permanently connected to the first meter-terminal of each pair; another bus-bar of different potential permanently connected to the first load-terminal of each pair; a set of substantially parallel conductor-bars permanently connected to the second meter-terminal of each pair; a plurality of contact-pieces connected to each one of said parallel bars, there being one of said contact-pieces adjacent to each pair of load-terminals and a wire whereby any load-circuit may be thrown onto any meter-circuit by attaching said wire at one end to the second load-terminal of such load-circuit and at the other end to the adjacent contact-piece leading to the proper meter-circuit.

3. In a panel-board, the combination of a board of insulating material; a plurality of pairs of meter-terminals mounted thereon; a plurality of pairs of load-terminals also mounted on said board; a bus-bar on said board permanently connected to the first meter-terminal of each pair; a bus-bar of different potential permanently connected to the first load-terminal of each pair; a set of substantially parallel conductor-bars permanently connected to the second meter-terminal of each pair; removable conductors and binding-studs connected to each one of said parallel bars, there being one of said studs adjacent to each pair of load-terminals whereby any load-circuit may be thrown onto any meter-circuit by means of a single removable conductor attached at one end to the second load-terminal of such load-circuit and at the other end to the adjacent binding-stud leading to the proper meter-circuit.

4. In a panel-board, the combination with loose conducting-wires of a board of insulating material; a plurality of pairs of meter-terminals arranged in a row thereon; a plurality of pairs of load-terminals in a row also mounted on said board; a bus-bar on said board permanently connected to the first meter-terminal of each pair; another bus-bar

of different potential from the first one permanently connected to the first load-terminal of each pair; a set of conductor-bars, permanently connected to the second meter-terminal of each pair, said conductor-bars running parallel to the row of load-terminals; and a plurality of binding-studs permanently connected to each one of said conductor-bars at intervals, there being one of said studs adjacent to each pair of load-terminals whereby any load-circuit may be thrown onto any meter-circuit by means of a single loose wire attached at one end to the second load-terminal of such load-circuit and at the other end to the adjacent binding-stud leading to the proper meter-circuit.

5. In a metering panel-board, the combination with the board and meter and load bus-bars of different potentials permanently mounted thereon, and removable conductors *k* of parallel conductor-bars permanently mounted on said board; contact-pieces connected thereto; a plurality of pairs of meter-terminals one terminal of each pair being connected to a meter bus-bar and the other to one of said parallel conductors; and load-terminals arranged in pairs in two rows each row lying on opposite sides of a median line running parallel to said parallel conductor-bars one load-terminal of each pair being connected to a load bus-bar and the other adapted to be electrically connected to a removable conductor, the load-terminals being arranged also in groups of four pairs to a group on each side of said median line, and the free load-terminals of each group lying nearest each other with a row of the aforesaid contact-pieces between them, one contact-piece for each parallel conductor, whereby any load-circuit may be thrown onto any meter-circuit by merely running a removable conductor from a free load-terminal to one of the contact-pieces in the nearest row without such conductors of necessity crossing any other removable conductors running to such row of contact-pieces.

6. In a metering panel-board, the combination with the board removable conductors and meter and load bus-bars of different potentials, permanently mounted thereon of parallel conductor-bars permanently mounted on back of the board; contact-studs coming through said board from said parallel bars and adapted to have removable conductors detachably connected thereto on the front of the board; a plurality of pairs of meter-terminals one terminal of each pair being connected to a meter bus-bar and the other meter-terminal being permanently connected to one of said parallel conductors; and load-terminals arranged in pairs in two rows each row lying on opposite sides of a median line running parallel to said parallel conductor-bars, one load-terminal of each pair being permanently connected to a load bus-bar and the other adapted to be detachably connected to a removable conductor, the load-terminals being arranged also in groups of four pairs there being two pairs on each side of said median line and the free load-terminal of each group lying nearest each other with a row of the aforesaid studs between them, one stud in said row for each parallel conductor, for the purpose described.

7. In a metering panel-board the combination with the board and parallel conductor-bars *g* and a removable conductor; of meter-terminals grouped in pairs and load-terminals also grouped in pairs, one terminal in every pair being adapted for connection with the proper side of a supply-circuit, the remaining terminals of one kind being attached to said parallel bars *g* and the remaining terminals of the other kind being attachable to said removable conductor and arranged in a row parallel to said bars *g*, said bars *g* being also attachable to the removable conductor, whereby any load-circuit may be thrown onto any meter-circuit by merely attaching one end of the removable conductor to a proper terminal and bridging straight over across the bars *g* until the proper one of them is reached.

8. In a metering panel-board the combination with the board, a removable conductor, permanent bus-bars and permanent parallel conductor-bars *g;* of meter-terminals grouped in pairs and load-terminals also grouped in pairs, one terminal *e* in every pair being permanently connected with the proper one of said bus-bars and the remaining terminals *f* of one kind being permanently attached to said bars *g*, and the remaining terminals *i'* of the other kind being attachable to said removable conductor and arranged in a row parallel to said bars *g*, said bars *g* being also attachable to said removable conductor.

9. In a metering panel-board the combination with the board, removable conductor, bus-bars and parallel bars *g;* of meter-terminals and load-terminals, one side of each being connected to the proper bus-bar, the remaining side of one kind of terminal being attached to said bars *g* and the remaining side of the other kind of terminal being attachable to said removable conductor, the last-mentioned terminals being arranged in a row parallel to bars *g*, and said bars *g* being also attachable to said removable conductor.

10. In a panel-board the combination with the board, bus-bars and a removable conductor; of a set of parallel conductors *g* and a row of load-terminals *i'* arranged alongside of them, said terminals and parallel conductors being attachable to said removable conductor; other load-terminals, which are companions to the ones above mentioned and are connected to the proper one of the bus-bars; and meter-terminals, one side whereof are

connected to the proper one of the bus-bars and the other side whereof are connected to said parallel conductors.

11. In a panel-board the combination with the board, bus-bars and a removable conductor; of a set of parallel conductors *g* and a row of load-terminals *i'* arranged alongside of them and adapted to be attached to said removable conductor; means on each of said parallel conductors at a point approximately as near as can be to said load-terminals for establishing connection with said removable conductor; a meter-terminal connected to each of said parallel conductors; and other load and meter terminals, companions to the ones above mentioned, properly connected to said bus-bars.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

ARTHUR C. McWILLIAMS.

Witnesses:

HOWARD M. COX,

GEO. M. MAYER.