No. 756,966. PATENTED APR. 12, 1904.

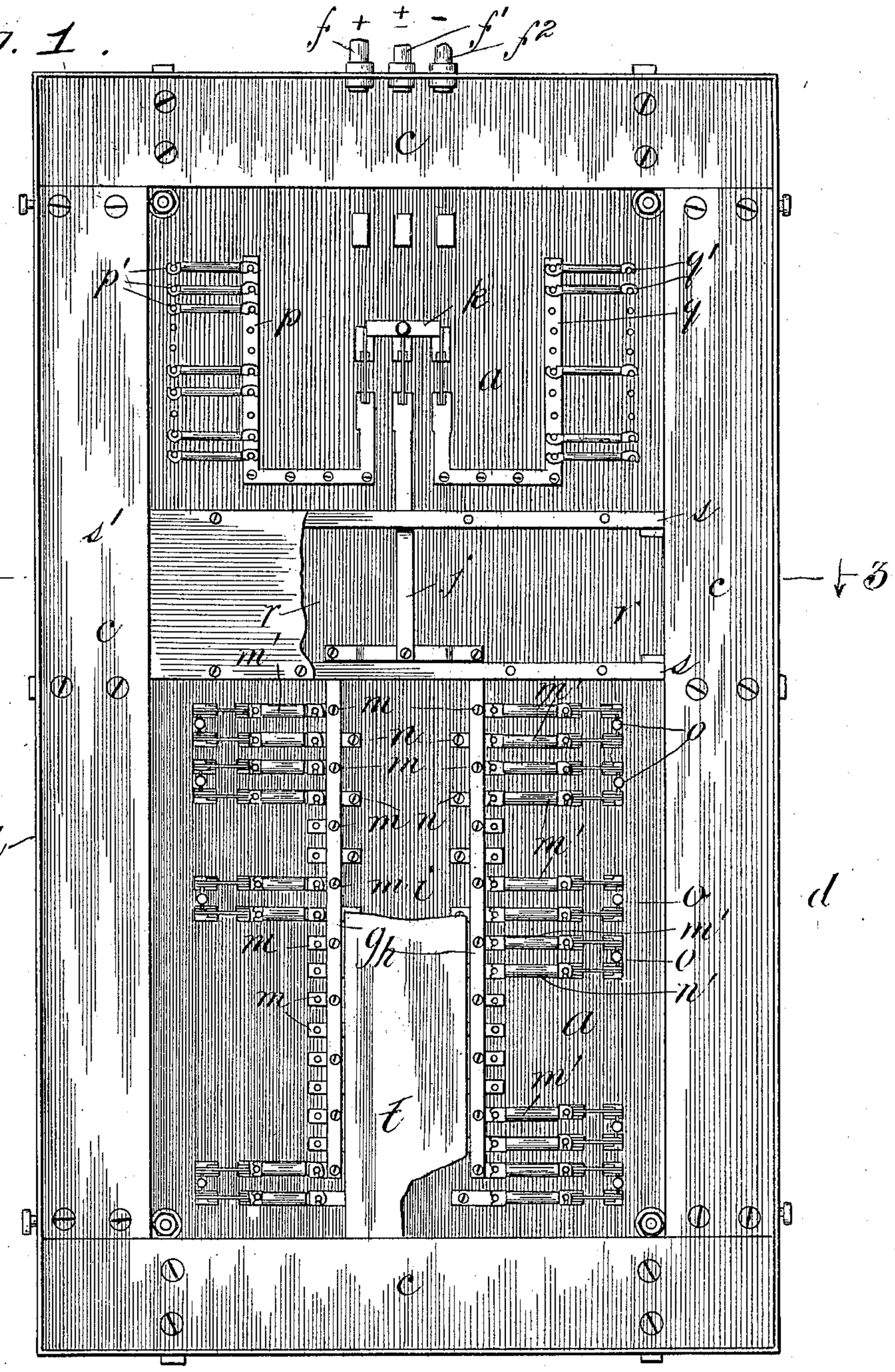
G. H. JONES.

PANEL BOARD FOR ELECTRIC DISTRIBUTION.

APPLICATION FILED NOV. 20, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

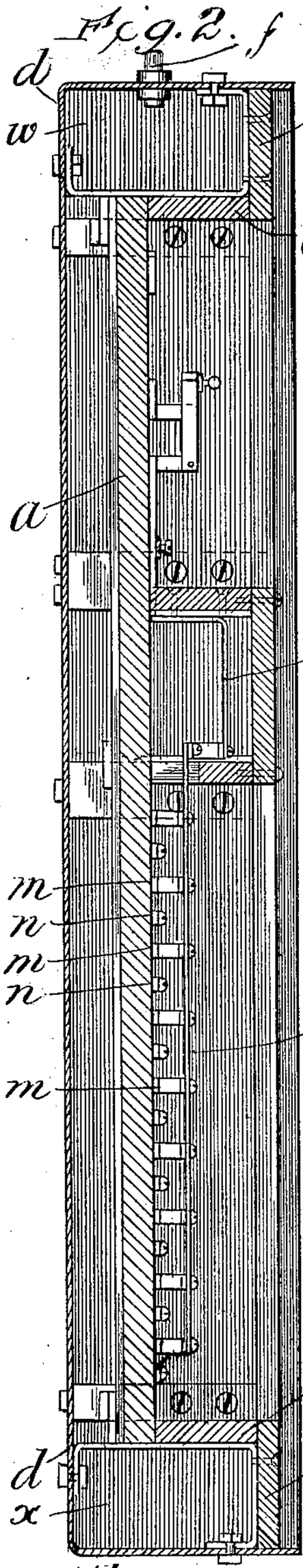


Fig. 3.

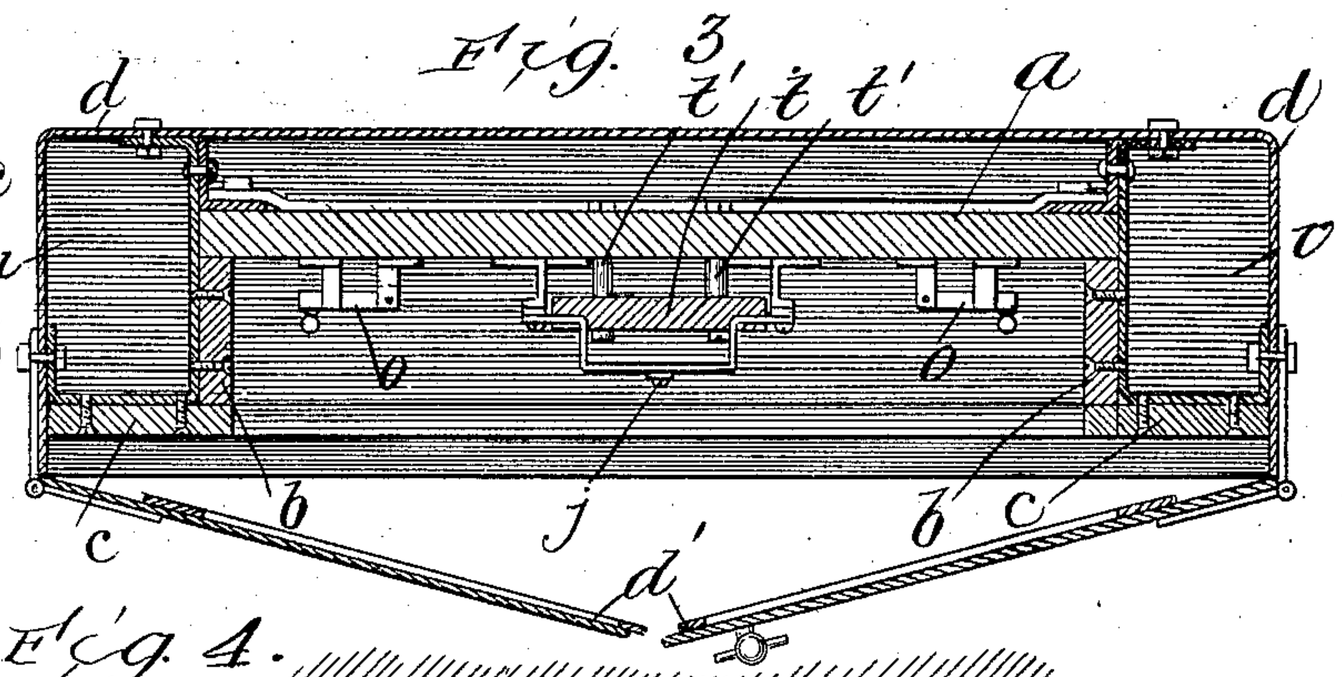


Fig. 4.

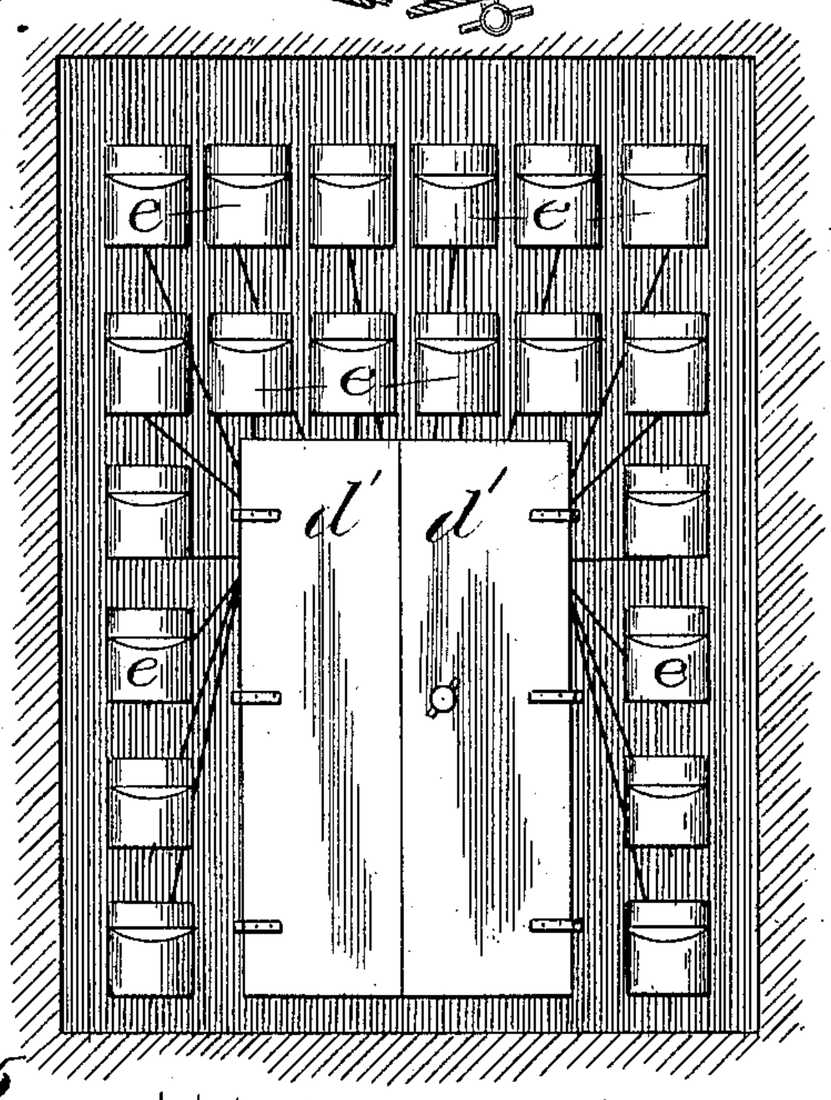
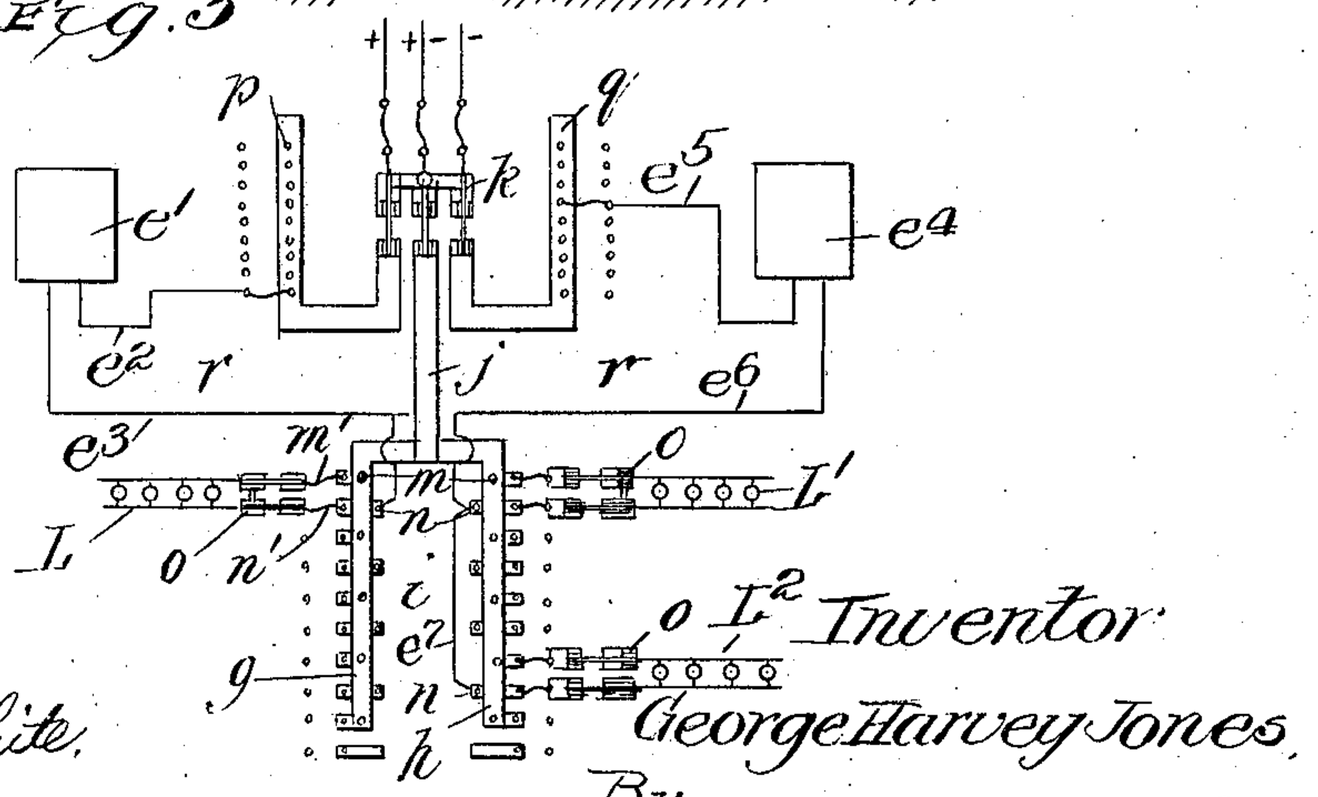


Fig. 5



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UNITED STATES PATENT OFFICE.

GEORGE HARVEY JONES, OF CHICAGO, ILLINOIS.

PANEL-BOARD FOR ELECTRIC DISTRIBUTION.

SPECIFICATION forming part of Letters Patent No. 756,966, dated April 12, 1904.

Application filed November 20, 1903. Serial No. 182,001. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HARVEY JONES, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Panel-Boards for Electric Distribution, of which the following is a specification.

My invention relates to panel-boards for the distribution of electric current for electric lighting and other purposes in office buildings and other structures; and the object of my invention is to provide means for readily altering the grouping of the different circuits to the meters, so that each circuit may be metered individually or any number of circuits may be readily grouped under one meter. I accomplish this object by the arrangement of devices illustrated in the accompanying drawings, in which—

Figure 1 is a front view of a panel-board embodying my invention, the front doors of the inclosing cabinet portion thereof being removed to better reveal the parts. Fig. 2 is a vertical sectional view. Fig. 3 is a horizontal sectional view of the board. Fig. 4 is a front view of the board, showing the doors closed and a group of meters surrounding the board and the whole being inclosed in a recess or closet provided in the building structure for their reception. Fig. 5 is a diagrammatic view illustrating different possible groupings of the load-circuits.

Similar letters refer to similar parts throughout the several views.

a represents a slab of marble, slate, or other insulating material, which is preferably bordered by the walls *b* and facings *c*, of the same or similar material. Said slab or foundation-board *a*, the walls *b*, and facings *c* are secured together in any suitable manner and are preferably incased in a metallic cabinet *d*, provided with the hinged doors *d'*. Said slab *a* forms the foundation of the panel-board and carries the various bus-bars, switches, contacts, and fuses hereinafter more fully described.

e e represent meters which are grouped in any suitable manner around the cabinet *d* and which are in ordinary practice inclosed together with said cabinet in a closet or other suitable space in the building.

The present board is arranged for a three-wire system of distribution—that is to say, a system in which both the plus and minus leads return through a third or neutral conductor, and the fragments of pipes *f*, *f'*, and f^2 indicate the means whereby the three conductors are led into the cabinet *d* from the source of electric energy. For purposes of description these pipes may be considered as the supply-terminals.

The load bus-bars *g* and *h* are substantially parallel to each other and located at a sufficient distance apart to form a rectangular space or raceway *i*, which extends substantially the lower half of the board. Near the middle of the board said bus-bars *g* and *h* are connected to the neutral bus-bar *j*, which is adapted to connect with the supply-terminal *f'*. The cut-out switch *k* is provided at a suitable point, preferably near the upper portion of the board, to afford means for disconnecting the supply-terminals from all of the bus-bars on the board.

Electrically connected to each of the bus-bars *g* and *h* is a set of contacts *m m*, adapted to make electric connection with the fuses *m' m'*, which carry current to the various loads. The contacts *m* are so arranged that said fuses *m'* will lie at right angles to the bus-bars *g* and *h* outside of the raceway *i*. Adjacent to each one of the contacts *m* is a contact *n*, which is electrically insulated from the load bus-bars *g h*, but is so arranged that the fuse *n'*, through which the current returns from the load, may lie parallel to and between two adjacent faces *m' m'*. The contacts *m* and *n* are grouped in pairs along the bus-bars *g* and *h* in the manner best shown in Fig. 1, and a cut-out switch *o* should be provided, so as to afford means for electrically disconnecting each pair of fuses *m' n'* from their respective load-circuits. Said contacts *m* and *n* are of any suitable type, having binding-posts, so that the electric conductors may be readily connected and disconnected. The bus-bars *m* and *n*, together with their fuses and cut-outs, are located on one portion of the slab *a*, while

the other portion thereof carries the meter bus-bars p and q. The raceway r lies between said bus-bars p and q and the bus-bars m and n.

For convenience the bus-bars p and q are preferably L-shaped, with the longest leg parallel to the lateral edges of the slab a and the shortest leg extending lengthwise of the raceway r. Said meter bus-bars are connected with the terminals f f^2, respectively.

The fuses p' and q' extend outwardly from the bus-bars p and q toward the edges of the slab a and are adapted to be electrically connected with the conductors leading from the various meters e. The strips s s, which are composed of insulating material, extend across the board and form the boundaries of the raceway r and also afford means of attachment for the raceway-cover s', so that the wiring within said raceway may be protected from injury from exterior objects. A cover t is provided for the raceway i to protect in a similar manner the wiring within said raceway, a suitable form of attachment for said cover t being the studs t' t'.

Referring now to the diagram for the purpose of illustrating the operation of the device, let L represent a particular load consisting of a group of lights, fan-motors, or other objects requiring a supply of electric current and let it be desired to connect this single load to the meter e'. To complete the wiring necessary to connect this load L to the meter e', it is merely necessary to run a short wire e^2 directly from said meter to the meter bus-bar p and another wire e^3 from said meter along the raceway r and raceway i and connect it with such one of the contacts n as leads to the proper polarity of said load L. It will be seen that all contacts or binding-posts are provided in readiness, so that two wires only are required to complete the passage of the load-current through the meter. Suppose, however, it becomes necessary to group a plurality of loads, as L' L^2, located at different parts of the building structure, to a single meter e^4. It is merely necessary to run a short wire e^5 directly from the meter to the bus-bar q and a second wire e^6 from the meter along the raceway r and raceway i to the load L', through its contacts n, adjacent to the load bus-bar h. This connects load L' to meter e^4, and load L^2 is grouped under the same meter by merely looping the wire from the contact n of load L^2 to the contact n of load L'. The opposite polarity of both loads L' and L^2 have their return through the bus-bar h. Thus a great number of loads may be connected to the same meter by simply providing an additional wire in the raceway i and connecting said wire in a manner analogous to the connection just described with reference to the wire e^7.

The great advantage of a panel-board of this construction lies in the ease and simplicity with which various groupings may be accomplished and the paucity of wires required for making the connections and also the symmetry with which the wires may be laid within the raceways i and r. Inasmuch as all the added wires—that is to say, those wires, such as e^2, e^3, e^5, e^6, and e^7, installed by the electrician when the final arrangement of loads has been decided upon—lie within the raceways i and r and may be substantially parallel therein, the danger of confusing the different connections is greatly lessened and the work of altering the groupings from time to time greatly reduced. Moreover, as these added wires may be encompassed within a small space they may all be protected upon the panel-board by means of the covers t and s', which occupy but a small portion of the superficial area of the device.

It is not always possible to lead the wires straight in from the loads to the bus-bar connections without turns or bends, because frequently there is inadequate space for the panel-board and it is necessary to come in to the panel-board from the top or bottom instead of straight in from the side. To provide for emergencies of such nature, lateral raceways u and v and a transverse top raceway w and bottom raceway x are formed at the boundaries of the device. These raceways or ducts are closed passage-ways, whose walls are of insulating material and preferably sheet-iron, as shown in the drawings. By taking advantage of these raceways it is possible to reach any point on the bus-bars from any point outside the device without danger of confusion or intertangling of wires.

I do not wish to be understood as limiting myself to a panel-board designed for a three-wire system nor to a board arranged precisely in the manner shown.

The particular arrangement of the various contacts and the number and location of the fuses and switches may be varied to a certain extent without departing from the spirit of my invention, which is more particularly pointed out in the accompanying claims.

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

1. In a panel-board for electric distribution, the combination of substantially parallel load bus-bars, a raceway between said load bus-bars for the meter-conductors; a set of load-contacts located at intervals along said bus-bars; a meter bus-bar; a meter connected to said load bus-bar and to said meter bus-bar and a set of fixed load-contacts, each fixed load-contact being adjacent to its respective load-contact on said load bus-bar, but insulated therefrom, and all of said load-contacts having their load connections arranged outside of the load bus-bars, whereby said raceway is free to receive the meter-conductors.

2. In a panel-board for electric-power dis-

tribution, the combination of a meter, meter-conductors, substantially parallel bus-bars connected to said meter through said meter-conductors, a raceway between the said bus-bars for receiving the meter-conductors, a set of load-contacts located at intervals along the bus-bar and arranged on the outer side therof to leave said raceway free to receive the said meter-conductors only, and a fixed contact adjacent to each one of said load-contacts but insulated therefrom and adapted to be connected to the remaining polarity of the various loads, said fixed contacts being adapted for electric connection with the proper supply-terminals through said meter-conductors.

3. In a panel-board for electric-power distribution, the combination of a meter, meter-conductors, two parallel bus-bars as *g* and *h* connected to one of the supply-terminals and forming between them a raceway for the meter-conductors, load-contacts mounted on said bus-bars to lead outwardly to one polarity of the loads, fixed load-contacts adjacent to each of first-mentioned contacts but insulated therefrom and also adapted to lead outwardly to the remaining polarity of the loads whereby said raceway is free for receiving the said meter-conductors only.

4. In a panel-board for electric distribution, the combination of a slab of insulating material, two parallel load bus-bars mounted thereon, a raceway for the meter-conductors between said parallel bus-bars; meter bus-bars; insulated strips transverse to said load and forming a second raceway between said meter bus-bars and the ends of the load bus-bars, means for connecting said meter bus-bars to the meters, load-contacts arranged along said load bus-bars and adapted to lead outwardly to the loads; and other load-contacts adjacent to the aforesaid load-contacts in pairs, but insulated therefrom, said last-mentioned load-contacts being also adapted to lead outwardly to the loads, the said raceways being thereby free of conductors except the remaining meter-conductors.

5. As an article of manufacture, a panel-board comprising a slab of insulating material; two parallel load bus-bars arranged longitudinally thereon parallel to the sides thereof, upon one end portion of said slab; two meter bus-bars as *p* and *q*, a portion of each also being arranged longitudinally on said slab and parallel to the edges thereof said load bus-bars and meter bus-bars occupying different end portions of said slab, transverse insulating-strips located between the meter bus-bars and the ends of the load bus-bars to thereby form a raceway extending transversely across said slab; and said load bus-bars being far enough apart to form a raceway between them, for the purpose described.

6. As an article of manufacture, a panel-board comprising a slab of insulating material; two parallel load bus-bars arranged longitudinally thereon parallel to the sides thereof, and located upon one half of the slab; a raceway between said load bus-bars, a removable cover for said raceway; a second raceway connecting with said first raceway and extending across the slab; a removable cover for said second raceway; and meter bus-bars located upon the other half of said slab and separated from said load bus-bars by said transverse raceway, all substantially for the purpose described.

7. As an article of manufacture, a slab of insulating material; a longitudinal and a transverse raceway thereon for the meter-conductors; bus-bars fixed on said slab at the sides of said raceways; a set of load-contacts fixed on the bus-bars bordering the longitudinal raceway; a second set of load-contacts insulated from the first but arranged adjacent thereto in pairs; means for connecting said second set of load-contacts to the meters; means for connecting the remaining bus-bars to the meters; and means for connecting the bus-bars on different sides of the transverse raceway to different supply-terminals.

8. As an article of manufacture, a slab of insulating material; a longitudinal and a transverse raceway thereon for the meter-conductors; bus-bars fixed on said slab at the sides of said raceways, a set of load-contacts fixed on the bus-bars bordering the longitudinal raceway; a second set of load-contacts insulated from the first but arranged adjacent thereto in pairs; means for connecting said second set of load-contacts to the meters; means for connecting the remaining bus-bars to the meters; means for connecting the bus-bars on different sides of the transverse raceway to different supply-terminals, and a metallic casing wherein said slab is inclosed and supported.

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Witnesses:
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