F. B. ADAM.

METER CONTROL PANEL BOARD.

APPLICATION FILED APR. 6, 1912.

1,099,683.

Patented June 9, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

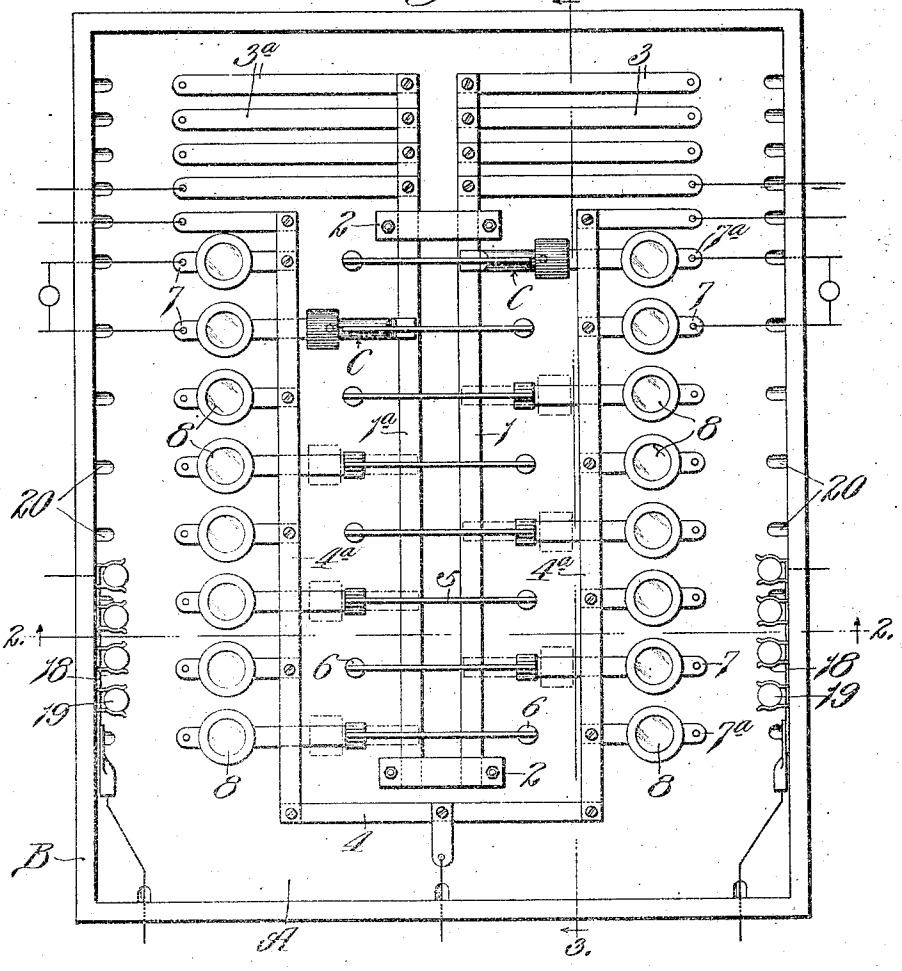
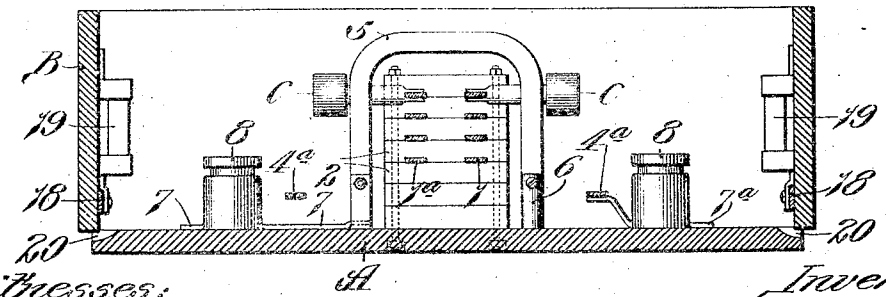


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

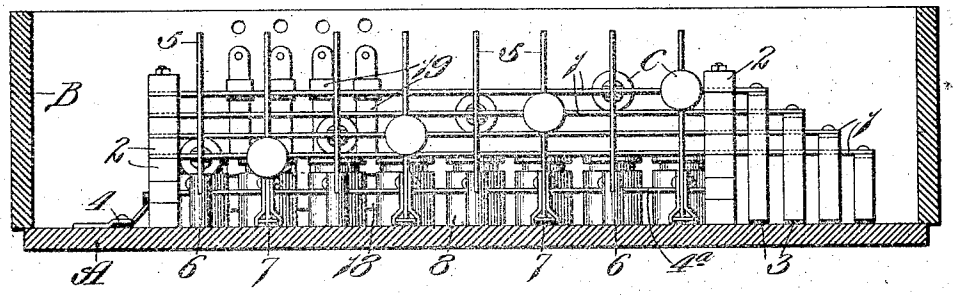


Fig. 4.

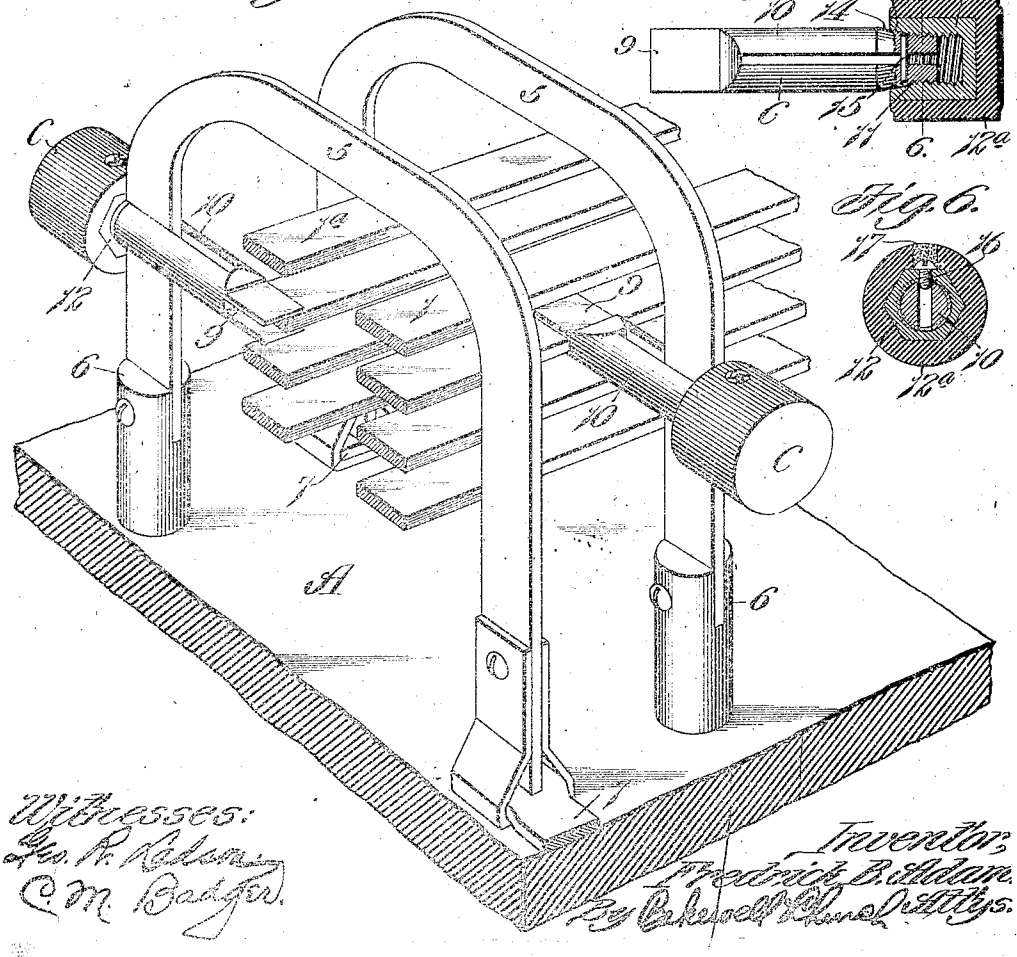


Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

FREDRICK B. ADAM, OF ST. LOUIS, MISSOURI, ASSIGNOR TO FRANK ADAM ELECTRIC COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

METER-CONTROL PANEL-BOARD.

1,099,683. Specification of Letters Patent. Patented June 9, 1914.

Application filed April 6, 1912. Serial No. 688,886.

To all whom it may concern:

Be it known that I, FREDRICK B. ADAM, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Meter-Control Panel-Boards, 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.

This invention relates to meter control panel boards of the type in which the meter bus bars are arranged in two groups in superimposed relation on the front face or side of the board.

One object of my invention is to provide a meter control panel board of the type referred to in which the circuit bus bars are so designed and arranged that any circuit bus bar can be connected to any meter bus bar on the board.

Another object is to provide a meter control panel board of the character above-described in which the circuit bus bars are arranged in such a manner with relation to the meter bus bars that the bus bar connecting devices are located outside of the two groups of meter bus bars instead of between the two groups of meter bus bars, as in the meter control panel boards of this type heretofore in use, thus enabling the proper meter and circuit bus bars to be selected quickly and connected together without liability of making a mistake.

Another object is to provide a meter control panel board comprising meter and circuit bus bars and connecting devices which are so constructed and arranged that a circuit bus bar cannot be connected either maliciously or accidentally to two meter bus bars on opposite sides of the system and thus create a short circuit.

Another object is to provide a meter control panel board in which the bus bar connecting devices are so constructed that any attempt to change the circuits or connect two or more circuits to one meter bus bar can be detected easily.

Another object is to provide a compact meter control panel board in which the meter terminals and fuses are mounted on the side lining of the board instead of on the front face of the board, thereby producing a shorter and more compact panel board than those heretofore in use. And still another object is to provide a meter control panel board which is so constructed that the circuit wires can be connected to the terminals on the front face of the board before the lining of the board is arranged in position.

Other objects and desirable features of my invention will be hereinafter pointed out.

Figure 1 of the drawings is a front elevational view of a meter control panel board constructed in accordance with my invention; Fig. 2 is a horizontal cross sectional view taken on approximately the line 2—2 of Fig. 1; Fig. 3 is a vertical sectional view taken on approximately the line 3—3 of Fig. 1; Fig. 4 is an enlarged perspective view showing the panel arranged in an approximately horizontal position and illustrates the arrangement of the circuit and meter bus bars, and the bus bar connecting devices; Fig. 5 is an enlarged detail view partly in section of one of the bus bar connecting devices; and Fig. 6 is a cross sectional view taken on the line 6—6 of Fig. 5.

Referring to the drawings which illustrate the preferred form of my invention, A designates the board proper which may either consist of a single slab or panel of insulating material, or of a plurality of panels, depending upon the size of the board, and B designates the side lining which surrounds the board and projects forwardly from the front face thereof, it being understood that the board lies in a vertical plane when it is arranged in operative position. Two sets of meter bus bars are arranged vertically on the front face of the board in superimposed relation to each other and parallel to the front face of the board, one set being designated by the reference character 1 and the other set by the reference character 1^a. The meter bus bars 1 and 1^a are supported and held in position by means of a plurality of superimposed blocks 2 of insulating material and the upper end of each of said meter bus bars is connected to a laterally projecting bus bar or branch to which one of the meter wires is connected, the branch bus bars that coöperate with the meter bus bars 1 branching to the right and being designated by the reference character 3 and those that coöperate with the meter

bus bar 1^a branching to the left and being designated by the reference character 3^a, as shown in Fig. 1. The neutral bus bar 4 is herein shown arranged adjacent the lower end of the board and is provided with two upwardly projecting branches 4^a that extend parallel to the meter bus bars.

The circuit bus bars 5 surround or inclose the meter bus bars and project forwardly from the front face of the board, said circuit bus bars preferably consisting of thin strips of metal that are bent edgewise into substantially U form, as shown in Fig. 4. The board lies in a vertical plane when it is arranged in operative position and consequently the bus bars 5 extend horizontally across the front face of the board, one above the other, one leg or side portion of each of said bars being connected to a bifurcated insulating post 6 that projects forwardly from the front face of the board. The other leg or side portion of each of the circuit bus bars 5 is connected to a pair of ears or wings on a circuit terminal 7, as shown in Fig. 4, the companion terminal 7^a being connected to one branch 4^a of the neutral bus bar, as shown in Fig. 1. Fuses 8 of any preferred type or design are combined with the circuit terminals 7 and 7^a so as to protect the circuits.

The meter and circuit bus bars are connected together by bus bar connecting devices C which are preferably adjustably mounted on the circuit bus bars 5, and comprise means for securely clamping them to said circuit bus bars, said devices C being arranged on the legs or side portions of the circuit bus bars when they are in service. As shown in Figs. 4, 5 and 6, each of the bus bar connecting devices C consists of a member provided at its inner end with a bifurcated portion 9 for receiving the meter bus bar with which it coöperates, and a second bifurcated portion 10 that receives the circuit bus bar on which it is mounted, the slots or openings in said bifurcated portions 9 and 10 being arranged at approximately right angles to each other. The outer end of the bifurcated portion of the device C is screw-threaded at 11 so as to coöperate with internal screw-threads on a clamping member 12 that is provided with a beveled surface 13 which coöperates with a tapered portion 14 on the bifurcated portion 10 located adjacent the screw-threads 11. Said clamping member 12 has a knurled covering or cap 12^a of insulating material so as to enable it to be screwed onto or off of the screw-threaded portion 11 of the bus bar connecting device C. When said clamping member is screwed downwardly the beveled surface 13 thereon engages the tapered surface 14 on the bifurcated portion 10 of the bus bar connecting device C and forces the sides of said bifurcated portion 10 tightly against the bus bar 5 on which the device C is mounted, thus securely clamping said device in adjusted position. When the clamping member 12 is turned in the opposite direction the device C will, of course, be released from its supporting circuit bus bar. After the bus bar connecting device C has been released it can be drawn laterally, away from the group of meter bus bars so as to disengage the bifurcated portion 9 thereof from engagement with the meter bus bar, and said device C can then be moved longitudinally of its supporting bus bar toward or away from the panel A into position to engage the meter bus bar which it is desired to connect to the circuit bus bar on which said device C is mounted, it being possible to connect either circuit bus bar to any meter bar on the board by simply moving the particular bus bar connecting device C longitudinally of the supporting circuit bus bar. In view of the fact that the bus bar connecting devices C are located outside of the meter bars instead of between the two sets of meter bus bars, the operator can quickly select the meter and circuit bus bars which he desires to connect together without liability of making an error.

In order to eliminate the possibility of two bus bar connecting devices C being arranged on the same circuit bus bar either accidentally or maliciously, I prefer to provide each of the bus bar connecting devices C with means that prevents it from being removed bodily from its supporting circuit bus bar after it has been arranged in operative position thereon by the manufacturer. The means herein shown for preventing the complete removal of the bus bar connecting devices consists of a pin 15 in each bus bar connecting device that extends transversely through the bifurcated portion 10 thereof at such a point that it does not interfere with the movement of said device relatively to its supporting circuit bus bar when it is desired to withdraw the bifurcated portion 9 from engagement with its coöperating meter bar but it does prevent said device C from being slipped off or bodily removed from its supporting circuit bus bar in case the clamping member 12 is completely removed. Consequently, with a meter control panel board of the construction above-described there is no possibility of two meter bus bars on opposite sides of the system being accidentally connected to the same circuit bus bar and thus causing a short circuit to be created because there is only one bus bar connecting device mounted on each circuit bus bar and it is mounted thereon in such a manner that it cannot be bodily removed after it has been arranged in position by the manufacturer, without mutilating or breaking said device.

If desired, means may be provided for locking the clamping members 12 of the bus

bar connecting devices C so as to prevent a dishonest person from changing the circuits or arranging two or more circuits on the same meter bus bar. One means that may be used for accomplishing this consists of a set screw 16 adjustably mounted in the clamping member 12 of each of the bus bar connecting devices in such a manner that it can be projected inwardly into the slot in the bifurcated portion 10 after the clamping member 12 has been screwed down, thus securely locking said clamping member so that it cannot be turned in the reverse direction to release the bus bar connecting device C. After the circuit and meter bus bars have been connected together by an authorized person the set screws 16 in the clamping member 12 of each bus bar connecting device is screwed inwardly so that it will project into the slot of the bifurcated portion 10 and a drop of sealing-wax 17, or some other suitable material, is placed in the hole in the covering 12^a of the member 12 through which said set screw is inserted so as to seal the clamping member and thus prevent an unauthorized person from releasing the device C and shifting it onto a different meter bar. I, of course, do not wish to be understood as meaning that the screws 16 and seal 17 in the clamping member 12 of each bus bar connecting device absolutely locks said device or prevents its position being changed, but I do claim that with a bus bar connecting device C of the character above-described a person who has charge of the meter panel board can readily detect any attempt to change the circuits or put two or more circuits on the same meter.

In order to reduce the size of the panel A and thus produce a compact meter control panel board I have arranged the meter terminals 18 and the meter fuses 19 on the side lining B of the board, as shown in Figs. 1 and 2, instead of on the front face of the board, as is now the general practice, the terminals 18 being connected to the meter bus bar branches 3 and 3^a by means of wires, not shown, that pass through openings in the side lining B and extend along the outside face of said lining. It is not absolutely essential, however, that the meter terminals and meter fuses be arranged in this manner but I prefer such a construction because it enables me to use a shorter panel A than those of the boards now in general use in which the meter terminals are mounted directly on the lower end portion of the panel.

Prior to my invention it was the usual practice to cut holes in the side lining B of the board so as to permit the circuit and meter wires to be fished in through said holes and connected to the terminals on the front face of the board. Said holes were generally cut in the side lining at the time the board was being installed and consequently a great deal of time was consumed in setting up a meter control panel board. Furthermore, the wires could not be connected to the terminals on the board until after the side lining had been arranged in position. To overcome these objectionable features I cut slots or grooves 20 in the front face of the board adjacent the edges of same, as shown in Figs. 1 and 2, at the time the board is being manufactured so as to receive the various wires which are connected to the terminals on the board, said grooves being of sufficient depth so that the wires will pass under the inner edge of the side lining B. When the board is being installed the workmen connect the wires to the terminals on the front face of the board and arrange the wires in the grooves or notches 20 provided for same in the edge portions of the board. Thereafter, the side lining B is arranged in operative position. In this way I reduce the time required to install the board and I also produce a more mechanically perfect structure than one in which the workmen form holes in the side lining at the time the board is being installed.

It is possible with a meter control panel board of the construction above-described to connect any circuit bus bar to any meter bus bar on the board owing to the fact that the circuit bus bars surround or inclose the two groups of meter bus bars which pass vertically through the circuit bus bars. The fact that all of the bus bars are located in plain view of the operator or the person making the connection, and the fact that the bus bar connecting devices are adjustably mounted on the outer group of bus bars and are slipped over the outside edges of the meter bus bars, permits the proper bus bars to be selected easily and connected together without liability of making an error. Furthermore, such a board practically eliminates the possibility of a short circuit being created because the bus bar connecting devices are permanently mounted on their supporting bus bars and only one bus bar connecting device is provided for each circuit bus bar, thereby preventing a circuit bus bar from being accidentally connected to both sides of the system or to one meter bar of each group. The fact that the bus bar connecting devices may be sealed reduces to a minimum the liability of a dishonest person shifting the bus bar connecting devices so as to connect two or more circuits to the same meter, and when the meter terminals and fuses are arranged on the side lining of the board as herein shown, a great saving is effected both in the cost of manufacturing the board and the space required to install the board.

Having thus described my invention, what

I claim as new and desire to secure by Letters Patent is:

1. A meter control panel board having a set of bus bars arranged one in front of the other in the same vertical plane on the front face of the board, and a second set of bus bars that are arranged one above the other and extend transversely of the board outside of the bus bars first referred to.

2. A meter control panel board having a set of substantially U-shaped bus bars that project forwardly from the front face of the board and which are arranged one above the other, a second set of bus bars arranged in superimposed relation to each other and passing through said U-shaped bus bars, and bus bar connecting devices slidingly mounted on said U-shaped bus bars and provided with handles or finger-pieces which extend beyond said U-shaped bus bars.

3. A meter control panel board having separate sets of meter bus bars arranged on the front face of the board, one set being parallel to the other and the bars of each set being arranged in alinement, one in front of the other, and circuit bus bars that surround or embrace said meter bus bars and extend transversely of same.

4. A meter control panel board having separate sets of meter bus bars arranged on the front face of the board, one set being parallel to the other and the bars of each set being arranged one in front of the other in the same vertical plane, and substantially U-shaped circuit bus bars that project forwardly from the front face of the board and surround or embrace said meter bus bars, said U-shaped bars being arranged horizontally one above the other.

5. A meter control panel board having a set of bus bars arranged one in front of the other in vertical alinement on the front face of the board, a second set of bus bars that project forwardly from the front face of the board and extend at approximately right angles to the bus bars first referred to, and bus bar connecting devices mounted on said forwardly projecting bus bars that are adapted to engage the bars of the set first referred to so as to onnect the bus bar of one set to the bus bar of the other set with which it coöperates.

6. A meter control panel board having a set of bus bars arranged in superimposed relation to each other on the front face of the board, a second set of bus bars that project forwardly from the front face of the board and extend at approximately right angles to said superimposed bus bars, and a bus bar connecting device adjustably mounted on each of said forwardly projecting bus bars and provided with a portion that is adapted to embrace one of said superimposed bus bars.

7. A meter control panel board having a set of bus bars arranged one in front of the other on the front face of the board, a second set of bus bars having portions that project forwardly from the front face of the board and portions that extend at approximately right angles to the bus bars first referred to, and a bus bar connecting device slidingly mounted on one of the forwardly projecting portions of each of said second set of bus bars and provided with a slotted or bifurcated portion that is adapted to receive one of the bus bars of the set first referred to.

8. A meter control panel board having a set of bus bars arranged in superimposed relation to each other on the front face of the board, a second set of bus bars that project forwardly from the front face of the board at approximately right angles to said superimposed bus bars, and adjustable bus bar connecting devices slidingly mounted on said forwardly projecting bus bars and provided with bifurcated portions that are adapted to embrace one of said superimposed bus bars.

9. A meter control panel board comprising bus bars arranged in superimposed relation to each other on the front face of the board, substantially U-shaped bus bars that project forwardly from the front face of the board and surround said superimposed bus bars, and bus bar connecting devices adjustably mounted on the side portions of said U-shaped bus bars and adapted to be moved into and out of engagement with said superimposed bus bars.

10. A meter control panel board having sets of meter bus bars that extend parallel to each other, the bars of each set being arranged one in front of the other on the front face of the board, substantially U-shaped circuit bus bars that embrace or surround said meter bus bars and extend transversely of same, and bus bar connecting devices mounted on the side legs of said circuit bus bars and constructed in such a manner that any circuit bus bar can be connected to any meter bus bar on the board.

11. A meter control panel board having sets of meter bus bars that extend parallel to each other, the bars of each set being arranged one in front of the other on the front face of the board, substantially U-shaped circuit bus bars that embrace or surround said meter bus bars and extend transversely of same, and bus bar connecting devices mounted on the side legs of said circuit bus bars and each consisting of a member provided with a bifurcated portion through which the circuit bus bar passes, a bifurcated portion for receiving one of the meter bus bars, and adjustable means for clamping said member to the circuit bus bar on which it is mounted.

12. A meter control panel board having

meter bus bars, circuit bus bars arranged edgewise with relation to said meter bus bars, bus bar connecting devices on said circuit bus bars, each of which consists of a member provided with a bifurcated portion for receiving its supporting circuit bus bar and a bifurcated portion for receiving its coöperating meter bar, a clamping member coöperating with one of said bifurcated portions for clamping said member to its supporting circuit bus bar, and a pin arranged transversely through said member for preventing it from being completely removed from its supporting bus bar.

13. A meter control panel board having meter bus bars and circuit bus bars set edgewise with relation to each other and arranged at approximately right angles, bus bar connecting devices having bifurcated portions through which said circuit bus bars pass, an adjustable clamping member on each of said devices for pressing one of the bifurcated portions of same tightly against its supporting bus bar, a cap or finger-piece of insulating material secured to said clamping member, a set screw in said clamping member for locking it in adjusted position, and means in said cap for receiving a sealing medium so as to prevent an unauthorized person from releasing the clamping member.

14. A meter control panel board having sets of meter bus bars arranged vertically on the front face of the board one in front of the other, substantially U-shaped circuit bus bars that project forwardly from the front face of the board and surround both sets of meter bus bars, said circuit bus bars being arranged horizontally one above the other, bus bar connecting devices slidingly mounted on the side legs of said circuit bus bars and adapted to be moved laterally into and out of engagement with the meter bus bars of either set, and means for clamping said bus bar connecting devices in adjusted position.

15. A meter control panel board having sets of meter bus bars arranged vertically on the front face of the board in superimposed relation to each other, substantially U-shaped circuit bus bars that project forwardly from the front face of the board and surround both sets of meter bus bars, said circuit bus bars being arranged one above the other, bus bar connecting devices slidingly mounted on said circuit bus bars and adapted to be arranged in engagement with the meter bus bars of either set, means for clamping said bus bar connecting devices in adjusted position, means for preventing said bus bar connecting devices from being completely removed from their supporting bus bars, and means for sealing said bus bar connecting devices so as to prevent an unauthorized person from moving them from the positions in which they have been set.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this second day of April 1912.

FREDRICK B. ADAM.

Witnesses:
WELLS L. CHURCH,
GEORGE BAKEWELL.