June 16, 1931. J. M. BROWN 1,810,694

SWITCH MECHANISM

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Fig. 1.

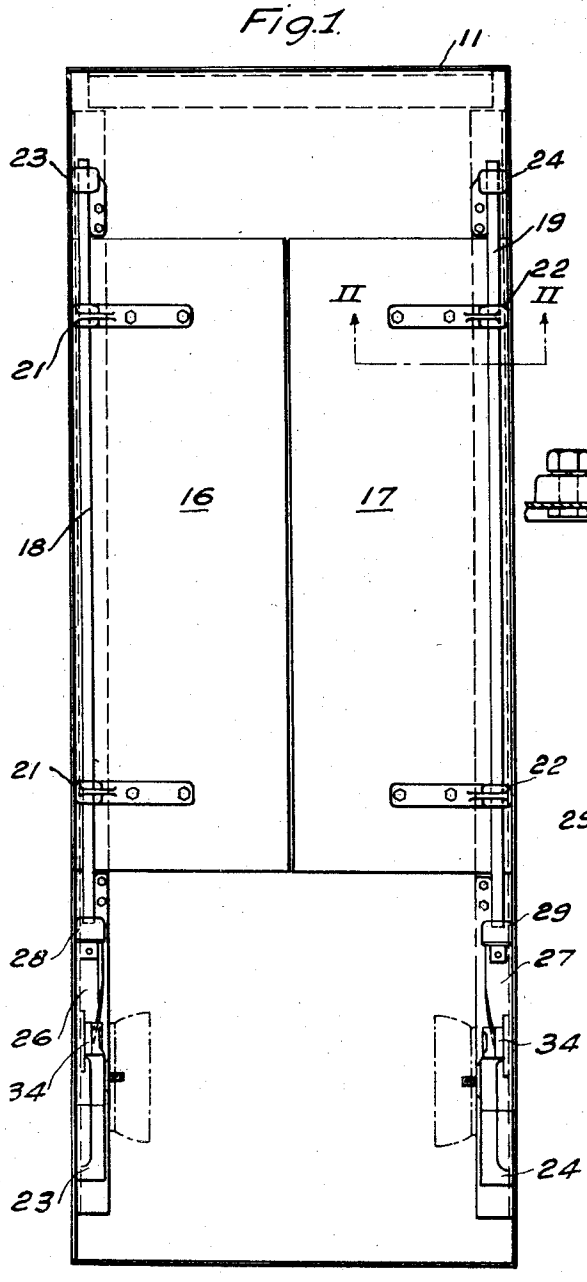


Fig. 2.

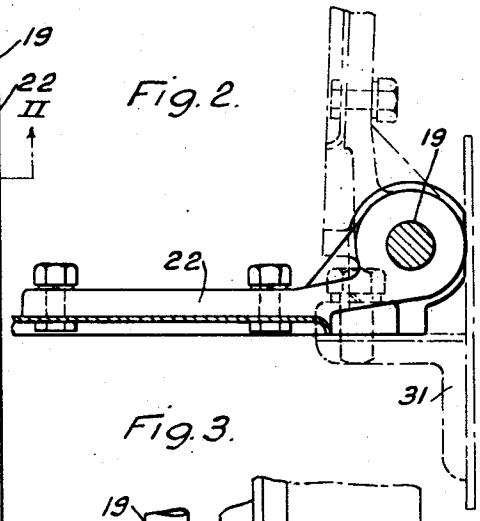
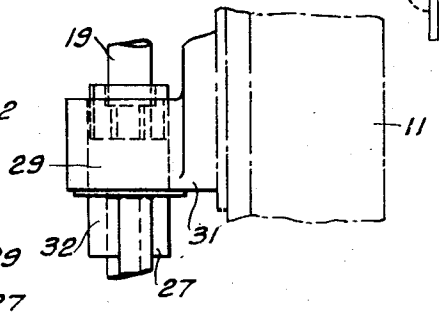


Fig. 3.



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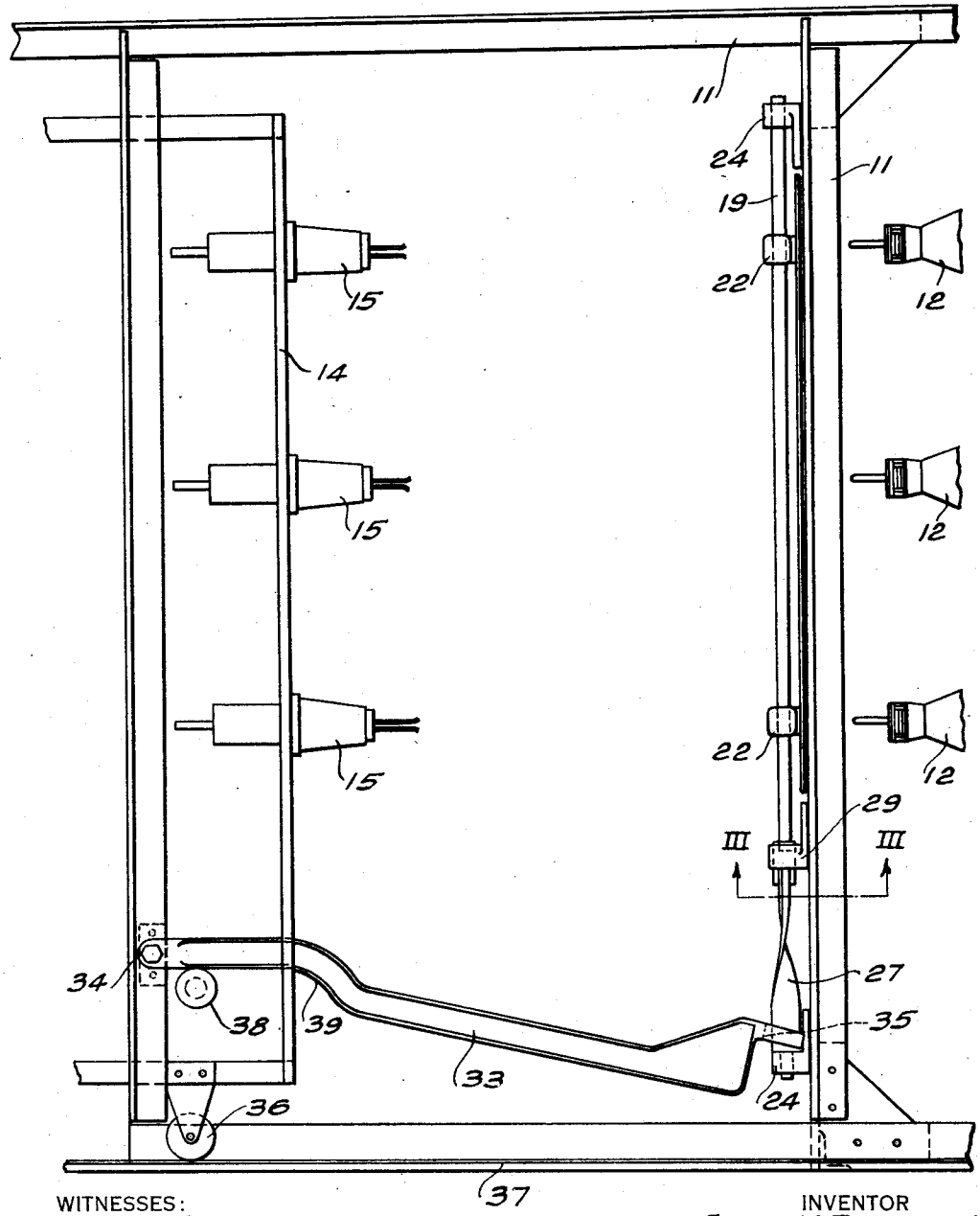
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SWITCH MECHANISM

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Fig. 4.



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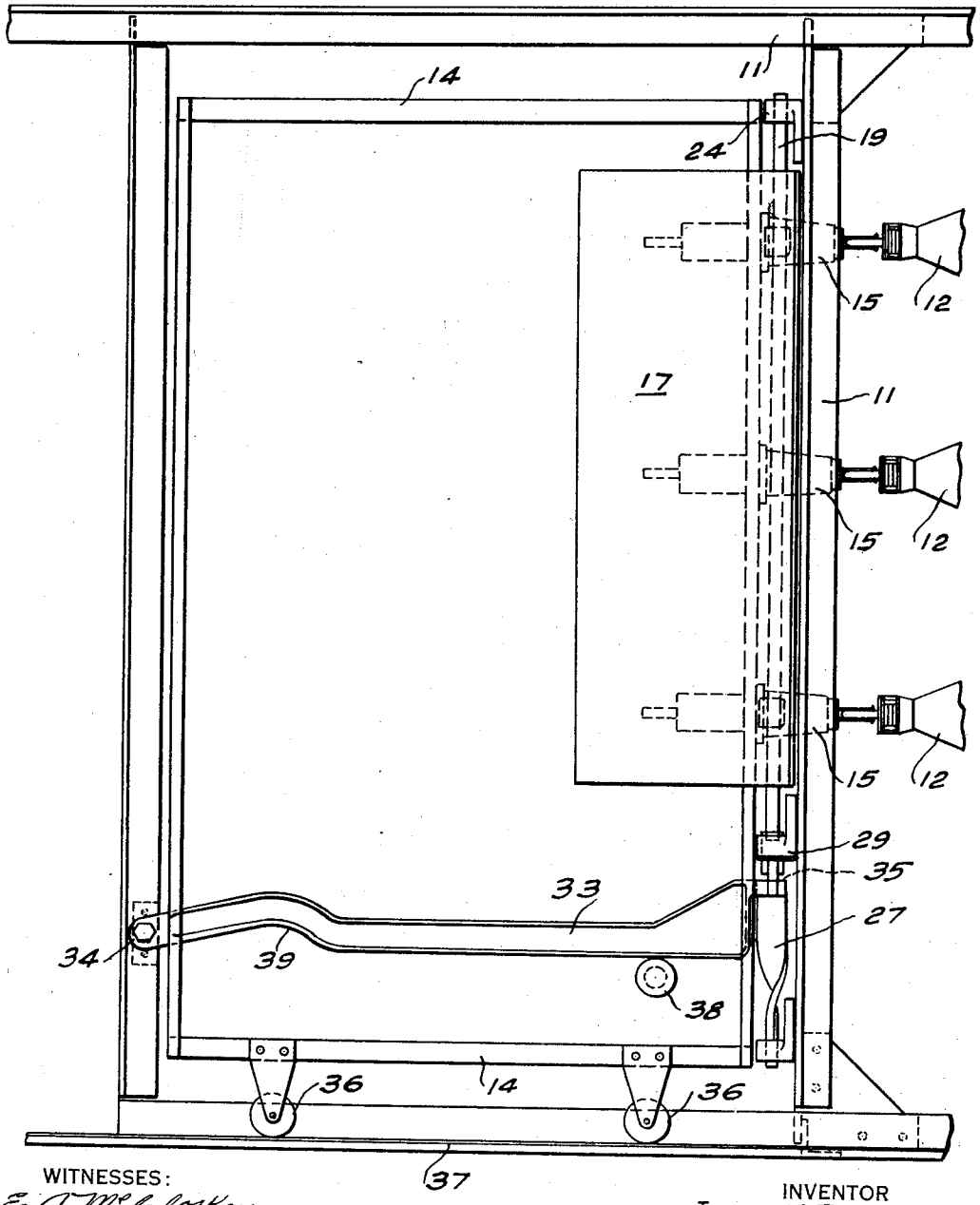
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SWITCH MECHANISM

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Fig. 5.



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UNITED STATES PATENT OFFICE

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SWITCH MECHANISM

Application filed November 1, 1926. Serial No. 145,650.

The invention relates to electrical switching mechanism and particularly to switch mechanism of the cell type.

One object of the invention is to provide a switch mechanism comprising two relatively movable structures having a partition therebetween that shall be positively opened and closed in response to movement of the structures toward and away from each other to prevent access to the electrically energized parts in one structure when the other structure is separated therefrom.

Another object of the invention is to provide a switch mechanism comprising a pair of relatively movable structures having a partition disposed therebetween and that shall be opened and closed in response to relative movement of the structures and means for independently opening and closing the partition when the structures are separated.

It is a further object of the invention to provide a switch mechanism having the above characteristics that shall be practical in its operation and inexpensive to manufacture.

Switch mechanism of the cell type usually comprises a stationary or fixed structure that is divided into one or more compartments in which the terminals of the power lines and other current-conducting parts are disposed, and a relatively movable structure that carries the circuit interrupters, meters and other well-known switchboard apparatus which are adapted to engage and co-operate with the corresponding apparatus mounted in the stationary compartment or compartments. It is desirable, in this class of switch mechanism, to so cover the entrances to the electrically energized parts when the movable structure is separated from the stationary structure that no live parts of the stationary structure shall be exposed.

Heretofore, it has been the practice to provide partitions between the relatively movable structures that are bolted or otherwise rigidly fastened to the stationary structures. Openings in such partitions are provided with shutters that are automatically operated to a closed or an open position in response to the movement of the movable structure toward and away from the stationary structure. In practice, it has been found that it is often necessary to obtain access to the apparatus disposed in the compartment or compartments of the stationary structure for the purpose of inspection or repairs after the enclosed main circuit interrupter has been opened. In order to gain access to the apparatus located in the stationary structure heretofore employed, it has been necessary to remove the partition by disconnecting the bolts or other means utilized for fastening the partition to the stationary structure.

According to the invention, the partition may be actuated to render complete access to the electrical apparatus in the associated compartment by the operation of a lever and cooperating mechanism.

These and other objects that will be made apparent throughout the further description of the invention are accomplished by means of the apparatus hereinafter described and illustrated in the accompanying drawings, wherein;

Fig. 1 is an elevational view of a switch cell embodying the invention, the front wall being removed.

Fig. 2 is a sectional view of a detail of the switch cell taken along the section line II—II of Fig. 1.

Fig. 3 is an enlarged elevational view of the details shown in Fig. 2.

Fig. 4 is a side elevational view of a cell structure embodying the invention, showing the partition in a closed position and the switch structures in an intermediate separated position, and

Fig. 5 is a view similar to Fig. 4, showing the partition in an open position and the switch structures in closed positions.

In practicing the invention, there is provided a switch mechanism of the cell type comprising a stationary or fixed structure divided into one or more compartments, in which electrical terminals and other current-conducting parts are disposed, and a relative movable structure in which electrical terminals, meters, and other well-known switchboard apparatus are disposed. The terminals mounted in the stationary structure are adapted to engage and co-operate with cor-

responding terminals mounted on the movable structure. A partition, comprising a pair of pivotally mounted sections, is adapted to cover the entrance to the electrically energized parts disposed on the fixed structure when the movable structure is separated therefrom. Means are provided for automatically operating the pivotally mounted sections in accordance with the movement of the movable structure.

Referring to Figs. 1, 4 and 5 of the drawings, the invention comprises a stationary or fixed structure 11 divided into one or more compartments, in which electrical terminals 12 and other current-conducting parts are disposed, a relatively movable structure 14 in which electrical terminals 15 and other well-known switch-board apparatus are disposed for co-operation with the corresponding terminals 12 mounted in the stationary structure 11. A partition, comprising pivotally mounted sections 16 and 17, is adapted to cover the entrance to the structure 11 containing the electrically energized parts when the movable structure 14 is separated therefrom.

Referring to Figs. 1, 2 and 3, the sections 16 and 17 are rigidly mounted on rods 18 and 19 by means of members 21 and 22, respectively. The rods 18 and 19 are journalled in bearing blocks or brackets 23 and 24, respectively, with which the frame 11 is provided. The rods 18 and 19 are provided at their lower ends, with helical strips 26 and 27, respectively, the ends of which have a substantially 90° relation to each other. The helical strips 26 and 27 are fastened to the rods 18 and 19 by means of couplings 28 and 29, respectively, each of which comprises a bracket 31 fastened to the structure 11 having a rotatable bushing 32 for receiving the rod 18 or the rod 19 at one end and the helical strip 26 or the strip 27 at the other end.

A lever 33 is provided on each side of the structure 11 and is secured thereto by means of a pivot 34. Each of the levers 33 is provided at its free end with a slot 35 that has substantially the shape of the horizontal cross-section of the helical strips 26 and 27, and engages the corresponding helical strips, as shown in Figs. 4 and 5.

Referring to Figs. 4 and 5, the movable structure 14 is supported upon wheels 36 that engage rails 37, constituting the bottom of the frame-work of the stationary cell 11, in order that it may be moved into, and out of, the stationary cell 11. The movable structure 14 is provided with rollers 38 for engaging the levers 33. Each of the levers 33 is provided with a curved portion 39.

As the structure 14 is moved towards the structure 11, the rollers 38, which are mounted in the structure 14, roll along the lower surfaces of the levers 33, and, by reason of the curved portions 39 they raise the free ends of the levers as shown in Fig. 5. The helical strips 26 and 27, being disposed in the slots 35 of the levers 33, are turned, thereby to cause the pivotally mounted sections 16 and 17 to move to their open positions, thereby rendering the terminals 15, located on the movable structure 14, accessible to the corresponding terminals 12 located on the stationary structure 11.

Referring to Fig. 4, upon separating the structures 11 and 14, the rollers 38 move outwardly along the lower edges of the levers 33, past the curved portion 39 and permit the free ends of the levers 33 to move in a downward direction. The levers 33 are biased to a downward position by means of springs, the force of gravity, or equivalent means. The downward movement of the levers 33 turns the helical strips 26 and 27 that are disposed in the slots 35, thereby moving the sections 16 and 17 to their closed positions.

According to the foregoing description, partition between the two switch structures 11 and 14 comprises sections 16 and 17 and is automatically closed or opened in response to the movement of the structures away from, or towards the other.

It is often necessary to obtain access to the apparatus disposed in the compartments of the stationary structure 11 for the purpose of inspection or repairs after the main circuit-interrupter has been opened. According to the invention, the levers 33, may be raised or lowered when the structures 11 and 14 are separated for opening the sections 16 and 17, thereby obtaining access to the compartments 11.

Accordingly, there has been devised shutters for cell-type switch structures that are automatically operated in accordance with the movements to engagement and separate positions of the fixed and movable parts of the cell structure.

While there has been described and illustrated one embodiment of the invention, it will be apparent to those skilled in the art that various changes, modifications, substitutions, additions and omissions may be made in the apparatus illustrated without departing from the spirit and scope thereof as set forth in the appended claims.

What is claimed is:

1. The combination with a pair of relatively movable structures having cooperating contact members thereon, of a partition disposed between said structures and comprising a plurality of vertical, pivoted shutter members, each having a helical cam thereon and a lever pivoted to one of the structures and movable by the other structure for co-operating with the cam to impart a turning movement to the shutters when the lever is operated.

2. The combination with a pair of relatively movable structures having cooperating contact members thereon, of a partition

disposed between the said structures and comprising a plurality of pivotally mounted sections, each having a helical strip thereon, and a slotted lever pivoted to one of the structures and movable by the other structure for cooperating with the helical strip to impart a turning movement to the sections when the lever is operated.

3. In a switchboard device, the combination with a stationary structure having a partition therein comprising a plurality of pivotally mounted sections, each having a helical strip thereon, slotted levers disposed on the sides of the stationary structure and adapted to engage the helical strips, of a relatively movable truck structure having means for operating the slotted levers whereby the said partition sections are positively moved to an open or to a closed position in response to relative movement of the said structures toward and away from the other.

In testimony whereof, I have hereunto subscribed my name this 27th day of October, 1926.

JANE D. BROWN,
Administratrix of the Estate of James M. Brown, Deceased.