No. 745,760. PATENTED DEC. 1, 1903.

G. BAEHR.

LEVER CONTROLLER.

APPLICATION FILED AUG. 6, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

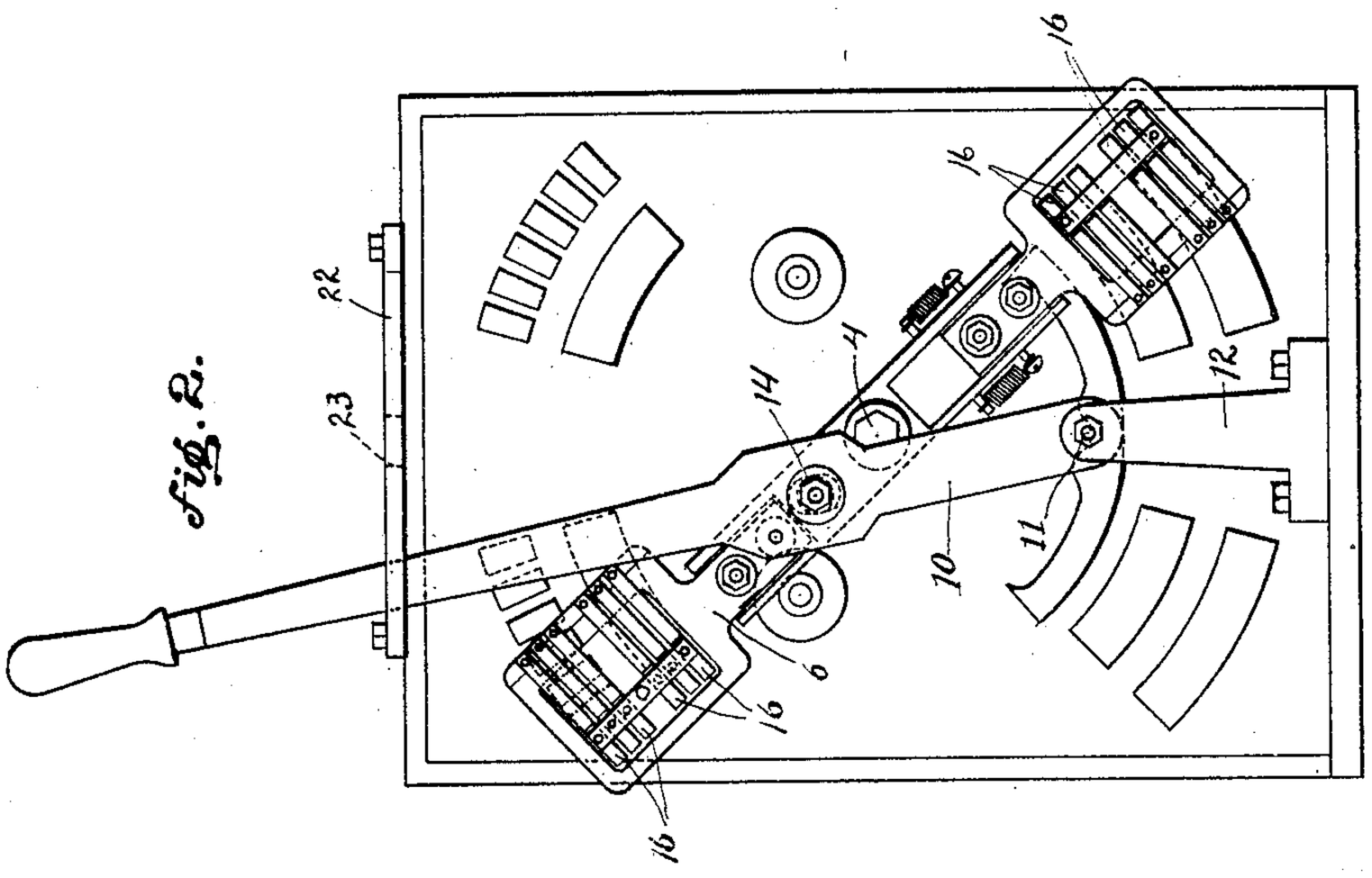

Fig. 2.

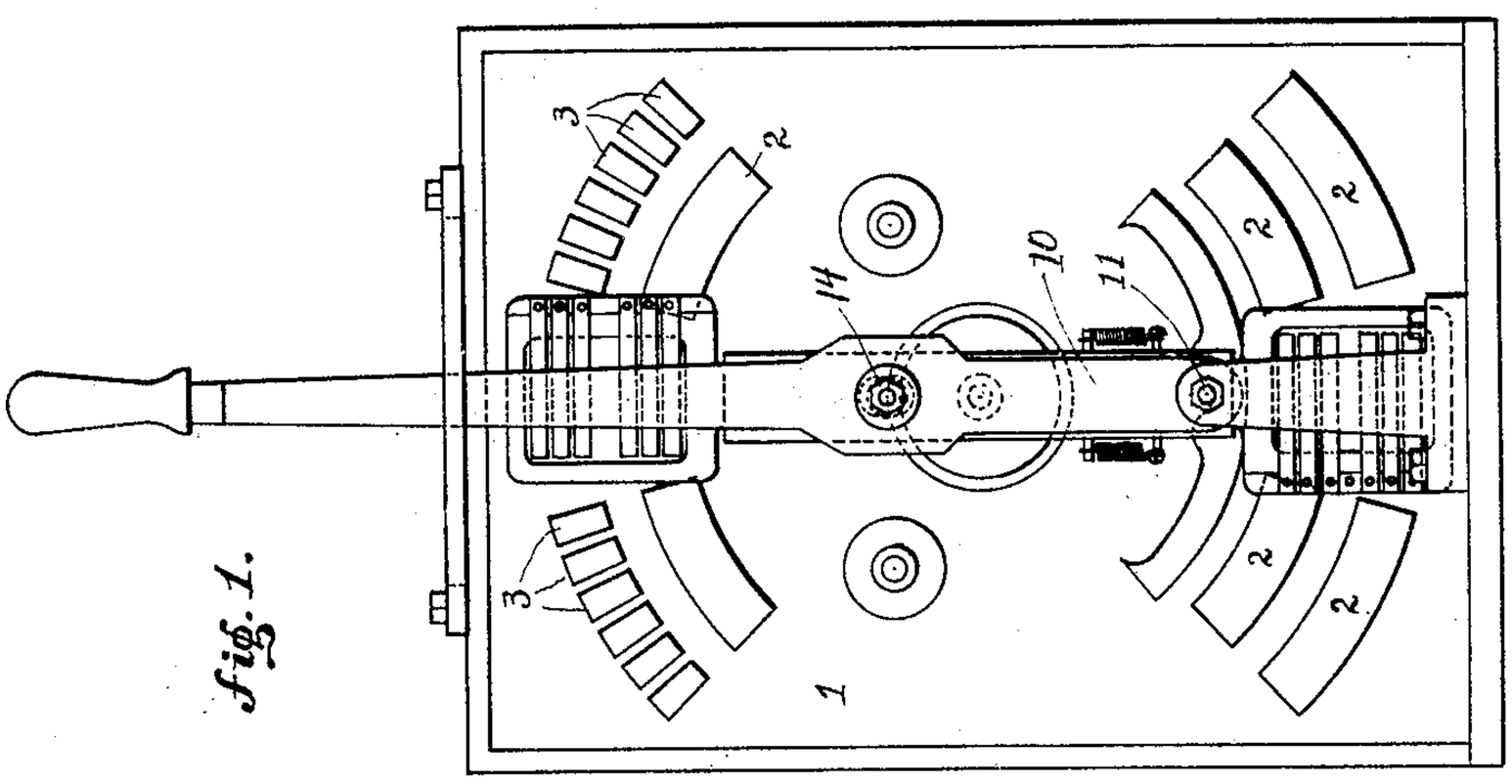

Fig. 1.

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NO MODEL. 2 SHEETS—SHEET 2.

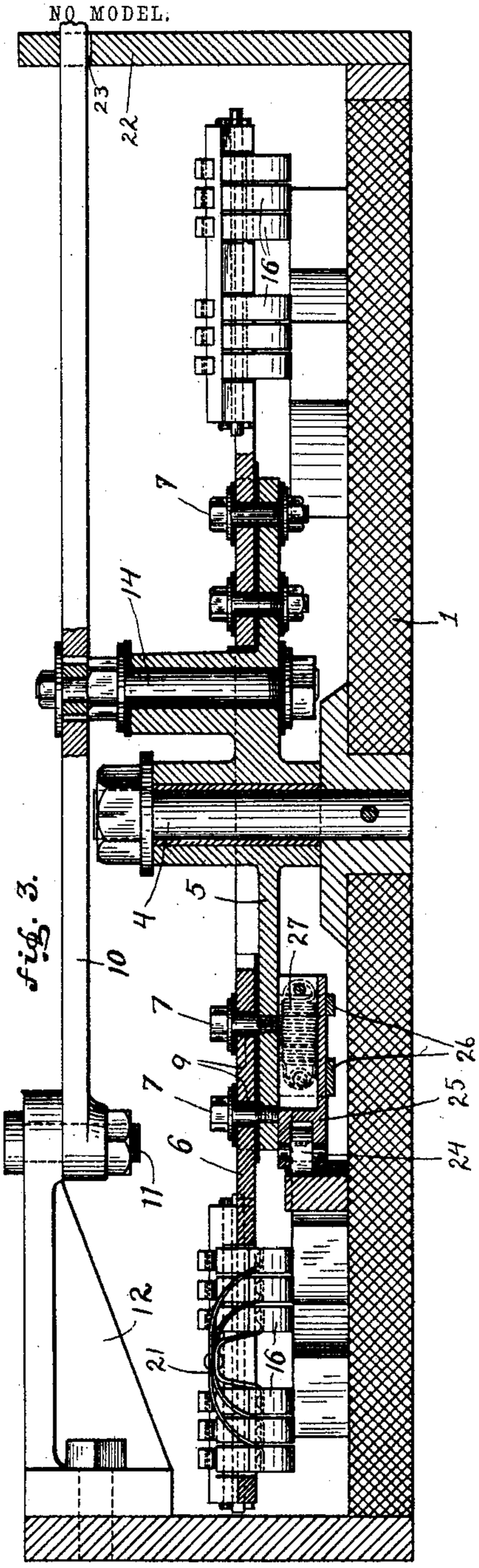

Fig. 3.

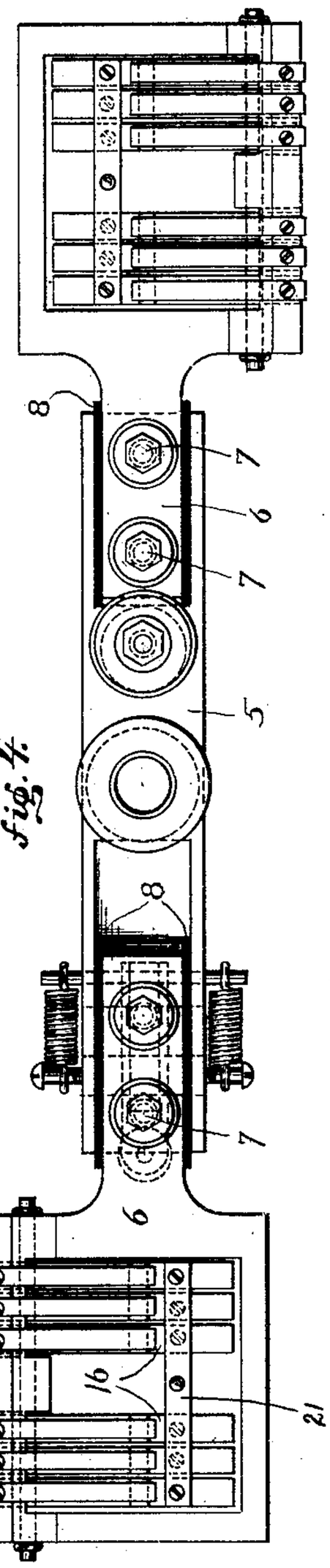

Fig. 4.

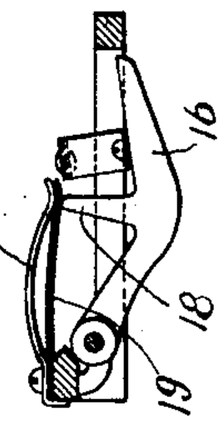

Fig. 5.

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No. 745,760. Patented December 1, 1903.

UNITED STATES PATENT OFFICE.

GEORGE BAEHR, OF McKEESPORT, PENNSYLVANIA, ASSIGNOR TO NATIONAL TUBE COMPANY, OF NEW YORK, N. Y., AND PITTSBURG AND McKEESPORT, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

LEVER-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 745,760, dated December 1, 1903.

Application filed August 6, 1902. Serial No. 118,563. (No model.)

To all whom it may concern:

Be it known that I, GEORGE BAEHR, a resident of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Lever-Controllers; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to electric controllers, and more especially to those of the lever type. Its object is to provide a controller wherein all of the parts are thoroughly insulated, so as to prevent short-circuiting and grounds or shocks to the operator, which is so constructed that it cannot readily get out of repair, or, if it does, the parts are so connected together and located that all are readily accessible, so that repairs can be quickly made.

A further object of my invention is to provide a lever-controller wherein the switch-blade is given a very rapid movement compared to the movement of the hand of the operator, so as to prevent the formation and maintenance of arcs.

In the accompanying drawings, Figure 1 is a face view of a switchboard and my improved lever-controller applied thereto. Fig. 2 is a similar view showing the switch-blade in a different position from that shown in Fig. 1. Fig. 3 is a vertical transverse section of the switchboard and controller. Fig. 4 is a plan view of the switch-blade, on an enlarged scale; and Fig. 5 is a cross-section of the same on the line 5 5, Fig. 4.

The switchboard is shown at 1, and this will preferably be formed of slate, as is usual, and will have secured thereto the contact-strips 2 and contact-blocks 3, four sets of such strips and blocks being shown, as indicated. The switch-blade is mounted on the switchboard by means of the bolt 4, and said blade comprises a body 5, through which said bolt passes, said body having its two ends preferably formed as channels, as shown. The contact-fingers of the blade are mounted on the carriers 6, which are provided with shanks fitting in the channels of the body 5. They are secured therein by means of the bolts or screws 7 and are thoroughly insulated therefrom by the layers of insulation 8, which fit into the channels of the body and project up at the edges of the shanks of the carriers 6. The screws or bolts 7 are insulated from the carriers 6 by means of suitable bushings and washers 9, of insulating material. The operating-lever is shown at 10, pivoted, as at 11, on a bracket 12, rising from the base of the switchboard. It is connected to the switch-blade by means of the bolt 14, which is also thoroughly insulated from the blade. This bolt, as shown, is connected to the switch-blade comparatively near the pivotal point 4 of said blade; but its point of connection to the operating-lever 10 is at a comparatively long distance from the fulcrum 11 of said lever. The movement of the lever 10 will move the connecting-bolt 14 through a given distance, and as this bolt is connected to the switch-blade very close to its pivotal point the distance of movement of the contact-fingers, which are mounted on the outer ends of the switch-blade, will be multiplied, and as a consequence a comparatively rapid movement will be given to said contact-fingers, thus preventing the formation or maintenance of arcs. The shorter the distance between the connecting-bolt 14 and the pivotal point of the switch-blade and the greater the distance between said connecting-bolt and the fulcrum of the lever 10 the greater will be the multiplication of this movement, and by varying this distance almost any desired speed or distance of movement of the contact-fingers can be secured with a comparatively short and slow movement of the operating-handle. The hole in the lever 10, into which the bolt 14 fits, is elongated, as shown in Fig. 3, to accommodate the movements of the lever 10 and blade 5 in arcs having different radii.

The contact-fingers are shown at 16, and they are pivotally mounted in the carriers 6, three fingers being shown in each set, although this is not absolutely necessary. These fingers are curved upwardly toward both ends,

so that they will readily ride over the contact-pieces 2 and 3, thus not only making the operation of the switch easier, but also preventing damaging or breaking the contact-fingers. They are held against the contact-pieces 2 and 3 by flat plate-springs 17, secured to the carriers and bearing on projections 18, formed on the fingers. To prevent the current passing through the springs 17, and thus destroying their resiliency, a strip of insulating material 19 is placed between each spring and the contact-finger upon which it bears. The contact-fingers of each set are connected to the contact-fingers of the companion set by means of flexible strips of conducting material, such as copper or brass 21, which strips are preferably bow-shaped, as shown in Fig. 3, and suitably united to the contact-fingers.

As above stated, four sets of contact strips and pieces 2 and 3 are employed, so that the current can be broken at two places and the direction of current can be reversed, depending upon which direction the controller is moved. When the blade is in the central position, as shown in Fig. 1, the contact-fingers do not rest upon any of the contact-strips, and this is therefore the "off" position of the controller. To indicate to the operator when this off position is reached and also to act as a sort of a check, so that he cannot move the switch beyond the off position without an effort, there is secured to the switchboard a segment 22, which is provided with a central notch 23. A suitable yielding detent in the form of a roller 24 is mounted on the switch-blade, said roller, as shown, being mounted on a slide 25, guided in loops 26, secured to the switch-blade, and being held against the segment by means of stiff spiral springs 27.

In the operation of the controller the lever 10 can be moved in either direction, depending upon the direction which the motor or other translating device is to be rotated. This movement of the lever will, through the connecting-bolt 14, impart movement to the switch-blade in the desired direction, said movement being multiplied in the manner hereinbefore described, so as to prevent the formation and maintenance of arcs. In the movement of the switch-blade the contact-fingers 16 lie over the contact strips and pieces 2 and 3, and by reason of the shape of said fingers they slide readily over such contact-strips without danger of breaking the fingers or injuring the contact-strips. Furthermore, the contact-fingers are so mounted on the switch-blade that they are readily accessible, so that should one be injured it can be quickly removed and another put in its place, thus greatly facilitating repairs and reducing the time during which the motor, which is controlled by the switch, need remain idle. All parts of the switch are very strongly constructed, so that even an ignorant laborer cannot readily injure the same, and all parts thereof are so thoroughly insulated that grounding of the current is prevented and shock to the operator by reason of such grounding is not possible.

What I claim is—

1. In a lever-controller, the combination with a pivoted switch-blade, of a pivoted actuating-lever, and a stud directly connecting the actuating-lever and switch-blade near the pivotal point of the latter, said stud being connected to one of said members and projecting into a substantially straight slot in the other member.

2. In a lever-controller, the combination with a pivoted switch-blade, of a pivoted actuating-lever, and a stud directly connecting the actuating-lever and switch-blade, said stud being connected to one of said members and engaging a straight slot formed in the other member, the distance between the pivotal point of the switch-blade and the point of connection of the stud thereto being less than the distance between the fulcrum of the actuating-lever and the connection of the stud thereto.

3. In a lever-controller, the combination with the contact-pieces, of a switch-blade, a contact-finger pivotally mounted thereon, a leaf-spring for pressing said fingers against the contact-pieces, a strip of insulating material between the said spring and the contact-finger, and securing means common to said spring and insulating-strip.

4. In a lever-controller, the combination with the contact-pieces, of a switch-blade, two sets of contact-fingers thereon and coöperating with the contact-pieces, said fingers being curved gradually toward both ends, and flexible conducting-strips uniting the fingers of the two sets.

5. In a lever-controller, the combination with the contact-pieces, of a switch-blade, two sets of contact-fingers thereon, and flexible conducting-strips uniting the fingers of the two sets.

6. In a lever-controller, the combination with a switchboard, two sets of contact-pieces thereon, a pivoted switch-blade moving over said two sets of contact-pieces, contact-fingers pivoted to said switch-blade on a pivot which is parallel to the axis of said switch-blade, said contact-fingers being curved toward both ends, flexible conducting-strips uniting the fingers of the two sets, and means for yieldingly holding said fingers against the contact-pieces.

7. In a lever-controller, the combination with a base having contact-pieces, of a switch-blade mounted thereon and insulated therefrom, a contact-carrier secured to said blade and insulated therefrom, and an operating-lever for said switch-blade.

8. In a lever-controller, the combination with a base having contact-pieces, of a switch-

blade mounted thereon, a contact-carrier secured to said blade and insulated therefrom, an operating-lever for said blade, and an insulated connection between said lever and said blade.

9. In a lever-controller, the combination with a base having contact-pieces, of a switch-blade mounted thereon and insulated therefrom, a contact-carrier secured to said blade and insulated therefrom, an operating-lever and an insulated connection between said lever and said blade.

In testimony whereof I, the said GEORGE BAEHR, have hereunto set my hand.

GEORGE BAEHR.

Witnesses:
A. M. STEEN,
G. C. RAYMOND.