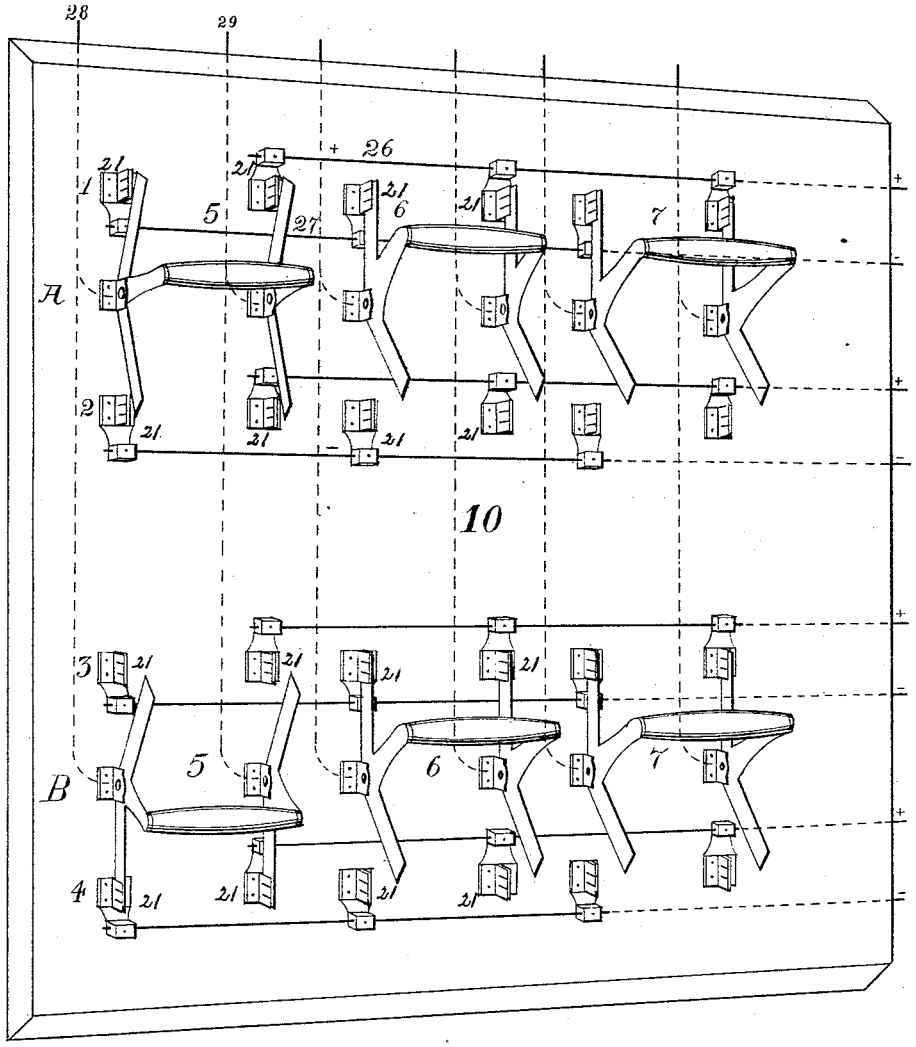
(No Model.) 2 Sheets—Sheet 1.

A. SECHRIST.

MULTIPLE SWITCH BOARD.

No. 385,826. Patented July 10, 1888.

Fig 1



WITNESSES:

Frank J. Hauga

INVENTOR,

Albert Sechrist

(No Model.)

2 Sheets—Sheet 2.

A. SECHRIST.

MULTIPLE SWITCH BOARD.

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Fig 2

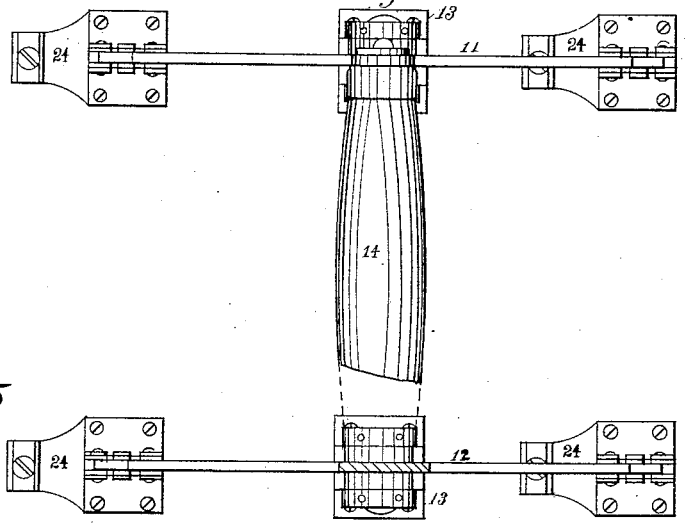


Fig 4

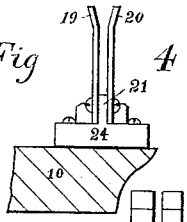


Fig 5

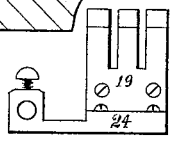


Fig 3

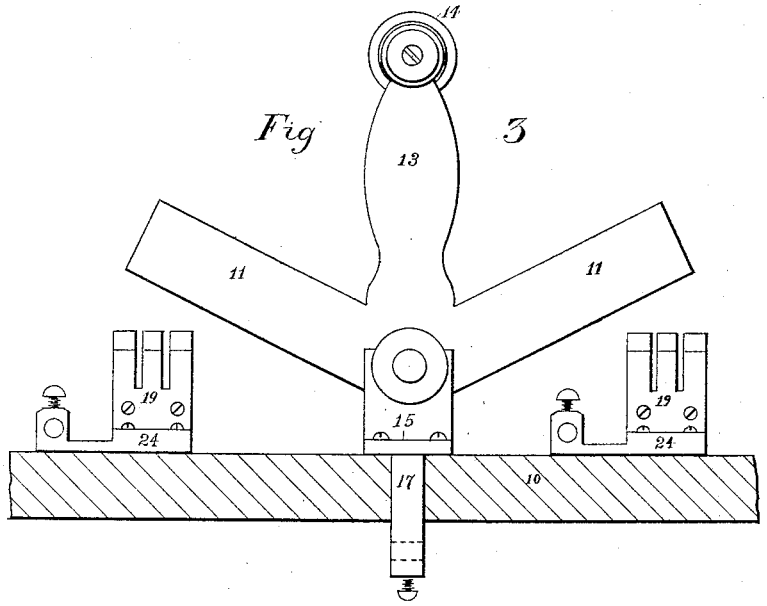
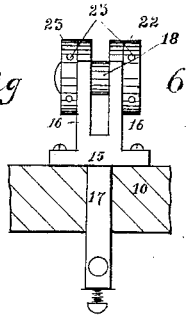


Fig 6



WITNESSES:

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Dennott.

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UNITED STATES PATENT OFFICE.

ALBERT SECHRIST, OF GREELEY, COLORADO.

MULTIPLE SWITCH-BOARD.

SPECIFICATION forming part of Letters Patent No. 385,826, dated July 10, 1888.

Application filed April 25, 1887. Serial No. 235,948. (No model.)

To all whom it may concern:

Be it known that I, ALBERT SECHRIST, a citizen of the United States, residing at Greeley, in the county of Weld and State of Colorado, have invented certain new and useful Improvements in Multiple Switch-Boards; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

In the electrical lighting by incandescence of an area or territory from a central station it is well known that the demand upon the central station varies largely during different hours of the lighting period, the quantity of current to be generated at any one time depending upon the number of lights in use at such time. It is usual, therefore, to provide several dynamos at the central station having a combined capacity equal to the greatest demand upon the station, and then to use a greater or less number of dynamos, as occasion requires. It is also usual to provide several circuits radiating from the central station, each having its own territory and allotted number of lights to feed. It happens from the variable number used that a dynamo whose capacity is at one time only equal to one circuit, at another, owing to the less number of lights used, is able to feed two or more circuits, economy then dictating the switching of such circuits from several dynamos to the one dynamo. Other causes often render it expedient to switch a lamp-circuit from one to another dynamo, or to exchange the lamp-circuits between several dynamos. It is desirable, therefore, to provide in such central stations a switching device which enables the ready transfer of a lamp-circuit from one to another dynamo, and which is also capable of connecting any lamp-circuit proceeding from the station with any one or more of the dynamos located thereat, and which shall do this so quickly that no injurious effect upon the light from the lamps in the circuit—such as flashing or a momentary total cessation—shall follow the switching.

The object of my invention, therefore, is to provide such a switching device, and my invention relates thereto and consists in the features more particularly hereinafter described and claimed.

In practice, my invention forms what may be termed a "multiple switch-board," the unit of which may be considered my improved switch for connecting one circuit with either of two dynamos. This switch is formed of two parallel metallic bars pivoted at their centers and insulated from each other, but connected by one or more insulating bars or handles, so that both may be always held in the same relative position to each other and be simultaneously moved when required. The pivot of each bar is connected to one branch or wire of a circuit. At either extreme of the range of motion of these bars are placed suitable contact springs or anvils, one for each end of each bar, to impinge upon and form electrical connection. Those at one end are connected to the commutators of a dynamo—one to the positive and the other to the negative pole—while those at the other end are in like manner connected to second dynamo. With this construction, if the parallel bars composing the switch-frame be depressed at one end, they will impinge and form electrical connection with the contact anvil or springs at that end, thus connecting the circuit with one of the dynamos, and vice versa, while the relation of the switch-bars, pivots, and contacts is such that the switch-frame may be placed to occupy a position clear of the contacts at both ends, and thus break the connection of the circuit with both dynamos. If, now, a series of such unitary switches be mounted or secured upon a suitable base of non-conducting material and suitably connected, a multiple switch-board is formed by which any circuit thereon represented may be connected or disconnected readily and instantaneously with or from any dynamo represented thereon. In such case the switches should be mounted in rows, the number of rows being equal to the number of dynamos to be provided for divided by two, while the number in each row should be equal to the number of lamp-circuits, there being one switch in each row for each circuit. All of the contacts in a row representing one pole of a dynamo should be connected together, and all rep-

resenting the other pole should be also connected together, while all the pivots of the switch-frames representing one side of one circuit should be connected together, and all representing the other side be likewise connected together. This general construction may be more readily understood by reference to the accompanying drawings, which show suitable means for the embodiment of my invention, and in which—

Figure 1 is a perspective view of a multiple switch-board arranged for four dynamos and three circuits; Fig. 2, a top view of a single switch-frame and contacts; Fig. 3, a side view of Fig. 2; Figs. 4, 5, and 6, details of construction. In these drawings the reference-numeral 10 indicates any suitable base of non-conducting material.

The frame of a single switch is composed of two parallel bars, 11 12, preferably bent at their centers, so that an angle is formed, as shown in Fig. 3. From the center rises from each a standard, 13, the bar and standard being preferably formed of one piece of metal. Between the standards 13 of 11 and 12 is secured the insulating-handle 14, which unites the two bars 11 and 12, and by which they are simultaneously manipulated. Each bar is pivoted in a support, 15, which is secured to the insulating-base 10, there being an independent support for each bar. These supports are formed of a base having a tongue, 17, projecting rearwardly through the base 10, for affording opportunity of securing thereto the proper circuit-wires. From the base rise two standards, 16, between which the bar 11 or 12, as the case may be, fits at its apex. The bar is pivoted therein by a bolt, 18, passing therethrough and through the standards, a nut, 22, securing it at its end. As the standards 16 are somewhat resilient, the nut and bolt are formed so as to be readily loosened or tightened. In this illustration holes 23, so that pins may be inserted therein and the nut turned windlass fashion, are shown for that purpose, the effect being that the bars may be made as friction-tight in their bearings as is desired to prevent accidental displacement, while they may be readily rocked in such bearings by the designed application of force to the handle 14.

Upon the base 10 are secured contact anvils and springs 19 20 21, there being two for each bar, one at each end thereof, arranged so that the bars shall contact and form electrical connection therewith when sufficiently depressed in that direction. To insure good firm contact, not affected by jar and shake, these contacts are formed of a base, 24, for securement to the base 10, while a block, 21, rises therefrom and forms an anvil for the bar. On either side of this anvil 21 are secured split spring-fingers 19 20, which securely grip the bar when forced between them, and curve outwardly at the end to permit the ready passage of the bar between them, as shown in Fig. 4. As also shown in this figure, the spring-fingers 19 20 are made as separate pieces and fastened to the anvil 21 by screws or equivalent devices, so that if one should burn out or otherwise become injured it may be replaced. As the edge of the bar rests upon the anvil 21 and the fingers 19 20 grip firmly the sides of the bar, a reliable electrical connection is formed and maintained.

The pivot of bar 11 is connected to one branch of a circuit, while the pivot of bar 12 is connected to the other branch. Of the two contacts 21 at one end of the switch-frame, one is to be connected to one pole of a dynamo, while the other is to be connected to the other pole. There are the same connections for the contacts at the other end of the switch-frame to a second dynamo. It will readily be seen that each switch thus constructed is capable of connecting one lamp or translating circuit to either one of two dynamos, according as the switch-bars are fully depressed at one end or the other, and also that by placing the bars in a medium position, as shown in Fig. 3, the circuit is disconnected from both dynamos. In practice, by the application of sufficient force to the handle 14, the circuit being connected to one dynamo, the switch-frame may be so rapidly moved from one set of contacts to the other, transferring the circuit from the first to the second dynamo, that no effect on the lights in the circuits will be noticeable, the current of the second being in full effect in the circuit before the effect of the first or cut-out dynamo has passed away.

To accommodate a station having a number of dynamos and a number of radiating circuits, a convenient and exceedingly practical arrangement of a number of these switches, forming a multiple switch-board, is shown in Fig. 1. In this figure, for convenience, is illustrated a switch-board for a central station having four dynamos and three outside or translating circuits, the switches being arranged in rows. The number here shown is merely arbitrary and for convenience, as a greater number of either may be used, these rows being equal in number to the number of dynamos divided by two, or if the quotient thereof be a fraction then the number of rows will be the next greater whole number, while the number in each row is equal to the number of circuits to be controlled. In this case, a station of four dynamos and three circuits being taken for illustration, there are two rows, A B, of switches, with three, 5 6 7, in each row. The rows of dynamo-contacts are represented by 1 2 3 4. In each row the contacts corresponding to one pole of the dynamo are connected together—as, for instance, those corresponding to the positive pole by the bar 26 and those corresponding to the negative pole by the bar 27. Such connections may be made by forming an eye on the base 24 and securing a rod therein, as shown in Fig. 1, or by soldering or securing directly to the bases. As before stated, there is in each row a switch-frame for each circuit to be controlled, (designated in both rows in Fig. 1 by

similar numbers in each row.) The pivotal connections on one side of all the switches for controlling a circuit are connected together, as likewise are those on the other side, as shown by the dotted lines 28 29. It can be readily comprehended from this that any one or more of the circuits 5 6 7 may be connected to or disconnected from any of the dynamo-circuits 1 2 3 4 as needed, and any desired shifting or switching or permutation of circuits between the four dynamos and three circuits be easily, effectually, and quickly made.

It is evident that the exact angle of the bars 11 12 is immaterial—that they may in fact be straight—and that the handle 14 may connect them at any readily accessible point, and that there may be more than one such handle, acting as a connecting-brace between them. I have preferred the angular form, as by its use the support 15 may be of less height, and, being brought near the supporting-base 10, greater firmness is secured.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A switch or circuit-changer consisting of two conducting-bars, two independent and separate standards, one for each bar, and in which such bar is centrally pivoted, the standards being placed parallel to each other and forming the terminals of an electric circuit, an insulating cross-bar or handle extending between and secured to the conducting-bars, and adapted to be grasped by the hands, and sets of contact-springs, one at the limit of motion in either direction of either conducting-bar, substantially as set forth.

2. A multiple switch-board having a row of switches, each suitably composed of parallel pivoted bars united by an insulating cross-bar or handle, the bars being connected in different branches of the same circuit, and sets of contact anvils or springs, one at each end of the bars, the sets being connected in the circuits of different sources of electricity, and connections between each switch of the row of switches electrically connecting all the corresponding parts of the switches in the row, substantially as set forth.

3. A multiple switch-board having two or more rows of switches, each switch composed of parallel pivoted bars united by an insulating cross-bar or handle, the bars being connected in different branches of the same electrical circuit, and sets of contact anvils or springs, one at each end of the bars, the sets being connected in the circuit of different sources of electricity, connections electrically connecting all the corresponding contacts from the sources of electricity in each row, and connections electrically connecting the corresponding parts of the corresponding switches in the different rows, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT SECHRIST.

Witnesses:
R. M. McDERMOTT,
Z. T. WILBER.