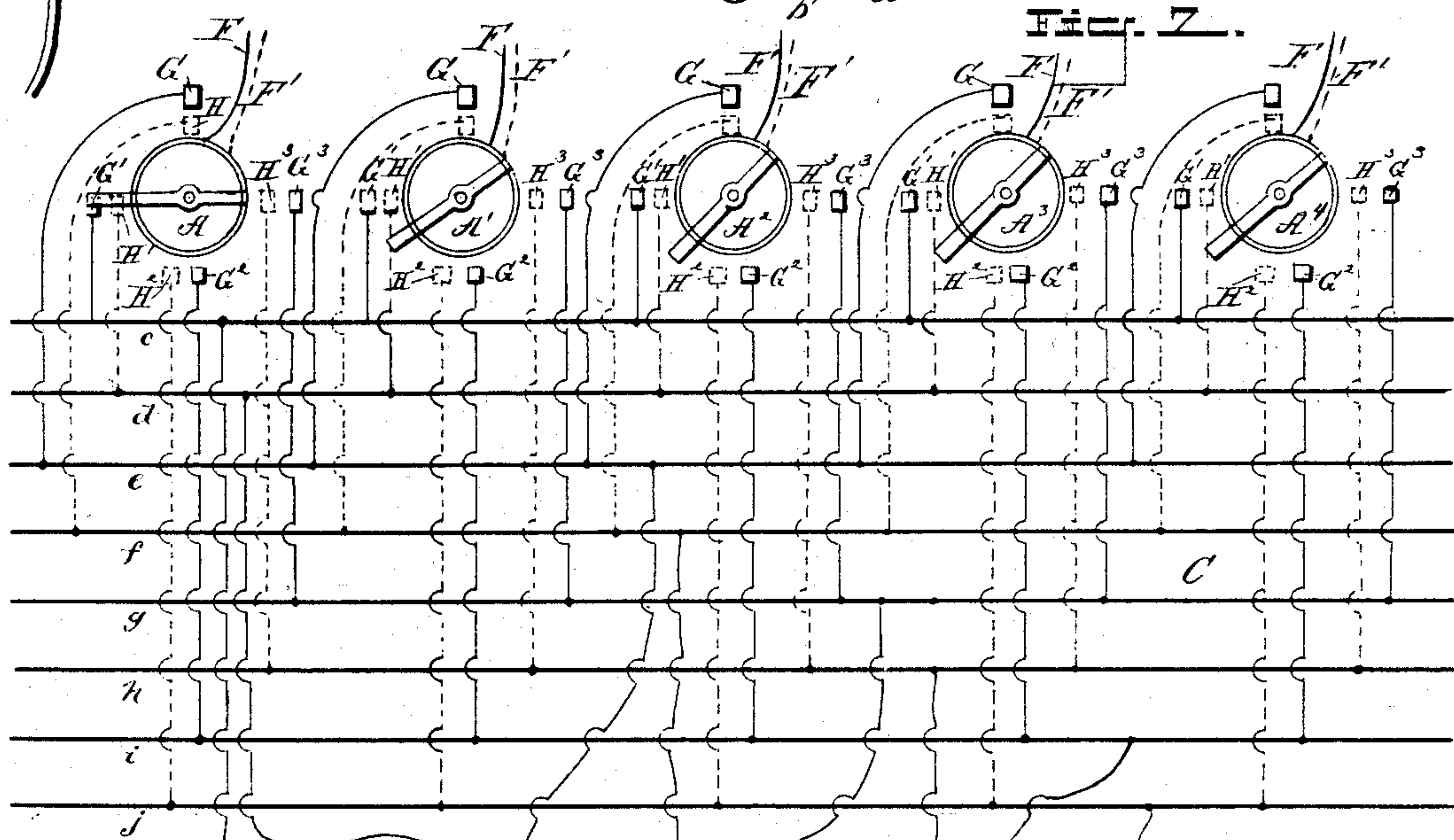
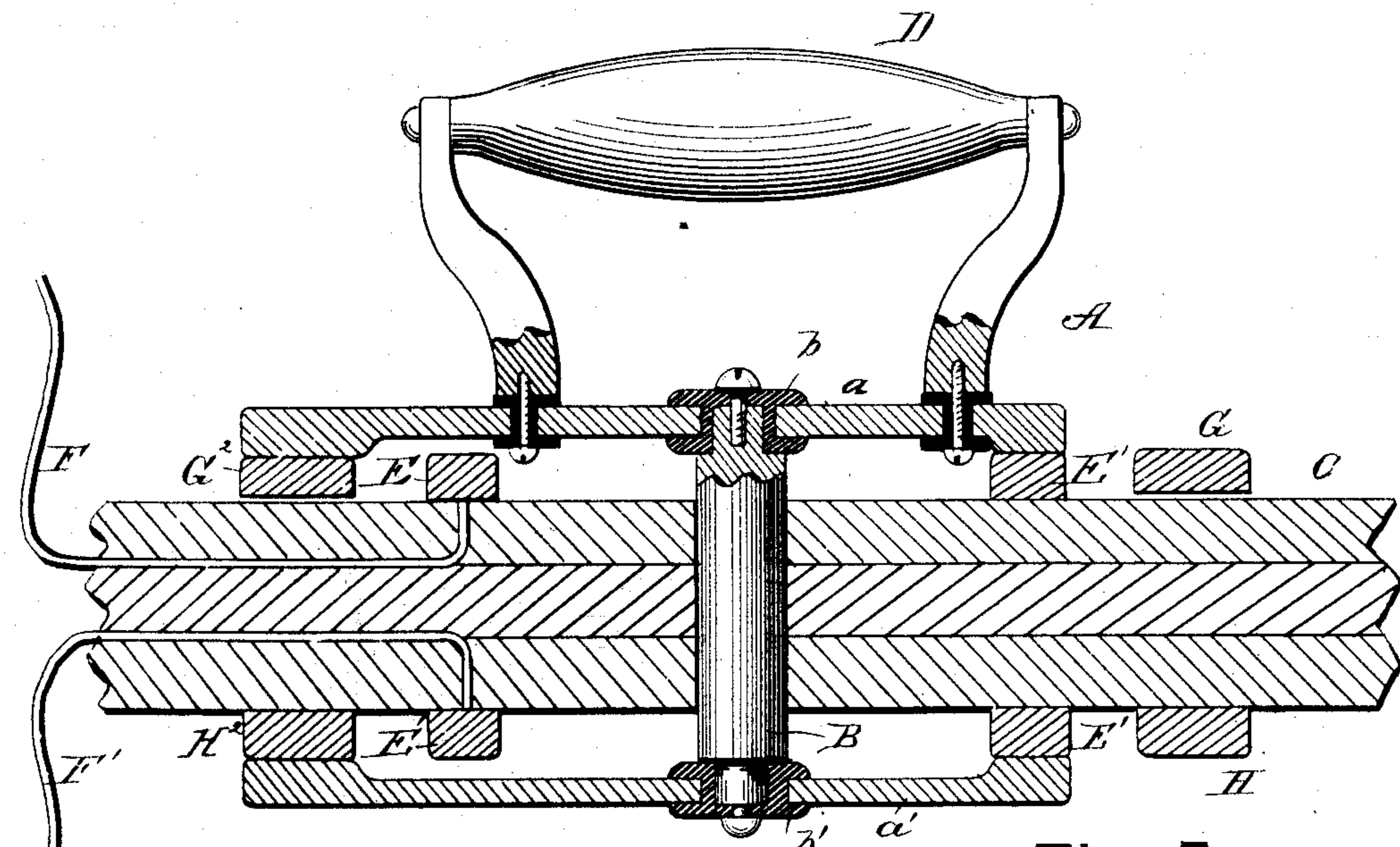


W. M. STEWART.
SWITCH BOARD.

No. 421,114.

Patented Feb. 11, 1890.

Fig. 1.



WITNESSES:

O. W. Mott
C. Bedgwick

INVENTOR:

W. M. Stewart
BY Munn & Co

ATTORNEYS.

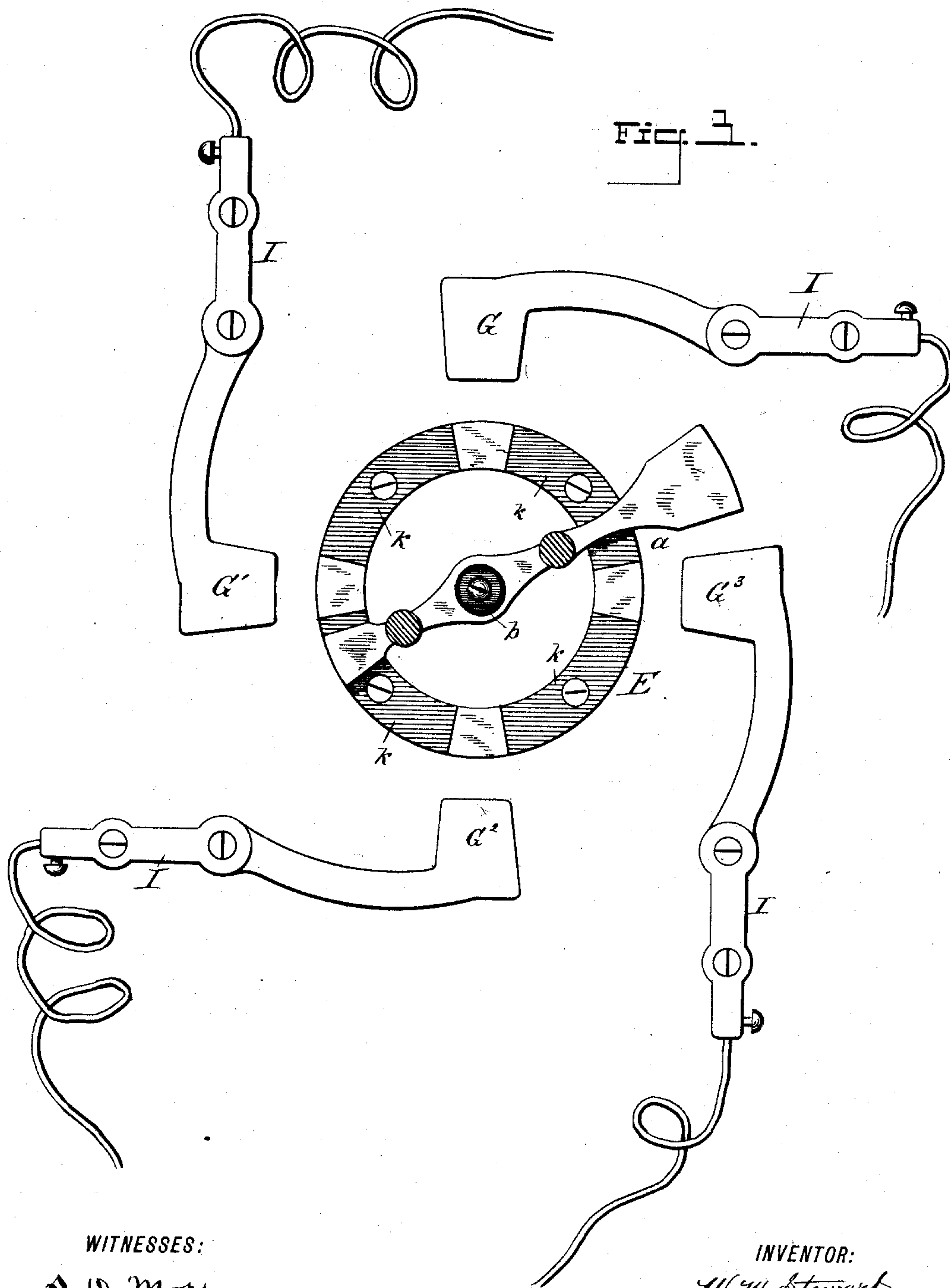
(No Model.)

3 Sheets—Sheet 2.

W. M. STEWART.
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WITNESSES:

D. D. Mott
C. Sedgwick

INVENTOR:

W. M. Stewart

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ATTORNEYS.

(No Model.)

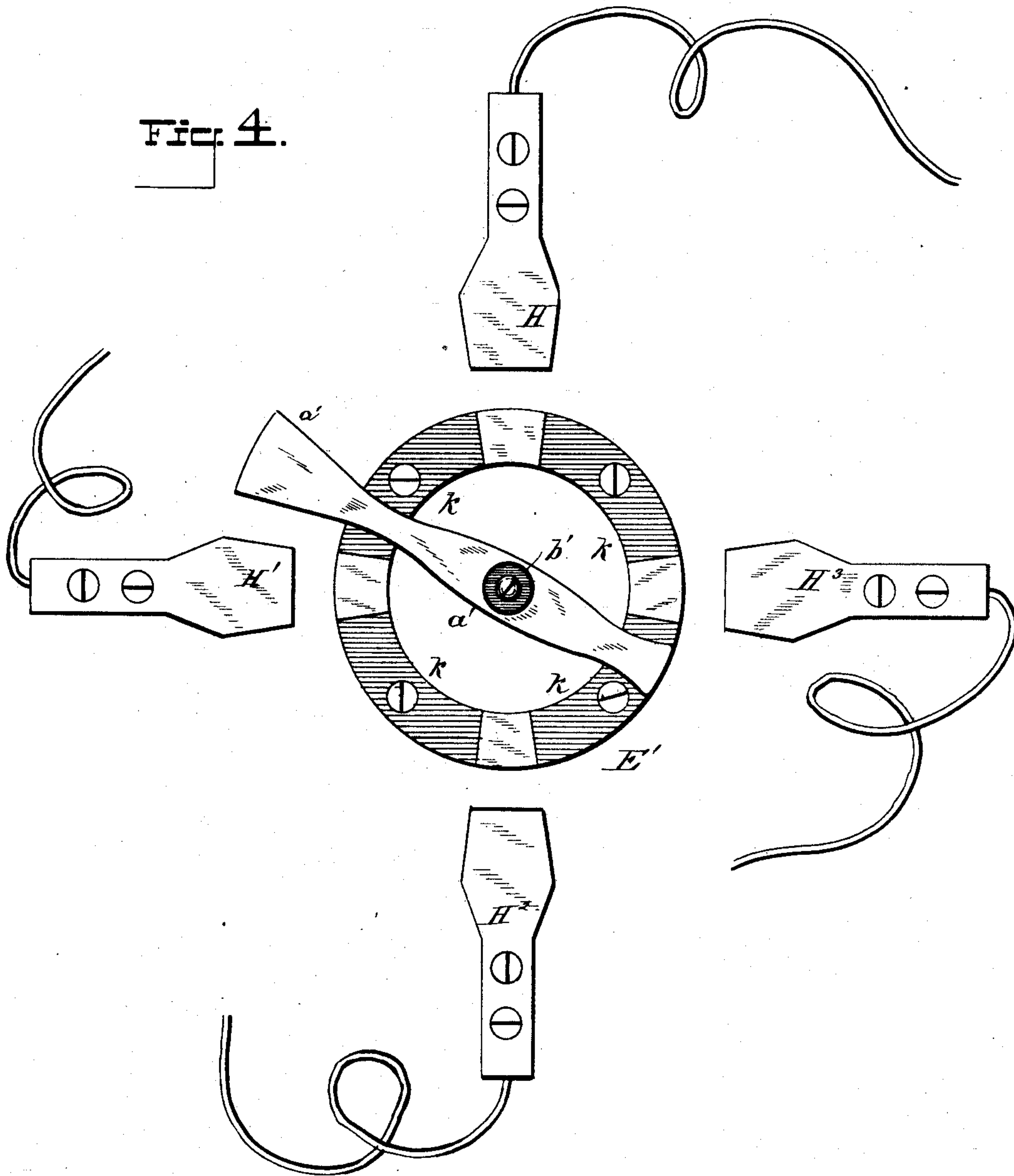
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W. M. STEWART.
SWITCH BOARD.

No. 421,114.

Patented Feb. 11, 1890.

Fig. 4.



WITNESSES:

J. D. Math
C. Sedgwick

INVENTOR:

W. M. Stewart

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM M. STEWART, OF SCHENECTADY, NEW YORK.

SWITCH-BOARD.

SPECIFICATION forming part of Letters Patent No. 421,114, dated February 11, 1890.

Application filed June 21, 1889. Serial No. 315,051. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. STEWART, of Schenectady, in the county of Schenectady and State of New York, have invented a new and Improved Switch-Board, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a transverse section of the switch used in connection with my improved switch-board. Fig. 2 is a diagrammatic view of the switch-board. Fig. 3 is a front sectional elevation of the switch, and Fig. 4 is a rear elevation of the switch.

Similar letters and figures of reference indicate corresponding parts in all the views.

The object of my invention is to construct a switch-board for central electric-lighting stations using alternating electric currents or currents of high electro-motive force, the said switch-board being designed to make connection between any of the dynamos of the station and any of the circuits running out of the station, so that if for any reason it becomes desirable any or all of the circuits may be switched onto other dynamos.

My invention consists of a switch having two switch-levers connected by a spindle, but insulated therefrom, each lever having a long and a short arm and having contact-points adapted to be engaged by the long arms and short arms, the said contacts being arranged in two concentric circles upon either side of the board, the contacts of the shorter arms being connected with the feeders of the outside circuit, and the contacts of the longer arms being connected with the different dynamo-conductors.

The invention also consists in the combination, with a series of such switches, of parallel conductors connected with a series of dynamos, and other conductors connected with the parallel conductors at right angles and in electrical communication with the contact-points of the switches.

I will first describe in detail the switch, and will afterward trace the connections upon the switch-board.

The levers $a a'$ of the switch A are connected with a spindle B, passing through the switch-board C, and the said levers are separated

from the spindle B by insulating-collars $b b'$. The outer switch-lever a is furnished with a handle D, which is insulated from the lever to prevent injury to the operator. Upon opposite sides of the board C are placed metallic rings E E', which are in electric contact with the shorter arms of the levers $a a'$. The rings E E' are connected with the feeders F F', which supply the external circuit.

Surrounding the rings E E' are arranged contacts G G' G² G³ H H' H² H³. The contacts G, &c., are upon the front side of the board, and the contacts H, &c., are on the back side. The levers a are arranged to touch the points of the contacts on the front of the switch-board C, and the levers a' are arranged to touch the contacts upon the back of the switch-board, so that by turning the handle D the long arms of the levers $a a'$ may be brought onto any pair of contacts upon the front and back of the switch-board, and the shorter arms of the said levers will touch the rings E E'.

The dynamos 1 2 3 4 are connected with the parallel conductors $c d e f g h i j$, the terminals of the dynamo 1 being connected electrically with the wires $c d$, those of the dynamo 2 with the wires $e f$, those of the dynamo 3 with the wires $g h$, and those of the dynamo 4 with the wires $i j$. The front contacts G G' G² G³ of the switch A are connected, respectively, with the conductors $e c i g$, and the back contacts H H' H² H³ are connected, respectively, with the conductors $f d j h$. In a similar way the corresponding contacts of the switches A' A² A³ are connected with the wires $c d f$, &c. The contacts G G' G² G³ upon the front of the switch-board are each pivoted in a support I, attached to the face of the switch-board and adapted to receive the conductor connecting it with one of the parallel conductors of the switch-board. The pivoting of these contacts permits of turning them out of the way when from any cause it is not desirable to make a connection.

The rings E E' are provided with segmental pieces k of insulating material let into the faces of the rings to prevent a continuous metallic contact of the shorter arms of the levers $a a'$.

The operation of my improved switch-board

is as follows: If dynamo 1 be delivering a current through the conductors *c d* and contacts *G' H'* to the feeders *F F'* of the switch *A*, and the other dynamos are running normally or idle, and if dynamo 1 should fail, or if for any reason it is desirable, then the switch *A* would be immediately turned to another pair of contacts, (say, for example, *G H*), which would throw the feeders *F F'* into communication with dynamo 2 through the conductors *e f*. The same would be true of any of the switches or any of the dynamos, so that should any change be desired between dynamos and circuits it can be made instantly, thereby preventing any noticeable break in the continuity of the illumination.

Although I have shown my invention in connection with four dynamos and five circuits, I do not limit myself to this number, as any number of dynamos and circuits may be connected in a similar way.

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

1. In a switch, the combination of two switch-levers connected together by a common spindle, but insulated from each other and

having long and short arms, two annular contacts normally pressed by the shorter arms of the switch-levers, and two series of contacts arranged to be touched by the longer arms of the said levers, substantially as described.

2. In a switch, the combination of two switch-levers connected together by a common spindle, but insulated from each other and having long and short arms, two annular contacts normally pressed by the shorter arms of the switch-levers, and two series of contacts arranged to be touched by the longer arms of the said levers, the said annular contacts being connected with the feeders of the outside circuit, and the series of contacts being connected with the terminals of a series of dynamos, substantially as specified.

3. The combination of a series of switches *A, A', A², and A³*, each furnished with a series of contacts *G G' G² G³ H H' H² H³* and the annular rings *E E'*, the dynamos 1 2 3 4, the conductors *c d e f g h i j*, and the intermediate connections, substantially as specified.

WILLIAM M. STEWART.

Witnesses:

H. W. DENNINGTON,
D. J. DE CAMP.